

Gonzales Community Center Complex

PART 2C - CRITERIA DOCUMENTS

Technical Specifications

Volume 3 of 3

100% DESIGN CRITERIA DOCUMENTS

MARCH 31, 2022

Architect's Project Number 21566-01

Group 4 Architecture Research + Planning, Inc.
211 Linden Avenue
South San Francisco, CA
(650) 871-0709

VOLUME 1

DOCUMENT 00 01 10 - TABLE OF CONTENTS

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS
(PROVIDED BY SWINERTON)

DIVISION 01 – GENERAL REQUIREMENTS
(PROVIDED BY SWINERTON)

VOLUME 2 – PERFORMANCE CRITERIA – DESIGN GUIDELINES

PART 1 PROJECT OVERVIEW AND PROGRAM

- 1-1 Project Overview
- 1-2 Alternates
- 1-3 Room Summary List
- 1-4 Building Program Summary

PART 2 SYSTEMS CRITERIA NARRATIVES

- 2-1 Civil
- 2-2 Landscape
- 2-3 Architecture
- 2-4 Structural
- 2-5 Mechanical and Plumbing
- 2-6 Electrical, Lighting, Low Voltage

VOLUME 3 – PERFORMANCE CRITERIA – SPECIFICATIONS

DIVISION 02 – EXISTING CONDITIONS (NOT USED)

DIVISION 03 – CONCRETE

SECTION 03 20 00 CONCRETE REINFORCEMENT
SECTION 03 30 00 CAST-IN-PLACE CONCRETE

DIVISION 04 – MASONRY

SECTION 04 27 31 REINFORCED UNIT MASONRY

DIVISION 05 – METALS

SECTION 05 12 00 STRUCTURAL STEEL
SECTION 05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING
SECTION 05 12 19 BUCKLING RESTRAINED BRACES
SECTION 05 31 00 STEEL DECK
SECTION 05 40 00 COLD-FORMED METAL FRAMING
SECTION 05 50 00 METAL FABRICATIONS
SECTION 05 53 00 METAL GRATINGS

SECTION 05 73 13 GLAZED DECORATIVE METAL RAILINGS

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

SECTION 06 10 53 MISCELLANEOUS ROUGH CARPENTRY
SECTION 06 41 00 ARCHITECTURAL WOODWORK
SECTION 06 64 13 FIBERGLASS-REINFORCED PLASTIC PANELS

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 07 21 00 BUILDING INSULATION
SECTION 07 24 13 POLYMER-BASED EXTERIOR INSULATION AND FINISH SYSTEM
(EIFS)
SECTION 07 27 26 WEATHER-RESISTIVE AIR BARRIERS
SECTION 07 42 10.21 CONTINUOUS INSULATION (CI) WITH COMPOSITE FRAMING
SUPPORT (CFS) SYSTEM
SECTION 07 42 13 METAL WALL PANELS
SECTION 07 42 43 COMPOSITE WALL PANELS
SECTION 07 42 53 PHENOLIC RAINSCREEN PANELS
SECTION 07 46 21 EQUIPMENT SCREENS
SECTION 07 54 23 THERMOPLASTIC-POLYOLEFIN ROOFING
SECTION 07 60 00 FLASHING AND SHEET METAL
SECTION 07 61 00 SHEET METAL ROOFING
SECTION 07 72 00 ROOF ACCESSORIES
SECTION 07 84 00 FIRESTOPPING
SECTION 07 92 00 JOINT SEALANTS

DIVISION 8 – OPENINGS

SECTION 08 11 13 HOLLOW METAL DOORS AND FRAMES
SECTION 08 11 16 INTERIOR ALUMINUM DOOR AND WINDOW FRAMES
SECTION 08 13 76 FOLDING METAL DOORS
SECTION 08 14 16 FLUSH WOOD DOORS
SECTION 08 31 13 ACCESS DOORS
SECTION 08 41 13 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
SECTION 08 42 30 SLIDING AUTOMATIC ENTRANCES
SECTION 08 44 13 GLAZED ALUMINUM CURTAIN WALLS
SECTION 08 71 00 DOOR HARDWARE
SECTION 08 81 00 GLASS GLAZING
SECTION 08 91 00 WALL LOUVERS

DIVISION 9 – FINISHES

SECTION 09 22 16 NON-STRUCTURAL METAL FRAMING
SECTION 09 22 19 CAVITY SHAFT-WALL ASSEMBLIES
SECTION 09 24 00 PORTLAND CEMENT PLASTERING
SECTION 09 29 00 GYPSUM BOARD
SECTION 09 30 00 TILING
SECTION 09 51 23 ACOUSTICAL TILE CEILINGS
SECTION 09 54 23 LINEAR PLANK METAL CEILINGS AND SOFFITS
SECTION 09 64 23 VAPOR EMISSION TREATMENT SYSTEM

SECTION 09 64 30	ENGINEERED WOOD FLOORS
SECTION 09 64 33	SPRUNG WOOD FLOOR
SECTION 09 65 00	RESILIENT FLOORING
SECTION 09 65 16	RUBBER ATHLETIC FLOORING
SECTION 09 67 23	RESINOUS EPOXY FLOORING
SECTION 09 68 13	TILE CARPETING
SECTION 09 84 14	ACOUSTICAL WALL PANELS
SECTION 09 91 00	PAINTING
SECTION 09 93 00	STAINING AND TRANSPARENT FINISHING
SECTION 09 96 00	HIGH-PERFORMANCE COATINGS
SECTION 09 96 23	GRAFFITI-RESISTANT COATINGS
SECTION 09 97 29	CONCRETE FLOOR SEALING

DIVISION 10 – SPECIALTIES

SECTION 10 11 00	VISUAL DISPLAY SURFACES
SECTION 10 14 00	SIGNAGE
SECTION 10 21 13	SOLID SURFACE TOILET COMPARTMENTS
SECTION 10 22 26	OPERABLE PARTITIONS
SECTION 10 26 23	IMPACT-RESISTANT WALL PROTECTION
SECTION 10 28 13	COMMERCIAL TOILET ACCESSORIES
SECTION 10 44 00	FIRE PROTECTION SPECIALTIES
SECTION 10 51 13	METAL LOCKERS
SECTION 10 56 10	METAL STORAGE SHELVING
SECTION 10 71 13	EXTERIOR SUN CONTROL DEVICES
SECTION 10 75 00	FLAG POLES

DIVISION 11 – EQUIPMENT

SECTION 11 24 26	FALL PROTECTION DEVICES
SECTION 11 40 00	FOOD SERVICE EQUIPMENT

DIVISION 12 – FURNISHINGS

SECTION 12 24 13	ROLLER WINDOW SHADES
SECTION 12 36 40	COUNTERTOPS
SECTION 12 48 16	ENTRANCE FLOOR GRILLES

DIVISION 13 – SPECIAL CONSTRUCTION – NOT USED

DIVISION 14 – CONVEYING EQUIPMENT– NOT USED

VOLUME 4 – PERFORMANCE CRITERIA – SPECIFICATIONS

FACILITY SERVICES SUBGROUP:

DIVISION 21 – FIRE SUPPRESSION

SECTION 21 05 00	COMMON WORK RESULTS FOR FIRE SUPPRESSION
SECTION 21 05 23	GENERAL-DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION PIPING
SECTION 21 05 53	IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT
SECTION 21 13 00	FIRE SUPPRESSION SPRINKLER SYSTEMS

DIVISION 22 – PLUMBING

SECTION 22 05 16	FLEXIBLE FITTINGS FOR PLUMBING PIPING
SECTION 22 05 17	SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING
SECTION 22 05 19	METERS AND GAUGES FOR PLUMBING PIPING
SECTION 22 05 23	GENERAL-DUTY VALVES FOR PLUMBING
SECTION 22 05 29	HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
SECTION 22 05 48	VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT
SECTION 22 05 53	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
SECTION 22 07 19	PLUMBING PIPING INSULATION
SECTION 22 10 05	PLUMBING PIPING
SECTION 22 10 06	PLUMBING PIPING SPECIALTIES
SECTION 22 30 00	PLUMBING EQUIPMENT
SECTION 22 40 00	PLUMBING FIXTURES

DIVISION 23 – HEATING VENTILATING AND AIR CONDITIONING

SECTION 23 05 17	SLEEVES AND SLEEVE SEALS FOR HVAC PIPING
SECTION 23 05 29	HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
SECTION 23 05 48	VIBRATION AND SEISMIC CONTROLS FOR HVAC
SECTION 23 05 53	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
SECTION 23 05 93	TESTING, ADJUSTING AND BALANCING FOR HVAC
SECTION 23 07 13	DUCT INSULATION
SECTION 23 07 19	HVAC PIPING INSULATION
SECTION 23 09 23	DIRECT DIGITAL CONTROL SYSTEM FOR HVAC
SECTION 23 09 93	SEQUENCE OF OPERATIONS FOR HVAC CONTROLS
SECTION 23 31 00	HVAC DUCTS AND CASING
SECTION 23 33 00	AIR DUCT ACCESSORIES
SECTION 23 34 00	CEILING PROPELLER FANS
SECTION 23 34 23	HVAC POWER VENTILATORS
SECTION 23 37 00	AIR OUTLETS AND INLETS
SECTION 23 63 13	AIR COOLED REFRIGERANT CONDENSERS
SECTION 23 72 00	AIR-TO-AIR ENERGY RECOVER EQUIPMENT
SECTION 23 81 29	VARIABLE REFRIGERANT FLOW HVAC SYSTEMS

DIVISION 26 – ELECTRICAL

SECTION 26 05 00	GENERAL REQUIREMENTS FOR ELECTRICAL SYSTEMS
SECTION 26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
SECTION 26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
SECTION 26 05 33.13	CONDUIT FOR ELECTRICAL SYSTEMS
SECTION 26 05 33.16	BOXES FOR ELECTRICAL SYSTEMS
SECTION 26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS
SECTION 26 05 73	POWER SYSTEM STUDIES
SECTION 26 09 13	ELECTRICAL POWER MONITORING
SECTION 26 09 43	DIGITAL LIGHTING CONTROLS
SECTION 26 21 00	LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE
SECTION 26 24 13	SWITCHBOARDS
SECTION 26 24 16	PANELBOARDS
SECTION 26 27 26	WIRING DEVICES
SECTION 26 28 13	FUSES
SECTION 26 28 16.16	ENCLOSED SWITCHES
SECTION 26 51 00	INTERIOR LIGHTING
SECTION 26 56 00	EXTERIOR LIGHTING

DIVISION 27 – COMMUNICATIONS

SECTION 27 05 00	GENERAL REQUIREMENTS FOR COMMUNICATIONS SYSTEMS
SECTION 27 10 00	WIRE AND CABLES FOR COMMUNICATION SYSTEMS
SECTION 27 20 00	DATA COMMUNICATION SYSTEMS
SECTION 27 30 00	VOICE COMMUNICATION SYSTEMS
SECTION 27 41 00	AUDIO VISUAL SYSTEMS
SECTION 27 41 16.06	ASSISTIVE-LISTENING SYSTEM

VOLUME 5 – PERFORMANCE CRITERIA – SPECIFICATIONS

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

SECTION 28 05 00	GENERAL REQUIREMENTS FOR SAFETY AND SECURITY
SECTION 28 05 13	WIRE AND CABLES FOR SAFETY AND SECURITY
SECTION 28 46 00	FIRE DETECTION AND ALARM

SITE AND INFRASTRUCTURE SUBGROUP:

DIVISION 31 – EARTHWORK

SECTION 31 00 00	SITE CLEARING
SECTION 31 20 00	EARTH MOVING

DIVISION 32 – EXTERIOR IMPROVEMENTS

SECTION 32 01 90	LANDSCAPE MAINTENANCE
SECTION 32 12 16	ASPHALT PAVING
SECTION 32 12 43	POROUS FLEXIBLE PAVEMENT
SECTION 32 13 12	LANDSCAPE CONCRETE

SECTION 32 13 13	CONCRETE PAVING
SECTION 32 14 29	RUBBER SURFACING
SECTION 32 15 40	DECOMPOSED GRANITE PAVEMENT
SECTION 32 18 13	SYNTHETIC TURF
SECTION 32 31 19	LANDSCAPE METAL AND HARDWARE
SECTION 32 33 00	SITE FURNISHINGS
SECTION 32 84 00	LANDSCAPE IRRIGATION
SECTION 32 91 13	LANDSCAPE SOIL PREPARATION
SECTION 32 92 13	LANDSCAPE HYDROSEEDING
SECTION 32 93 00	LANDSCAPE PLANTING

DIVISION 33 – UTILITIES

SECTION 33 10 00	WATER UTILITIES
SECTION 33 30 00	SANITARY SEWER SYSTEM
SECTION 33 40 00	STORM DRAIN

PROCESS EQUIPMENT SUBGROUP: NOT USED

APPENDICES

Cutsheets

- HVAC
- Plumbing
- Power
- Lighting
- Fire Alarm
- Low Voltage
- Renewables

END OF DOCUMENT 00 01 10

SECTION 28 05 00
GENERAL REQUIREMENTS FOR SAFETY AND SECURITY
PART 1 GENERAL

1.1 DESCRIPTION OF WORK:

- A. The work of this Section consists of providing all required labor, supervision, materials and equipment (except equipment furnished by the Owner to be installed by the Contractor) to satisfactorily complete the work shown on the drawings and/or specified in all Sections of Division 28 and all other work and miscellaneous items, not specifically mentioned, but reasonably inferred for a complete and fully operating facility. The work shall include but not be limited to the following:
 - 1. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.2 RELATED WORK:

- A. This Section provides the basic Electrical Requirements which supplement the General Requirements of Division 1 and apply to all Sections of Division 28.

1.3 STANDARDS AND CODES:

- A. All work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes:
 - 1. California Building Code (CBC)
 - 2. California Electrical Code (CEC)
 - 3. California Fire Code (CFC)
 - 4. American National Standards Institute (ANSI) Publications:
 - a. C2-02 National Electrical Safety Code
 - 5. Code of Federal Regulations (CFR):
 - a. 29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)
 - 6. Electronics Industries Association (EIA)
 - 7. Institute of Electrical and Electronics Engineers (IEEE)
 - 8. National Electrical Testing Association (NETA):
 - a. Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, Standard ATS
 - 9. National Electrical Manufacturers Association (NEMA)
 - 10. Occupational Safety and Health Act (OSHA) Standards
 - 11. State of California Public Utilities Commission:
 - a. General Order 128 Rules for Construction of Underground Electric Supply and Communication Systems
- B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.
- C. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Safety labeling and listing by other organizations, such as ETL Testing Laboratories, may be substituted for UL labeling and listing if acceptable to the Owner. Provide service entrance labels for all equipment required by the NEC to have such labels.

1.4 SUBMITTALS:

- A. As specified in Division 1. Submit to the Engineer shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Obtain approval before procurement, fabrication, or delivery of the items to the job site. Partial

submittals are not acceptable and will be returned without review.

- B. Submittals are required for all items, regardless of whether they are furnished as specified or are substituted.
- C. Information to be submitted includes manufacturer's name, trade name, equipment model number, nameplate data, equipment drawings including: size, layout dimensions and capacity, manufacturer's descriptive literature of cataloged products, diagrams, test data, and performance and characteristic curves as applicable. Furnish project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contract compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.
- D. If submittal information includes multiple products, items being submitted for approval shall be clearly identified and Items not to be used on the project shall be clearly marked out.
- E. Organize submittals for equipment and items related to each specification section together as a package.
- F. Submit submittal packages in digital PDF format.
 - 1. Certificates of Conformance: Submit manufacturer's certifications as required on products, materials, finish, and equipment indicated in the technical sections. Certifications shall be documents prepared specifically for this contract. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements that imply the item does not meet requirements specified, such as "as good as", "achieve the same end use and results as materials formulated in accordance with the referenced publications;" or "equal or exceed the service and performance of the specified material." Certifications shall state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official, authorized to sign certificates of conformance.
- G. Substitutions:
 - 1. The equipment included in the Contract Documents is used to establish standards of quality, utility, and appearance. Equipment which in the opinion of the Engineer is equal in quality, utility, and appearance will be approved as substitutions to that specified.
 - a. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are approved by the Engineer prior to bidding.
 - 2. Substitutions will be accepted for review where there is a reasonable reason for the substitution. Reasonable reasons include:
 - a. Cost savings to the owner. Include deductive change order with submittal.
 - b. A product with features providing additional benefits to the end user.
 - c. Improved finished environment / Lay out of the final installation.
 - d. Delivery considerations.
 - e. Owner's specific requests.
 - 3. Where items are noted as "or equal", a product of equal design, construction and performance will be considered.
 - 4. Any item proposed as a substitute shall be accompanied by the following:
 - a. Drawings and/or data giving sizes, capacities, all pertinent test data, catalog cut sheets, product information, and all other necessary information required to substantiate that the product is equal or exceeds that specified.
 - b. A summary sheet noting each performance characteristic noted in the specification section or elsewhere in the contract documents of the specified product and the

corresponding performance characteristics of the proposed substitution. The summary sheet shall contain the following information:

- 1) Reason for Substitution Request
 - 2) Pertinent Performance Characteristics
 - 3) Specified Product Values
 - 4) Substituted Product Values
 - 5) Any substitution request that does not include the above information shall be rejected.
 - 6) Refer to the end of this specification section for an example form to be used for substituted products. A Microsoft Word version of the form can be provided to the Contractor for their use upon request.
5. Substitutions shall be equal, in the opinion of the Engineer, to the specified equipment. The burden of proof of such shall rest with the Contractor. When the Engineer in writing accepts a substitution, it is with the understanding that the Contractor guaranteed the substituted equipment to be equal to the one specified and dimensioned to fit within the construction. Approved substitutions shall not relieve the Contractor of responsibilities for the proper execution of the work, or from any provisions of the Plans or Specifications.
 6. Contractor shall be responsible for coordination of the substituted products with other trades. Provide all additional connectivity, equipment, increased wire/conduit size, installation hardware, testing, and other miscellaneous appurtenances as required for a complete and fully functional installation.
 7. Only one substitution will be considered for each product specified.
 8. Alternate manufacturers must be submitted for approval 10 days prior to bid date unless noted otherwise in Division 1.
 9. The Contractor shall be responsible for all expenses in connection with the substitution materials, process, and equipment, including the effect of his/her substitution on him/her, his/her sub-Contractor's or other Contractor's work. No substitution shall be permitted without written authorization of the Engineer. Any assumptions on the acceptability of a proposed substitution prior to acceptance by the Engineer are at the sole risk of the Contractor.

H. Change Orders:

1. Where a change to the contract documents would result in a credit due to the Owner or a value add change to the project, provide a detailed change order request for the Engineer to review.
2. It shall be understood that the Engineer's review of costs associated with the change order shall not constitute approval of the change order or their associated costs. The Engineer's review shall be intended to assist the Owner in evaluating the costs associated with the change only. Final approval or rejection of the change order shall be at the discretion of the Owner.
3. Change order requests shall include the following information:
 - 1) Description of the change
 - 2) Reference to the document or written direction to make the change:
 - (a) In the case of design-team directed changes, reference the drawing/sketch number or RFI number.
 - (b) In the case of Owner-directed changes, reference the email, memo, or other written direction from the Owner and provide a copy of the direction.
 - 3) Detailed cost breakdown for the change:
 - (a) Line item for each material noting:
 - (1) Material used (e.g. ¾" EMT)
 - (2) Total quantity (e.g. 200lf)
 - (3) Unit cost (e.g. \$2/lf)

- (4) Total materials cost (e.g. \$400)
- (5) Unit labor hours (e.g. 6hrs/100lf)
- (6) Total labor hours (e.g. 12hrs)
- (7) Hourly rate (e.g. \$90/hr)
- (8) Total labor cost (e.g. \$1,080)
- (b) Total labor hours for each position (e.g. Journeyman vs. Superintendent)
- (c) Total materials cost
- (d) Overhead
- (e) Profit
- (f) Total change order value (positive for value added changes, negative for credits)

I. Closeout Submittals:

- 1. As-built drawings: Submit As-Built Record documents as in accordance with section 3.05 below.
- 2. Cost analysis: Submit final cost information including original bid and any change orders broken down by system, material and labor costs (as applicable):
 - a. Fire Alarm System
 - b. Intrusion System
 - c. Surveillance System
 - d. Card Access System
- 3. Operation and Maintenance Manuals: Furnish O & M Manuals for equipment where manuals are specified in the equipment specifications or are specified in Division 1. Electrical O & M Manuals shall include as a minimum:
 - a. Copies of equipment supplied on the project.
 - b. Instruction manuals including operation instructions and maintenance requirements/recommendations.
 - c. List of suppliers for all equipment with addresses and telephone numbers.
 - d. List of service support for all equipment with addresses and telephone numbers.
 - e. Copies of all test reports required in Division 28 specification sections.
 - f. Spare Parts: For each piece of equipment, submit a list of recommended spare parts. Include part numbers and the name, address, and telephone number of the supplier.
 - g. Other closeout documentation and test results as required under other sections of the specifications.
 - h. Provide in a single transmittal.
 - i. Warranty for all work, including contractor's general warranty.
 - j. All warranties begin as per the Contract, Division 1 or final acceptance of the Work by the Owner, Architect, Engineer, and Authority Having Jurisdiction, which ever is later:
 - 1) Manufacturer's Warrantees and Guarantees that are longer than the base contract/specified amount are to be provided with the manuals.
 - 2) The Contractor is responsible for all Warranty and Guarantee work whether or not the Manufacturer also Warrantees and Guarantees the product.

1.5 CONTRACT DOCUMENTS:

- A. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for the installations:
 - 1. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Engineer for favorable review.
 - 2. All drawings and divisions of these specifications shall be considered as whole. This contractor shall report any apparent discrepancies prior to submitting bids.

3. Should there be a conflict or discrepancy between the drawings and specifications, or between different drawings sheets, or between different specification sections, the most expensive option shall be required, at the discretion of the Engineer.

B. Drawings:

1. The Drawings shall govern the general layout of the completed construction.
 - a. Locations of equipment, inserts, anchors, panels, pullboxes, manholes, conduits, stub-ups, fittings, devices, and ground connections are approximate unless dimensioned; verify locations with the Engineer prior to installation. Field verify scaled dimensions on Drawings.
 - b. The general arrangement and location of existing conduits, piping, apparatus, etc., is shown as existing on drawings or specified. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions. Extreme accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Engineer.

1.6 COORDINATION:

- A. Coordinate the electrical work with the other trades, code authorities, utilities and the Engineer:
 1. Failure to accomplish this coordination is not a basis for additional cost reimbursement to the Contractor.
 2. Coordinate does not mean to only send a Request For Information. Coordinate implies that the contractor is to take the lead in bringing all of the necessary organizations together to coordinate the work and to provide for the associated costs.
- B. Where connections must be made to existing installations, properly schedule all the required work, including the power and system shutdown periods. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities:
 1. Include costs for work during non-normal working hours and temporary facilities as may be required.
 2. Include costs as necessary for sub-contractors to accomplish the specified work.
- C. When two trades join together in an area, make certain that no electrical work is omitted. Failure to accomplish this coordination is not a basis for additional cost reimbursement to the Contractor.
- D. Operations:
 1. Perform all work in compliance with Division 1:
 - a. Keep the number and duration of power and system shutdown periods to a minimum.
 - b. All shutdowns which would interfere with the operations of Owner's equipment or facilities shall be coordinated with the Owner a minimum of 15 days in advance.
 - 1) Where Owner's equipment or facilities must remain operational during the shutdown, provide sufficient means to temporarily backup the interrupted services for the duration of the interruption.
 - c. Show all proposed shutdowns and their expected duration on the construction schedule.
 - 1) If the construction schedule is created and maintained by others, make sure that the associated information is incorporated.
 - 2) Failure by the Contractor to properly schedule and plan for such activities is not a basis for additional compensation.
 - d. Carry out shutdown only after the Engineer has favorably reviewed the schedule. Submit power/communications interruption schedule 15 days prior to date of

interruption. Failure to provide schedule with adequate review time may result in rescheduling of the work at the Contractor's expense.

- E. Construction Power:
 - 1. See Division 1 Temporary Utilities.
- F. Storage:
 - 1. Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from sun, weather, condensation, dust, water, or construction operations.
- G. Damaged Products:
 - 1. Notify the Engineer in writing in the event that any equipment or material is damaged. Obtain approval from the Engineer before making repairs to damaged products.
- H. Order material in such a timely manner and after approval of the same so as to insure that the approved material is available to be installed on site in a timely manner. Additional costs or substitutions necessitated because the Contractor failed to order material in a timely manner are not reimbursable. Costs associated with processing of paperwork by the owner and design consultants resultant of such failures to coordinate the work by the Contractor shall have such costs reimbursed by the Contractor

1.7 LOCATIONS:

- A. General:
 - 1. Use equipment, materials and wiring methods suitable for the types of locations in which they are located:
 - a. Dry Locations:
 - 1) All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.
 - b. Wet Locations:
 - 1) All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

1.8 SAFETY AND INDEMNITY:

- A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and properly during performance of the work. This requirement will apply continually and not be limited to normal working hours:
 - 1. No act, service, drawing review or construction review by the Owner, the Engineer or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.
 - 2. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the engineer, their Consultants or their officers, agents and employees.

PART 2 PRODUCTS

2.1 STANDARD OF QUALITY:

- A. Material and Equipment:

1. Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.
 - B. Service Support:
 1. Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.
 - C. Manufacturer's Recommendations:
 1. Where installation procedures are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.
- 2.2 NAMEPLATES:
- A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings, the model designation, and shop order number.
 - B. Additionally, identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 1 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25 inch high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel screws or, where favorably reviewed by the Engineer, with epoxy cement. Where no inscriptions are indicated on the Drawings, furnish nameplates with appropriate inscriptions furnished by the Engineer upon prior request by the Contractor.
- 2.3 FASTENERS:
- A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.
- 2.4 FINISH REQUIREMENTS:
- A. Equipment:
 1. Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which as been damaged or is otherwise unsatisfactory, to the satisfaction of the Engineer.
 - B. In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.
 - C. Conduits for fire alarm or life safety raceways shall be factory painted red along their entire length.
- PART 3 EXECUTION
- 3.1 INSTALLATION:
- A. Ensure that all equipment and materials fit properly in their installation.
 - B. Perform any required work to correct improperly fit installation at no additional expense to the owner.

- C. Equipment Installation:
 - 1. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.
 - 2. Mount all metal panels which are mounted on or abutting concrete walls or any outside walls a minimum of ¼ inch from the wall, and paint the back sides of the panels with Bituminous Coating, Rust-oleum C9578 Coal Tar Epoxy Coating or approved equal. Film thickness shall be 10 mils minimum.
- D. Cutting, Drilling and Welding:
 - 1. Provide the required cutting, drilling welding that is required for the electrical construction work. Comply with Division 1 requirements.
 - 2. Structural members shall not be cut or drilled, except after approval by the Engineer. Use a core drill wherever it is necessary to drill through concrete or masonry.
 - 3. Provide the required welding for equipment supports. Conduits and fittings shall not be welded to structural steel. Where welding is required, it shall be accomplished by tradesmen certified to do such work. Provide fire and other protection as appropriate.

3.2 FIELD TESTS:

- A. Test shall be in accordance with Acceptance Testing specifications issued by the National Fire Protection Association (NFPA) 72 Chapter 7 for fire alarm and manufacturer's recommendations for security systems.
- B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all devices and components, and demonstrate as ready for service. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the Engineer prior to any test so that the tests may be witnessed.
- C. Provide instruments, supplies, other equipment, temporary facilities as may be necessary and material required for the tests. Instruments shall be of the type designed for the type of tests to be performed and shall be calibrated by a recognized testing laboratory within three months prior to testing.
- D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.
- E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the Engineer. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.
- F. Perform calibration and adjustment on all equipment.
- G. Maintain records of each test and submit five copies to the Engineer when testing is complete. All tests shall be witnessed by the Engineer. These records shall include:
 - 1. Name of equipment tested.
 - 2. Date of report.
 - 3. Date of test.
 - 4. Description of test setup.
 - 5. Identification and rating of test equipment.
 - 6. Test results and data.
 - 7. Name of person performing test.
 - 8. Owner or Engineer's initials.
- H. Items requiring testing as a minimum:

1. Fire Alarm System.
2. Intrusion System.
3. Surveillance System.
4. Card Access System.

3.3 PAINTING OF EQUIPMENT:

A. Factory Applied:

1. Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section. Fire alarm raceways shall be factory painted red.

B. Field Applied:

1. Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria.

3.4 SIGNAGE:

A. Nameplate Mounting:

1. Provide number, location and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of two stainless steel sheet-metal screws or two rivets.

3.5 RECORDS:

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the record “as built” condition. After completion of the work, the Contractor shall neatly and carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Drawings and associated as-built changes shall be completed in AutoCAD or Revit and submitted in CAD/Revit as well as PDF format. Documents with hand-written changes or with RFI responses and field sketches pasted on shall not be acceptable. Engineer shall make digital backgrounds of original contract documents available for Contractor’s use upon request.
2. Cable Size and Type: Provide the size and type of each cable installed on the project.
3. Substructure: Where the location of duct lines, adjacent utilities, cable boxes, and manholes are found to differ than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.
4. Record (As Built) Drawings: At the completion of the Work the Contractor shall provide a set of record “as built” drawings over to the Owner for his use:
 - a. Record drawings are required to be transmitted within 30 days of beneficial occupancy.
 - b. Transmittal and approval process:
 - 1) Contractor is to transmit one printed copy for review and comment.
 - 2) After acceptance of the above, the Contractor is to transmit three printed sets and one digital reproducible set.
 - 3) Contractor to provide information on their company in the margin of record drawings along with the date of the revisions and the associated revision number.

3.6 POSTED OPERATING INSTRUCTIONS:

A. Provide for each system and principal item of equipment as specified in the technical sections for use by operation and maintenance personnel. The operating instructions shall include the following:

1. Single line diagrams, wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
2. Start up, proper adjustments, operating, lubrication and shutdown procedures.
3. Safety precautions.
4. The procedure in the event of equipment failure, trouble or alarm.
5. Other items of instruction as recommended by the manufacturer of each system or item of equipment.

3.7 INSTRUCTION TO OWNER'S PERSONNEL:

- A. Where specified in the technical sections, furnish the services of competent instructors to give full instruction to designated personnel in the adjustment, operation and maintenance of the specified systems and equipment, including pertinent safety requirements as required. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or systems has been accepted and turned over to the Owner for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section. When more than 4 man-days of instruction are specified, use approximately half of the time for classroom instruction. Use other time for field instruction with equipment or system. When significant changes or modifications in the equipment or system are made under the terms of the contract, provide additional instructions to acquaint the operating personnel with the changes or modifications.
- B. Contractor shall video record all training sessions and shall provide the Owner with a copy of the recording at the conclusion of the training. Recording shall be in digital video format (MP4, AVI, or similar) and shall be provided on USB stick or DVD labeled with the Contractor's contact information, the training topic, and date of training.
- C. Contractor shall maintain an attendance sheet from each session which contains the following information:
 1. Attendees with associated arrival and departure time.
 2. Topics covered.
 3. Information provided.
 4. Signatures of attendees taken at the completion of the session.

3.8 CLEAN UP:

- A. Thoroughly clean all soiled surfaces of installed equipment and materials.
- B. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Engineer.

END OF SECTION

SECTION 28 05 13
WIRE AND CABLES FOR SAFETY AND SECURITY

PART 1 GENERAL

1.1 DESCRIPTION OF WORK:

- A. The work of this Section consists of providing all wire and cable rated 600 volts or less, including splices and terminations, as shown on the Drawings and as described herein.

1.2 RELATED WORK:

- A. See the following Specification Section for work related to the work in this Section:
 - 1. 28 05 00 General Requirements for Safety and Security Systems
 - 2. 26 05 33.13 Conduit for Electrical Systems
 - 3. 26 05 33.16 Boxes for Electrical Systems

1.3 STANDARDS AND CODES:

- A. Work and materials shall be in compliance with and according to the requirements of the latest revision of the following Standards and Codes:
 - 1. American Society for Testing and Materials (ASTM):
 - a. B3-01, Specification for Soft or Annealed Copper Wire
 - b. B8-99, Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft
 - c. B173-01a, Specification for Rope-Lay-Stranded Copper Conductors Having Concentric-Stranded Members, for Electrical Conductors
 - 2. Federal Standards (FED. STD.):
 - a. 228, Methods of Testing Insulated Cable and Wire
 - 3. Federal Specifications (FS):
 - a. A-A-59544, Cable and Wire, Electrical
 - b. A-A-55809, Pressure Sensitive Electrical Plastic Insulation Tape
 - 4. National Electrical Manufacturers Association (NEMA):
 - a. WC 70-1999/ICEA S-95-658-1999, Cross-Linked Thermosetting Polyethylene, Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
 - 5. California Electrical Code (CEC)
 - 6. National Electrical Code (NEC)
 - 7. Underwriters Laboratories (UL):
 - a. 44-83 (R1988), Rubber-Insulated Wires and Cable
 - b. 83-1983 (R1989), Thermoplastic-Insulated Wires and Cables
 - c. 510-1986, Insulating Tape

1.4 SUBMITTALS:

- A. As specified in Division 1 and Section 28 05 00.
 - 1. Catalog Data: Provide manufacturer's descriptive literature.
 - 2. Single Submittal: A single complete submittal is required for all products covered by this Section.

PART 2 PRODUCTS

2.1 CONDUCTORS:

- A. General:
 - 1. Conductors shall be copper, Class B stranded and of the sizes indicated. All conductors 120 volts and above shall be in raceway unless otherwise noted. Minimum power and control wire size shall be No. 12 AWG unless otherwise specified by the Owner's Representative. All cable used on this Project shall be of the same type and conductor material.

- B. Unless otherwise noted, conductors #6 and larger shall be XHHW insulation suitable for operation in wet or dry locations at temperatures not to exceed 75C in wet locations and 90C in dry locations. Conductors #8 and smaller shall be THHN in dry locations and THWN/THHN in wet locations. Control Cable shall be THHN.
 - C. Insulation Marking:
 - 1. All insulated conductors shall be identified with printing colored to contrast with the insulation color.
 - D. Special Wiring:
 - 1. Where special wiring is proposed by an equipment manufacturer, submit the special wiring requirements to the Owner's Representative and, if approved, provide same. Special wire shall be the type required by the equipment manufacturer.
 - E. Other Wiring:
 - 1. Wire or cable not specifically shown on the Drawings or specified, but required, shall be of the type and size required for the application and as approved by the Owner's Representative.
 - F. Terminations:
 - 1. Cable Termination for Copper: Crimp style two hole NEMA spade terminals designed and rated for copper cable.
 - 2. Wire Terminations: Crimp on ring-tongue terminals, insulated sleeve, of proper size for the wire used.
 - 3. End Seals: Heat shrink plastic caps of proper size for the wire on which used.
 - 4. Manufacturer: T&B, Burndy or approved equal.
 - G. Manufacturer: General Cable Inc., Southwire, or approved equal.
- 2.2 FIRE ALARM CABLES:
- A. Addressable Loop Cables:
 - 1. Verify recommended cable type with system manufacturer. Cable shall be minimum #14 shielded twisted pair, unless otherwise noted. Refer to drawings and 28 31 00 Fire Alarm system for additional requirements:
 - a. Cable for all exterior, underground or wet locations shall be outdoor rated with water-blocked construction, sunlight and moisture resistance jacket.
 - 1) Manufacturer: #14ga - WestPenn AQ295 or approved equal
 - b. Cable for all interior areas shall be plenum rated cable.
 - 1) Manufacturer: #14ga - WestPenn 60992BS or approved equal
 - B. Notification Circuit Cables:
 - 1. Refer to section 2.01 Conductors for Notification Circuit Cables. Refer to drawings for size and quantity. Refer to Specification Section 28 31 00 - Fire Alarm System for additional requirements.
- 2.3 SECURITY CABLES:
- A. Verify recommended cable type with system manufacturer. Cable shall be minimum #14 shielded twisted pair. Refer to drawings for additional requirements:
 - 1. Cable for all exterior, underground or wet locations shall be outdoor rated with water-blocked construction, sunlight and moisture resistance jacket.
 - a. Manufacturer: #14ga - WestPenn AQ295 or approved equal
 - 2. Cable for all interior areas shall be plenum rated cable.
 - a. Manufacturer: #14ga - WestPenn 60992BS or approved equal

2.4 TAPE:

- A. Tape used for cable marking shall be compatible with the insulation and jacket of the cable and shall be of plastic material. Tape shall conform to FS HH-I-595 and UL 510.

PART 3 EXECUTION

3.1 CABLE INSTALLATION:

- A. Clean Raceways:
 - 1. Clean all raceways prior to installation of cables as specified in Specification Section 28 05 00 – Safety/Security System Raceways and Fittings.
- B. Cable Pulling:
 - 1. Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, putting undue stress on the cables or otherwise abrading them. No grease will be permitted in pulling cables. Only soapstone, talc, or UL listed pulling compound will be permitted. The raceway construction shall be complete and protected from the weather before cable is pulled into it. Swab conduits before installing cables and exercise care in pulling, to avoid damage to conductors.
- C. Bending Radius:
 - 1. Cable bending radius shall be per applicable code. Install feeder cables in one continuous length.
- D. Equipment Grounding Conductors:
 - 1. Provide an equipment grounding conductor, whether or not it is shown on the Drawings, in any conduit or any raceway.
- E. Wiring at Hinges:
 - 1. For cables crossing hinges, utilize extra flexible stranded wire, make up into groups not exceeding 12, and arrange so that they will be protected from chafing when the hinged member is moved.
- F. All wiring and cable shall be supported from the structure above. All wiring below 100 volts shall be installed in conduit unless otherwise noted.
- G. Low Voltage Cables:
 - 1. All cables provided inside buildings shall be plenum rated.
 - 2. All cables provide outside buildings shall be outdoor rated, gel filled cables.
 - 3. All low voltage wires and cables concealed in walls shall be run in EMT conduit from flush outlet boxes to above accessible ceilings. Provide conduit where cables penetrate floors and fire walls above ceilings. Where low voltage cables run parallel to line voltage (over 120 volts), they shall be installed a minimum of 12 inches apart.

3.2 CABLE TERMINATIONS AND SPLICES:

- A. Splices:
 - 1. All fire alarm and security cables shall be continuous below grade (i.e. no splices or terminations below grade).
 - 2. Use UL listed wirenuts for line voltage branch circuits in dry locations.
- B. Terminations: Shall comply with the following:
 - 1. Make up and form cable and orient terminals to minimize cable strain and stress on device being terminated on.
 - 2. Burnish oxide from conductor prior to inserting in oxide breaking compound filled terminal.

3.3 FIELD TESTS:

- A. The Contractor shall perform the following tests at his expense:

1. Continuity Test of Wire:
 - a. Test each wire for continuity and accuracy of the identifying tags at both ends and at all locations marked. Submit a report to the Owner's Representative certifying the fact of the test and the accuracy of the marking.
2. Insulation Resistance Tests:
 - a. Perform insulation resistance tests on all wire and cable installed. Make these tests after all equipment has been connected, except that equipment which may be damaged by the test voltage shall be disconnected. Test the insulation with a 500 Vdc insulation resistance tester with a scale reading not less than 100 megohms. The insulation resistance shall be 2 megohms or more. Submit results for review.

END OF SECTION

SECTION 28 46 00
FIRE DETECTION AND ALARM
PART 1 GENERAL

1.1 DESCRIPTION OF WORK:

- A. Furnish and install all materials and equipment including all required equipment, panels, raceways, conductors and connections, and provide all labor required and necessary to complete the work shown on the drawings and/or specified and all other work and miscellaneous items, not specifically mentioned, but reasonably inferred for a complete addressable fire alarm installation including all accessories and appurtenances required for testing the systems. It is the intent of the drawings and specifications that all systems be complete, and ready for operation. No extra charge will be paid for furnishing items required by regulations, but not specified herein, or on drawings.
- B. The fire alarm system shall comply with requirements of NFPA Standard 72 for Protected Premises Signaling Systems except as modified and supplemented by this specification. The system shall be electrically supervised and monitor the integrity of all conductors.
- C. The facility shall have an emergency voice alarm communication system. Digitally stored message sequences shall notify the building occupants that a fire or life safety condition has been reported. Message generator(s) shall be capable of automatically distributing up to eight (8) simultaneous, unique messages to appropriate audio zones within the facility based on the type and location of the initiating event. The Fire Alarm Control Panel (FACP) shall also support Emergency manual voice announcement capability for both system wide or selected audio zones, and shall include provisions for the system operator to override automatic messages system wide or in selected zones.
- D. Each designated zone shall transmit separate and different alarm, supervisory and trouble signals to the FACP and designated personnel in other buildings at the site via a multiplex communication network.
- E. See site drawings for specific requirements for the site.

1.2 RELATED WORK:

- A. Refer to the General Conditions, Supplementary General Conditions, and Division 1 General Requirements.
- B. See the following specification sections for work related to the work in this section:
 - 1. 28 05 00 - General Requirements for Electronic Safety and Security
 - 2. 26 05 33.13 - Raceways and Fittings for Electrical Systems
 - 3. 26 05 33.16 - Boxes for Electrical Systems
 - 4. 28 05 13 - Wire and Cable for Electronic Safety and Security

1.3 STANDARDS AND CODES:

- A. Devices and equipment for fire alarm system shall be U.L. listed. Underwriters Laboratories (UL) Standards:
 - 1. UOJZ Control Units
 - 2. 38 Manual Operation Signal Boxes
 - 3. 268 Smoke Detectors for Fire Alarm Signaling Systems
 - 4. 268A Smoke Detectors for Duct Application
 - 5. 464 Audible Signal Appliances
 - 6. 521 Heat Detectors for Fire Protective Signaling Systems
 - 7. 864 Control Units and Accessories for Fire Alarm Systems
 - 8. 1635 Digital Alarm Communicator System Units
 - 9. 1971 Signaling Devices for Hearing Impaired

- B. Devices and equipment for fire alarm system shall be listed by the California State Fire Marshal for the specific purpose the device or equipment is used.
- C. Work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes:
 - 1. California Building Code (CBC), Volumes #1 and #2 (Part 2, Title 24, CCR).
 - 2. California Electrical Code (Part 3, Title CCR).
 - 3. California Mechanical Code (CMC) (Part 4, Title 24, CCR).
 - 4. California Plumbing Code (CPC) (Part 5, Title 24, CCR).
 - 5. California Energy Code (Part 6, Title 24, CCR).
 - 6. California Fire Code (CFC) (Part 9, Title 24).
 - 7. California Green Code (Part 11, Title 24, CCR).
 - 8. California Referenced Standards Code (Part 12, title 24, CCR).
 - 9. NFPA 72 National Fire Alarm Code.
 - 10. NFPA 13 Standards for Fire Sprinkler Systems.
 - 11. ADA Standards for Accessible Design: ADA Accessibility Guidelines (ADAAG) 28, Part 36 Appendix A.
 - 12. ADA Standards for Accessible Design: Code of Regulations (Including Amendments)

1.4 SUBMITTALS:

- A. In accordance with Section 28 05 00.
- B. Submit the following items:
 - 1. Manufacturer's Catalog Data: Manufacturer's original catalog cuts and original description of data of all material and equipment with sufficient information provided so that the exact function of each device is known. Each item supplied shall be clearly identified including both U.L. number and a copy of the State Fire Marshal's listing.
 - 2. Description of conductors to be used with a statement that all wire shall be in conduit.
 - 3. Voltage drop calculations: Verify that voltage drop on signal device circuits does not exceed 10%.
 - 4. Battery Calculations: Verify that battery capacity exceeds supervisory and alarm power requirements, minimum twenty-four (24) hours supervisory plus 15 minutes at full alarm.
 - 5. Floor plan of the point to point connections.
 - 6. Diagram of the power circuitry.
 - 7. Riser diagram.
 - 8. Copy of California State DIR Fire/Life Safety Certificate of installer.
 - 9. Letter on contractor's letterhead certifying that contractor has at least 3 years experience successfully installing fire alarm systems of similar type and design, or that there is a contractual agreement with a subcontractor having at least 3 years experience successfully installing fire alarm systems of similar type and design.

1.5 SUBSTITUTIONS:

- A. Fire Alarm System Manufacturer is an Owner Standard no substitutions allowed.

1.6 QUALIFICATIONS OF INSTALLER:

- A. NICET level 2 or greater.
- B. Prior to installation, submit data for review showing that the contractor has at least 3 years experience successfully installing fire alarm systems of similar type and design, or that there is a contractual agreement with a subcontractor having at least 3 years experience successfully installing fire alarm systems of similar type and design.
- C. One contractor shall furnish and install a complete Fire Alarm and Smoke Detection System as described herein and drawn. Installation shall be by a factory authorized installer of the fire alarm system.

1.7 WARRANTIES:

- A. The contractor shall warrant all equipment and wiring free from inherent mechanical and electrical defects for one year (365 days) from the date of final acceptance. The contractor shall without additional expense to the owner, replace any defective materials or equipment provided by him under this contract within the warranty period.
- B. FACP shall have a five year manufacturer's warranty from the date of final acceptance.
- C. Signaling devices shall have a two year manufacturer's warranty from the date of final acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURER:

- A. Fire Alarm Control Panel (FACP):
 - 1. Notifier NFS2-3030, CSFM 7165-0028:0224
- B. Remote Annunciator:
 - 1. Notifier LCD-160, CSFM 7120-0028:0227
- C. Manual Pull Station:
 - 1. Notifier NBG-12LX, CSFM 7150-0028:0199
- D. Smoke Detector (Photoelectric):
 - 1. Notifier FSP-951(A), CSFM 7272-0028:0206
- E. Duct Smoke Detector:
 - 1. Notifier FSP-951R with DNR housing, CSFM
- F. Heat Detector (Combination Fixed Temp and Rate of Rise):
 - 1. Notifier FST-951R(A), CSFM
- G. Combination Smoke, Heat, and Carbon Monoxide (CO) Detector:
 - 1. Notifier FSC-851, CSFM 7272-0028:0255
- H. Addressable Monitor Module:
 - 1. Notifier FMM-101, CSFM 7300-0028:0219
- I. Addressable Relay Module:
 - 1. Notifier FRM-1(A), CSFM 7300-0028:0219
- J. Amplifier:
 - 1. Notifier NFS2-3030, CSFM 7165-0028:0224
- K. Remote Notification Power Supply:
 - 1. Notifier FCPS-24S8, CSFM 7315-0028:0225
- L. Strobe:
 - 1. System Sensor SR, CSFM 7125-1653:0186
- M. Speaker:
 - 1. System Sensor SPR, CSFM 7320-1653:0201
- N. Speaker/Strobe:
 - 1. System Sensor SPSR, CSFM 7320-1653:0201
- O. Weatherproof Speaker:
 - 1. System Sensor SPRK, 7320-1653:0201

2.2 COMPONENTS:

- A. Colors: Provide finish colors under this section in accordance with FED-STD-595.

2.3 FIRE ALARM CONTROL PANEL:

- A. Main FACP or network node shall contain a microprocessor based Central Processing Unit (CPU) and power supply. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system controlled devices.
- B. In conjunction with intelligent Loop Control Modules and Loop Expander Modules, the main FACP shall perform the following functions:
 - 1. Supervise and monitor all intelligent addressable detectors and monitor modules connected to the system for normal, trouble and alarm conditions.
 - 2. Supervise all initiating signaling and notification circuits throughout the facility by way of connection to addressable monitor and control modules.
 - 3. Detect the activation of any initiating device and the location of the alarm condition. Operate all notification appliances and auxiliary devices as programmed. In the event of CPU failure, all SLC loop modules shall fallback to degrade mode. Such degrade mode shall treat the corresponding SLC loop control modules and associated detection devices as conventional two-wire operation. Any activation of a detector in this mode shall automatically activate associated Notification Appliance Circuits.
- C. The FACP shall be capable of communicating over a Local Area Network (LAN) or Wide Area Network (WAN) utilizing a peer-to-peer, inherently regenerative communication format and protocol. The network shall support communication speed up to 100 Mb and support up to 200 panels / nodes per network.
- D. The control panel shall be capable of expansion via up to 10 SLC loops. Each module shall support up to 318 analog/addressable devices for a maximum system capacity of 3180 points. The Fire Alarm Control Panel shall include a full featured operator interface control and annunciation panel that shall include a backlit 640-character liquid crystal display, individual, color coded system status LEDs, and a keypad for the control of the fire alarm system. Said LCD shall also support graphic bit maps.
- E. All programming or editing of the existing program in the system shall be achieved without interrupting the alarm monitoring functions of the fire alarm control panel.
- F. The FACP shall be able to provide the following software and hardware features:
 - 1. Pre-signal and Positive Alarm Sequence: The system shall provide means to cause alarm signals to only sound in specific areas with a delay of the alarm from 60 to up to 180 seconds after start of alarm processing. In addition, a Positive Alarm Sequence selection shall be available that allows a 15-second time period for acknowledging an alarm signal from a fire detection/initiating device. If the alarm is not acknowledged within 15 seconds, all local and remote outputs shall automatically activate immediately.
 - 2. Smoke Detector Pre-alarm Indication at Control Panel: To obtain early warning of incipient or potential fire conditions, the system shall support a programmable option to determine system response to real-time detector sensing values above the programmed setting. Two levels of Pre-alarm indication shall be available at the control panel: alert and action.
 - 3. Alert: It shall be possible to set individual smoke detectors for pre-programmed pre-alarm thresholds. If the individual threshold is reached, the pre-alarm condition shall be activated.
 - 4. Action: If programmed for Action and the detector reaches a level exceeding the pre-programmed level, the control panel shall indicate an action condition. Sounder bases installed with either heat or smoke detectors shall automatically activate on action Pre-Alarm level, with general evacuation on Alarm level.
 - 5. The system shall support a detector response time to meet world annunciation requirements of less than 3 seconds.

6. Device Blink Control: Means shall be provided to turn off detector/module LED strobes for special areas.
7. NFPA 72 Smoke Detector Sensitivity Test: The system shall provide an automatic smoke detector test function that meets the sensitivity testing requirements of NFPA 72.
8. Programmable Trouble Reminder: The system shall provide means to automatically initiate a reminder that troubles exist in the system. The reminder will appear on the system display and (if enabled) will sound a piezo alarm.
9. On-line or Off-line programming: The system shall provide means to allow panel programming either through an off-line software utility program away from the panel or while connected and on-line. The system shall also support upload and download of programmed database and panel executive system program to a Personal Computer/laptop. A single change to one CPU database shall not require a database download to other CPUs.
10. History Events: The panel shall maintain a history file of the last 4000 events, each with a time and date stamp. History events shall include all alarms, troubles, operator actions, and programming entries. The control panels shall also maintain a 1000 event Alarm History buffer, which consists of the 1000 most recent alarm events from the 4000-event history file.
11. Smoke Control Modes: The system shall provide means to perform FSCS mode Smoke Control to meet NFPA-92A and 90B and HVAC mode to meet NFPA 90A.
12. The system shall provide means for all SLC devices on any SLC loop to be auto programmed into the system by specific address. The system shall recognize specific device type ID's and associate that ID with the corresponding address of the device.
13. Passwords and Users: The system shall support two password levels, master and user. Up to 9 user passwords shall be available, each of which may be assigned access to the programming change menus, the alter status menus, or both. Only the master password shall allow access to password change screens.
14. Block Acknowledge: The system shall support a block Acknowledge for Trouble Conditions
15. Sensitivity Adjust: The system shall provide Automatic Detector Sensitivity Adjust based on Occupancy schedules including a Holiday list of up to 15 days.
16. Environmental Drift Control: The system shall provide means for setting Environmental Drift Compensation by device. When a detector accumulates dust in the chamber and reaches an unacceptable level but yet still below the allowed limit, the control panel shall indicate a maintenance alert warning. When the detector accumulates dust in the chamber above the allowed limit, the control panel shall indicate a maintenance urgent warning.
17. Custom Action Messages: The system shall provide means to enter up to 100 custom action messages of up to 160 characters each. It shall be possible to assign any of the 100 messages to any point.
18. Local Mode: If communication is lost to the central processor the system shall provide added survivability through the intelligent loop control modules. Inputs from devices connected to the SLC and loop control modules shall activate outputs on the same loop when the inputs and outputs have been set with point programming to participate in local mode or when the type codes are of the same type: that is, an input with a fire alarm type code shall activate an output with a fire alarm type code.
19. Read status preview - enabled and disabled points: Prior to re-enabling points, the system shall inform the user that a disabled device is in the alarm state. This shall provide notice that the device must be reset before the device is enabled thereby avoiding activation of the notification circuits.
20. Custom Graphics: When fitted with an LCD display, the panel shall permit uploading of a custom bit-mapped graphic to the display screen.

21. Multi-Detector and Cooperating Detectors: The system shall provide means to link one detector with up to two detectors at other addresses on the same loop in cooperative multi-detector sensing. There shall be no requirement for sequential addresses on the detectors and the alarm event shall be a result of all cooperating detectors chamber readings.
22. ACTIVE EVENT: The system shall provide a Type ID called FIRE CONTROL for purposes of air-handling shutdown, which shall be intended to override normal operating automatic functions. Activation of a FIRE CONTROL point shall cause the control panel to (1) initiate the monitor module Control-by-Event, (2) send a message to the panel display, history buffer, installed printer and annunciators, (3) shall not light an indicator at the control panel, (4) Shall display ACTIVE on the LCD as well a display a FIRE CONTROL Type Code and other information specific to the device.
23. NON-FIRE Alarm Module Reporting: A point with a type ID of NON-FIRE shall be available for use for energy management or other non-fire situations. NON-FIRE point operation shall not affect control panel operation nor shall it display a message at the panel LCD. Activation of a NON-FIRE point shall activate control by event logic but shall not cause any indication on the control panel.
24. Mass Notification Override: The system shall be UL 2572 listed for Mass Notification and shall be capable, based on the Risk Analysis, of being programmed so that Mass Notification/Emergency Communications events take precedence over fire alarm events.
25. Security Monitor Points: The system shall provide means to monitor any point as a type security.
26. One-Man Walk Test: The system shall provide both a basic and advanced walk test for testing the entire fire alarm system. The basic walk test shall allow a single operator to run audible tests on the panel. All logic equation automation shall be suspended during the test and while annunciators can be enabled for the test, all shall default to the disabled state. During an advanced walk test, field-supplied output point programming will react to input stimuli such as CBE and logic equations. When points are activated in advanced test mode, each initiating event shall latch the input. The advanced test shall be audible and shall be used for pull station verification, magnet activated tests on input devices, input and output device and wiring operation/verification.
27. Control By Event Functions: CBE software functions shall provide means to program a variety of output responses based on various initiating events. The control panel shall operate CBE through lists of zones. A zone shall become listed when it is added to a point's zone map through point programming. Each input point such as detector, monitor module or panel circuit module shall support listing of up to 10 zones into its programmed zone map.
28. Permitted zone types shall be general zone, releasing zone and special zone. Each output point (control module, panel circuit module) can support a list of up to 10 zones including general zone, logic zone, releasing zone and trouble zone. It shall be possible for output points to be assigned to list general alarm. Non-Alarm or Supervisory points shall not activate the general alarm zone.
29. 1000 General Zones: The system shall support up to 1000 general purpose software zones for linking inputs to outputs. When an input device activates, any general zone programmed into that device's zone map will be active and any output device that has an active general zone in its map will be active. It shall also be possible to use general zone as arguments in logic equations.
30. 1000 Logic Equations: The system shall support up to 1000 logic equations for AND, OR, NOT, ONLY1, ANYX, XZONE or RANGE operators that allow conditional I/O linking. When any logic equation becomes true, all output points mapped to the logic zone shall activate.
31. 100 trouble equations per device: The system shall provide support for up to 100 trouble equations for each device, which shall permit programming parameters to be altered,

based on specific fault conditions. If the trouble equation becomes true, all output points mapped to the trouble zone shall activate.

32. Control-By-Time: A time based logic function shall be available to delay an action for a specific period of time based upon a logic input with tracking feature. A latched version shall also be available. Another version of this shall permit activation on specific days of the week or year with ability to set and restore based on a 24 hour time schedule on any day of the week or year.
33. Multiple agent releasing zones: The system shall support up to 10 releasing zones to protect against 10 independent hazards. Releasing zones shall provide up to three cross-zone and four abort options to satisfy any local jurisdiction requirements.
34. Alarm Verification, by device, with timer and tally: The system shall provide a user-defined global software timer function that can be set for a specific detector. The timer function shall delay an alarm signal for a user-specified time period and the control panel shall ignore the alarm verification timer if another alarm is detected during the verification period. It shall also be possible to set a maximum verification count between 0 and 20 with the "0" setting producing no alarm verification. When the counter exceeds the threshold value entered, a trouble shall be generated to the panel.

G. Central Processing Unit

1. The Central Processing Unit shall contain and execute all control-by-event (including Boolean functions including but not limited to AND, OR, NOT, ANYx, and CROSSZONE) programs for specific action to be taken if an alarm condition is detected by the system. Such control-by-event programs shall be held in non-volatile programmable memory, and shall not be lost with system primary and secondary power failure.
2. The Central Processing Unit shall also provide a real-time clock for time annotation, to the second, of all system events. The time-of-day and date shall not be lost if system primary and secondary power supplies fail.
3. The CPU shall be capable of being programmed on site without requiring the use of any external programming equipment. Systems that require the use of external programmers or change of EPROMs are not acceptable.
4. The CPU shall provide an EIA-232 interface between the fire alarm control panel and the UL Listed Electronic Data Processing (EDP) peripherals.
5. The CPU shall provide two EIA-485 ports for the serial connection to annunciation and control subsystem components.
6. The EIA-232 serial output circuit shall be optically isolated to assure protection from earth ground.

H. Display

1. The system display shall provide a 640-character backlit alphanumeric Liquid Crystal Display (LCD). It shall also provide eleven Light-Emitting-Diodes (LEDs) that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM, SECURITY, SUPERVISORY, SYSTEM TROUBLE, OTHER EVENT, SIGNALS SILENCED, POINT DISABLED, CONTROLS ACTIVE, and CPU FAILURE.
2. The system display shall provide a keypad with control capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels with up to ten (one Master and nine User) passwords shall be accessible through the display interface assembly to prevent unauthorized system control or programming.

I. Loop (Signaling Line Circuit) Control Module

1. The Loop Control Module shall monitor and control a minimum of 318 intelligent addressable devices. This includes 159 intelligent detectors (Ionization, Photoelectric, or

- Thermal) and 159monitor or control modules.
2. The Loop Control Module shall contain its own microprocessor and shall be capable of operating in a local/degrade mode (any addressable device input shall be capable of activating any or all addressable device outputs) in the unlikely event of a failure in the main CPU.
 3. Each Loop shall be capable of operating as a NFPA Style 4 (Class B) circuit.
 4. The SLC interface board shall receive analog or digital information from all intelligent detectors and shall process this information to determine whether normal, alarm, or trouble conditions exist for that particular device. Each SLC Loop shall be isolated and equipped to annunciate an Earth Fault condition. The SLC interface board software shall include software to automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The analog information may also be used for automatic detector testing and the automatic determination of detector maintenance requirements.
- J. Digital Voice Command Center
1. The Digital Voice Command Center located with the FACP, shall contain all equipment required for all audio control, emergency telephone system control, signaling and supervisory functions. This shall include speaker zone indication and control, telephone circuit indication and control, digital voice units, microphone and main telephone handset.
 2. Function: The Voice Command Center equipment shall perform the following functions:
 - a. Operate as a supervised multi-channel emergency voice communication system.
 - b. Operate as a two-way emergency telephone system control center.
 - c. Audibly and visually annunciate the active or trouble condition of every speaker circuit and emergency telephone circuit.
 - d. Audibly and visually annunciate any trouble condition for digital tone and voice units required for normal operation of the system.
 - e. Provide all-call Emergency Paging activities through activation of a single control switch.
 - f. As required, provide vectored paging control to specific audio zones via dedicated control switches.
 - g. Provide a factory recorded "library" of voice messages and tones in standard WAV. File format, which may be edited and saved on a PC running a current Windows® operating system.
 - h. Provide a software utility capable of off-line programming for the DVC operation and the audio message files. This utility shall support the creation of new programs as well as editing and saving existing program files. Uploading or downloading the DVC shall not inhibit the emergency operation of other nodes on the fire alarm network.
 - i. Support an optional mode of operation with four analog audio outputs capable of being used with UL 864 fire-listed analog audio amplifiers and SLC controlled switching.
 - j. The Digital Voice Command shall be modular in construction, and shall be capable of being field programmable without requiring the return of any components to the manufacturer and without requiring use of any external computers or other programming equipment.
 - k. The Digital Voice Command and associated equipment shall be protected against unusually high voltage surges or line transients.
- K. Power Supply
1. The Main Power Supply shall operate on 120/240 VAC, 50/60 Hz, and shall provide all necessary power for the FACP.

2. The Main Power Supply shall provide the required power to the CPU using a switching 24 VDC regulator and shall incorporate a battery charger for 24 hours of standby power using dual-rate charging techniques for fast battery recharge.
3. The Main Power Supply shall provide a battery charger for 24 hours of standby using dual-rate charging techniques for fast battery recharge. The supply shall be capable of charging batteries ranging in capacity from 7-200 amp-hours within a 48-hour period.
4. The Main Power Supply shall provide a very low frequency sweep earth detect circuit, capable of detecting earth faults.
5. The Main Power Supply shall be power-limited per UL864 requirements.
6. The Main Power Supply shall communicate power supply, line voltage, battery status and charger status to the local LCD display. Any abnormal condition shall be annunciated and logged to the system alarm history log.
7. Addressable Charger Power SupplyThe auxiliary addressable power supply is a remote 24 VDC power supply used to power Notification Devices and field devices that require regulated 24 VDC power. . NOTIFIER model # ACPS-610
8. The addressable power supply for the fire detection system shall provide up to a minimum of 6.0 amps of 24 volt DC regulated power for Notification Appliance Circuit (NAC) power or 10.0 amps of 24 volt DC general power. The power supply shall have an additional 0.5 amp of 24 VDC auxiliary power for use within the same cabinet as the power supply. It shall include an integral charger designed to charge 12 - 200 amp hour batteries.
9. The addressable power supply shall provide four individually addressable Notification Appliance Circuits that may be configured as Class "A" or Class "B" circuits. All circuits shall be power-limited per UL 864 requirements.
10. The addressable power supply shall provide built-in synchronization for certain Notification Appliances on each circuit without the need for additional synchronization modules. The power supply's output circuits shall be individually selected for synchronization. A single addressable power supply shall be capable of supporting both synchronized and non-synchronized Notification Devices at the same time.
11. The addressable power supply shall operate on 120 or 240 VAC, 50/60 Hz.
12. The interface to the power supply from the Fire Alarm Control Panel (FACP) shall be via the Signaling Line Circuit (SLC) or other multiplexed means Power supplies that do not use an intelligent interface are not suitable substitutes. The required wiring from the FACP to the addressable power supply shall be a single unshielded twisted pair wire.
13. The addressable power supply shall supervise for battery charging failure, AC power loss, power brownout, battery failure, NAC loss, and optional ground fault detection. In the event of a trouble condition, the addressable power supply shall report the incident and the applicable address to the FACP via the SLC.
14. The addressable power supply shall have an AC Power Loss Delay option. If this option is utilized and the addressable power supply experiences an AC power loss, reporting of the incident to the FACP will be delayed. A delay time of zero, two, eight or sixteen hours shall be programmable.
15. The addressable power supply shall have an option for Canadian Trouble Reporting and this option shall be programmable.
16. The addressable power supply mounts in either the FACP backbox or it's own dedicated surface mounted backbox with cover.
17. Each of the power supply's four output circuits shall be programmed- for Notification Appliance Circuit or General Purpose 24 VDC power. Any output circuit shall be able to provide up to 2.5 amps of 24 VDC power.
18. The addressable power supply's output circuits shall be individually supervised when they are selected to be either a Notification Appliance Circuit when wired Class "A" or by the use of an end-of-line resistor. When the power supply's output circuit is selected as

General 24 VDC power, the circuit shall be individually supervised when an end-of-line relay is used.

19. When selected for Notification Appliance Circuits, the output circuits shall be individually programmable for Steady, March Time, Dual Stage or Temporal.
 20. When selected as a Notification Appliance Circuit, the output circuits of the addressable power supply shall have the option to be coded by the use of a universal zone coder.
 21. The addressable power supply shall interface and synchronize with other power supplies of the same type. The required wiring to interface multiple addressable power supplies shall be a single unshielded, twisted pair wire.
 22. An individual or multiple interfaced addressable power supplies shall have the option to use an external charger for battery charging. Interfaced power supplies shall have the option to share backup battery power.
- L. Audio Message Generator (Prerecorded Voice)/Speaker Control
1. Each initiating zone or intelligent device shall interface with an emergency voice communication system capable of transmitting a prerecorded voice message to all speakers in the building.
 2. Actuation of any alarm initiating device shall cause a prerecorded message to sound over the speakers. The message shall be repeated four (4) times. Pre- and post-message tones shall be supported.
 3. A built-in microphone shall be provided to allow paging through speaker circuits.
 4. System paging from emergency telephone circuits shall be supported.
 5. The audio message generator shall have the following indicators and controls to allow for proper operator understanding and control:
 - a. Lamp Test
 - b. Trouble
 - c. Off-Line Trouble
 - d. Microphone Trouble
 - e. Phone Trouble
 - f. Busy/Wait
 - g. Page Inhibited
 - h. Pre/Post Announcement Tone
- M. Controls with associated LED Indicators
1. Speaker Switches/Indicators
 - a. The speaker circuit control switches/indicators shall include visual indication of active and trouble status for each speaker circuit in the system.
 - b. The speaker circuit control panel shall include switches to manually activate or deactivate each speaker circuit in the system.
 2. Emergency Two-Way Telephone Control Switches/Indicators
 - a. The emergency telephone circuit control panel shall include visual indication of active and trouble status for each telephone circuit in the system.
 - b. The telephone circuit control panel shall include switches to manually activate or deactivate each telephone circuit in the system.
- N. Remote Transmissions
1. Provide local energy or polarity reversal or trip circuits as required.
 2. The system shall be capable of operating a polarity reversal or local energy or fire alarm transmitter for automatically transmitting fire information to the fire department.
 3. Provide capability and equipment for transmission of zone alarm and trouble signals to remote operator's terminals, system printers and annunciators.
 4. Transmitters shall be compatible with the systems and equipment they are connected to such as timing, operation and other required features.

O. Field Programming

1. The system shall be programmable, configurable and expandable in the field without the need for special tools, laptop computers, or other electronic interface equipment. There shall be no firmware changes required to field modify the system time, point information, equations, or annunciator programming/information.
2. All field defined programs shall be stored in non-volatile memory.

P. Specific System Operations

1. Smoke Detector Sensitivity Adjust: A means shall be provided for adjusting the sensitivity of any or all addressable intelligent detectors in the system from the system keypad. Sensitivity range shall be within the allowed UL window and have a minimum of 9 levels.
2. Alarm Verification: Each of the intelligent addressable smoke detectors in the system may be independently selected and enabled to be an alarm verified detector. The alarm verification delay shall be programmable from 0 to 60 seconds and each detector shall be able to be selected for verification. The FACP shall keep a count of the number of times that each detector has entered the verification cycle. These counters may be displayed and reset by the proper operator commands.

Q. System Point Operations

1. Any addressable device in the system shall have the capability to be enabled or disabled through the system keypad or video terminal.
2. System output points shall be capable of being turned on or off from the system keypad or the video terminal.
3. Point Read: The system shall be able to display the following point status diagnostic functions without the need for peripheral equipment. Each point shall be annunciated for the parameters listed:
 - a. Device Status.
 - b. Device Type.
 - c. Custom Device Label.
 - d. Software Zone Label.
 - e. Device Zone Assignments.
 - f. Analog Detector Sensitivity.
 - g. All Program Parameters.
4. System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing up to 4000 system events. Each of these events will be stored, with time and date stamp, until an operator requests that the contents be either displayed or printed. The contents of the history buffer may be manually reviewed; one event at a time, and the actual number of activations may also be displayed and or printed. History events shall include all alarms, troubles, operator actions, and programming entries.
5. The history buffer shall use non-volatile memory. Systems which use volatile memory for history storage are not acceptable.
6. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent system detector and shall analyze the detector responses over a period of time.
7. If any intelligent detector in the system responds with a reading that is below or above normal limits, then the system will enter the trouble mode, and the particular Intelligent Detector will be annunciated on the system display, and printed on the optional system printer. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.
8. The system shall include the ability (programmable) to indicate a "pre-alarm" condition. This will be used to alert maintenance personal when a detector is at 80% of its alarm threshold in a 60 second period.

R. Universal Digital Alarm Communicator Transmitter (UDACT):

1. The UDACT is an interface for communicating digital information between a fire alarm control panel and an UL-Listed central station.
2. The UDACT shall be compact in size, mounting in a standard module position of the fire alarm control cabinet. Optionally, the UDACT shall have the ability for remote mounting, up to 6,000 feet from the fire alarm control panel. The wire connections between the UDACT and the control panel shall be supervised with one pair for power and one pair for multiplexed communication of overall system status. Systems that utilize relay contact closures are not acceptable.
3. The UDACT shall include connections for dual telephone lines (with voltage detect), per UL/NFPA/FCC requirements. It shall include the ability for split reporting of panel events up to two different telephone numbers.
4. The UDACT shall be capable of transmitting events in 4+2, SIA, and Contact ID.
5. Communication shall include vital system status such as:
 - a. Independent Zone (Alarm, trouble, non-alarm, supervisory)
 - b. Independent Addressable Device Status
 - c. AC (Mains) Power Loss
 - d. Low Battery and Earth Fault
 - e. System Off Normal
 - f. 12 and 24 Hour Test Signal
 - g. Abnormal Test Signal (per UL requirements)
 - h. EIA-485 Communications Failure
 - i. Phone Line Failure
6. The UDACT shall support independent zone/point reporting when used in the Contact ID format. In this format the UDACT shall support transmission of up to 3,064 points. This enables the central station to have exact details concerning the origin of the fire or response emergency.
7. The UDACT shall be capable of being programmed with the same programming utility as the host FACP, and saved, edited and uploaded and downloaded using the utility. UDACT shall be capable of being programmed online or offline. The programming utility shall also support upgrading UDACT operating firmware.
8. The UDACT shall be capable of generating Central Station reports providing detailed programming information for each point along with the central station point address.
9. An IP or IP/GSM Communicator option shall be available to interface to the UDACT and be capable of transmitting signals over the internet/intranet or Cellular (GSM) network to a compatible receiver.

S. Printer

1. The printer shall provide hard-copy printout of all changes in status of the system and shall time-stamp such printouts with the current time-of-day and date. The printer shall be standard carriage with 80-characters per line and shall use standard pin-feed paper. The printer shall be enclosed in a separate cabinet suitable for placement on a desktop or table. The printer shall communicate with the control panel using an interface complying with Electrical Industries Association standard EIA-232D. Power to the printer shall be 120 VAC @ 60 Hz.
2. The system shall have a strip printer capable of being mounted directly in the main FACP enclosure. Alarms shall be printed in easy-to-read RED, other messages, such as a trouble, shall be printed in BLACK. This printer shall receive power from the system power supply and shall operate via battery back-up if AC mains are lost. The strip printer shall be UL 864 listed.
3. The system shall have a strip printer capable of being mounted directly in the main FACP enclosure. Alarms shall be printed in easy-to-read RED, other messages, such as a trouble,

shall be printed in BLACK. This printer shall receive power from the system power supply and shall operate via battery back-up if AC mains are lost. The strip printer shall be UL 864 listed.

T. Smoke Control Annunciator

1. On/Auto/Off switches and status indicators (LEDS) shall be provided for monitoring and manual control of each fan, damper, HVAC control unit, stairwell pressurization fan, and smoke exhaust fan. To ensure compliance the units supplied shall meet the following UL categories: UUKL, PAZX, UDTZ, QVAX as well as the requirements of NFPA 90A, HVAC, and NFPA 92A & 92B, Smoke Control. The control System shall be field programmable for either 90A operation or 92A/B operation to allow for future use and system expansion.
2. The OFF LED shall be Yellow, the ON LED shall be green, the Trouble/Fault LED shall be Amber/Orange for each switch. The Trouble/Fault indicator shall indicate a trouble in the control and/or monitor points associated with that switch. In addition, each group of eight switches shall have two LEDS and one momentary switch which allow the following functions: An Amber LED to indicate an OFF-NORMAL switch position, in the ON or OFF position; A Green LED to indicate ALL AUTO switch position; A Local Acknowledge/Lamp Test momentary switch.
3. Each switch shall have the capability to monitor and control two addressable inputs and two addressable outputs. In all modes, the ON and OFF indicators shall continuously follow the device status not the switch position. Positive feedback shall be employed to verify correct operation of the device being controlled. Systems that indicate on/off/auto by physical switch position only are not acceptable.
4. All HVAC switches (i.e., limit switches, vane switches, etc.) shall be provided and installed by the HVAC contractor.
5. It shall be possible to meet the requirements mentioned above utilizing wall mounted custom graphic.

2.4 ADDRESSABLE DEVICES – GENERAL

- A. Addressable devices shall provide an address-setting means using rotary decimal switches. Addressable devices that require the address be programmed using a programming utility are not an allowable substitute.
- B. Addressable devices shall use simple to install and maintain decade, decimal address switches. Devices shall be capable of being set to an address in a range of 001 to 159.
- C. Addressable devices, which use a binary-coded address setting method, such as a DIP-switch, are not an allowable substitute. Addressable devices that require the address be programmed using a special tool or programming utility are not an allowable substitute.
- D. Addressable devices, which use a binary-coded address setting method, such as a DIP-switch, are not an allowable substitute. Addressable devices that require the address be programmed using a special tool or programming utility are not an allowable substitute.
- E. Detectors shall be intelligent (analog) and addressable, and shall connect with two wires to the fire alarm control panel Signaling Line Circuits.
- F. Addressable smoke and thermal detectors shall provide dual alarm and power/polling LEDS. Both LEDS shall flash green under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDS shall be placed into steady red illumination by the control panel, indicating that an alarm condition has been detected. If required, the LED flash shall have the ability to be removed from the system program. An output connection shall also be provided in the base to connect an external remote alarm LED.
- G. The fire alarm control panel shall permit detector sensitivity adjustment through field programming of the system. The panel on a time-of-day basis shall automatically adjust

sensitivity.

- H. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72.
- I. The detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature. Base options shall include a sounder base with a built-in (local) sounder rated at 85 DBA minimum, a relay base and an isolator base designed for Style 7 applications. The system shall also support an intelligent programmable sounder base, the programmable sounder base shall be capable of providing multiple tones based on programming and at a minimum be capable of providing a Temp-4 tone for CO (Carbon Monoxide) activation and a Temp-3 tone for fire activations and be capable of being synchronized with other programmable sounder bases and common area notification appliances; 85 DBA minimum.
- J. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL).
- K. Detectors will operate in an analog fashion, where the detector simply measures its designed environment variable and transmits an analog value to the FACP based on real-time measured values. The FACP software, not the detector, shall make the alarm/normal decision, thereby allowing the sensitivity of each detector to be set in the FACP program and allowing the system operator to view the current analog value of each detector.
- L. Addressable devices shall store an internal identifying code that the control panel shall use to identify the type of device.
- M. A magnetic test switch shall be provided to test detectors and modules. Detectors shall report an indication of an analog value reaching 100% of the alarm threshold.
- N. Addressable modules shall mount in a 4-inch square (101.6 mm square), 2-1/8 inch (54 mm) deep electrical box. An optional surface mount Lexan enclosure shall be available.

2.5 REMOTE ANNUNCIATOR:

- A. The annunciator shall communicate to the fire alarm control panel via an EIA 485 (multi-drop) two-wire communications loop. The system shall support two 6,000 ft. EIA-485 wire runs. Up to 32 annunciators, each configured up to 96 points, may be connected to the connection, for a system capacity of 3,072 points of annunciation.
- B. An EIA-485 repeater shall be available to extend the EIA-485 wire distance in 3,000 ft. increments. The repeater shall be UL864 approved.
- C. Each annunciator shall provide up to 96 alarm and 97 trouble indications using a long-life programmable color LED's. Up to 96 control switches shall also be available for the control of Fire Alarm Control Panel functions. The annunciator will also have an "ON-LINE" LED, local piezo sounder, local acknowledge and lamp test switch, and custom zone/function identification labels.
- D. The annunciator may be field configured to operate as a "Fan Control Annunciator". When configured as "Fan Control," the annunciator may be used to manually control fan or damper operation and can be set to override automatic commands to all fans/dampers programmed to the annunciator.
- E. Annunciator switches may be programmed for System control such as, Global Acknowledge, Global Signal Silence, Global System Reset, and on/off control of any control point in the system.
- F. An optional module shall be available to utilize annunciator points to drive EIA-485 driven relays. This shall extend the system point capacity by 3,072 remote contacts.

- G. The LED annunciator shall offer an interface to a graphic style annunciator and provide each of the features listed above.

2.6 MANUAL PULL STATION:

- A. Addressable manual fire alarm boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.
- B. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.
- C. Manual fire alarm boxes shall be constructed of Lexan with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches (44 mm) or larger.

2.7 SMOKE DETECTOR (PHOTOELECTRIC):

- A. The intelligent photoelectric smoke detector shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.

2.8 DUCT SMOKE DETECTOR:

- A. The smoke detector housing shall accommodate an intelligent photoelectric detector that provides continuous analog monitoring and alarm verification from the panel. When sufficient smoke is sensed, an alarm signal is initiated at the FACP, and appropriate action taken to change over air handling systems to help prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by the duct system. The Intelligent Duct Smoke Detector shall support the installation of addressable Photoelectric detector capable or being tested remotely.

2.9 HEAT DETECTOR (COMBINATION FIXED TEMP AND RATE OF RISE):

- A. The intelligent thermal detectors shall be addressable devices rated at 135 degrees Fahrenheit (58 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute.

2.10 COMBINATION SMOKE, HEAT, AND CARBON MONOXIDE (CO) DETECTOR:

- A. Intelligent multi-criteria fire detector shall combine multiple sensing technologies in a single device. Smoke detector shall be an addressable intelligent multi-criteria smoke detector. The detector shall be comprised of four sensing elements, including a photoelectric (light-scattering) particulate sensor, an electrochemical carbon monoxide (CO) sensor, a daylight-filtered infrared sensor and solid state thermal sensor(s) rated at 135°F (57.2°C). The device shall be able to indicate distinct smoke and heat alarms.
- B. The intelligent multi-criteria detection device shall include the ability to combine the signal of the photoelectric signal with other sensing elements in an effort to react quickly in the event of a fire situation. It shall also include the inherent ability to distinguish between a fire condition and a nuisance alarm condition. The product design shall be capable of selecting the appropriate sensitivity levels based on the environment type chosen by user in which it is installed (office, manufacturing, kitchen etc.) and then have the ability to automatically change the setting as the environment changes.
- C. The detector shall be capable of automatically adjusting its sensitivity by means of drift compensation and smoothing algorithms. The detector shall be capable of automatically adjusting its sensitivity by means of drift compensation and smoothing algorithms. The device shall provide unique signals to indicate when 20% of the drift range is remaining, when 100% of drift range is used, and when there is a chamber fault to show unit requires maintenance.

- D. The detector shall indicate CO trouble conditions including 6 months of sensor life remaining and sensor life has expired. The detector shall indicate a combined signal for any of the following: low chamber trouble, thermistor trouble, CO self test failure, IR self test failure, and freeze warning.
- E. The detectors shall provide address-setting means on the detector head using rotary switches. Because of the possibility of installation error, systems that use binary jumpers or DIP switches to set the detector address are not acceptable. The detectors shall also store an internal identifying code that the control panel shall use to identify the type of detector. Systems that require a special programmer to set the detector address (including temporary connection at the panel) are labor intensive and not acceptable. Each detector occupies any one of at least 99 possible addresses on the signaling line circuit (SLC) loop. It responds to regular polls from the system and reports its type and status.
- F. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a switch) or initiated remotely on command from the control panel. There are three test methods: functional magnet, smoke entry aerosol, or direct heat method.
- G. The detectors shall provide two LEDs to provide 360° visibility. The LEDs are placed into steady red illumination by the control panel indicating that an alarm condition has been detected. An output connection shall also be provided in the base to connect an external remote alarm LED, sounder base, and / or relay base (optional accessories). The external remote alarm can be interconnected to other sounder or relay bases for activating all devices in a space via a single alarming unit.
- H. Two LEDs on the sensor are controlled by the panel to indicate sensor status. Coded signals, transmitted from the panel, can cause the LEDs to blink, latch on, or latch off. Refer to the control panel technical documentation for sensor LED status operation and expected delay to alarm.
- I. The detectors shall be ceiling-mount and shall be plug-in mounted into a twist-lock base. These detectors shall be constructed of off-white UV resistant polymer and shall be detachable from the mounting base to simplify installation, service and maintenance. Mounting base wiring connections shall be made by means of SEMS screws. The detector shall allow pre-wiring of the base and the head shall be a plug-in type. Mounting base shall be mounted on junction box which is at least 1.5 inches (3.81 cm) deep. Mounting base shall be available to mount to standard junction boxes. Suitable boxes include:
 - 1. 4.0" (10.16 cm) square box with and without plaster ring.
 - 2. 4.0" (10.16 cm) octagonal box.
 - 3. 3.5" (8.89 cm) octagonal box.
 - 4. Single-gang box.
- J. Meets Agency Standards
 - 1. ANSI/UL 268 -Smoke Detectors for Fire Alarm Signaling Systems
 - 2. CAN/ULC-S529- Smoke Detectors for Fire Alarm Systems
 - 3. FM 3230-3250- Smoke Actuated Detectors for Automatic Fire Alarm Signaling

2.11 ADDRESSABLE MONITOR MODULE:

- A. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any Normally Open (NO) dry contact device) to one of the fire alarm control panel SLCs.
- B. The IDC zone shall be suitable for Style D/Class A or Style B/Class B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.

- C. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch (70 mm) x 1-1/4 inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED.
- D. For multiple dry contact monitoring a module shall be available that provides 10 Style B or 5 Style D input circuits.

2.12 ADDRESSABLE RELAY MODULE:

- A. Addressable Relay Modules shall be available for HVAC control and other network building functions.
- B. The module shall provide two form C relays rated at up to 3 Amps resistive and up to 2.0 Amps inductive.
- C. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary devices energize at the same time on the same pair of wires;
- D. For multiple relay control a module shall be available that provides 6 programmable Form-C relays.

2.13 AMPLIFIER:

- A. The Audio Amplifiers will provide Audio Power () for distribution to speaker circuits.
- B. Multiple audio amplifiers may be mounted in a single enclosure, either to supply incremental audio power, or to function as an automatically switched backup amplifier(s).
- C. The audio amplifier shall include an integral power supply, and shall provide built-in LED indicators for the following conditions:
 - 1. Earth Fault on DAP A (Digital Audio Port A)
 - 2. Earth Fault on DAP B (Digital Audio Port B)
 - 3. Audio Amplifier Failure Detected Trouble
 - 4. Active Alarm Bus input
 - 5. Audio Detected on Aux Input A
 - 6. Audio Detected on Aux Input B
 - 7. Audio Detected on Firefighter's Telephone Riser
 - 8. Receiving Audio from digital audio riser
 - 9. Short circuit on speaker circuit 1
 - 10. Short circuit on speaker circuit 2
 - 11. Short circuit on speaker circuit 3
 - 12. Short circuit on speaker circuit 4
 - 13. Data Transmitted on DAP A
 - 14. Data Received on DAP A
 - 15. Data Transmitted on DAP B
 - 16. Data Received on DAP B
 - 17. Board failure
 - 18. Active fiber optic media connection on port A (fiber optic media applications)
 - 19. Active fiber optic media connection on port B (fiber optic media applications)
 - 20. Power supply Earth Fault
 - 21. Power supply 5V present
 - 22. Power supply conditions - Brownout, High Battery, Low Battery, Charger Trouble
- D. The audio amplifier shall provide the following built-in controls
 - 1. Amplifier Address Selection Switches
 - 2. Signal Silence of communication loss annunciation Reset
 - 3. Level adjustment for background music
 - 4. Enable/Disable for Earth Fault detection on DAP A

5. Enable/Disable for Earth Fault detection on DAP A
6. Switch for 2-wire/4-wire FFT riser
- E. Adjustment of the correct audio level for the amplifier shall not require any special tools or test equipment.
- F. Includes audio input and amplified output supervision, back up input, and automatic switch over function, (if primary amplifier should fail).
- G. System shall be capable of backing up digital amplifiers.
- H. One-to-one backup shall be provided by either a plug-in amplifier card or a designated backup amplifier of identical model as the primary amplifier.
- I. One designated backup amplifier shall be capable of backing up multiple primary amplifiers mounted in the same or adjacent cabinets.
- J. Multi-channel operation from a single amplifier shall be supported by the addition of an optional plug-in amplifier card.

2.14 REMOTE NOTIFICATION POWER SUPPLY:

- A. RNPS shall provide additional supervised, notification appliances circuits to the fire alarm system.
- B. Primary Power:
 1. Provide 120 VAC service to each RNPS, transformed through a two-winding isolation-type transformer and rectified to 24 VDC for operation of alarm notification circuits. All primary power supplies for the system shall be via separate, lockable, circuit breakers, dedicated to fire alarm equipment. The circuit breakers shall be identified "Fire Alarm System" with a red and white engraved plastic sign permanently affixed to the face of the circuit breaker.
- C. Auxiliary Power:
 1. Provide 24 VDC auxiliary power for system operation in the event of a primary power source failure. Independent auxiliary power systems shall be located in each RNPS. Transfer from normal to auxiliary power or restoration from auxiliary to normal power shall be automatic and shall not cause transmission of a false alarm.
- D. RNPS shall be provided with sufficient battery capacity to operate all output circuits upon loss of normal 120 VAC power in a normal supervisory mode for a period of twenty four (24) hours followed by 5 minutes of alarm operation at the end of this period. The system shall automatically transfer to the standby batteries upon power failure.
- E. Battery Charger:
 1. Provide solid state, automatic, variable type, battery charger, capable of recharging completely discharged batteries to fully charged condition in 24 hours or less.
 - a. Batteries 24 V, rechargeable, gelled electrolyte, totally sealed, fully charged with all interconnections ready for service. Maintenance free, long-life.
- F. RNPS shall be modular with solid state microprocessor based electronics. RNPS shall provide stand alone power supply for powering notification appliance circuits. RNPS shall have capacity for up to four class "B" notification appliances circuits. RNPS shall contain built in synchronization to synchronize Code 3 Temporal horns and flashes of strobes. RNPS shall provide the ability to silence horns while maintaining strobe functions. RNPS shall interface with the addressable fire alarm system by means of a Notification Appliance Circuit Module connected to the initiation circuits.
- G. RNPS shall provide up to 200 milliamps of continuous auxiliary output for control functions.

2.15 STROBE:

- A. The strobe shall be listed to UL 1971 and UL 1480 and be approved for fire protective signaling systems. It shall be a dual-voltage transformer strobe capable of operation at 12.0 or 24.0 nominal Vrms. It shall have an operating temperature between 32°F and 120°F. It shall mount to a 4 x 4 x 2 1/8-inch back box.
- B. A universal mounting plate shall be used for mounting ceiling and wall strobe products. The notification appliance circuit wiring shall terminate at the universal mounting plate. Strobes and the Sync Circuit Module accessory, if used, shall be powered from a non-coded notification appliance circuit output and shall operate on a nominal 12 or 24 volts (includes fire alarm panels with built in sync). When used with the Sync Circuit Module, 12-volt rated notification appliance circuit outputs shall operate between 8.5 and 17.5 volts; 24-volt rated notification appliance circuit outputs shall operate between 16.5 to 33 volts. If the notification appliances are not UL 9th edition listed with the corresponding panel or power supply being used, then refer to the compatibility listing of the panel to determine maximum devices on a circuit.
- C. Strobes shall be plug-in and shall have the ability to check wiring continuity via a shorting spring on the universal mounting plate. The shorting spring shall also provide tamper resistance via an open circuit if the device is removed.
- D. The strobe shall consist of a xenon flash tube with associated lens/reflector system and operate on either 12V or 24V. The strobe shall also feature selectable candela output, providing options for 15 or 15/75 candela when operating on 12V and 15, 15/75, 30, 75, 110, or 115 when operating on 24V. The strobe shall comply with NFPA 72 and the Americans with Disabilities Act requirement for visible signaling appliances, flashing at 1 Hz over the strobe's entire operating voltage range.
- E. All notification appliances shall be backward compatible.

2.16 SPEAKER:

- A. The speaker shall be listed to UL 1480 for Fire Protective Signaling Systems. It shall be a dual-voltage transformer speaker capable of operation at 25.0 or 70.7 nominal Vrms. The speaker shall have a frequency range of 400 to 4,000 Hz and shall have an operating temperature between 32°F and 120°F. It shall mount to a 4 x 4 x 2 1/8-inch back box.
- B. A universal mounting plate shall be used for mounting ceiling and wall speaker products. The notification appliance circuit and amplifier wiring shall terminate at the universal mounting plate.
- C. Speakers shall be plug-in and shall have the ability to check wiring continuity via a shorting spring on the universal mounting plate. The shorting spring shall also provide tamper resistance via an open circuit if the device is removed. Speaker design shall isolate speaker components to reduce ground fault incidents.
- D. The speaker shall have power taps (from ¼ watt to 2 watts) and voltage that are selected by rotary switches. All models shall have a maximum sound output of 86 dB at 10 feet and shall incorporate an open back construction.
- E. All notification appliances shall be backward compatible.

2.17 SPEAKER/STROBE:

- A. The speaker strobe shall be listed to UL 1971 and UL 1480 and be approved for fire protective signaling systems. It shall be a dual-voltage transformer speaker strobe capable of operation at 25.0 or 70.7 nominal Vrms. The speaker shall have a frequency range of 400 to 4,000 Hz and shall have an operating temperature between 32°F and 120°F. It shall mount to a 4 x 4 x 2 1/8-inch back box.

- B. A universal mounting plate shall be used for mounting ceiling and wall speaker strobe products. The notification appliance circuit and amplifier wiring shall terminate at the universal mounting plate. Speaker strobes and the Sync Circuit Module accessory, if used, shall be powered from a non-coded notification appliance circuit output and shall operate on a nominal 12 or 24 volts (includes fire alarm panels with built in sync). When used with the Sync Circuit Module, 12-volt rated notification appliance circuit outputs shall operate between 8.5 and 17.5 volts; 24-volt rated notification appliance circuit outputs shall operate between 16.5 to 33 volts. If the notification appliances are not UL 9th edition listed with the corresponding panel or power supply being used, then refer to the compatibility listing of the panel to determine maximum devices on a circuit.
- C. Speaker strobes shall be plug-in and shall have the ability to check wiring continuity via a shorting spring on the universal mounting plate. The shorting spring shall also provide tamper resistance via an open circuit if the device is removed. Speaker strobe design shall isolate speaker components to reduce ground fault incidents.
- D. The speaker strobe shall have power taps (from ¼ watt to 2 watts) and voltage that are selected by rotary switches. All models shall have a maximum sound output of 86 dB at 10 feet and shall incorporate an open back construction. The strobe shall consist of a xenon flash tube with associated lens/reflector system and operate on either 12V or 24V. The strobe shall also feature selectable candela output, providing options for 15 or 15/75 candela when operating on 12V and 15, 15/75, 30, 75, 110, or 115 when operating on 24V. The strobe shall comply with NFPA 72 and the Americans with Disabilities Act requirement for visible signaling appliances, flashing at 1 Hz over the strobe's entire operating voltage range.
- E. All notification appliances shall be backward compatible.
- F. Speakers located in outdoor areas shall be listed for outdoor use.

2.18 WEATHERPROOF SPEAKER:

- A. The speaker shall be listed to UL 1480 for Fire Protective Signaling Systems. It shall be a dual-voltage transformer speaker capable of operation at 25.0 or 70.7 nominal V_{rms}. The speaker shall have a frequency range of 400 to 4,000 Hz and shall have an operating temperature between 32°F and 120°F. It shall mount to a 4 x 4 x 2 1/8-inch back box.
- B. A universal mounting plate shall be used for mounting ceiling and wall speaker products. The notification appliance circuit and amplifier wiring shall terminate at the universal mounting plate.
- C. Speakers shall be plug-in and shall have the ability to check wiring continuity via a shorting spring on the universal mounting plate. The shorting spring shall also provide tamper resistance via an open circuit if the device is removed. Speaker design shall isolate speaker components to reduce ground fault incidents.
- D. The speaker shall have power taps (from ¼ watt to 2 watts) and voltage that are selected by rotary switches. All models shall have a maximum sound output of 86 dB at 10 feet and shall incorporate an open back construction.
- E. All notification appliances shall be backward compatible.
- F.

2.19 SIGNAL CONTROL ELEMENT (SCE):

- A. Signal control element shall be provided to create an additional supervised notification circuit from an addressable loop. All supervision and trouble reporting to the FACP shall be via the addressable loop.
- B. Power for the device and any indicating devices shall be provided via the associated RNPS.

2.20 DUAL SYNC MODULES (DSM):

- A. DSM's shall be capable of synchronizing both horns and strobes on a single pair of wires. DSM's shall synchronize two class "B" notification circuits. Horns shall be synchronized to sound in a temporal (code 3) pattern. Provide DSM's for all notification circuits supplied directly by the FACP.

2.21 WIRING:

- A. See section 28 05 13. Provide wiring in accordance with NFPA 72. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
- B. Conductors shall be solid copper. Wiring shall be in accordance with local, state and national codes and as recommended by the manufacturer of the fire alarm system. Conductors for 120 volt circuits shall be No. 12 AWG minimum; conductors for low-voltage DC circuits shall be No. 14 AWG minimum for annunciation circuits and No. 18 AWG minimum for initiation circuits.
- C. Provide color-coded conductors. Identify conductors by plastic-coated, self-sticking, printed markers or by heat-shrink type sleeves. Each conductor used for the same specific function shall be distinctively color coded. Use different color codes for each interior alarm circuit. Each circuit color code wire shall remain uniform throughout the circuit.
- D. Wire and cable not installed in conduit shall have a fire resistance rating suitable for the installation as indicated in NFPA 70 (e.g., FPLR).
- E. Pigtail or "T" tap connections to evacuation alarm horns, horn/strobes and strobes are not acceptable.

2.22 CONDUITS:

- A. See section 28 05 13. All fire alarm wiring from the FACP to final devices shall be run in conduit unless other wise noted.
- B. Identification of Conduit: New conduits containing fire alarm system conductors shall be permanently painted with red paint at the factory. Junction boxes, covers, gutters, and terminal cabinets, containing fire alarm system conductors, shall be painted red or provided with engraved plastic identification signs permanently attached to the equipment.
- C. Fire alarm circuits shall not be run in the same conduit with non-fire alarm circuits. AC circuits shall not be run in the same conduit with DC circuits.
- D. Provide wiring in rigid metal conduit, except electrical metallic tubing conduit may be provided in dry locations not enclosed in concrete or where not subject to mechanical damage or vandalism.
- E. Conceal conduit in finished areas of new construction and wherever practical in existing construction. Conduit runs shall be straight, neatly arranged, properly supported, and parallel or perpendicular to walls and partitions. Identify conductors within each enclosure where a tap, splice, or termination is made.
- F. Underground circuit or circuits in wet areas shall be Type UF or USE cable in schedule 40 PVC conduit

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Equipment, materials, installation, workmanship, inspection, and testing shall be in accordance with the NFPA publications and as modified herein.
- B. Follow manufacturers' directions in all cases for installation, testing and energizing.
- C. Accurately set, level, support and fasten all equipment.

D. Batteries:

1. All batteries shall have the date of installation hand written on the side in a location clearly visible to service personnel.
2. Replace any existing batteries over 4 years old or of unknown age with new compatible, rechargeable, gelled electrolyte, totally sealed, fully charged batteries.

E. Smoke and heat detectors:

1. Locate detectors in accordance with NFPA 72. If the proposed type of detector has an area coverage capability less than required by NFPA 72, revise detector layout and submit for approval with the detail drawings. Mount detectors at the underside of ceiling or roof decks unless otherwise indicated.
2. No detector shall be located closer than 12 inches to any part of any lighting fixture. Detectors, located in areas subject to moisture or exterior atmospheric conditions, or hazardous locations as defined by NFPA 70, shall be approved for such locations.
3. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.

F. Conduit where exposed shall be installed parallel with walls or structural elements; vertical runs to be plumb; horizontal runs level or parallel with structure; conduit grouped neatly together with straight runs, all bends parallels and uniformly spaced.

G. Earthquake Resistant installation/fastening of all electrical equipment shall conform to seismic code requirements. Where anchorage details are shown or not shown on the Drawings, the field installation shall be approved by a Structural Engineer.

H. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.

I. Manual fire alarm boxes shall be suitable for surface mounting or semi-flush mounting as shown on the plans, and shall be installed not less than 42 inches (1067 mm), nor more than 48 inches (122 mm) above the finished floor.

3.2 PRELIMINARY TESTS:

A. Before final acceptance of the work, pre-test system to demonstrate compliance with the contract requirements. System shall be subjected to complete functional and operational tests, including tests in place for each detector. Correct deficiencies pertaining to these requirements prior to formal functional and operational tests of the system. When tests have been completed and corrections made, submit test results and a signed and dated request for formal inspection and final test witnessing.

B. Conduct the following tests during installation of wiring and system components. Preliminary test shall be performed in the presence of the Local Fire Authority and Project Inspector of Record to determine conformance with the specified requirements:

1. Visually inspect all strobes and horn/strobes to ensure that strobe settings are as shown on the drawings.
2. Ground Resistance:
 - a. Measure the resistance of each connection to ground. Ground resistance shall not exceed 10 ohms.
3. Dielectric Strength and Insulation Resistance:
 - a. Test the dielectric strength and the insulating resistance of the system interconnecting wiring by means of an instrument capable of generating 500 volts DC and equipped to indicate leakage current in megohms. For the purpose of this test, connect the instrument between each conductor on the line and between each conductor and ground at the control panel end of the line, with the other extremity open circuited

and all series-connected devices in place. The system shall withstand the test without breakdown and shall indicate a resistance of not less than 50 megohms, the measurement being taken after an electrification of 1.0 minute with a DC potential of 500 volts.

4. Standby Battery Test:
 - a. Prior to formal inspection and tests, place the fire alarm system on standby battery power for twenty-four (24) hours; immediately thereafter, sound the building evacuation alarm signaling devices for 5 minutes. When the test is complete, allow fire alarm system battery charger to recharge the standby batteries for 24 hours and place the fire alarm system on standby battery power for an additional twenty-four (24) hours; immediately thereafter, sound the building evacuation alarm signaling devices for 5 minutes. Certify that the Fire Alarm System has satisfactorily sounded building evacuation alarms for 5 minutes after the second twenty-four (24) hours on battery power.

3.3 FIELD INSPECTION AND FINAL TEST:

- A. Perform the formal inspection and final test in the presence of the in the presence of the manufacturer's representative, the owners representative, Local Fire Authority and Project Inspector of Record (IOR). NFPA 72 "Inspection and Testing Form" shall be filled out completely and signed by those performing and witnessing the final test:
 1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
 2. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.
 3. Verify activation of all waterflow switches.
 4. Open initiating device circuits and verify that the trouble signal actuates.
 5. Open and short signaling line circuits and verify that the trouble signal actuates.
 6. Open and short notification appliance circuits and verify that trouble signal actuates.
 7. Ground all circuits and verify response of trouble signals.
 8. Check presence and audibility of tone at all alarm notification devices.
 9. Check installation, supervision, and operation of all intelligent smoke detectors using the walk test.
 10. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
 11. When the system is equipped with optional features, the manufacturer's manual shall be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.
 12. Test 100% of all automatic fire detection devices:
 - a. Where application of heat would destroy any heat detector, it may be manually activated.
 13. The communication loops and the indicating appliance circuits shall be opened in at least two (2) locations per zone to check for the presence of correct supervisory circuitry.
- B. Test Equipment: It shall be the responsibility of the installing Contractor to furnish tools, instruments, and materials required for the thorough test of the system. This includes, but is not limited to, the following:
 1. VOM meter
 2. Manufacturers recommended smoke detector testing device and sensitivity test equipment.
 3. Heat source for testing rate of rise heat detectors.
 4. Keys to all control panels
 5. Ladders

3.4 TRAINING:

- A. Provide minimum four hours on site training by FACP manufacturer factory trained and authorized personnel.
- B. Training sessions shall provide:
 - 1. Instruction on operating the fire alarm system.
 - 2. "Hands-on" demonstrations of the operations of all system components.
 - 3. Instruct process for changing program and functions.
- C. Permanently attach Sequence of Operation for fire alarm panel on wall next to FACP. Coordinate exact location with Owner.

3.5 PROJECT CLOSEOUT:

- A. As Built Drawings:
 - 1. Provide in accordance with section 28 05 00.
 - 2. Provide a complete set of reproducible "as-built" drawings showing installed wiring, color coding, and wire tag notations for exact locations of all installed equipment, specific interconnections between all equipment, and internal wiring of the equipment upon completion of system:
 - a. Drawings shall include actual voltage drop calculations as installed for all new or modified notifications circuits.
 - b. Drawings shall include actual battery calculations as installed for any new FACP's or RNPS's or any FACP's or RNPS's whose loads have been modified.
- B. Operating and Instruction Manuals:
 - 1. Operating and instruction manuals shall be submitted prior to testing of the system. Four (4) complete sets of operating and instruction manuals shall be delivered to the owner upon completion.
 - 2. Complete, accurate, step-by-step testing instructions giving recommended and required testing frequency of all equipment, methods for testing each individual piece of equipment, and a trouble shooting manual explaining how to test the primary internal parts of each piece of equipment shall be delivered to the owner upon completion of the system.
 - 3. Maintenance instructions shall be complete, easy to read, understandable, and shall provide the following information:
 - a. Instruction on replacing any components of the system, including internal parts.
 - b. Instructions on periodic cleaning and adjustment of equipment with a schedule of these functions.
 - c. A complete list of all equipment and components with information as to the address and telephone number of both the manufacturer and local supplier of each item.
 - d. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit in accordance with U.L. Standard 864.

END OF SECTION

SECTION 31 00 00 – SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Clearing and grubbing of the site, including the removal of debris, vegetation, foreign objects, fencing, landscaping, concrete slabs and foundations, asphalt and portland concrete paving and curbs, gutters, site lighting and bases, masonry walls, area drains and catch basins, unwanted existing underground utilities and drain lines, conduits, trees, and other site construction, as required to provide a site suitable for constructing the proposed Project.
 - 1. This Section does not include demolition of structures, or removal of asbestos-containing or toxic substances.

1.2 REFERENCES

- A. California Building Standards Code (CBSC):
 - 1. California Building Code [CCR Title 24, Part 2] (CBC), 2019 edition:
 - a) Chapter 33 - Safeguards During Construction.
 - 2. California Plumbing Code [CCR Title 24, Part 5] (CBC), 2019 edition.
- B. Geotechnical Investigation Report, as described in Section 31 20 00 Earth Moving.

1.3 DEFINITIONS

- A. *Clean*: To remove dirt clods, rocks, tree branches, and other items which may fall from hauling equipment or which may be "tracked" from the site.

1.4 QUALITY ASSURANCE

- A. Personnel Qualifications: Regularly engaged and specializing in site clearing and related operations preparatory to building construction.

1.5 FIELD CONDITIONS

- A. Ambient Conditions:
 - 1. Do not perform the work of this Section under conditions which would preclude effective dust suppression by conventional means. a. Conform to the applicable requirements of Section 31 20 00 regarding earthwork activities.
 - 2. Use of blowers to distribute dust is not allowed.
 - 3. Burning of plants or fires of any kind are strictly prohibited.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Regulatory Requirements:

1. Comply with applicable portions of CBC Chapter 33, as amended by governmental agency having jurisdiction.
2. Comply with State of California regulations governing removal of underground tanks and abandoning existing wells.
3. Obtain and pay for permits required in connection with this work. Pay fees made necessary by the removal and dumping of debris.
4. Comply with Sediment and Erosion Control Measures, in accordance with State of California requirements, subject to erosion and sediment control inspector's approval.
 - a) Comply with requirements indicated on Contract Documents.

2.2 MATERIALS

- #### A. Drainage Fill: Selected stone or gravel, graded to pass a 3-inch sieve and retained on a 1-inch sieve.

END OF SECTION

SECTION 31 20 00 – EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Clearing and grubbing site.
2. Removing refuse and debris remaining from building demolition and site clearing operations.
3. Rough and finish grading of site. Compacting fill and backfill to attain indicated grades.
4. Erosion and sediment control.
5. Excavating for footings and foundations.
6. Requirements for trenching and bedding of pipeline trenches performed under separate respective utility sections.
7. Furnishing and installing granular base course, as required, under interior concrete slabs on grade, behind retaining walls, and for trench bedding.

1.2 REFERENCES

A. ASTM International (ASTM):

1. C 33-07 - Specification for Concrete Aggregates.
2. D 422-63(2007) Standard Test Method for Particle-Size Analysis of Soils.
3. D 698-07 - Test Method for Laboratory Comparison Characteristics of Soil Using Standard Effort (12,000 ftlb/ft³ [600 kNm/m³]).
4. D 1556-07 - Test Method for Density of Soil in Place by Sand-Cone Method.
5. D 2419-02 - Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
6. D 2487-06 - Classification of Soils for Engineering Purposes.
7. D 2488-06 - Practice for Description and Identification of Soils (Visual-Manual Procedure).
8. D 4318-05 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

B. California Building Standards Code (CBSC):

1. California Building Code [CCR Title 24, Part 2] (CBC), 2019 edition:
 - a) Chapter 18A - Foundations and Retaining Walls.
 - b) Chapter 33 - Safeguards During Construction.

C. California Occupational Safety and Health Standards (OSHA): 1.

1. Article 6 - Excavations and Shoring.
- D. California Department of Transportation (CALTRANS): 1. Standard Specifications, latest edition.
- E. Public Works Standards, Inc. (PWS):
 1. Standard Specifications for Public Works Construction, (Greenbook), 2006 edition with amendments, published by BNi Building News, division of BNi Publications, Inc., Anaheim, CA (714)517-0970

1.3 GEOTECHNICAL REPORTS

- A. Subsurface investigations shall be conducted and a Geotechnical report for the site shall be provided for the Design-Build team. At a minimum this report should address the required paving structural sections, earthwork and compaction recommendations, soil bearing pressures, surcharge pressures, settlement issues, soil infiltration/percolation rates, groundwater levels, and corrosion recommendations.
- B. Interpretations: Specific requirements included in this Section are intended to comply with the recommendations of the Geotechnical Investigation Report, including all current supplements. If discrepancies or conflicts between this Section and the Geotechnical Investigation Report occur, interpretations will be made by the Geotechnical Engineer. Since the Geotechnical Investigation Report is based on a limited sample of testing conducted on the site, actual conditions may dictate recommendations different from this Section or the Geotechnical Investigation Report.

1.4 definitions

- A. Excavation consists of removal and disposal of material encountered when establishing required grade elevations.
- B. Material includes soils, obstructions visible on ground surface, underground structures, and utilities indicated to be removed, and other items encountered that are not classified as rock excavation or unauthorized excavation.
- C. Unauthorized Excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect.

1.5 QUALITY ASSURANCE

- A. Certification:
 1. Certify source and type of backfill proposed to be incorporated into the work.
 2. Certify levels of excavations, footings, and subbed grades by licensed surveyor.

1.6 FIELD CONDITIONS

- A. Underground Utilities: Buried utility lines may exist. If encountered, notify the Architect and Civil Engineer for direction on preservation, relocation, or demolition.
1. Cooperate with Owner and utility companies in maintaining respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 2. Do not interrupt existing utilities serving facilities occupied by Owner or others, except when authorized in writing by Owner, and then only after acceptable temporary utility services have been provided.
 3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. Regulatory Requirements: Comply with applicable portions of codes and regulations of governmental agencies having jurisdiction, including applicable portions of CBC Chapter 33. Where those requirements conflict with the Contract Drawings, comply with the more stringent provisions.
1. Soils Report: Comply with recommendations of the Geotechnical Investigation report referenced. Grading, backfill, and compaction provisions stated in this Section are minimum recommendations.
 2. Geotechnical Engineer: The Owner will retain the Project Geotechnical Engineer who will have the responsibilities of observing the performance of the work of this Section, making supplementary recommendations, and approving or rejecting import materials proposed for use.
 - a) Conform to the recommendations of the Geotechnical Engineer.
 3. Work not covered by governing agency standards shall conform to Contract Drawings and Project Manual, in that order.
 4. Comply with appropriate provisions of the Storm Water Pollution Prevention Plan regarding cleaning and protection.

2.2 PERFORMANCE CRITERIA

- A. Performance Requirements: Classification of soils when made in connection with the work of this Contract shall be in accordance with the applicable requirements of ASTM D 2487 and ASTM D 2488.

2.3 MATERIALS

- A. Backfill Material: Provide native soils approved for backfill by the Geotechnical Engineer.
- B. Subslab Base (Sand – To be approved by Geotechnical Engineer):
 - 1. Provide clean, dry, free-draining washed concrete sand.
 - 2. Provide clean, free-draining sand having a Sand Equivalent of not less than 30, as determined in accordance with ASTM D 2419.
 - 3. ASTM C 33 having a Sand Equivalent of not less than 30 as determined in accordance with ASTM D 2419.
- C. Subslab Base (Aggregate – To be approved by Geotechnical Engineer):
 - 1. Provide clean, free-draining aggregate, having a gradation equal to the following:

SIEVE SIZE	PERCENTAGE PASSING
1-inch	100
3/8	30-100
No. 4	0-5

- D. Utility Trench Pipe Bedding: Clean, free-draining sand, gravel, crushed aggregate, or native materials having a Sand Equivalent of not less than 30, as determined in accordance with ASTM D 2419.
- E. Water: Clean and free from deleterious amounts of acids, alkalis, salts, and organic matter.
- F. Filter Fabric: Mirafi 140N, or equal unless otherwise called out on plans.

2.4 SOURCE QUALITY CONTROL

- A. Import fill material shall be tested by laboratory and approved by Geotechnical Engineer prior to importing.
 - 1. Notify Geotechnical Engineer of location of material proposed for use at least 72 hours in advance of import operations.
- B. Contractor shall comply with the sampling requirements in the guidelines and will be required to pay for removal and disposal costs of any soil brought on site determined not to conform to the Geotechnical Engineer's recommendations.

END OF SECTION

SECTION 32 01 90 – LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.1 SCOPE

- A. Work in this section includes the growing and maintenance operations necessary to establish the newly planted shrubs, trees, and other plantings; to provide insect and disease control, and to maintain the irrigation system, and related construction elements.
- B. Related work specified elsewhere:
 - 1. Landscape Irrigation - Section 32 84 00
 - 2. Landscape Soil Preparation – Section 31 92 13
 - 3. Landscape Planting - Section 32 93 00

1.2 SUBMITALS

- A. Soil Testing: Contractor shall collect two (2) one-quart samples in the container planting areas of the in-place topsoil 20 days after completion of planting and submit to Waypoint Analytical, Inc. of Anaheim, (714)282-8777, for maintenance period fertilizer recommendation. Test results shall be made available to the Owner's/City's/County's Representative. Sample shall be a representative composite taken from several planting areas. Cost of soil test shall be paid for by the Contractor.
- B. Herbicide/Fungicide/Insecticide: Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by City Inspector and/or City's appropriately licensed individual.

1.3 SCHEDULE

- A. Work in this section will not begin until the irrigation audit is complete.
- B. Maintenance and Warranty Period: Shall be per City of Gonzales Standard Specifications.
- C. Maintenance period shall be for a minimum period of ninety (90) calendar days after pre-final inspection.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fertilizer: Used during the course of the maintenance period shall be determined by soils test required under Part 1 of this Section. For bidding purposes only,

assume the use of ammonium sulfate (21-0-0) at 5 lbs. per 1000 SF, minimum of two applications.

- B. Water: During the course of construction and maintenance period water shall be paid for by the Contractor.
- C. Herbicide/Fungicide/Insecticide: Shall be a commercially available chemical recommended for this project and these plantings by a State of California appropriately licensed individual. The licensed individual shall review all planting, including but not limited to seed, sod, groundcovers, shrubs, and trees, the types and extent of soil preparation, the irrigation systems, drainage patterns, and other project characteristics to verify type, compatibility, and recommend the appropriate chemical(s) for use. Contractor shall be responsible for all overspray, spreading, runoff, plant health, and other impacts from the use of the chemical(s).
- D. Animal Control Materials: None required under these specifications.

PART 3 - EXECUTION

- 3.1 TIME LIMITS: The maintenance period shall commence from the date of substantial completion of planting as defined in paragraph 3.6 below, and extend for a (90) day period thereafter, or until the acceptance of Final Completion.
- 3.2 FERTILIZER APPLICATION: Fertilizer(s) shall be applied per Waypoint Analytical, Inc. recommendations. For bidding purposes, assume initial application to be four weeks after planting and subsequent applications to be at 45-day intervals.
- 3.3 HERBICIDE APPLICATION: Herbicide shall not be used until all plant material has been planted a minimum of 20-days. All planting areas shall be kept weed-free by non-herbicide methods during this time period. Herbicide shall not be applied to any areas that are or have been seeded. Contractor must apply the material in conformance with the written recommendations of the State appropriately licensed individual.
- 3.4 BASIC REQUIREMENTS: All planting areas shall be kept weed-free at all times during the maintenance period. All pest and disease control shall be the Contractor's responsibility. All planting areas shall be kept at optimum moisture for plant growth. Settlement of soil and plants and soil erosion shall be repaired and areas replanted as required. Dying or deficient plants shall be replaced as soon as they become apparent.
- 3.5 CITY'S RESPONSIBILITY: Work installed under this contract that is damaged or stolen prior to Substantial Completion shall be repaired or replaced by the Contractor without cost to the City. After Substantial Completion and through the maintenance period, these damages and similar factors such as extensive litter, abuse and defacement shall be the City's responsibility to repair or replace and shall not be a part of this contract. No planting shall be guaranteed beyond the maintenance period, except as to conformance to specified species and variety, and except as to conditions specified under "Root Systems" of Planting, Section 32 93 00.

- 3.6 SUBSTANTIAL COMPLETION: Shall be deemed as the time all major plantings, including groundcover, are installed, and when all other work is satisfactorily completed (with the exception of minor items to be completed as noted upon a checklist compiled by the City's Representative). Maintenance period shall not commence until work is deemed substantially complete by the Owner's/City's/County's Representative.
- 3.7 FINAL REVIEW: Contractor shall request a final review of the project at least five days in advance of the proposed date. Failure to request this notice shall automatically extend the date of completion. The maintenance period will continue until project is deemed complete.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be paid for at the lump sum price bid for PLANTING and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in PLANTING, and related incidental work.

END OF SECTION 32 01 90

(This page intentionally left blank)

SECTION 32 12 16 – ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Asphalt concrete paving.

1.2 REFERENCED STANDARDS

A. ASTM International:

1. D 977-05 - Specification for Emulsified Asphalt.
2. D 1557-02 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
3. D 1883-07 - Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils.
4. D 2026-97(2004) - Specification for Cutback Asphalt (Slow-Curing Type).
5. D 2489-02 - Test Method for Degree of Particle Coating of Bituminous-Aggregate Mixtures.
6. D 2844-07 - Test Method for Resistance R-Value and Expansion Pressure of Compacted Soils.
7. D 2950-05 - Test Method for Density of Bituminous Concrete in Place by Nuclear Method.
8. D 3381-05 - Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
9. D 3549-03 - Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.

B. American Association of State Highway and Transportation Officials (AASHTO):

1. T 180 - Method for Determining Laboratory Density of Untreated Aggregate Bases and Subbases (ASTM D 1557, Method D).
2. T 190 - Method of Test for Resistance R-Value and Expansion Pressure of Compacted Soils (ASTM D 2844).
3. T 193 - Method of Test for the California Bearing Ratio (ASTM D 1883).
4. T 274 - Method of Test for Resilient Modulus of Subgrade Soils.

C. Asphalt Institute (AI):

1. MS-10 - Soils Manual for Design of Asphalt Pavement Structures.

D. California Department of Transportation (CALTRANS):

1. Standard Specifications, latest edition.

2. Highway Design Manual, latest edition.
- E. Public Works Standards, Inc. (PWS):
1. Standard Specifications for Public Works Construction, (Greenbook), 2006 edition with amendments, published by BNi Building News, division of BNi Publications, Inc., Anaheim, CA (714)517-0970.

1.3 FIELD CONDITIONS

- A. Ambient Conditions:
1. Do not apply bituminous prime or tack coats when:
 - a) Ambient temperature in the shade is below 50 degrees F and falling.
 - b) Base surface contains an excess of moisture that would prevent uniform distribution and the required penetration.
 2. Construct asphalt concrete surface course only when atmospheric temperature is above 50 degrees F and rising, when the underlying base is dry, and when weather conditions allow proper handling and finishing.
 3. Colder application temperatures may be approved by the Paving Inspector under special circumstances.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
1. Elanco Products Company, a division of Eli Lilly and Company, Indianapolis, IN (317)276-2000.
 2. Neyra Industries, Inc., Cincinnati, OH (800)543-7077.
- B. Like materials shall be the products of one manufacturer and shall be either the ones upon which the design is based or the products of other manufacturers accepted in advance.

2.2 DESCRIPTION

- A. Regulatory Requirements: Comply with the applicable requirements of the PWS Standard Specifications, and the applicable highway department standard specifications commonly used in the local area. Where those requirements conflict with the Contract Drawings, comply with the more stringent provisions. Work not covered by governing agency standards shall conform to Contract Drawings and Project Manual, in that order.

1. Soils Report: Comply with the requirements and recommendations of the Geotechnical Investigation as directed by the Geotechnical Engineer. After final grades are established, perform additional soil testing to determine actual soil bearing values to determine final paving requirements.
2. Paving Inspector: The Owner will employ a Certified Deputy Paving Inspector or qualified civil engineer experienced in paving work for the purposes of observing paving operations at plant and on site, and for making supplementary recommendations.
 - a) As authorized by the Owner, comply with the recommendations and directions of the Paving Inspector.
3. Air Quality Regulations: Comply with the regulations of the air quality management district in force at the time of the performance of the work of this Section.
4. When required by governing agencies, prepare, secure approval, and implement a Traffic Control Plan.
5. Comply with governing agency standards on pavement replacement, where applicable.

2.3 PERFORMANCE CRITERIA

A. Design Requirements:

1. Final pavement section recommendations will be based on R-value (AASHTO T 190/ASTM D 2844), CBR (AASHTO T 193/ASTM D 1883), or Mr (AASHTO T 274) tests, as appropriate to local practice, after grading operations are complete.
2. Refer to Contract Civil Drawings and Geotechnical Investigation for thicknesses of crushed stone base and asphalt surface course based on preliminary analysis.
 - a) Verify final thicknesses and other requirements with Geotechnical Engineer after completion of earthwork operations and prior to submitting mix designs and performing work.
 - b) Match existing thickness where patching occurs, unless otherwise indicated on Contract Drawings.

B. Performance Requirements:

1. Materials specified in Article 2.04 - Materials are preliminary and subject to final analysis of soils compaction tests and anticipated traffic loads. Provide materials and mixes meeting the traffic use

requirements for actual soils conditions as determined by Geotechnical Engineer.

2.4 MATERIALS

- A. Aggregate for Base: Size and gradation as recommended by local standards for anticipated traffic loads, and as required on Civil Contract Drawings. One of the following, or as indicated on Contract Drawings:
 - 1. Crushed aggregate base or crushed miscellaneous base complying with Section 200-2 - Untreated Base Materials, of the PWS Standard Specifications.
 - 2. Crushed aggregate base or crushed miscellaneous base conforming to Section 400-2 - Untreated Base Materials, of the Standard Specifications.
 - 3. Class 2 aggregate base as defined in Section 26 of CALTRANS Standard Specifications.
- B. Aggregate for Asphaltic Concrete: Sound, clean, angular crushed stone or crushed gravel complying with Section 203-6 - Asphalt Concrete of the PWS Standard Specifications, or in accordance with Section 39 of CALTRAN Standard Specifications.
 - 1. Access Roads, Loading Docks, and Trash Loading Areas: Aggregate gradation and percentage of asphalt binder shall conform to Class B in accordance with Section 203-6.3 of the PWS Standard Specifications.
 - 2. Base Courses, Commercial Parking Areas, and General Use: Aggregate gradation and percentage of asphalt binder shall conform to Class C2 in accordance with Section 203-6.3 of the PWS Standard Specifications.
 - 3. Light Parking Areas and Play Areas: Aggregate gradation and percentage of asphalt binder shall conform to Class D2 in accordance with Section 203-6.3 of the PWS Standard Specifications.
- C. Paving Asphalt: Steam refined asphalt free from water and residues in accordance with Section 2.03.1 of the PWS Standard Specifications, and conforming to the requirements ASTM D 3381 for Viscosity Grade AR-4000 minimum to Grade AR-8000 maximum, and as required by the design mix.
- D. Prime Coat: Grade SC 250 liquid asphalt, conforming to ASTM D 2026, or as required by local practice.
- E. Paint Binder (Tack Coat): Grade SS-1h emulsified asphalt, or as required by local practice. Conform to the PWS Standard Specifications when tested in accordance with ASTM D 977.
- F. Herbicide Treatment: Non-crystallizing type, equal to Spike 80-W manufactured by Elanco Company.

- G. Sealer: Asphaltic emulsion penetrant, equal to the following:
1. PaveShield, manufactured by Neyra Industries.
 - a) Crack Sealant: Thermo-Seal PLS, manufactured by Neyra Industries.
 - b) Primer: Polyprime, manufactured by Neyra Industries.
 - c) Oil Spot Primer: Oil Seal, manufactured by Neyra Industries.
 - d) Sand: As recommended by sealer manufacturer.

2.5 EQUIPMENT

- A. Provide type, size and quantity of pavers and rolling equipment to complete work within the requirements of the accepted construction schedule. Areas inaccessible to power rollers shall be compacted with pneumatic-powered, vibratory, hand-operated equipment.
1. Bituminous Pavers: Self-propelled machines that spread hot asphalt concrete mixtures without tearing, shoving, or gouging asphalt surfaces. Control pavement edges to true lines without use of stationary forms.
 2. Rolling Equipment:
 - a) Self-propelled rollers in good condition that can reverse direction without backlash.
 - b) Provide sufficient rollers to obtain the required pavement density.
 - b. Minimum roller rating shall be 8 tons.
 - c. Minimum number of rollers shall be in accordance with Section 302-5.6.1 of the PWS Standard Specifications.

2.6 MIXES

- A. Design Criteria: Comply with Hveem or Marshall mix design criteria methods, as required by local practice.
1. Provide separate job-mix formulae for each required asphalt aggregate mixture.
 2. Establish a single percentage of aggregate passing each required sieve size, a single percentage of asphalt cement to be added to aggregate, and a single temperature at which asphalt concrete will be produced.
 3. Comply with the mix requirements of local agency governing public works standards.
 4. Maintain material quantities within allowable tolerances of the governing standards.
- B. Asphalt:

1. Heat asphalt at the mixing plant to a viscosity that can be uniformly distributed throughout mixture.
 2. Use lowest possible temperature to suit temperature-viscosity characteristics of asphalt.
 3. Do not exceed 375 degrees F.
- C. Aggregate:
1. Deliver dry aggregate to mixer at recommended temperature to suit penetration grade and viscosity characteristics of asphalt, ambient temperature, and workability of mixture.
 2. Accurately weigh or measure dry aggregates and asphalt cement to comply with job-mix formula requirements.
- D. Mixing: Mix aggregate and asphalt in accordance with PWS Standard Specifications 203-6.6 to achieve 90 to 95 percent of coated particles for base mixtures and 85 to 90 percent of coated particles for surface mixture, when tested in accordance with ASTM D 2489. All aggregate shall be sufficiently well coated.
- E. Transporting:
1. Transport asphalt concrete mixtures from mixing site in trucks having tight, clean compartments.
 2. Coat hauling compartments with environmentally safe release agent to prevent asphalt concrete mixture from sticking. Elevate and drain compartment of excess solution before loading mix.
 3. Provide covers over asphalt concrete mixture when transporting to protect from weather and to prevent loss of heat.
- F. Slurry: Mix emulsion with power equipment to a homogeneous consistency in accordance with the manufacturer's instructions.
1. For sand slurry, slowly add 4 to 6 pounds of sand per gallon of emulsion after initial mixing. Maintain mixture under constant agitation, and mix to even slurry consistency.
 2. Add water to mix as required for application, amount not to exceed 10 percent of emulsion.

2.7 SOURCE QUALITY CONTROL

- A. As authorized by the Owner, comply with the recommendations and directions of the Certified Deputy Paving Inspector at asphalt plant and during paving operations. Comply with requirements of Article 3.07 - Field Quality Control.

END OF SECTION

SECTION 32 12 43 – POROUS FLEXIBLE PAVEMENT

PART 1 - GENERAL

1.1 SCOPE

A. Work included:

1. Provide and install base course.
2. Provide Grasspave2 Paving System products including Grasspave2 units, Hydrogrow soil polymer, and installation per the manufacturer's instructions furnished under this section.
3. Provide and install clean sharp sand to fill the Grasspave2 units, when needed.

1.2 QUALITY ASSURANCE

- A. Installation: Performed only by skilled work people with satisfactory record of performance on landscaping or paving projects of comparable size and quality.

1.3 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions.
- B. Submit a 10" x 10" section of Grasspave2 material for review. Reviewed and accepted samples will not be returned to the contractor.
- C. Submit material certificates for base course and sand fill materials.

1.4 DELIVERY, STORAGE & HANDLING

- A. Protect turf paver from damage during delivery and store under tarp when time from delivery to installation exceeds one week. Keep Hydrogrow in a dark and dry location.

1.5 PROJECT/SITE CONDITIONS

- A. Review installation procedures and coordinate work with other work affected.
- B. All hard surface paving adjacent to turf pave areas, including concrete walks and asphalt paving, must be completed prior to installation.
- C. Protect partially completed paving against damage from other construction traffic when work is in progress, and until grass root system has matured (approximately 3 to 4 weeks). Construct barricades to keep pedestrians and vehicles off.

- D. Protect adjacent work from damage.

PART 2 - PRODUCTS

2.1 AVAILABILITY

- A. Manufacturer: (Grasspave2, Hydrogrow) Invisible Structures, Inc., 14704-D East 33rd Place, Aurora, Colorado 80011, 800-233-1510, fax 303-373-1223.

2.2 MATERIALS

- A. Base Course: Sandy gravel material from local sources commonly used for road base construction, passing the following sieve analysis.

% Passing	Sieve Size
100	3/4"
85	3/8"
60	#4
30	#40
< 5	#200

1. Sources of the material can include either "pit run" or "crusher run." Crusher run material will generally require sharp sand to be added to mixture (30 to 40% by volume) to ensure long term porosity.
 2. Selected materials should be nearly neutral in pH (range from 6.5 to 7.2) to provide adequate root zone development for turf.
- B. Hydrogrow Polymer: A dry synthetic crystal made of polyacrylimide (<0.1%) polymer. This polymer is non-toxic and neutral in pH, and will absorb 150 to 350 times its weight in water from most tap sources. Hydrogrow is a non-ionic form of polymer that allows absorption of fertilizers and other minerals without degradation. Alternative polymers of ionic, or anionic, forms shall not be substituted.
 - C. Grasspave2 Grass Paving Units: Lightweight injection-molded plastic units 0.5x0.5x0.025 m (20"x20"x1" high, 2.7 ft² each) with hollow rings rising from a strong open grid allowing maximum grass root penetration and development. The plastic shall be 100% post-consumer recycled plastic resins, predominately HDPE, with minimum 3% carbon black concentrate added for UV protection. Loading capability is equal to 402 kg/cm² (5700 psi) when filled with sand, over an appropriate depth of road base. Standard color is black. Unit weight = 510 g (18 oz.), volume = 8% solid. Units may also be shipped in pre-assembled 1 meter squares.

Sand: Obtain clean sharp sand (washed concrete sand) to fill the 25 mm (one inch) high rings and spaces between the rings when seeding or using 13 mm (half inch) thick sod (soil thickness).

PART 3 - EXECUTION

3.1 INSPECTION

- A. Do not start Grasspave2 installation until the Engineer has examined subgrade and base course. Check for improperly compacted trenches, debris, and improper gradients.

3.2 PREPARATION

- A. Place base course material over prepared subbase to grades shown on plans, in lifts not to exceed 150 mm (6"), compacting each lift separately to 95% modified proctor. Leave 35 mm (1.5") for Grasspave2 unit and sand/sod fill to final grade.
- B. Spread all Hydrogrow mix provided (spreader rate = 2.25 kg per 100 m² (5 lbs per 1000 ft²) evenly over the surface of the base course with a hand-held, or wheeled, rotary spreader. The Hydrogrow mix should be placed immediately before installing the Grasspave2 units to assure that the polymer does not become wet and expanded when installing the units.

3.3 INSTALLATION OF GRASSPAVE2 UNITS

- A. Install the Grasspave2 units by placing units with rings facing up, and using pegs and holes provided to maintain proper spacing and interlock the units. Units can be easily shaped with pruning shears or knife. Units placed on curves and slopes shall be anchored to the base course, using 16d Common nails with fender washer, as required to secure units in place. Tops of rings shall be between 6 mm to 13 mm (0.25" to 0.5") below the surface of adjacent hard-surface pavements.
- B. Install sand in rings as they are laid in sections by "backdumping" directly from a dump truck, or from buckets mounted on tractors, which then exit the site by driving over rings already filled with sand. The sand is then spread laterally from the pile using flat bottomed shovels and/or wide "asphalt rakes" to fill the rings. A stiff bristled broom should be used for final "finishing" of the sand. The sand must be "compacted" by using water from hose, irrigation heads, or rainfall, with the finish grade no less than the top of rings and no more than 6 mm (0.25") above top of rings.

3.4 CLEANING

- A. Remove and replace segments of Grasspave2 units where three or more adjacent rings are broken or damaged, reinstalling as specified, so no evidence of replacement is apparent.
- B. Perform cleaning during the installation of work and upon completion of the work. Remove all excess materials, debris, and equipment from site. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 Full compensation for Turf Pavers shall be paid for at the contract unit price per square foot, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing said Turf Pavers, complete in place, as shown on the plans, as specified in the Standard Specifications, these special provisions, or as directed by the Engineer.

END OF SECTION 32 12 43

SECTION 32 13 12 – LANDSCAPE CONCRETE (FINISHES AND COLORS)

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all landscape concrete as shown on the plans and specified herein including, but not necessarily limited to the following:
 - 1. Colored concrete pavement #1 & #2
 - 2. Colored concrete band
 - 3. Landscape concrete seat wall

1.2 STANDARDS

- A. Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:
 - 1. City Standards for Public Improvements.
 - 2. The State of California, Department of Transportation Standard Specifications (DTSS) sections 52, 73 and 90 except for measurement and payment requirements.
 - 3. Applicable ASTM Specifications as they reasonably apply to this work, except for measurement and payment requirements.
 - 4. American Concrete Institute (ACI), current standards.

1.3 TOLERANCES

- A. Tolerances for subgrade, subbase and finished grade shall be as specified by DTSS except that Contractor shall deliver the full aggregate base and concrete thickness shown. No combination of high and low tolerances that compromise the section will be permitted.
- B. Concrete Final Finishes: The Contractor shall demonstrate to the satisfaction of the City and the Owner's Representative that they, or their subcontractor, possesses sufficient skills and experience to perform the work. Photographs and/or site visits of past work may be required to supply this information. A 2'x2' sample of each colored concrete pavement, concrete band, and seatwall shall be poured and finished at the site for Owner's Representative's and City's review prior to commencing concrete pouring. Once the samples have been reviewed, the Contractor shall meet or exceed that quality of finish in all subsequent work. Contractor shall be responsible for removal of the samples at the completion of the work.
- C. Submittals: The following shall be submitted by the Contractor to the Engineer in accordance with the applicable portions of the referenced specifications:

1. The proposed mix design, giving the brand of cement, type, gradations and source of aggregates, water/cement ratio, mix proportions, and unit weight.
2. Manufacturer's literature for admixtures, embedded items, liquid membrane-form curing compound and non-shrink grout.
3. Certification that materials are in compliance with specification requirements.
4. Method of transporting and placing concrete.

1.4 JOB CONDITIONS

- A. Weather Limitations: Construct concrete surface course only when atmospheric temperature is above 40 degrees F., when the underlying base is dry, and when weather is not rainy.
- B. Grade Control: Establish and maintain the required lines and grades, including cross-slope during construction operations. All concrete shall slope to drain with no ponding of water.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Forms and Reinforcing: Per section 32 13 13.
- B. Concrete: All sidewalks, pavements, and curb ramps shall conform to Section 32 13 13. For landscape concrete seatwall shall conform to Section 90 of the DTSS "Minor Concrete".
 1. Cement: Type II modified conforming to ASTM-C-150-02a.
 2. Aggregate: Shall not be less than 3/8" or more than 1 inch in size.
 3. Compression strength at 28 days to be a minimum 3,000 p.s.i.
- C. Color Admixture: All concrete colors shall be reviewed and confirmed with the city.
 1. For colored concrete pavement #1 and #2, seatwall, and bands add Hi-con black at the rate of 1/8 lb. per sack.
 2. For colored concrete pavement #1, add Outback 677 by Davis Colors or approved equal. Install at rate per manufacturer's recommendation.
 3. For colored concrete pavement #2 and concrete pavement #2 band, add Pewtor 860 by Davis Colors or approved equal. Install at rate per manufacturer's recommendation.
- D. Cleaning Agents: As required.
- E. Aggregate Base: Per section 32 13 13.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clear area to be paved of all debris and organic material. Recompact and regrade as necessary prior to placement of concrete. Verify that the subgrade and/or aggregate base is properly compacted and at suitable grade.
- B. Before beginning paving work and during construction, take all steps necessary for protection of existing improvements. As the concrete is being placed, extreme care shall be taken not to discolor or damage any improvements. If damage occurs, repair same, and if satisfactory repair cannot be made, remove and replace the section as directed.
- C. Formwork and Reinforcement:
 - 1. Assure that excavations and formwork are completed.
 - 2. Check that reinforcement is secured in place.
 - 3. Verify that expansion joint material, anchors, and other embedded items are secured in position.

3.2 INSTALLATION

- A. Finishes
 - 1. Medium Sandblast: Provide a uniformly textured medium sandblast finish to expose the sand particles in the mix. Sample finish shall be reviewed prior to pouring the concrete.
 - 2. Broom Finish: Provide a light broom finish with strokes perpendicular to direction of travel along walks.
 - 3. Trowel Finish: Smooth, parallel to longest surface direction.

- 3.3 CLEAN UP: Upon completion of the work under this section, remove immediately all surplus materials, rubbish, and equipment associated with or used in the performance of this work.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be paid for at the lump sum price bid for site concrete and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in site concrete and related incidental work.

END OF SECTION 32 13 13

(This page intentionally left blank)

SECTION 32 13 13– CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Non-decorative finished portland cement concrete paving, stairs, ramps, curbs, gutters, sidewalks, decorative concrete, site/landscape features, low retaining walls and required base courses.
- 1) Refer to Section 32 13 12 for landscape concrete (finishes and colors)
 - 2) Refer to Section 32 13 16 for decorative concrete paving used in landscape work, including special textures and detectable warning units.

1.2 REFERENCES

- A. ASTM International (ASTM):
- 1) A 29-05 - Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for.
 - 2) A 82-07 - Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - 3) A 615-08a - Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - 4) C 33-07 - Specification for Concrete Aggregates.
 - 5) C 39-05 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 6) C 94-07 - Specification for Ready-Mixed Concrete.
 - 7) C 131-06 - Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - 8) C 150-07 - Specification for Portland Cement.
 - 9) C 309-07 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - 10) C 979-05 - Specification for Pigments for Integrally Colored Concrete.
 - 11) D 1751-04 - Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-Extruding and Resilient Bituminous Types).
 - 12) D 2047-04 - Test Method Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
 - 13) D 2419-02 - Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- B. California Building Standards Code (CBSC):
- 1) California Building Code [CCR Title 24, Part 2] (CBC), 2019 edition: a. Chapter 11B - Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Publicly Funded Housing:
 - a. Division I - New Buildings:
 - 1) Section 1117B - Other Building Components.
 - b. Division II - Site Accessibility:
 - 1) Section 1127B - Exterior Routes of Travel.

- 2) Section 1129B - Accessible Parking Required.
- c. Division III - Accessibility of Entrances, Exits and Paths of Travel:
 - 1) Section 1133B - General Accessibility for Entrances, Exits and Paths of Travel.
- C. American Concrete Institute (ACI):
 - 1) ACI Manual of Concrete Practice, latest edition.
 - a. 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
 - b. 315 - Details and Detailing of Concrete Reinforcement.
 - c. 347 - Recommended Practice for Concrete Formwork.
- D. Concrete Reinforcing Steel Institute (CRSI):
 - 1) Manual of Standard Practices.

1.3 QUALITY ASSURANCE

- A. Certifications: Employ a registered civil engineer or licensed land surveyor, acceptable to the Architect, to lay out the work, to establish reference points set for construction, and to certify that finish grades meet requirements of the Contract Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Bonding Agent and Curing Compounds
 - 1) Anti-Hydro International, Inc., Flemington, NJ (800)777-1773, www.anti-hydro.com.
 - 2) L&M Construction Chemicals, Inc., Omaha, NE (402)453-6600, (800)362-3331.
 - 3) ProSoCo, Inc., Lawrence, KS (800)255-4255
 - 4) W.R. Meadows, Inc., Elgin, IL (312)683-4500
- B. Curb Drain Forms:
 - 1) Curb-O-Let, Huntington, Beach, CA (714)903-2468, represented by K&B Associates, LLC, (714)378-2722, www.curb-o-let.com.
- C. Form Coatings:
 - 1) Grace Construction Products, division of W.R. Grace and Co.-Conn., Cambridge, MA (617)876-1400.
- D. Sealer:
 - 1) ProSoCo, Inc., Lawrence, KS (800)255-4255, www.prosoco.com.
- E. Slip Dowel Sleeves
 - 1) Greenstreak, Inc., St. Louis, MO (800)225-9400, www.greenstreak.com
- F. Like materials shall be the products of one manufacturer and shall be either the ones upon which the design is based, or the products of other manufacturers accepted in advance in accordance.

2.2 DESCRIPTION

- A. Regulatory Requirements:
- 1) Comply with applicable codes and regulations of governmental agencies having jurisdiction, including applicable requirements of the *Standard Specifications*, applicable requirements for accessible access contained in local governing agency security ordinances, and applicable federal access laws.
 - 2) Comply with applicable requirements of the *CSRI Manual*.
 - 3) Accessible Curb Ramps: In accordance with CBC Section 1127B.5, surface of each curb ramp and its flared sides shall be slip resistant and of contrasting finish from that of adjacent sidewalk. Refer to Article 3.09 - Ramps.
 - 4) Comply with CBC Section 1133B.7.1 requirements for slip resistance. a. Concrete paving shall have a minimum slip resistance coefficient of friction of 0.6 as tested in accordance with ASTM D 2047.
 - 5) Products shall comply with California Title 24 requirements regarding patterns, color, and sound on cane contact.

2.3 MATERIALS

- A. Form Materials: Provide adequate bracing in conformance with the general material requirements of Section 03 10 00.
- 1) Forms shall be new material specifically furnished for this Project. Reuse of forms from other projects will not be permitted.
 - 2) Earth forms are not permitted to form paving work.
- B. Reinforcing Steel: Comply with the applicable requirements of ACI 531.1 and the *CSRI Manual*.
- 1) Bars: ASTM A 615, Grade 60, unless otherwise indicated on the Contract Drawings. a. Reinforcing bars No. 3 and larger shall be deformed type.
 - 2) Tie Wires: Black annealed, ASTM A 82, minimum 16 gage.
 - 3) Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.
 - 4) Stirrup Steel: ASTM A 82.
 - 5) Dowels: ASTM A 29, Grade 40, smooth steel bars for construction joints.
- C. Aggregate for Base: Provide one of the following, where base is indicated on Contract Drawings:
- 1) Gradation: Crushed miscellaneous base graded in accordance with Section 200-2.4 of the *Standard Specifications*, or...
 - 2) Gradation: Crushed aggregate base graded in accordance with Section 200-2.2 of the *Standard Specifications*, or....
 - 3) Gradation: Class 2 aggregate base as defined in Section 26 of CALTRANS Standard Specifications.
 - 4) Gradation: Aggregate base as defined in Geotechnical Report.
- D. Sand Base: Provide minimum of 2 inches of washed concrete sand over aggregate base over compacted subgrade.
- E. Concrete Materials:

- 1) Portland Cement: ASTM C 150, Type II/V (Low Alkali) or Type V portland cement or as recommended in soils report. Maximum alkali content shall be in accordance with FS SS-C-192. Use only one manufacturer and one color cement throughout project.
 - 2) Aggregate: ASTM C 33, uniformly graded and clean.
 - a. Coarse Aggregate: Crushed rock or washed gravel with maximum size between 3/4-inch and 1-1/2-inches, and with minimum size No. 4.
 - b. Fine Aggregate: Natural washed sand of hard and durable particles varying from fine to particles passing a 3/8-inch screen, of which at least 12 percent shall pass a 50-mesh screen. Provide all sand from a single source of like visual appearance.
 - 3) Water: Clean and potable.
- F. Admixtures: Use only admixtures stipulated in the mix design and accepted by the Architect and governmental agencies having jurisdiction.
- G. Accessory Materials:
- 1) Isolation Filler:
 - a. Pre-molded asphalt saturated strips 3/8-inch thick conforming to ASTM D 1751.
 - 1) Top 1/2-inch portion shall be foam filler which is removable after concrete is cured to allow sealant to be applied.
 - 2) Slip Dowel Sleeves: Speed Dowel 1/2-inch diameter by 12-inch long two-piece polypropylene sleeve to allow movement of reinforcing dowels at expansion joints, manufactured by Greenstreak, Inc., or equal.
 - 3) Dowel Adhesive: Simpson Set 22, or equal.
 - 4) Bonding Agent: Equal to one of the following:
 - a. Everbond, manufactured by L&M Construction Chemicals.
 - b. Weldcrete, manufactured by Larsen Products Corporation.
 - 5) Curing Compounds: Non-staining, dissipating resin, conforming to ASTM C 309, Type 1, Class B, translucent. One of the following, or equal:
 - a. Clear Cure WB, manufactured by Anti-Hydro International.
 - b. L&M Cure R, manufactured by L&M Construction Chemicals.
 - c. W.R. Meadows Sealtight 1100.
 - 6) Form Release: Debond Form Coating, manufactured by L&M Construction Chemicals, or equal.
- H. Detectable Warning Units: Refer to Section 32 13 16.

2.4 CONCRETE MIXES

- A. Provide concrete mixes producing concrete with compressive strengths required by Contract Drawings, as determined by ASTM C 39.
- B. Proportioning shall be by weight of loose, dry material.
 - 1) Fine aggregate volume shall be at least 50 percent of the sum of the separate fine and coarse aggregate volumes for broom finish paving.
 - 2) Coarse aggregate shall be 50 percent for broom finish paving.

- 3) Weighing equipment shall be accurate to within 1 percent for cement and 2 percent for aggregate, and be adjustable for varying aggregate moisture content. A beam auxiliary shall register any part of the last 100 pounds of each aggregate. The aggregate hopper shall have a volume adjustment.
 - 4) Accurately control proportions, water content, and air content.
 - 5) Slump shall not exceed 4 inches.
 - 6) Water-Cement Ratio: 0.50 to 0.55.
 - 7) Compressive Strength: 3250 psi, or as indicated in Geotechnical Report and on the Contract Drawings.
- C. Admixture: If admixture is used, comply with recommendations of manufacturer and laboratory furnishing mix design.

2.5 FABRICATION

- A. Fabricate reinforcement to indicated shapes and dimensions, and in accordance with requirements of the CSRI Manual and Section 03 20 00.

END OF SECTION

(This page intentionally left blank)

SECTION 32 14 29 – RUBBER SURFACING

PART 1 - GENERAL

1.1 SCOPE

- A. Work in this section includes the installation and furnishing of all rubberized surfacing and related work thereto.
- B. Related Sections:
 - 1. Concrete Paving - Section 32 13 13

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
 - 2. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
 - 3. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
 - 4. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
 - 5. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
 - 6. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment.
 - 7. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide a 2 layer rubber-polyurethane playground surfacing system which has been designed, manufactured and installed to meet the following criteria:
 - 1. Shock Attenuation (ASTM F1292):
 - a. Gmax: Less than 200.
 - b. Head Injury Criteria: Less than 1000.
 - 2. Flammability (ASTM D2859): Pass.
 - 3. Tensile Strength (ASTM D412): 60 psi (413 kPa).
 - 4. Tear Resistance (ASTM D624): 140%.
 - 5. Water Permeability: 0.4 gal/yd²/second.
 - 6. Accessibility: Comply with requirements of ASTM F1951.

1.4 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Product Data: Submit manufacturer's product data and installation instructions.
- C. Verification Samples: Submit manufacturer's standard verification samples of 9" x 9" (229 x 229 mm) minimum.
- D. Quality Assurance/Control Submittals: Submit the following:
 - 1. Certificate of qualifications of the playground surfacing installer.
- E. Closeout Submittals: Submit the following:
 - 1. Warranty documents specified herein.

1.5 QUALITY ASSURANCE

- A. Qualifications: Utilize an installer approved and trained by the manufacturer of the playground surfacing system, having experience with other projects of the scope and scale of the work described in this section.
- B. Certifications: Certification by manufacturer that installer is an approved applicator of the playground surfacing system.
- C. International Play Equipment Manufacturers Association (IPEMA) certified.

1.6 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirement Section.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at a minimum temperature of 40 degrees F (4 degrees C) and a maximum temperature of 90 degrees F (32 degrees C).

1.7 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Install surfacing system when minimum ambient temperature is 33 degrees F (1 degree C) and maximum ambient temperature is 90 degrees F (32 degrees C). Do not install in steady or heavy rain.

1.8 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

- B. Manufacturer's Warranty: Submit, for City's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.
 - 1. Warranty Period: 5 years from date of completion of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Rubber Surfacing: Totturf Supreme Poured Rubber, manufactured by Playcore, supplied by Robertson Recreational Surfaces, (800)858-0519, or approved equal.
- B. Poured-In-Place Primer: Polyurethane
- C. Poured-in-Place Cushion Course: Blend of 100% recycled SBR (styrene butadiene rubber) and 100% solids polyurethane binder.
 - 1. Thickness: Per manufacturer's recommendation
 - 2. Formulation Components: Blend of strand and granular material.
- D. Poured-In-Place Wear Course: Blend of Thermal Plastic Vulcanizes granules with polyurethane binder.
 - 1. Thickness: Per manufacturer's recommendation
 - 2. Color: City to determine final color
 - 3. Dry Static Coefficient of Friction (ASTM D2047): 1.0.
 - 4. Wet Static Coefficient of Friction (ASTM D2047): 0.9.
 - 5. Dry Skid Resistance (ASTM E303): 89.
 - 6. Wet Skid Resistance (ASTM E303): 57.

2.2 PRODUCT SUBSTITUTIONS

- A. Substitutions: Or approved equal.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the instructions and recommendations of the playground surfacing manufacturer.

3.2 EXAMINATION

- A. Site Verification of Conditions: Verify that substrate conditions are suitable for installation of the playground surfacing system.
- B. Do not proceed with installation until unsuitable conditions are corrected.

3.3 PREPARATION

- A. Surface Preparation: Using a brush or short nap roller, apply primer to the substrate perimeter and any adjacent vertical barriers such as playground

equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 ft²/gal (7.5 m²/L).

3.4 INSTALLATION

- A. Do not proceed with playground surfacing installation until all applicable site work, including substrate preparation, fencing, playground equipment installation and other relevant work, has been completed.
- B. Cushion Course Installation:
 - 1. Using screeds and hand trowels, install the cushion course at a consistent density of 29 pounds, 1 ounce per cubic foot (466 kg/m³) to the specified thickness.
 - 2. Allow cushion course to cure for sufficient time so that indentations are not left in the cushion course from applicator foot traffic or equipment.
 - 3. Do not allow foot traffic or use of the cushion course surface until it is sufficiently cured.
- C. Primer Application: Using a brush or short nap roller, apply primer to the cushion course perimeter and any adjacent vertical barriers such as playground equipment support legs, curbs or slabs that will contact the surfacing system at the rate of 300 ft²/gal (7.5 m²/L).
- D. Wear Course Installation:
 - 1. Using a hand trowel, install wear course at a consistent density of 58 pounds, 9 ounces per cubic foot (938 kg/m³) to a nominal thickness of 1/2" (12.7 mm).
 - 2. Allow wear course to cure for a minimum of 48 hours.
 - 3. At the end of the minimum curing period, verify that the wear course is sufficiently dry and firm to allow foot traffic and use without damage to the surface.
 - 4. Do not allow foot traffic or use of the surface until it is sufficiently cured.

3.5 PROTECTION

- A. Protect the installed playground surface from damage resulting from subsequent construction activity on the site.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 The contract unit price paid per square foot of Rubber Surfacing (including concrete footings and aggregate base) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in the respective items, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

END OF SECTION 32 14 29

SECTION 32 15 40 – DECOMPOSED GRANITE PAVEMENT

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all decomposed granite paving as shown and specified.
- B. Related work specified elsewhere:
 - 1. Concrete Paving - Section 32 13 13

1.2 QUALITY CONTROL

- A. Standards: Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:
 - 1. The State of California, Department of Transportation Standard Specifications (DTSS) Section 20-5.
 - 2. Applicable ASTM Specifications as they reasonably apply to this work.
- B. Tolerances: Tolerances for subgrade, subbase, and finish grade shall be as specified by DTSS except that Contractor shall deliver the full decomposed granite thickness shown. No combination of high and low tolerances that compromise the section will be permitted.

1.3 SUBMITTALS

- A. Soil Sterilant: Submit written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by City Inspector and/or City's appropriately licensed individual.
- B. Decomposed Granite: A one-quart sample with supplier and source clearly indicated of decomposed granite to be used shall be submitted to the City's Representative for approval prior to delivery to the site.
- C. Stabilizer: Submit product data.
- D. Reviews: Contractor shall stake and layout all paving areas for review by the City's Representative prior to excavation.
- E. Samples: The Contractor shall demonstrate to the satisfaction of the City's Representative that they or their subcontractor possesses sufficient skills and experience to perform the work in all aspects required. A five-square-foot sample of decomposed granite paving shall be installed at the site for review and approval by the City's Representative. The Contractor shall meet or exceed that quality of work in all subsequent work. Contractor shall be responsible for the removal of the sample at the completion of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Soil Sterilant: Shall be a commercially available herbicide recommended for this project by a State of California appropriately licensed individual. The licensed individual shall review the type of construction, soils, base, adjacent plantings, time and season of application, and other project requirements; verify compatibility; and recommend procedures for proper application in accordance with the label. Contractor shall be responsible for all overspray, spreading, or runoff of material into adjacent areas.
- B. Decomposed Granite: Decomposed granite, hereafter referred to as “DG”, shall be Chardonnay Fines available through T.M.T Enterprises, 1996 Oakland Road, San Jose, CA, 95131, (408)434-9040, per the following specifications:

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8”	100%
No. 4	85% - 95%
No. 8	70% - 80%
No. 16	50% - 60%
No. 30	40% - 50%
No. 50	25% - 35%
No. 100	15% - 25%
No. 20	10% - 20%

The yellow-brown color of decomposed granite is a requirement for this material.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Soil Sterilant: Shall be applied to the subgrade soil of areas to be paved prior to paving operations; uniformly applied according to the label. Contractor shall take all precautions necessary to avoid spray onto or runoff into planting areas, play areas, or other surfaces.
- B. Immediately prior to placing the decomposed granite, the subgrade shall be moistened. The decomposed granite shall be deposited in such a manner as to minimize the necessity for spotting, picking up, or otherwise shifting the decomposed granite. The decomposed granite shall be leveled by raking and compacted by use of a light roller.
- C. Fill in any low spots or cracks with additional decomposed granite.

3.2 GRADES

- A. The finish grades of the decomposed granite paving shall conform to the lines and grades on the drawings and allow for drainage.

3.3 CLEAN-UP

- A. All waste produced as a result of decomposed granite paving construction shall be removed from the site and disposed of legally. All excess decomposed granite shall be removed from planting areas.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be included in the lump sum price bid for decomposed granite paving and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in decomposed granite paving, and related incidental work.

END OF SECTION 32 15 40

(This page intentionally left blank)

SECTION 32 18 13 – SYNTHETIC TURF

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install synthetic turf system, and related work thereto.

1.2 SUBMITTALS

- A. Provide catalog cuts of proposed synthetic turf and infill type including specific line or model numbers. Specific information to include product data and specifications, including fiber manufacturer's name, type of fiber, composition of fiber and color samples of striping for field markings and different turf colors. Turf manufacturer to provide letter certifying their product proposed for the project is lead-free, including the backing, infill and turf fibers.
- B. Provide one 1'x1' sample of synthetic turf with infill.
- C. Provide manufacturer's recommended substrate requirements and installation details. Shop drawings shall include typical section, typical edge with all materials clearly labeled and identified. Where details are at variance with project plans and/or specifications, provide manufacturer's certification that materials may be installed per project plans and specifications with no less of or reduction of standard manufacturer's warranty.
- D. Provide certification that the synthetic turf installer is an approved installer of the manufacturer's synthetic turf and meets installation experience requirements.
- E. Submit seaming plan.
- F. Provide certified product data from independent (third-party) laboratory reports on ASTM tests as follows:
 - 1. Abrasiveness – ASTM F1015
 - 2. Yarn denier – ASTM D1577
 - 3. Pile height – ASTM D5823
 - 4. Pile weight – ASTM D5848
 - 5. Primary and secondary backing weight – ASTM D5848
 - 6. Yarn breaking strength – ASTM D2256
 - 7. Impact attenuation – ASTM F355
 - 8. Tuft bind (with and without infill) – ASTM D1335
 - 9. Tuft gauge – ASTM D5793
 - 10. Grab and tear strength – ASTM D5034
 - 11. Lead Content – ASTM F-2765
 - 12. Water Permeability – ASTM F-1551

13. Submit a copy of the minimum 8-year, prepaid, non-prorated, third-party insured warranty.

H. Composite Underlayment

1. Provide 8"x8" product sample and technical data sheet, including specific line or model number.
2. Provide manufacturer's recommended installation details. Details shall include typical installed cross section including any edge attachments. Where details are at variance with project plans or specifications, provide manufacturer's certification that materials may be installed per project plans and specifications with no loss of warranty.

1.3 QUALITY CONTROL

A. STANDARDS: Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:

B. QUALIFICATIONS OF SYNTHETIC TURF INSTALLER:

1. Turf installation contractor shall have operated its company for a minimum of (5) five years in North America and shall have installed synthetic turf at a minimum of twenty (20) separate project sites in North America with a minimum of 65,000 s.f. of synthetic turf installed at each site.
2. Installer shall be certified by the turf manufacturer for installation of manufacturer's synthetic turf.
3. Installer must possess an active California D-12 Synthetic Products license and be in good standing.

C. QUALIFICATIONS OF SYNTHETIC TURF PRODUCT:

1. Synthetic turf manufacturer shall have operated its company for a minimum of six (6) years in North America and shall have had a minimum of eighty (80) installations of its products in North America.
2. Synthetic turf manufacturer's warranty shall be insured by a third-party insurer.
3. Synthetic turf manufacturer shall be a member of Synthetic Turf Council or shall have installed a minimum of 200 fields in Northern California.

D. QUALIFICATIONS OF COMPOSITE UNDERLAYMENT:

1. Product manufacturer shall have a minimum of 5 million square feet of composite underlayment installed beneath synthetic turf in North America.
 2. Products used shall be new and shipped for this specific installation. Used, recycled or refurbished materials are not acceptable.
 3. Adjoining panels fastened together by hand without use of connectors.
 4. Vendors certified personnel must be present on-site during all phases of composite underlayment installation.
- E. Supervision: Manufacturer certified personnel must be present on site during all phases of synthetic turf installation.
- F. Proposition 65 Compliance: Turf manufacturer shall comply with State of California’s “Proposition 65, Safe Drinking Water and Toxic Enforcement Act of 1986”. Consumer product warning requirements shall be as specified in Article 6 “Clear and Reasonable Warnings” in Title 27 of the California Code of Regulations. Turf manufacturer shall be responsible for providing and installing all required consumer product warnings. Locations, quantities, content, layout and dimensions of product warnings shall be “clear and reasonable” as determined by the State.

1.4 WARRANTY

A. Warranty Form:

1. Warranty is to be provided by the synthetic turf manufacturer’s independent carrier with the name on the warranty made out to the City. Warranty shall stipulate that synthetic turf shall remain free from defects in materials and workmanship and serviceable for its intended use for the duration of the warranty period. Defects in materials and workmanship discovered during the warranty period shall be corrected at no cost to the City.
2. Greater than 10% loss in pile height per year or 50% loss within the warranty period shall be corrected at no cost to the City. The maximum G-force value according to procedure A, B or C of ASTM F355 shall not exceed 165 gmax at any location throughout the warranty period. The warranty shall remain valid for the following prescribed uses: soccer, baseball, softball, lacrosse, pedestrian use, physical education, pneumatic rubber-tired maintenance and service vehicles. The warranty shall not cover damage or undue wear to the synthetic turf caused by abuse, neglect, acts of God, static or dynamic loads exceeding manufacturer’s recommendations, metal cleats, or metal spiked footwear. Warranty to be insured by an independent Class A-rated carrier. Self-insurance is disallowed.

- B. Warranty Period: 8-year minimum warranty on synthetic turf. 16-year minimum warranty on composite underlayment product.

1.5 CLOSE OUT

- A. Shock Absorbency: Contractor shall provide testing for shock absorbency by an independent accredited testing laboratory that has been approved by the City. The laboratory shall provide the necessary testing data to the City's Representative that verifies the finished field meets or exceeds the required shock attenuation. Tests shall be taken at ten locations selected by the City. The allowable G-max range shall be between 90 and 165 for the life of the warranty, as determined by the ASTM F355A and F1936 test procedures. Any test results that do not meet the requirements of this specification will require the turf installer to repair the failed test area, be required to retest the entire field as stated above, and conform to these requirements prior to the issuance of the Certificate of Substantial Completion. All costs for initial testing, field corrections and re-testing shall be borne by the Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Synthetic Turf: Shall be Forever Lawn as available from Field of Green, (916)889-4715.
 - 1. Teen Lounge and Amphitheater Synthetic Turf: Forever Lawn Landscape Fresh or Equal.
 - 2. Interactive Art Mound: Forever Lawn Playground Grass or equal. Pile height per manufacture recommendation.
- B. Synthetic Turf Infill: Per manufacture recommendation.
- C. Turf Nailer: Per manufacturer's recommendation.
- D. Composite Underlayment for Interactive Art Mound: Per manufacturer's recommendation to accommodate play area.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that the permeable rock base is compacted and at suitable grade for receiving synthetic turf per requirements in Section 33 40 00 – Site Drainage Utilities.

3.2 INSTALLATION

- A. Composite Underlayment Installation: Install per manufacturer's recommendations.

- B. Turf Installation: No equipment shall be used in installation of synthetic turf that would cause displacement, compaction, or degradation (fracturing) of prepared composite underlayment or stone base. In the event that stone base is disturbed, it shall be re-graded, compacted, and grades and compaction shall be tested until conformance with specifications is achieved. The synthetic turf rolls are to be installed directly over the properly installed composite underlayment or directly over the properly installed base. Turf installer shall strictly adhere to the written instructions provided by the composite underlayment manufacturer for installing synthetic turf on top of their product. Synthetic turf shall be installed in accordance with plans, shop drawings, and manufacturer's specifications.
- B.
 - C. Infill shall be applied in uniform and even layers across the entire field surface and dragged between lifts. Infill shall be installed in the pounds per square foot density specified by the turf manufacturer.
 - D. Synthetic turf panel seams shall be sewn along the selvedge edging flap of the turf roll.
 - a. Seams shall be flat, tight, and permanent with no separation or fraying.
- C.
 - E. Synthetic turf connection to the turf nailer shall be done with industrial staples (min. depth embedment is one inch (1") at maximum 2 inch (2") on-center staple spacing).
 - F. Impact Attenuation: Turf manufacturer shall conduct impact attenuation testing for the life of the warranty. Testing shall be performed at completion of installation and at two-year intervals thereafter. Final test shall be conducted no more than 30 days prior to expiration of warranty. Tests shall be conducted at five locations on the field. Locations shall be as selected by the City. Testing shall be performed in accordance with the methods described in paragraph 1.5.A of this section. Areas failing to meet requirements shall be corrected by the turf manufacturer in a manner approved by the City and re-tested until compliance is achieved. Testing shall be conducted by an independent testing laboratory. All costs for testing and field corrections shall be paid by the turf manufacturer.

3.1 CLEAN-UP

- A. Upon completion of the work under this section, remove immediately all surplus materials, rubbish and equipment associated with or used in the performance of this work. Failure to perform such clean-up operations shall be considered adequate grounds for having the work done by others at the Contractor's expense.

3.2 SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE

- A. The Contractor shall achieve Substantial Completion for the work under this Contract when the project is ready and available for use.

- B. The turf installer and/or the turf manufacturer must provide the following prior to Final Acceptance:
1. Warranties: The turf manufacturer shall provide the written warranty for the project per the minimum requirements identified in this specification section. Submit Manufacturer Warranty and ensure that forms have been completed in City's name and registered with Manufacturer and Insured Carrier. Submit information confirming that the third-party insurance policy, non-cancelable and pre-paid, is in effect covering this installation, and underwritten by a Class "A" Rated insurance Carrier. Insurance carrier must confirm that the policy is in force and premiums paid.
 2. Maintenance Manuals: Three (3) copies of Maintenance Manuals, which will include all necessary instructions for the proper care and preventive maintenance of the turf system, including painting and markings.
 3. Turf Maintenance Equipment: Supply a field groomer and sweeper as specified.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 The contract unit price paid per linear foot for Nailer shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in Nailer, and related incidental work.
- 4.2 The contract lump sum price paid for Synthetic Turf and Composite Underlayment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in Synthetic Turf and Composite Underlayment, and related incidental work.
- 4.3 The contract lump sum price paid for Field Maintenance Equipment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in Field Maintenance Equipment, and related incidental work.

END OF SECTION 32 18 13

SECTION 32 31 19 – LANDSCAPE METAL AND HARDWARE

PART 1 - GENERAL

1.1 SCOPE

- A. Provide 4'-0" high decorative metal fencing and gates at the Library Courtyard and Fitness Courtyard, and 8'-0" high decorative metal fencing and gates at the Central Courtyard with integrated concrete footings and complete ADA compliant hardware.

1.2 STANDARDS

- A. The following standards are hereby made a part of this section and miscellaneous metal work shall conform to the applicable requirements therein except as otherwise specified herein or shown on the drawings. Nothing contained herein shall be construed as permitting work that is contrary to code requirements or governing rules and regulations.
 1. Section 75 of the Department of Transportation Standard Specifications, latest edition.
 2. Steel Structures Painting Council Surface Preparation Specifications, Vol. 2, Painting Manual.

1.3 SHOP DRAWINGS

- A. Contractor shall be responsible for the engineering of shop drawings and shall submit shop drawings and details for review by the City's Representative. Shop drawings stamped by a licensed Engineer currently registered in the State of California. Said stamped shop drawings shall specify structural components, and methods required to withstand the design loads associated with handling and servicing.
 - i. Structural design shall meet applicable local, state, and national codes, as well as testing laboratory listings, where required.
- B. Submit shop drawings where required by the technical specifications or on the drawings for:
 1. The Decorative Metal Fence
 2. The Decorative Metal Gate
 3. The Decorative Metal Double Gate
 4. The Decorative Metal Sliding Gate, with all necessary fittings

Shop drawings shall show dimensions, sizes, thicknesses, gauges, finishes, joining, attachments, and relationship of work to adjoining construction. Where concrete, masonry, or other materials must be set to exact locations to receive work, furnish assistance and direction necessary to permit other trades to properly locate their work. Where welded connectors, concrete or masonry inserts are

required to receive work, shop drawings shall show exact locations required, and all such drawings shall be furnished to the trades responsible for installing the connectors or inserts. Catalog work sheets showing illustrated cuts of item to be furnished, scale details and dimensions may be submitted for standard manufactured items.

- C. Samples: Submit 2'x2' sample for each color and finish by manufacturer. Prior to submittal, Contractor shall verify that colors submitted as samples match accurately any samples or specifications provided by Owner's Representative.

PART 2 - MATERIALS

2.1 FABRICATORS:

- A. Subject to compliance with requirements, fabricators and distributors offering products which may be incorporated in the work include, but are not limited to, the following:

2.2 MATERIALS

- A. 4 foot high decorative fence (with gates with 'Post Fence A' system and decorative fence 3/16 inch aluminum powder coat panels design model 'B21' modular fence system manufactured by Bok Modern, (415) 749-6500. 'B21' model pattern shall be custom modified to "50% percent open". Finish color shall be 'Satin/Statuary Bronze' #38/60080.
- B. 8 foot high decorative fence (with gates with 'Post Fence A' system and decorative fence 3/16 inch aluminum powder coat panels design model 'B21' modular fence system manufactured by Bok Modern, (415) 749-6500. 'B21' model pattern shall be custom modified to "50% percent open". Finish color shall be 'Satin/Statuary Bronze' #38/60080.
- C. Steel Tubing: ASTM A500 (cold-formed), Grade A or B, welded or seamless.
- D. Steel Pipe: ASTM 53, Type E or S, unless otherwise noted.
- E. Miscellaneous Steel Plates and Structural Steel Shapes: Conforming to ASTM A36.
- F. Bolts: Structural grade steel, ASTM A307, with suitable hex nuts and washers, all galvanized.
- G. Welding Electrodes: As permitted by AWS Code D1.0.
- H. Fasteners, Hardware and Devices: Stock proprietary fastening devices of approved standard manufacture such as cadmium plated screws, bolts and washers, and stainless steel hinges.
 - a. Conceal fasteners except where noted or shown otherwise.
 - b. Finish on exposed devices to match overall gate finish, unless otherwise noted.
 - c. Provide vandal-resistant fasteners at exposed locations unless otherwise noted.
 - d. Use fasteners fabricated from metals that are non-corrosive to either the gate material(s) or the mounting surface.
- I. Hot Phosphate Treatment: conforming to SSPC-PT-4.

- J. Powder Coating: Tiger drylac powder coatings applied per manufacturer's recommendations or approved equal. Color to be approved by Owner's Representative.

PART 3 - EXECUTION

3.1 GENERAL

- A. Verify all measurements at site prior to ordering materials.
- B. Coordinate all metal work with adjoining work for details of attachment, fitting, etc. Do all cutting, shearing, drilling, punching, threading, tapping, etc., required for miscellaneous metal or for attachment of adjacent work. Drill or punch holes; do not use cutting torch. Shearing and punching shall leave true lines and surfaces.
- C. Contractor shall inspect installation locations for conditions that will adversely affect the execution, permanence and/or quality of the Work, and notify City's Representative in writing of any and unsatisfactory conditions. Contractor shall not proceed with installation until said unsatisfactory conditions have been corrected. Commencement of installation indicates acceptance of site conditions and guarantees delivery of an acceptable product.
- D. Securely attach gates to footings or site work in accordance with Engineer's specifications.
- E. Conceal all fastenings where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Form joints exposed to weather to exclude water.
- F. Make all permanent connections in ferrous metal surfaces using welds where at all possible. Do not use bolts or screws where they can be avoided. Regalvanize all welds.
- G. Provide all lugs, clips, anchors and miscellaneous fastenings necessary for the complete assembly and installation.
- H. Set all work plumb, true, rigid, and neatly trimmed out.
- I. Where items must be incorporated or built into adjacent work, deliver to trade responsible for proper location of such items.

3.2 WELDING

- A. Perform all welding in accordance with Section 75 of the DTSS.

- B. Welds shall be made only by operators experienced in performing the type of work indicated.
- C. Welds normally exposed to view in the finished work shall be uniformly made and shall be ground smooth.
- D. Where welding is done in proximity to glass or finished surfaces, such surfaces shall be protected from damage due to welds, sparks, spatter, or tramp metal.

3.3 BOLTED, SCREWED AND RIVETED CONNECTIONS

- A. In general, use bolts for field connections only as detailed. Provide washers under all heads and nuts. Draw all nuts tight and nick threads of permanent connections to prevent loosening. Use beveled washers where bearing is on sloped surfaces.
- B. Each bolt hole in wood shall be drilled 1/16 inch larger than the bolt diameter.
- C. Where screws must be used for permanent connections in ferrous metal, use flat head type, countersunk, with screw slots filled and finished smooth and flush.

3.4 CLEAN UP

- A. Protection and Cleaning: Remove all soiled and foreign matter from finished surfaces and apply such protective measures as required to prevent damage or discoloration of any kind until acceptance of project.
- B. During construction, keep premises as clear as possible of materials and debris, and at the completion of work remove all tools, appliances, materials, and debris from the premises.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be paid for at the lump sum price bid for metal and hardware and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Metal and Hardware, and related incidental work.

END OF SECTION 32 31 19

SECTION 32 33 00 – SITE FURNISHINGS

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all site furnishings, including but not necessarily limited to, planters, lounge furniture, bollards, picnic tables, café tables, shade umbrellas, bicycle racks, entry gates, ping pong tables, decorative fencing, monument signs, drinking fountains, and trash receptacles.

- 1.2 ACCEPTANCE: Prior to the purchase of the items and within five days of the award of the contract, the Contractor shall supply the Owner's Representative with samples of the finishes for approval by the City. No materials for this section shall be purchased until such approval is granted.

- 1.3 CERTIFICATION: Delivery schedules shall be verified and certified in writing to the Owner's Representative within ten days after the project commences.

1.4 SUBMITTALS: Submit catalog information for items:

- A. Raised Planter, Type 1
- B. Raised Planter, Type 2
- C. Lounge Sofa
- D. Lounge Chair
- E. Lounge Table, Type 1
- F. Lounge Table, Type 2
- G. Lounge Picnic Table
- H. Picnic Table
- I. Picnic Table Umbrella
- J. Café Table and Chairs
- K. Ping Pong Table
- L. Interactive Sculpture
- M. Bicycle Rack
- N. Trash Receptacles
- O. Bollard
- P. Digital Monument Sign
- Q. Drinking Fountain
- R. Flag Pole
- S. String Lighting Post

PART 2 - PRODUCTS

2.1 MATERIALS

Final decisions on material shall be reviewed and confirmed with the City.

- A. Raised Planter, Type 1: Shall be Tournesol, Model: Wilshire, Color: To be determined by City, or approved equal.
- B. Raised Planter, Type 2: Shall be Tournesol, Model: Wilshire Round, Color: To be determined by City, or approved equal.
- C. Lounge Sofa: Shall be Hauser, Model: Quantum Loveseat w/ 2 armrests, Frame Color: Pewter, Seat and Back Color: Canvas Natural, or approved equal.
- D. Lounge Chair: Shall be Hauser, Model: Quantum Club Chair, Frame Color: Pewter, Seat and Back Color: Canvas Natural, or approved equal.
- E. Lounge Table, Type 1: Shall be Hauser, Model: Quantum Coffee Table, Frame Color: Pewter, or approved equal
- F. Lounge Table, Type 2: Shall be Hauser, Model: Quantum End Table, Frame Color: Pewter, or approved equal
- G. Lounge Picnic Table: Shall be Landscape Forms, Model: Carosel, casual height table, 30” dia wood tabletop, Hoop seats, Color: white, or approved equal.
- H. Picnic Table: Shall be Landscape Forms, Model: Carosel, 4 seat dining height table, 42” dia wood tabletop, Backed grid seat, Color: White, or approved equal.
- I. Picnic Table Umbrella: Shall be Landscape Forms, Model: Solstice Umbrella, Model: Cygnus, Color: Buttercup, or approved equal.
- J. Café Table and Chairs: Shall be Landscape Forms, Model: Bravo Bistro, Color: Carbon, or approved equal.
- K. Ping Pong Table: Shall be Modloft, Model: Amsterdam Ping Pong Table – Outdoor, Color: Grey Concrete, or approved equal.
- L. Interactive Sculpture: Shall be Id Created, Model: Moonstone w/ wood seat, or approved equal.
- M. Bicycle Rack: Shall be Landscape Forms, Model: Ride, Surface mount, Color: Steel, or approved equal.
- N. Trash Receptacles: Shall be Forms+Surfaces, Model: Dispatch Receptacle, 45-gallon capacity, split-stream configuration, Color: Slate Texture powder coated lid and body, or approved equal.
- O. Bollard: Shall be Forms+Surfaces, Model: Helio, Series 600, Non-illuminated, Color: Stainless Steel, or approved equal.
- P. Digital Monument Sign: To be determine at a later time by the City.
- Q. Drinking Fountain: Shall be Most Dependable Fountains, Inc., Model: 10145 SMSS, Color: Chrome, or approved equal.
- R. Flag Pole: Shall be Eagle Mountain, Model: Continental Series – ESR, Height: 35’, Color: Aluminum, or approved equal.
- S. String Lighting Post: Shall be AV Poles and Lighting, Pole model per manufacturer’s recommendation, Height: 15’, (844)770-2875 or approved equal.

PART 3 - EXECUTION

3.1 LAYOUT: Prior to commencing installation, Contractor shall stake layout and request a review by the City’s Representative to determine adjustments on site from locations shown on drawings.

3.2 INSTALLATION

- A. All site accessories shall be installed per manufacturer's specifications.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be included in the lump sum price bid for site furnishings and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in site furnishings, and related incidental work.

END OF SECTION 32 33 00

(This page intentionally left blank)

SECTION 32 84 00 – LANDSCAPE IRRIGATION

PART 1 - GENERAL

1.1 SCOPE

- A. Work in this section includes installation of a complete automatic irrigation system, including excavation for points of connection, trenching, piping, equipment, electrical components and incidentals related thereto.
- B. Related work specified elsewhere:
 - 1. Landscape Soil Preparation - Section 31 92 13

1.2 QUALITY CONTROL

- A. Standards: Unless otherwise shown or specified, all materials and methods shall conform to section 20-2 of the State of California Department of Transportation Standard Specifications (DTSS) as they reasonably apply to this work except for measurement and payment requirements.
- B. All irrigation shall be provided and performed in accordance with the current City of Gonzales Standard Specifications and Details. Wherever these plans and the City Standards conflict, the higher quality standard or specification will apply.
- C. Reviews: Contractor shall specifically request the following reviews prior to progressing with the work:
 - 1. Layout of system.
 - 2. Points-of-connection excavation.
 - 3. Trenching and pipe assembly.
 - 4. Coverage adjustment of all heads and valve box installation.
 - 5. Operation of system.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Quality: All materials shall be new and the best quality available unless otherwise specified. All materials shall be clearly marked by manufacturer on all material, containers, or certificates of contents for inspection.
- B. Plastic Pipe and Fittings: All mainline pipe $\frac{3}{4}$ " – 1- $\frac{1}{2}$ " in size shall be polyvinyl chloride (PVC) Schedule 40; sizes 2" and larger shall be Class 315. Unless otherwise noted, all laterals shall be Class 200 PVC pipe; solvent weld fittings, if used, shall be Schedule 40, or Schedule 80 as called for on details. Solvent for piping shall be as recommended by manufacturer. All pipe shall be clearly labeled with manufacturer type and specification numbers.

- C. Control Wire: Type UF, 600 v. insulation, minimum size #14, copper, common to be white, valve control wire to be red or black, U.L. approved for irrigation control use; splices shall be "Scotch-Lok" seal pack, or equal.
- D. Valve Boxes: Precast concrete or plastic of type and size indicated; free of all cracks, chips or structural defects. Boxes located in pavement (asphalt or concrete) and/or subject to vehicular traffic shall be concrete and have heavy duty steel covers. Boxes shall be sized to provide a 4" minimum clearance around the irrigation equipment inside the box, excluding all pipes and fittings.
- E. Irrigation Equipment: Refer to drawings. Any desired substitutions require submittals in duplicate for specific written approval.
- F. Thread Sealant: Permatex Thread Sealant, part #14H, white in color.
- G. Valve ID Tags: All control valves to be labeled with standard yellow valve ID tags, available from Ewing Irrigation, (650)592-9530, or similar.

PART 3 - EXECUTION

- 3.1 GRADING: Contractor shall be responsible for installing all irrigation features to their finished grade and at depths indicated. All rough grading shall be completed before trenching commences.
- 3.2 LAYOUT AND TRENCHING: All features of the irrigation system shall be staked and pipe alignments marked prior to trenching for review by the Engineer.
- 3.3 BACKFILLING: Do not cover joints until system has been reviewed by the Engineer. Backfill with damaging rocks and debris shall not be permitted. Compact all backfill and eliminate settlement. Previously prepared soil is to be replaced as the top six inches of backfill.
- 3.4 FABRICATION: Snake pipe from side to side when trench exceeds thirty feet in length. All manifolds shall be neat, orderly, and constructed for ease in maintenance operations. Construct manifolds to allow valve boxes to be parallel to each other and to adjacent walls, walks, curbs, and buildings. Cuts and joints shall be free of burrs, smooth, and minimum in quantity. All pipe above finish grade shall be galvanized unless noted otherwise.
- 3.5 PIPELINES: All pipelines shown parallel on the drawing may be installed in a common trench. Where pipelines are shown parallel or adjacent to shrub or groundcover areas, they shall be installed in these areas. All changes in depth of pipe shall be accomplished using 45-degree fittings.
- 3.6 TESTING: Test mainline at 125 psi for six (6) hours. Test and repair as necessary until satisfactory test conditions are obtained.

- 3.7 CONTROL WIRE: Install control wire in pipe trenches wherever practical. Tape to underside of pipe every ten feet. Loop wire every 20 feet. Splices shall occur in valve boxes only and shall be accomplished utilizing approved connectors. All wire shall be installed below or level with the bottom of adjacent pipes. All wiring above finish grade shall be enclosed in steel conduit. Splices shall be installed in junction boxes.
- 3.8 ADJUSTMENTS: Adjust all heads for arc, radius, riser height, and distribution for uniform and optimum coverage. Such adjustments shall include nozzle changes without additional cost to city.
- 3.9 FINISH GRADE: Unless otherwise noted, all heads shall be set at finish grade and on double or triple swing joints as called for on drawings. The top of all valve boxes shall be flush with finish grade.
- 3.10 CONTROLLER: Contractor shall clearly label and sequence stations for ease in maintenance operations. Station valves to operate as they are located around the site. Fasten controller and wire conduits securely to wall with conduit clamps and screws. Contractor shall complete all forms and labels shipped with and/or attached to the controller; attach his their own name, address and phone number to the controller via a permanent label; and shall properly execute and file with city the controller and valve guarantees.
- 3.11 IRRIGATION SYSTEM AUDIT: Contractor shall coordinate and provide assistance to a third-party certified irrigation auditor to complete the irrigation audit. The Contractor shall schedule the audits once the irrigation system is in operation. Provide a two week (14 day) notice for scheduling the audit. Contractor shall anticipate providing staff to assist auditor during the process, allow up to (8) hour(s) at site.
- 3.12 RECORD DRAWING: Contractor shall regularly update a print of the system and any changes made to the system throughout the project. Features below ground shall be indicated with at least two measurements from surface features such as walks, building, or sprinkler heads. All changes shall be recorded on this plan before trenches are backfilled. The record drawing shall be completed and submitted to city before final payment shall be made for work installed.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be paid for at the lump sum price bid for PLANTING IRRIGATION and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in PLANTING IRRIGATION, and related incidental work.

END OF SECTION 32 84 00

(This page intentionally left blank)

SECTION 32 91 13 – LANDSCAPE SOIL PREPARATION

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all landscape soil preparation as shown and specified, including, but not necessarily limited to, the following: soil testing, stockpiling of native soil, topsoil placement, organic amendment, fertilizer, and finish grading.
- B. Related work specified elsewhere:
 - 1. Landscape Planting - Section 32 93 00

1.2 QUALITY CONTROL

- A. Reviews: Contractor shall specifically request at least two working days in advance of the following reviews prior to progressing with the work:
 - 1. Completion of rough grading
 - 2. Verification of amendment incorporation depths
 - 3. Finish grade
- B. Certification: Written certificates stating quantity, type, and composition, weight and origin for all amendments and chemicals shall be delivered to the City's Representative before the material is used on the site.
- C. Soil Testing: Contractor shall provide soil samples to Waypoint Analytical, Inc. of Anaheim, (714) 282-8777 for testing in accordance with these specifications. Test results shall be made available to the City's Representative. Contractor shall allow sufficient time for testing prior to preparing soil for planting.
 - 1. The following soils tests are required under these specifications:
 - i. Native Soil: Prior to construction, Contractor shall submit native soil for horticultural soil analysis, consisting of: two (2) one-quart samples from proposed planting areas. Sample shall be a representative composite taken from several planting areas.
 - ii. Import Soil: Prior to construction, Contractor shall submit for horticultural soil analysis: one quart-sized sample of import soil.
 - iii. Construction Residues: Following completion of rough grading, Contractor shall submit for horticultural soil analysis: one quart-sized sample of in-place soil.
 - iv. Pre-Plant: Following amendment and fine grading and prior to installation of plant material, contractor shall submit for horticultural soil analysis: one quart-sized sample of in-place topsoil. Sample shall be a representative composite taken from several planting areas.

2. If test results indicate that soils fail to meet the specifications, contractor shall obtain other sources of import material or re-amend as required, retest and resubmit until a passing result is obtained.
 3. Testing costs for initial samples and costs for any additional samples due to non-compliance shall be paid for by the Contractor.
 4. No material shall be delivered to the site until the City's Representative approves the material.
 5. Contractor shall allow for sufficient time for testing prior to construction.
- D. Amendment Samples: Contractor shall provide an analysis of the amendment from a Seal of Testing Assurance (STA) Certified Compost Lab, designated by the US Composting Council (USCC). Or, send a one-gallon sample of each proposed amendment to Soil Control Lab of Watsonville (831)724-5422, for their testing for conformance to this specification.
- 1.No material shall be delivered to the site until the City's Representative approves the samples.
 - 2.Testing costs shall be paid for by the Contractor.
 - 3.If an alternate laboratory is used, the laboratory must be STA certified by the USCC, using test methods described in the "Test Methods of the Examination of Composting and Compost" (TMECC) test methods manual.
- E. Planting Areas: All areas to be planted, whether in seed, container stock, flats, or otherwise, are defined as planting areas in these documents.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Import Topsoil: Shall be a homogeneous mineral soil classified as loam, sandy clay loam, or sandy loam with clay content between 15 and 25%. The sum of silt plus clay shall be less than 35%. Import topsoil shall not contain more silt and clay than the on-site native soil.
1. Particle size data shall be based upon standard USDA methodology. Of the material falling in the sand category, a minimum of 50% shall fall in the fine sand range .05 - 5mm. Gravel content greater than 2.0mm shall be less than 15%.
 2. Soil chemistry shall be suitable for growing the plants specified; the soil shall be non-saline as determined on the saturation extract. Salinity shall not exceed 3.0 mmhos/cm, boron shall not exceed 1.0 ppm and the sodium absorption ratio (SAR) shall not exceed 6.0. Soil reaction as determined on a saturated paste shall fall between 5.5 and 7.5.
 3. The soil shall be free of organic herbicides, or other growth-restricting chemicals. Contamination may be tested by greenhouse trials using rye grass and radish as test crops using the proposed import soil as substrate. These trials require four to five weeks for completion.

B. Fertilizer: Shall be determined from soils analysis results. For purposes of bidding only, assume the use of 6-20-20 commercial fertilizer, iron sulfate, and 20-10-5 Best-Pak planting packets by J.R. Simplot Company.

C. Organic Amendment:

1. Compost:

I. Seal of Testing Assurance Program from the US Composting Council.

II. Compost parameters, below:

Property	Test Method	Unit of Measurement	Requirement
TBD			

Note: TMECC refers to "Test Methods for the Examination of Composting and Compost," published by the United States Department of Agriculture and the United States Compost Council (USCC). (Table modified from the US Composting Council Landscape Architectural Specifications 2005.)

D. Biotreatment Soil Mix: Shall meet the following criteria:

1. General Requirements: Biotreatment Soil Mix shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Biotreatment Soil Mix shall also support vigorous plant growth.

a. Biotreatment Soil Mix shall be a mixture of fine sand and compost, measured on a volume basis:

60%-70% Sand

30%-40% Compost

2. Sand for Biotreatment Soil Mix

I. General: Sand shall be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size shall be non-plastic.

II. Sand for Biotreatment Soil Mix Texture: Sand for Biotreatment Soil Mix shall be analyzed by an accredited lab using #200, #100, #40 or #50, #30, #16, #8, #4, and 3/8 inch sieves (ASTM D 422, CTM 202 or as approved by municipality), and meet the following gradation:

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>	
	<i>Min</i>	<i>Max</i>
3/8 inch	100	100
No. 4	90	100
No. 8	70	100
No. 16	40	95
No. 30	15	70
No. 40 or	5	55

No. 50		
No. 100	0	15
No. 200	0	5

Note: All sands complying with ASTM C33 for fine aggregate comply with the above gradation requirements.

3. Compost for Biotreatment Soil Mix: Compost shall conform to the Seal of Testing Assurance Program from the US Composting Council and to the parameters below:

- I. Organic Matter Content: 35%-75% by dry wt.
- II. Carbon and Nitrogen Ratio: C:N<25:1 and C:N>15:1
- III. Maturity/Stability: Any one of the following is required to indicate stability:
 - 1. Oxygen Test < 1.3 O₂/unit TS/hr
 - 2. Specific Oxy. Test < 1.5 O₂/unit BVS
 - 3. Respiration Test < 8 C/unit VS/day
 - 4. Dewar Test < 20 Temp. rise (°C) e.
 - 5. Solvita® > 5 Index value
- IV. Toxicity: Any one of the following measures is sufficient to indicate non-toxicity.
 - 1. NH₄⁺ : NO₃-N < 3
 - 2. Ammonium < 500 ppm, dry basis
 - 3. Seed Germination > 80% of control
 - 4. Plant Trials > 80% of control
 - 5. Solvita® > 5 Index value
- V. Nutrient Content: Provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.
 - 1. Total Nitrogen content 0.9% or above preferred.
 - 2. Boron: Total shall be < 80 ppm
- VI. Salinity: Must be reported; <6.0 mmhos/cm
- VII. PH shall be between 6.2 and 8.2 May vary with plant species.
- VIII. Compost Quality Analysis by Compost Supplier: Before delivery of the compost to the soil supplier the Compost Supplier shall verify the following:
 - I. Weed seed/pathogen destruction: provide proof of process to further reduce pathogens (PFRP). For example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.

4. Compost for Biotreatment Soil Mix Texture: Compost for Biotreatment Soil Mix shall be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by City), and meet the following gradation:

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>
-------------------	------------------------------------

	<i>Min</i>	<i>Max</i>
1 inch	99	100
½ inch	90	100
¼ inch	40	90
No. 200	2	10

- I. Bulk Density: Shall be between 500 and 1,100 dry lbs/cubic yard.
- II. Moisture Content: Shall be between 30%-55% of dry solids.
- III. Inerts: Compost shall be relatively free of inert ingredients, including glass, plastic, and paper, < 1% by weight or volume.
- IV. Select Pathogens: Salmonella < 3 MPN/4 grams of TS, or Coliform Bacteria < 10,000 MPN/gram.
- V. Trace Contaminants Metals (Lead, Mercury, etc.) Products: Must meet US EPA, 40 CFR 503 regulations.

E. Pot Soil Mix: Shall be a pre-mix planter mix, if tested and approved by the Owner’s/City’s/County’s Representative, composed of fine sand, untreated fir bark, sphagnum peat moss or ligna peat, and fertilizers as follows:

1. Sand:

<u>Percent passing sieve</u>	<u>Sieve size</u>
100	No. 4
95-100	No. 10
90-100	No. 18
65-100	No. 35
0-50	No. 60
0-20	No 140
0-10	No. 270
Salinity (ECe x 10 ³)	Nil – 3.0
Boron in saturation extract	Nil – 1.0 ppm
SAR	Nil – 6.0

2. Fir Bark:

<u>Percent passing sieve</u>	<u>Sieve size</u>
100	3/8”0
95-100	1/4”
75-100	No. 8
0-30	No. 35
Dry bulk density	450 – 580 lbs./cu. yd
Organic content (dry weight basis)	94% - 100%

Fertilizer:

Urea formaldehyde	38-0-0
Single superphosphate	0-20-0
Potassium nitrate	13-0-44
Dolomite lime Kaiser	65 AG or equal
Gypsum	---

3. Sphagnum Peat Moss or Ligna Peat:

<u>Percent passing sieve</u>	<u>Sieve size</u>
95-100	3/8”
0-40	No. 35

Organic content (dry weight basis)	95% - 100%
Salinity (ECe x 10 ³)	Nil – 3.0
Chemical p.H.	3.0 – 4.5
Nitrogen (dry weight basis)	0.6 – 3.0%

PART 3 - EXECUTION

3.1 LIMITS AND GRADES

- A. **Grade Review:** Prior to commencing soil preparation operations, Contractor shall request a review by the Owner's/City's/County's Representative to verify specified limits and grades of work completed to date and soil preparation work to commence. Contractor shall complete the rough grading as necessary to round the top and toe of all slopes, providing naturalized contouring to integrate newly graded areas with the natural topography. Finish grading under this section shall be completed in accordance with the grades indicated on the drawings.
- B. **Grading at Existing Trees:** Soil work within the dripline of existing trees shall be performed in accordance with tree protection requirements indicated on the plans and section 32 1 91, Tree Protection and Pruning.

3.2 TOPSOIL PLACEMENT

- A. **Depths indicated in this section are for bidding purposes.** Depth of scarification, height of soil lifts and depths of incorporation shall be as recommended by the soil testing lab.
- B. **Soil Moisture:** If soils are saturated, suspend soil work operations until the soil moisture drains to below field capacity.
- C. **Subgrade preparation:** Excavate planting areas to the proposed subgrade and remove all construction debris and materials.
 - 1. Do not over excavate compacted subgrades of adjacent pavement or structures.
 - 2. Subgrades shall slope approximately parallel to the finished grade and/or toward the subsurface drain lines as shown on the drawings.
 - 3. Scarify or rip to a depth of seven inches and protect from compaction.
- D. **Topsoil Incorporation:** Uniformly distribute a three-inch layer of topsoil and incorporate into the top six inches of subsoil by ripping, scraping, or tilling to mix the subsoil with the topsoil into a homogeneous mixture. Repeat until the total depth of topsoil placed is as indicated on the drawings. The final layer of topsoil shall be uniformly distributed in the planting areas and compacted in place to 85% compaction
- E. **Existing Topsoil to Remain:** Except within tree protection zones, in those planting areas where native topsoil is to be left in place, cross rip to a depth of ten inches.

Then incorporate the amendments to a homogeneously blended soil depth of six inches.

3.3 BIOTREATMENT SOIL MIX PLACEMENT

- A. Do not excavate, place soils, or amend soils during wet or saturated conditions.
- B. Operate equipment adjacent to (not in) the Biotreatment soil mix facility. If machinery must operate in the facility, use lightweight, low ground-contact pressure equipment.
- C. Place soil in 12” lifts with machinery adjacent to the facility. If working within the facility, to avoid over-compacting, place first lifts at far end from entrance and place backwards toward entrance.
- D. Allow Biotreatment soil mix lifts to settle naturally, boot pack (walk around to firm) lifts to achieve 85% compaction effort. After all lifts are placed, wait a few days to check for settlement and add additional media as needed.
- E. Verify Biotreatment soil mix elevations before applying mulch or installing plants.

3.4 ORGANIC AMENDMENT AND FERTILIZER INCORPORATION

- A. Organic amendment: After topsoil placement and compaction, spread organic amendment at a rate of 6 cubic yards per 1000 square feet, unless otherwise specified by the soils report.
- B. Fertilizer: Spread uniformly on top of compost at rates determined by soil tests. For bidding, assume per 1000 square feet:

30 pounds commercial fertilizer (6-20-20)
10 pounds iron sulfate

Note: Iron sulfate should be applied cautiously, avoiding contact with concrete, since permanent staining may result. Any such stained concrete shall be replaced at Contractor’s expense.

- C. Incorporate organic amendment and fertilizer into the top 6 inches of topsoil, until homogeneously blended.

3.5 PLANT PITS

- A. Plant Pit Preparation: Plant pits shall have their sides and bottoms loosened or otherwise broken to prevent glazed or compacted surfaces, and shall be as shown on the planting detail.

3.6 BACKFILL

- A. Backfill Material and Placement: Only unamended soil shall be used beneath the root ball; cultivate bottom of plant pit to improve porosity. Backfill around sides of rootball shall be the amended soil taken from adjacent prepared areas. Spread material excavated from plant pits onto adjacent areas as replacement. Should additional backfill be necessary, a mixture of one-third organic amendment/fertilizer mix and two-thirds topsoil may be used for the top 12 inches of backfill.

3.7 PLANT PACKETS

- A. Packet Quantities: All container plants shall receive plant packets as follows:

one-gallon plants	one 10-gram packets
five-gallon plants	two 10-gram packets
fifteen-gallon plants	nine 10-gram packets
24 inch box trees	sixteen 10-gram packets
36 inch box trees	twenty-four 10-gram packets

Space the packets evenly around the root ball in backfill, 6-8 inches from soil surface, 1 inch away from root ball. Owner's/City's/County's Representative may require excavation of up to 5% of all plants selected at random for conformance review.

3.8 POT MIX

- A. Mix Quantities: Contractor shall pre-mix and install the following mix at 85% compaction in all pots:

0.5 cu. yd.	fine sand
0.15 cu. yd.	spaghnum peat moss or ligna peat
0.35 cu. yd.	raw fir bark
2 lbs.	urea formaldehyde
3 lbs.	single superphosphate
1 lb.	potassium nitrate
10 lbs.	dolomite lime
3 lbs.	gypsum

Prior to placement of this mixture, Contractor shall deliver and have tested a one-quart sample to verify degree of compliance. No mix shall be installed until tested by the soils laboratory and approved for installation by the Owner's Representative.

3.9 FINISH GRADING

- A. Grading Operations: Contractor shall finish grade all irrigated planting areas unless otherwise noted, and shall remove all rocks and clods over one cubic inch to a depth of one inch below finish grade. All areas shall be smooth and uniformly

graded. All erosion damage during the construction period shall be repaired by the Contractor.

- B. Finish Grades: Unless otherwise noted, all soil finish grades shall be one inch below finish grade of walks, pavements, and curbs.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be included in the lump sum price bid for landscape soil preparation and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in landscape soil preparation, and related incidental work.

END OF SECTION 32 91 13

(This page intentionally left blank)

SECTION 32 92 13 – LANDSCAPE HYDROSEEDING

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all hydroseeding and related work, including application of fertilizer, seed, straw, fiber, stabilizing emulsion and water with hydroseeding equipment to areas shown on the drawings and as specified herein.
- B. Related work specified elsewhere:
 - 1. Landscape Soil Preparation - Section 31 91 13
 - 2. Landscape Planting - Section 32 93 00

1.2 REFERENCES

- A. Interpretations of plant names and descriptions shall reference the following documents. Where the names or plant descriptions disagree between the several documents, the most current document shall prevail.
 - 1. USDA – The Germplasm Resources Information Network (GRIN)
<http://www.ars-grin.gov/npgs/searchgrin.html>
 - 2. Manual of Woody Landscape Plants; Michael Dirr; Stipes Publishing, Champaign, Illinois; most current edition.
 - 3. New Sunset Western Garden Book, Oxmoor House, most current edition.
- B. Unless otherwise shown or specified, all materials and methods shall conform to the most current Section 21 of The State of California, Department of Transportation Standard Specifications (DTSS).

1.3 QUALITY CONTROL

- A. Reviews: The Contractor shall specifically request a review by City's Representative of finish grade to receive hydroseeding, and site inspection of seed, fiber and fertilizer, prior to starting work. Certificates shall be submitted to City's Representative prior to review; see below.
- B. Nomenclature and Labels: Plant botanical names shall conform to current literature noted in section 1.2.
- C. Certification:
 - 1. Seed: Contractor shall furnish the City's Representative with seed supplier's certificate stating quantity, type composition, weight and origin for all seed within five days after award of contract.

2. Fiber: Cellulose Fiber for hydroseeding shall be certified for all requirements specified herein. Weight of fiber material specified and shipped shall refer only to air dry weight, containing not more than 10 percent (by weight) water.
- D. Schedule: Hydroseeding schedule shall be submitted to the City’s Representative within fourteen (14) days of the signed contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Seed Mix: Seed shall be pre-mixed and packaged by a commercial seed supplier such as Pacific Coast Seed, Inc. 6144-A Industrial Way, Livermore, CA 94550, (925) 373-4417 (contact David Gilpin). The seed shall be tagged and labeled in accordance with California Agricultural Code, and shall include the following seed proportions.

Species	Pure Live Seed, Pounds Per Acre	Minimum Purity/ %Germination
TBD		

- B. Fertilizer: Fertilizer shall be as specified in paragraph 3.5 and shall conform to the applicable state fertilizer laws. It shall be uniform in composition, dry and free flowing and shall be delivered to the site in original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer that becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted.
- C. Cellulose Fiber: Fiber shall be colored with a non-toxic, water soluble green dye to provide a visual gauge for metering of material over ground surfaces.
1. Fiber shall be produced from natural or recycled (pulp) fiber, such as wood chips or similar wood materials or from newsprint, chipboard, corrugated cardboard or a combination of these processed materials, and shall be free of synthetic or plastic materials. Fiber shall not contain more than 7 percent ash as determined by the Technical Association of the Pulp and Paper Industry (TAPPI) Standard T-413, shall contain less than 250 parts per million boron, and shall be otherwise nontoxic to plant or animal life.
 2. Fiber shall have a water holding capacity by weight of not less than 1,200 percent as determined by the procedure used in the Department's Final Report, CA-DOT-TL-2176-1-76-36, "Water-holding Capacity for Hydromulch", available at the Transportation Laboratory, 5900 Folsom Boulevard, Sacramento, CA 95819.
 3. Fiber shall be of such character that the fiber will disperse into a uniform slurry when mixed with water. Water content of the fiber before mixing

into slurry shall not exceed 15 percent of the dry weight of the fiber. The percentage of water in the fiber shall be determined by California Test 226. Commercially packaged fiber shall have the moisture content of the fiber marked on the package. Fiber shall be colored to contrast with the area on which the fiber is to be applied and shall not stain concrete or painted surfaces.

4. A Certificate of compliance for fiber shall be furnished to the City's Representative.
- D. Organic Stabilizer: Stabilizer shall be a 100% biodegradable tackifier, non-toxic to plant or animal life, such as Sentinel or M-Binder.
- E. Stabilizer on Steep Slopes: For slopes greater than 5:1, use premium tackifier such as Natures Own Triple Tac. Apply at rate recommended by manufacturer per slope. Minimum 30 lbs. per acre.
- F. Water: Provided by Contractor.

PART 3 - EXECUTION

- 3.1 GENERAL: Hydroseeding shall be performed during a windless period using approved equipment and materials. The Contractor shall verify that hydroseeded areas are adequately graded for seed application and free of deleterious material and weeds at the time of planting. Soil shall be left serrated or rough and broken so it can hold seed and retard run-off. All seeding shall be completed between October 31 and December 15, the approximate beginning of the rainy season.
- 3.2 EQUIPMENT: Hydraulic equipment shall be reviewed by the Landscape Architect prior to starting work.
 - A. Equipment: Shall have a built-in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry of water, fertilizer, fiber, seed and other additives.
 - B. Slurry distribution lines: Shall be large enough to prevent clogging and shall be equipped with a set of hydraulic spray nozzles which provide a continuous non-fluctuating discharge and uniform delivery of slurry in prescribed quantities without misses, waste or erosion.
 - C. Slurry tank: Shall have a minimum capacity of 1000 gallons and shall be mounted on a traveling unit which may be drawn by a separate or self propelled unit in order to properly place the slurry tank and spray nozzle for uniform distribution.
- 3.3 SLURRY PREPARATION: All preparation shall occur on site and materials shall be added in such a manner that they are uniformly blended into the mixture. Slurry shall be completely homogenous before application.

- A. Agitation: With agitation system operating at half speed, water shall be added to the tank, and good circulation established. The seed shall be added first; then fiber. The mixture shall be agitated at full speed when the tank is half full.
 - B. Additives: Fiber shall not be added until the tank is at least one-third filled with water. Fertilizer and seed mix shall be added at the last practical moment. Total time from the addition of seed to seed discharge shall be less than one hour; if more than one hour, the remainder of the load shall be recharged with seed.
- 3.4 APPLICATION: The operator shall spray the areas with a uniform, visible coat using the green color of the wood pulp as a guide. The slurry shall be applied in a sweeping motion, so as to allow the fibers to build on each other until a good coat is achieved and the material is spread at the required rate per acre.
- 3.5 APPLICATION RATES: The materials shall be mixed and applied in the approximate proportions:

<u>Materials</u>	<u>Per Acre</u>
Fiber	1800 lbs.
Seed Mix	See 2.1 MATERIALS
16-20-20 (N-P-K)	350 lbs. *
Organic Stabilizer	80 lbs.
Water	As needed for application
* Amount for bidding purposes only; see 1.2 QUALITY CONTROL; Contractor shall fertilize per Soil Control Laboratory's recommendation.	

- 3.6 LIMITS OF HYDROSEEDING: The limits indicated on the drawings reflect only part of the area required to be hydroseeded. This area, plus all other areas graded and disturbed by the Contractor shall be hydroseeded. Any compacted or otherwise unsuitably prepared areas within these descriptions shall be scarified and rototilled to prepare the areas for seeding.
- 3.7 CLEAN-UP: Prior to completion of all operations, Contractor shall remove, wash clean, or otherwise correct any unsightly overspray, trash, excess soil, other debris, or damage. All walks and pavement shall be swept and washed clean, and clean-up operations performed in the general work area as needed to leave the entire area in neat, orderly condition.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be paid for at the lump sum price bid for Hydroseeding and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Hydroseeding, and related incidental work.

END OF SECTION 32 91 13

SECTION 32 93 00 – PLANTING

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all, container plantings, trees, shrubs, groundcover, hydroseed, root barrier, mulch, headerboard, staking, and related work thereto.
- B. Related work specified elsewhere:
 - 1. Landscape Soil Preparation - Section 31 92 13
 - 2. Landscape Maintenance - Section 32 01 90

1.2 REFERENCES

- A. Interpretations of plant names and descriptions shall reference the following documents. Where the names or plant descriptions disagree between the several documents, the most current document shall prevail.
 - 1. USDA – The Germplasm Resources Information Network (GRIN)
<http://www.ars-grin.gov/npgs/searchgrin.html>
 - 2. Manual of Woody Landscape Plants; Michael Dirr; Stipes Publishing, Champaign, Illinois; most current edition.
 - 3. New Sunset Western Garden Book, Oxmoor House, most current edition.
- B. ANSI American Standard for Nursery Stock
- C. Federal, State, and County laws requiring inspection for plant disease and insect control.

1.3 QUALITY CONTROL

- A. Reviews: The Contractor shall specifically request the following reviews prior to progressing with the work:
 - 1. Plant material approval
 - 2. Plant layout
 - 3. Finish grade
 - 4. Substantial completion
 - 5. Final completion

1.4 SUBMITTALS

- A. Plant Material: Within (15) days after award of contract, Contractor shall submit notice to the City's Representative certifying the quantity and species of plant material ordered, the nursery supplying the material, any plant material unavailable at the time, and proposed plant substitutions. No plants shall be ordered or delivered prior to written acceptance by the City's Representative.
- B. Mulch: Name of supplier and one quart-sized sample.
- C. Certificates: All plant materials shall meet the specifications of Federal, State, and County laws requiring inspection for plant diseases and insect infestations. Inspection certificates required by law shall accompany each shipment, invoice, or order of stock, and when such plants arrive at the site of work, the certificate of inspection shall be filed with the City's Representative.
- D. Seed: Within (15) days after award of contract, Contractor shall submit written certificates stating quantity, type composition, purity, weight, and origin for all seed to the City's Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Nomenclature and Labels: Plant botanical names shall conform to current literature noted in section 1.2. All plants of each clone, species, and cultivar shall be delivered to the site labeled with their full botanical names. Every plant species shall be labeled with no less than one label for every ten plants of a species.
- B. Quality: Minimum quality of all plant material shall conform to prevailing published specifications of the California Association of Nurserymen and the American Association of Nurserymen's American Standard for Nursery Stock unless otherwise indicated. Additional specifications shall be indicated on the drawings.
- C. Quantities: The quantities shown on the plant list and in labels are for the City's Representative's use and are not to be construed as the complete and accurate limits of the contract. Contractor shall furnish and install all plants shown schematically on the drawings. Any unlabeled plants shall be considered as the smaller size shown for that type on the drawings.
- D. Root Systems: All container-grown stock shall be grown in its container for at least six months prior to its planting. Contractor shall allow one percent of the quantity of plants for removal and inspection. Any plant material, within one year following the final acceptance of the project, determined by the City's Representative to be defective, restricted, declining or otherwise deficient due to abnormal root growth, shall be replaced by Contractor to the equal condition of adjacent plants at the time of replacement.

- E. Trees: All trees shall have straight trunks of uniform taper, larger at the bottom. Trunks shall be free of girdling roots or damaged bark, with all minor abrasions and cuts showing healing tissue. Sucker basal growth and sucker lateral growth shall be removed and treated to eliminate re-sprouting. Normal lower side branching shall remain. Trees unable to stand upright without support shall be rejected.
- F. Health: Foliage, roots and stems of all plants shall be of vigorous health and normal habit of growth for its species. All plants shall be free of all diseases, insect stages, burns, or disfiguring characteristics.
- G. Untrue Species: All plant material, within two years following the final acceptance of the project, determined by the City's Representative to be untrue to the species, clone, and/or variety specified, shall be replaced by the Contractor, to the equal condition of adjacent plants at the time of replacement.
- H. Mulch: Mulch shall be: walk-on bark, free of disease, invasive weeds and seeds. Available from: Redi-Gro (800)654-4358/Lyngso Garden Materials, 345 Shoreway Road, San Carlos, CA 94070, (650)364-1730). Maximum 3" grind.
 - 1. Mulch from removal of existing trees shall be chipped to max 2"-3" particle size and retained on-site for use in finished landscape/tree protection measures.
 - 2. Mulch in bioretention areas shall be Z-Best Organic Mulch, (408)846-1577/ Wonder Mulch, available from Vision Recycling (831)479-7857)
- I. Headerboard: Shall be 2x4 length manufactured by Trex Company, Inc or approved equal. Color shall Redwood. Stakes shall also be made of boards manufactured by Trex Company, Inc. or approved equal. Color to match headerboard. Available through. Berco Redwood, 4560 Auburn Boulevard, Sacramento, CA 95841 (916) 483-2001. Install per plan, per manufacture specifications.
- J. Root Barrier: Shall be Deep Root Corporation, Model: #UB18. Root barrier shall be flush with side of face of curb or pavement.

PART 3 - EXECUTION

3.1 GENERAL

- A. Plant Material Approvals: Before planting operations commence, all or a representative sampling of plant material shall be reviewed at the site by the City's Representative. Defective plants installed without such review shall be removed from the site upon request by the City's Representative and an acceptable plant substituted in its place.
- B. Storage and Handling:

1. Plant materials shall be protected and maintained in good condition. Bare root and balled materials shall be watered regularly and placed in a cool area. Plant material shall be protected at all times from animal damage, vandalism, drought damage, wind damage, frost damage, toxic irrigation water, or any other condition that would damage or reduce the viability of the plants. Plants shall be kept moist at all times and shall be completely watered twelve (12) hours or less before planting and shall be moist when installed.
- C. Layout: Only those plants to be planted in any single day shall be laid out. Locations of all plants shall be reviewed prior to planting. Plants installed without this review shall be transplanted as directed by the City's Representative.
- D. Protection of Plants: Contractor shall maintain all plant material in a healthy growing condition prior to and during planting operations. Contractor shall be responsible for vandalism, theft and damage to plant material until the commencement of the maintenance period.
- E. Root Systems: Contractor shall be responsible for inspection of all root systems on plant materials. Inspection shall include, but not be limited to, checking for rootbound stock, encircling roots at the perimeter of the container, evidence of girdling roots, and other defective root conditions. Such inspections shall include the complete removal of soil from one percent of plant material containers, or at least one plant from each nursery and each plant type. Contractor shall cut defective or potentially defective girdling, rootbound, and encircling roots and spread the root system into the surrounding backfill. Plants with excessively defective root systems shall be rejected by the Contractor.
- F. Pruning: Contractor shall do no pruning without the specific approval of the City's Representative. Plants pruned without approval shall be replaced by the Contractor, if required.
- G. Basins: Construct basins as necessary to water plants. Remove basins from all plants under a permanent irrigation system prior to final inspection and finish grade the planting area. Basins for plants to be hand-watered shall remain in place. Basin bottoms shall drain to berm away from plant stem.
- H. Staking: All trees shall be staked as drawn with stakes driven securely into existing soil aligned with the trunk and perpendicular to the direction of the prevailing winds. A minimum of two figure-eight rubber tree ties required per stake.
- I. Plant Pits, Backfill and Finish Grading: See Soil Preparation Section 31 92 13 for materials and installation requirements.
- J. Cleanup: After completion of all operations, Contractor shall remove all trash, excess soil and other debris. All walks and pavement shall be swept and washed clean, leaving the entire area in a neat, orderly condition.

- K. Seeding: After all lawn areas have been finish graded, they shall be moistened and lightly raked to provide a granular seed bed. All rocks over one cubic inch shall be removed from the surface of the seed bed. Seeding shall be at the rate and mixture specified and shall be uniformly applied using mechanical devices, sowing half of the rate in one direction and half at right angles. Seed shall be lightly raked or rolled in place before watering. See manufacturer's recommendations for additional planting requirements.
1. Seed: 9 lbs./1,000 s.f

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 All work under this section shall be paid for at the lump sum price bid for PLANTING and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in PLANTING, and related incidental work.

END OF SECTION 32 93 00

(This page intentionally left blank)

SECTION 33 10 00 – WATER UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for installation of water systems.

1.2 REFERENCES

- A. ASTM International (ASTM):
- 1) B 75-02 Standard Specification for Seamless Copper Tube.
 - 2) B 88-03 - Specification for Seamless Copper Water Tube
 - 3) D 1785-06 - Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - 4) D 2241-05 - Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR-Series).
 - 5) D 2466-06 - Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 - 6) D 2855-96(2002) - Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.
 - 7) D 3035-06 - Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
 - 8) D 3139-98(2005) - Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
- B. California Department of Transportation (CALTRANS):
- 1) Standard Specifications.
 - 2) California Test No. 217.
 - 3) California Test No. 229.
- C. American Society of Mechanical Engineers (ASME):
- 1) B16.18-2001 - Cast Copper Alloy Solder Joint Pressure Fittings.
 - 2) B16.22-2001 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- D. American National Standards Institute (ANSI):
- 1) A21.1 - Thickness Design of Cast Iron-Pipe
 - 2) A21.4 - Cement-Mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fittings for Water.
 - 3) A21.10 - Gray-Iron and Ductile-Iron Fittings, 3 Inches Through 48 Inches for Water and Other Liquids.
 - 4) A21.11 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 - 5) A21.50 - Thickness Design of Ductile-Iron Pipe.
 - 6) A21.51 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.

- E. American Water Works Association (AWWA):
 - 1) C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2) C111 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 - 3) C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
 - 4) C500 - Gate Valves, 3 Inches Through 48 Inches NPS, for Water and Sewage Systems.
 - 5) C502 - Wet Barrel Fire Hydrants.
 - 6) C504 - Rubber-Sealed Butterfly Valves.
 - 7) C508 - Swing-Check Valves for Waterworks Service, 2 In. (50 mm) Through 24 In. (600 mm) NPS.
 - 8) C600 - Installation of Ductile-Iron Water Mains and Appurtenances.
 - 9) C651 - Disinfecting Water Mains.
 - 10) C800 - Underground Service Line Valves and fittings.
 - 11) C900 - Polyvinyl Chloride (PVC) Pressure Pipe 4 Inches Through 12 Inches for Water.
- F. Public Works Standards, Inc. (PWS):
 - 1) *Standard Specifications* for Public Works Construction, (Greenbook), 2006 edition with amendments, published by BNi Building News, division of BNi Publications, Inc., Anaheim, CA (714)517-0970.
- G. National Fire Protection Association (NFPA):
 - 1) 13 - Installation of Sprinkler Systems.
 - 2) 24 - Outside Protection.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. General: Water pipe, fittings, hydrants, and valves shall be carefully handled at all times. Only suitable and proper equipment and appliances shall be used for the safe loading, hauling, unloading, handling, and placing of materials.
- B. Soil at Project site is corrosive; special care shall be exercised so that (if applicable) any coating on pipe, valves, and fittings is not damaged. If such damage should occur, the coating shall be repaired to the satisfaction of the Architect. All metal pipes and fitting shall be wrapped with an 8 inch polyethylene membrane to avoid contact with soil unless otherwise approved by the Geotechnical Engineer.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. Regulatory Requirements: Comply with PWS *Standard Specifications* Section 205 for water distribution systems, water engineering division of public utilities having jurisdiction, and applicable AWWA standards and specifications. Where those requirements conflict with the Contract Drawings, comply with the more stringent provisions.

- 1) Work not covered by governing agency standards shall conform to Contract Drawings and Project Manual, in that order.

2.2 PERFORMANCE CRITERIA

- A. Mains: Refer to Article 2.3.
- B. Fire Sprinkler Service Lines:
 - 1) Work shall comply with the requirements of NFPA 13 and NFPA 24 including appendices, as required.
 - 2) The general extent of the work of this Section as noted on the Contract Drawings and includes, but is not necessarily limited to, the following:
 - a. Construction of underground fire sprinkler service lines to the connection at sprinkler riser in building.
 - b. Construction of fire protection water system components including fittings and thrust blocks as required.
 - c. Testing for pressure and leakage.
 - d. Flushing of the completed installation.
 - e. Obtaining of permits.
 - 3) If not otherwise indicated on Contract Drawings, the PVC portion of fire sprinkler service lines shall stop 5 feet from the building foundation.

2.3 MATERIALS

- A. Pipe:
 - 1) Ductile Iron:
 - a. AWWA C151 Class 51, cement-lined in accordance with ANSI A21.4.
 - b. Pipe ends shall be bell and spigot with mechanical joints that conform with ANSI A21.11 or with ends joined by a method that employs a single circular rubber gasket, subject to approval by the Architect.
 - 2) Polyvinyl Chloride (PVC): AWWA C900, Class 200 minimum. a. Provide Class 200 pipe where pressure exceeds 150 psi. 1) Fire water supply piping shall be Class 200.
 - 3) Copper:
 - a. ASTM B 88, Type K, annealed.
 - 4) Polyethylene:
 - a. AWWA C901, molded or fabricated.
- B. Water Service Lines:
 - 1) 2-1/2-inch Lines and Smaller: Provide water service lines from water meter to building service at a point approximately 5 feet from building. Water service lines shall be Type K copper tubing or AWWA C900, Class 200 PVC Pipe.
 - 2) 3-inch Lines and Larger: AWWA C900, Class 200 PVC pipe.
- C. Mains:
 - 1) Type: Ductile iron, or polyvinyl chloride (PVC).
 - 2) Pipe Size: As indicated on Contract Drawings.

- 3) Location: As indicated on Contract Drawings.
 - 4) Depth: The minimum cover shall be 3.5 feet.
- D. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with WATER SERVICE in large letters.

2.4 PIPE FITTINGS

- A. Fittings and Joints:
- 1) Ductile Iron:
 - a. Fittings, Twelve-inch and Smaller: Cement-lined in accordance with ANSI/AWWA C104/A21.4.
 - 2) Mechanical joint, spigot, or modified bell ends may be substituted for the bell ends. Flange ends may be substituted only with the Architect's approval.
 - a. Joints: ANSI/AWWA C111/A21.11, rubber gasket with rods.
 - 3) Polyvinyl Chloride (PVC):
 - a. Fittings: ANSI A21.10 gray-iron or ductile iron for use with PVC pipe and with mechanical joint ends.
 - b. Couplings: Certainteed Corporation Fluid-Tite, Johns-Manville Ring-Tite, or equal.
 - 4) Copper:
 - a. Fittings: ASTM B 75, cast copper or ANSI B16.22, wrought copper.
 - b. Joints: Compression connection or AWS A5.8, BCuP silver braze.
 - 5) Polyethylene:
 - a. Fittings: AWWA C901, molded or fabricated.
 - b. Joints: Compression.

2.5 VALVES

- A. Gate Valves: Gate valves shall be parallel seats, O-ring seals and 2-inch square operating nut; Mueller H-667 or equal.
- 1) Up to 3 Inches: Brass or bronze body, non-rising stem, inside screw, single wedge or disc, IPA ends with control rod, extension box, and valve key.
 - 2) 3 Inches and Over: AWWA C500, iron body, bronze trim, non-rising stem with square nut, single wedge, flanged or mechanical joint ends, control rod, extension box, and valve key.
- B. Check Valves: Swing check type, AWWA C508, mounted horizontally, and shall have cast iron discs with rubber-faced seat.
- C. Valve Boxes: Cast iron, slip adjustment type, in accordance with utility company requirements.
- D. Tapping Sleeve and Tapping Valve: Compatible with tapping machine used, and in accordance with utility company requirements.

2.6 FIRE PROTECTION

- A. Post Indicator Valve (PIV): Valve shall conform to Paragraph 2.03-A above, be UL approved, be designed for use with indicator post, and have flanged ends; Mueller

A-2072, or approved equal. Each post indicator sprinkler control valve shall be equipped with a valve supervisory switch having SPDT contacts. Sprinkler Supervisory Devices shall be PIVS, installed under Division 13.

- B. Indicator Post: Indicator post shall be UL approved and designed for use with indicator valve; Mueller A-20800, or equal.
- C. Fire Department Connection: Fire department connection shall be horizontal type with dual clappered inlets, red plastic plugs, and a sign with raised letters reading AUTOMATIC SPRINKLER. Provide check valve.
- D. Fire Hydrant: In accordance with Contract Drawings.

2.7 ACCESSORIES

- A. Backflow Prevention Assembly: Reduced pressure principle type manufactured with resilient seated shut-off valves.
 - 1) Conform to standard specifications of public utilities department having jurisdiction.
- B. Concrete Mix for Thrust Blocks: Not leaner than 1 part cement, 2-1/2 parts sand, 5 parts stone, with a compressive strength of not less than 2000 psi at 28 days.
- C. Rust Proofing: Bitumastic No. 50, as manufactured by Koppers or equal.

2.8 IDENTIFICATION

- A. Warning Tape: Polyethylene plastic tape, 6 inches wide by 4 mils thick, solid *blue* in color with continuously printed caption in black letters CAUTION—WATER LINE BURIED BELOW.

END OF SECTION

(This page intentionally left blank)

SECTION 33 30 00 – SANITARY SEWER

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for construction of sanitary sewers.

1.2 REFERENCES

- A. ASTM International (ASTM):
1. A 48-03 - Specification for Gray Iron Castings.
 2. A 746-03 - Specification for Ductile Iron Gravity Sewer Pipe.
 3. C 62-05 - Specification for Building Brick (Solid Masonry Units Made from Clay or Shale).
 4. C 425-07 - Specification for Compression Joints for Vitrified Clay Pipe and Fittings.
 5. C 478-08 - Specification for Precast Reinforced Concrete Manhole Sections.
 6. C 700-07a - Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated.
 7. D 1782-95(2001) - Standard Test Methods for Operating Performance of Particulate Cation-Exchange Materials.
 8. D 2321-05 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
 9. D 2751-05 - Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Piping and Fittings.
 10. D 3034-06 - Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 11. D 3212-96a(2003) - Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
 12. F 402-05 - Practice for Safe Handling of Solvent Cements and Primers Used for Joining Thermoplastic Pipe and Fittings.
- B. Public Works Standards, Inc. (PWS):
1. Standard Specifications for Public Works Construction, (Greenbook), 2006 edition with amendments, published by BNi Building News, division of BNi Publications, Inc., Anaheim, CA (714)517-0970.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Handling: Pipe, fittings, precast concrete manhole sections, and cast iron frames and manhole covers shall be carefully handled at all times. Use suitable equipment and appliances for the safe loading, hauling, unloading, handling, and placing of materials. Exercise special care so that the preformed resilient joints on pipe and fittings are not damaged.
- B. Protect pipe during handling against impact shocks and free falls. Keep pipe clean at all times. Do not use pipe that does not conform to the specifications.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. Regulatory Requirements: Comply with PWS *Standard Specifications (Greenbook)* and applicable local governing agency regulations regarding sanitary sewerage systems as referenced in the Contract Documents. Where those requirements conflict with the Contract Drawings, comply with the more stringent provisions.
 - 1. Work not covered by governing agency standards shall conform to Contract Drawings and Project Manual, in that order of priority.

2.2 MATERIALS

- A. PVC Sewer Pipe and Fittings:
 - 1. Pipe: Non-pressure polyvinyl chloride (PVC) pipe conforming to ASTM D 3034, SDR 26 (green), with push-on rubber gasket joints. Made of PVC plastic having a cell classification of 12454-B or 12454- C or 13364-B (with minimum tensile Modulus of 500,000 PSI) as defined in ASTM D 1784.
 - a. Compounds with different superior cell classifications are acceptable.
 - b. Clean reworked material generated by the manufacturer's own production meeting all requirements of specifications are acceptable.
 - c. Provide PVC sewer piping having a dimension ratio (DR) of 36 and minimum pipe stiffness (PS) of 46 PSI.
 - d. Uniform in color, opacity, density and other physical properties.
 - 2. Fittings and Accessories: As manufactured or supplied by the pipe manufacturer and conforming to the following additional requirements:
 - a. Fittings: Made of PVC plastic having a cell classification of 12454-B, 12454-C or 13343-C as defined in ASTM D 1782.
 - b. Joints:
 - 1) Integral bell gasketed joint designed for radial compression of the elastomeric gasket inside the bell on the pipe spigot to ensure a positive seal.
 - 2) Design joint to avoid displacement of the gasket when installed under provisions of the manufacturer's recommendation.
 - 3) Use lubricants to join pipe as recommended by the manufacturer. Solvent cement joints: acceptable. Joint pipe entirely in the trench under strict provisions of the pipe manufacturer's instructions.
 - c. Gaskets:
 - 4) Provide gaskets molded in a circular form or extruded to the proper section and then spliced into circular form, consisting of a properly vulcanized high grade elastomeric compound.
 - 5) Basic polymer: Natural rubber, synthetic elastomer or a blend of both.
 - 6) Manufacture gaskets of materials resistant to domestic sewage.
 - 7) Apply an adequate compressive force to gasket to affect a positive seal under all combinations of joint tolerance.
 - 8) Gasket: Depended upon to make the joint flexible and water tight.
 - 9) Pipe and Fittings: Homogenous throughout and free from cracks,

- holes, foreign inclusions or other injurious defects.
- 10) PVC pipe and fittings showing signs of ultra-violet degradation are *not* allowed.
3. Pipe Marking: Mark each standard and random length of pipe with the following information:
 - a. Manufacturer's Name or Trademark.
 - b. Nominal Pipe Size.
 - c. PVC Cell Classification.
 - d. Legend: SDR 26 PVC SEWER PIPE.
 4. Fittings Marking: Mark fittings with the following information:
 - a. Manufacturer's Name or Trademark.
 - b. Nominal Size.
 - c. Material Designation PVC PSM.
 5. Adapters: As required by the field conditions.
 6. Service Plugs: Flexible virgin polyvinyl chloride similar to those supplied by Fernco Joint Sealer Company.
- B. Sewer Clean Out: In accordance with Contract Documents.
- C. Bedding Material for Sewer: Refer to Civil Contract Drawings.

END OF SECTION

(This page intentionally left blank)

SECTION 33 40 00 – STORM DRAIN

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Storm drain lines and related storm drain structures.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1) A 48-03 - Specification for Gray Iron Castings.
 - 2) A 74-06 - Specification for Cast Iron Soil Pipe and Fittings.
 - 3) C 14-07 - Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
 - 4) C 33-03 - Specification for Concrete Aggregates.
 - 5) C 76-08a - Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
 - 6) C 139-05 - Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
 - 7) C 387-06a - Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
 - 8) C 478-08 - Specification for Precast Reinforced Concrete Manhole Sections.
 - 9) C 700-07a - Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated.
 - 10) D 1785-06 - Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - 11) D 3034-06 - Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - 12) D 3350-08 - Specification for High Density Polyethylene Plastics Pipe and Fittings Materials.
- B. Public Works Standards, Inc. (PWS):
 - 1) Standard Specifications for Public Works Construction, (Greenbook), 2006 edition with amendments, published by BNi Building News, division of BNi Publications, Inc., Anaheim, CA (714)517-0970.

1.3 FIELD CONDITIONS

- A. Field Measurements: Lay out and stake storm drain piping at 25-foot intervals, at ends of pipe, and at drainage structures before starting excavation.
 - 1) Comply with the applicable requirements of Section 01 71 23.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:

- 1) ACO Polymer Products, Inc., Chardon, OH (323)646-3196, (440)285- 7000, (800)543-4764, with local representation at (323)646-3196, www.acousa.com.
- 2) Advanced Drainage Systems, Inc. (ADS), Fontana, CA (760)247-3346.
- 3) Alhambra Foundry Company, Ltd., Alhambra, CA (626)289-4294.
- 4) Ameron, Rancho Cucamonga, (909)944-4100.
- 5) Brooks Products, Inc., Fontana, CA (909)350-4111.
- 6) NDS, Inc., Lindsay, CA (559)562-9888, (800)726-1994, www.ndspro.com.
- 7) Urban Accessories, Woodinville, WA (425)487-0488, with local representation at (949)552-1130.

- B. Like materials shall be the products of one manufacturer and shall be either the ones upon which the design is based or those previously accepted.

2.2 DESCRIPTION

- A. Regulatory Requirements: Comply with *PWS Standard Specifications (Greenbook)* and applicable local governing agency regulations regarding storm drainage systems as referenced in the Contract Documents. Where those requirements conflict with the Contract Drawings, comply with the more stringent provisions.
- 1) Work not covered by governing agency standards shall conform to Contract Drawings and Project Manual, in that order of priority.
 - 2) For gratings located in the surface of any pedestrian ways at path of travel, grid/openings in gratings shall be limited to 1/2-inch width maximum in the direction of traffic flow. If such conditions occurs, provide manufacturer cutsheets of grate proposed of use.

2.3 PIPE MATERIALS

- A. Storm Drain Pipe:
- 1) Under Parking and Road Pavements: Comply with the following where indicated on the Contract Drawings:
 - a. PVC: ASTM D 3034 Type SDR 35 polyvinyl chloride (PVC) plastic pipe with gasketed joints.
 - b. HDPE: High density polyethylene pipe conforming to ASTM D 3350 with smooth interior and watertight joints.
- B. Bedding Material for Storm Drains: Well graded crushed gravel, pea gravel, or crushed stone, particles ranging in size between 1/4-inch and 3/4-inch in size. Conform to ASTM C 33, Gradation 67.

2.4 UTILITY STRUCTURES

- A. Storm Utility Structures:
- 1) Precast Reinforced Concrete: Conform to ASTM C 478.
 - 2) Precast-segmental concrete masonry units conforming to ASTM C 139.
 - 3) Cast-in-place Concrete: 2500 psi compressive strength concrete conforming to requirements specified in Section 03 31 00.

- a. Concrete Fill: Conform to ASTM C 387 for benching utility hole structures. Mix with minimum water to produce a compressive strength of 3000 psi or greater.
- 4) Mortar: Provide Type S mortar conforming to ASTM C 387 for jointing precast-segmental concrete units and joining drainage pipe to new storm utility holes. Mortar shall be mixed with minimum water necessary to produce a workable mortar.
- 5) Steps for Concrete Utility Hole Structures: Cast iron conforming to ASTM A 48, or hot-dipped galvanized steel bar.
 - a. Provide steps on storm utility holes where the invert is 2 feet or more from the bottom of the cast iron frame.
- B. Cast Iron Frames, Grates, Cleanouts, and Covers for Storm Drain Structures: Gray cast iron castings conforming to ASTM A 48. Provide traffic or non-traffic types as indicated on Contract Civil Drawings.
 - 1) Alhambra Foundry Company Type A-1240, or Long Beach Iron Works Type X-150, or equal.
- C. Catch Basins: As specified on plans.
- D. Atrium Grate Area Drain: As indicated on Contract Drawings.
- E. Area Drain Grate: As indicated on Contract Drawings.
- F. Trench Drains: As indicated on Contract Drawings.

2.5 IDENTIFICATION

- A. Warning Tape: Metalized polyethylene plastic tape with magnetic detectable trace wire, 6 inches wide by 4 mils thick, solid *yellow* in color with continuously printed caption in black letters CAUTION—STORM LINE BURIED BELOW.

END OF SECTION

(This page intentionally left blank)

APPENDICES



GONZALES COMMUNITY CENTER

HVAC Cut Sheets

Blue Forest Engineering, Inc
3622 Kingsley Street
Oakland, CA 94610-2833

March 31, 2022

Architectural Ceiling Diffusers

OMNI / OMNI-AA

- The Titus OMNI diffuser satisfies architectural as well as engineering criteria. Its strong, clean, unobtrusive lines harmonize with the ceiling system, without sacrificing performance.
- The curvature of the OMNI backpan works with the formed edges of the face panel to deliver a uniform 360° horizontal air pattern, without excessive noise or pressure drop
- The OMNI diffuser is an excellent choice for variable air volume systems. The air pattern remains tight and horizontal for effective room air distribution, even when the volume varies over a wide range.
- The face panel is constructed from 22-gauge steel or heavy gauge aluminum. The edges of the face panel are formed to a radius for a solid, crisp appearance. The formed edges also stiffen the face panel and assure a straight and level surface.



OMNI / OMNI-AA



retrofit

MRI compatible

wood grains

metric sizes

MODELS:

OMNI / Steel

OMNI-AA / Aluminum

FINISHES:

Standard Finish - #26 White

Optional Finish - Wood grains (See Wood grains Brochure for Finishes)

OVERVIEW

Square Plaque

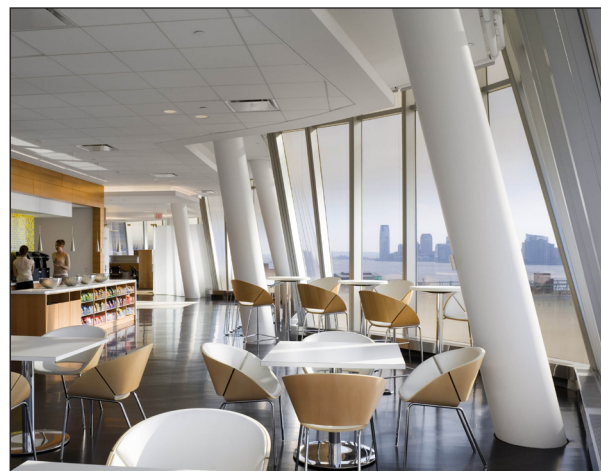
The Titus OMNI (steel plaque) & OMNI-AA (all-aluminum plaque) face diffusers that satisfy architectural and engineering criteria. Their strong, clean, unobtrusive lines harmonize with ceiling systems without sacrificing performance. The curvature of the OMNI & OMNI-AA backpans work with the formed edges of the face panel to deliver a uniform 360 degree horizontal air pattern, without excessive noise or pressure drop. They are an excellent selection for variable air volume systems.

ADDITIONAL FEATURES

- The formed edges of the face panel capture another 22-gauge steel or heavy gauge aluminum panel that the hanger brackets are mechanically fastened to. This process provides the OMNI face with a smooth finish under any lighting conditions.
- The OMNI-AA is entirely constructed of aluminum, perfect for MRI applications



See website for Specifications

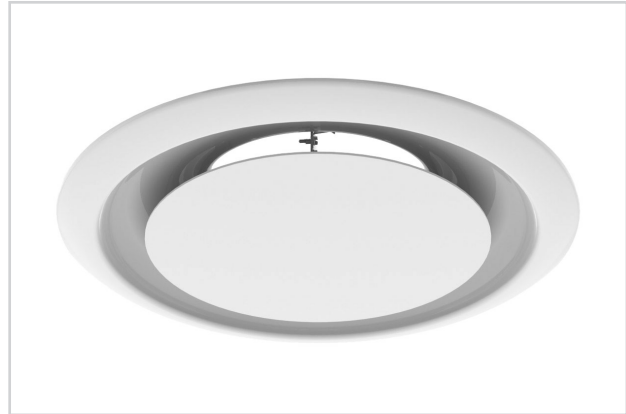


Several OMNI diffusers installed in the breakroom of a corporate office

- The face panel is held in place by four hook brackets that positively engage into slots in the backpan. The panel can be removed from the backpan for easy installation of the diffuser or for access to the optional damper.
- Optional factory-insulated R-6 foil-backed insulation available for 24 x 24" full face models, neck sizes 6-15

R-OMNI

- The Titus R-OMNI - a great look in circular diffusers designed for architectural ceilings and facilities with exposed ductwork
- R-OMNI's completely smooth face is adjustable in three positions for horizontal or vertical flow. Can be used effectively in heating or cooling applications.
- Uniform 360° discharge pattern
- Excellent performance in variable air volume systems
- Optional Type B outer cone for reducing ceiling smudging
- Spring lock allows easy removal and replacement of the plaque assembly
- Material is heavy gauge steel



R-OMNI



energy solutions



open ceiling

MODEL:

R-OMNI / Steel

FINISH:

Standard Finish - #26 White

OVERVIEW

Round Plaque / Steel

The appearance of the R-OMNI diffuser is designed for architectural ceilings and facilities with exposed ductwork. The smooth face is adjustable in three positions for horizontal or vertical flow. The R-OMNI can be used effectively in heating or cooling applications and is an excellent choice in Variable Air Volume Systems.



See website for Specifications

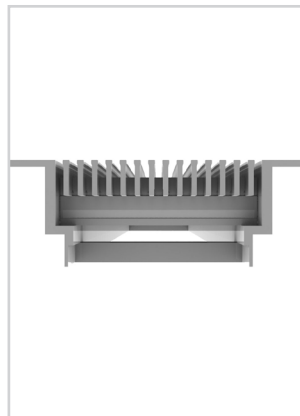


Several R-OMNI diffusers installed in a locker room

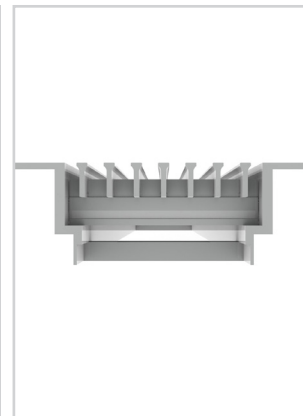
Linear Bar Diffusers

CT

- When both appearance and performance are of prime importance in an air distribution system, Titus linear bar diffusers are a logical choice
- Designed for both heating and cooling applications, supply as well as return
- Available in eight different core styles plus a wide selection of frames and borders
- Can be selected for ceiling, side wall, or sill installations. Heavy duty models (Frames 5 and 6) are designed especially for typical floor installations.
- Accessories such as directional blades, dampers, blank-offs, access doors and mitered corners make these diffusers even more versatile
- Ideal for continuous length applications. Multiple sections are shipped with required alignment strips or pins for field installation.



CT-480



CT-580



metric sizes

wood grains

MRI compatible

MODELS:

1/4" Spacing

- CT-480 / 1/8" Bars / 0° Deflection
- CT-481 / 1/8" Bars / 15° Deflection

1/2" Spacing

- CT-580 / 1/8" Bars / 0° Deflection
- CT-581 / 1/8" Bars / 15° Deflection
- CT-540 / 1/4" Bars / 0° Deflection
- CT-541 / 1/4" Bars / 15° Deflection

7/16" Spacing

- CT-PP-0 / 7/32" Bars / 0° Deflection
- CT-PP-3 / 7/32" Bars / 30° Deflection

FINISHES:

Standard Finish - #26 White

Optional Finishes - #01 Aluminum / #04 Mill / #25 Off White / #84 Black

Anodized finishes available

OVERVIEW

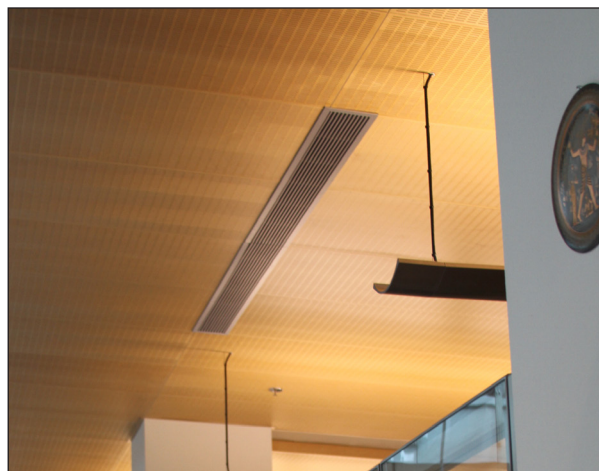
Fixed Bars / Pencil Proof-Aluminum

When both appearance and performance are of prime importance in an air distribution system, Titus linear bar diffusers are a logical choice. Designed for both heating and cooling applications, supply as well as return.

ADDITIONAL FEATURES

- Maximum one piece section is 6 feet. Lengths greater than 6 feet are furnished in multiple sections.
- Sections can be joined together end-to-end for continuous appearance, using standard alignment strips or alignment wires

 See website for Specifications



CT diffuser installed in the ceiling of a building on a college campus

- All deflection bars are fixed and parallel to the long dimension
- Fixed bars and support bars are extruded aluminum
- Optional curving to a 2' feet (24" minimum radius) on most models, available for architectural enhancement

300 / 350 Supply Grilles

300 / 350 grilles

301 / 300 (RL / RS)

301RS

- ¾" blade spacing
- Single deflection
- Individually adjustable blades
- Blades parallel to the short dimension

301RL

- Same as 301RS with blades parallel to the long dimension

300RS

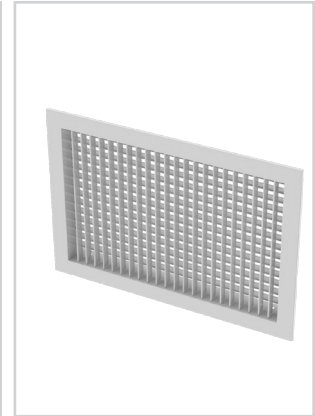
- ¾" blade spacing
- Double deflection
- Individually adjustable blades
- Front blades parallel to the short dimension

300RL

- Same as 300RS with front blades parallel to the long dimension



301RL



300RS



metric sizes

MODELS:

Single Deflection Models

301RL
301RS

Double Deflection Models

300RL
300RS

FINISH:

Standard Finish - #26 White

OVERVIEW

¾" Blade Spacing / Steel

Titus' 300 / 350 Series supply grilles define the standard for the industry. With high quality and competitive pricing these grilles form the backbone of a standard offering that will meet any application requirements.

PRODUCTS INCLUDE

- Material: Roll-formed Steel
- Welded Border
- Available Border Types:
 - #1 - Surface Mount
- Countersunk Screw Holes
- #8 x 1¼" Long Phillips Flat Head Sheet Metal Screws, Painted White
- Optional Steel-Opposed Blade Damper



See website for Specifications

350 (RL-RS / ZRL-ZRS)

350RL

- 3/4" blade spacing
- 35° fixed deflection
- Reinforced corners
- Blades parallel to the long dimension

350RS

- Same as 350RL with blades parallel to the short dimension

350ZRL

- 3/4" blade spacing
- 0° fixed deflection
- Reinforced corners
- Blades parallel to the long dimension

350ZRS

- Same as 350ZRL with blades parallel to the short dimension



350 (RL / RS)



350 (ZRL / ZRS)



metric sizes

MODELS:

35° Deflection Models

350RL

350RS

0° Deflection Models

350ZRL

350ZRS

FINISH:

Standard Finish - #26 White

OVERVIEW

3/4" Blade Spacing / Steel

Titus' 300 / 350 Series return grilles define the standard for the industry. With high quality and competitive pricing these grilles form the backbone of a standard offering that will meet any application requirements.

For Performance Data, refer to page H37 for 350R, and page H39 for 350ZR.

PRODUCTS INCLUDE

- Material: Roll-formed Steel Border and Blades
- Welded Border
- Available Border Types:
 - #1 - Surface Mount
 - #2 - Snap-In
 - #3 - Lay-In
 - #4 - Spline



See website for Specifications

- Countersunk Screw Holes
- #8 x 1/4" Long Phillips Flat Head Sheet Metal Screws, Painted White
- Optional Steel Opposed-Blade Damper

121 / 122 (RL / RS)

121RS

- 2" blade spacing
- Single deflection
- Individually adjustable airfoil blades
- Blades parallel to the short dimension
- 20-gauge border

121RL

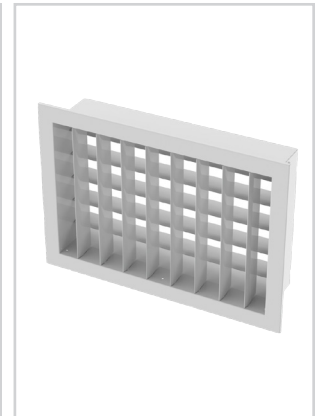
- Same as 121RS with blades parallel to the long dimension

122RS

- 2" blade spacing
- Double deflection
- Individually adjustable airfoil blades
- Front blades parallel to the short dimension
- 20-gauge border



121 (RL / RS)



122 (RL / RS)

122RL

- Same as 122RS with front blades parallel to the long dimension



metric sizes



factories



energy solutions

MODELS:

Single Deflection Models

121RL
121RS

Double Deflection Models

122RL
122RS

FINISH:

Standard Finish - #26 White

OVERVIEW

2" Blade Spacing / Steel

Titus' state-of-the-art AeroBlade grilles are the quietest in the industry. Utilizing a unique airfoil blade design, these grilles provide the ultimate in performance and noise reduction. AeroBlade grilles are available in steel or aluminum construction and various blade spacing options.

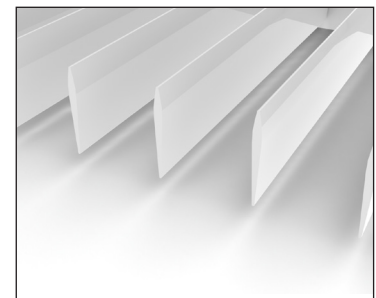
For Performance Data, refer to page G17

PRODUCTS INCLUDE

- Material: Steel Border with Extruded Aluminum Blades
- Welded Border.
- Available Border Types:
#1 - Surface Mount
- Countersunk Screw Holes
- #8 x 1¼" Long Phillips Flat Head Sheet Metal Screws, Painted White
- Optional Steel Opposed-Blade Damper



See website for Specifications



Heavy Duty Bar Return Grilles

specialized grilles

33 / 30 (RL / RS)

33RL

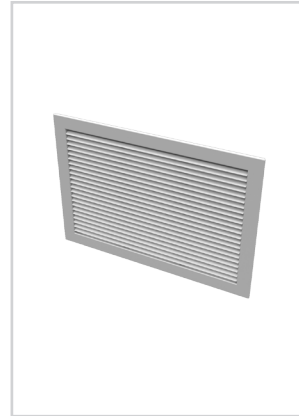
- ½" blade spacing
- 38° fixed deflection
- 16-gauge border, 14-gauge blades
- Support bars 6 inches on center
- Blades parallel to the long dimension

33RS

- Same as 33RL with blades parallel to the short dimension

30RL

- 3/8" blade spacing
- 0° fixed deflection
- 16-gauge border, 14-gauge blades
- Support bars 6 inches on center
- Blades parallel to the long dimension



33RL



30RL

30RS

- Same as 30RL with blades parallel to the short dimension



metric sizes



gymnasiums



rugged areas



See website for Specifications

MODELS:

38° Deflection Models

33RL
33RS

0° Deflection Models

30RL
30RS

FINISH:

Standard Finish - #26 White

OVERVIEW

Grilles / Steel

Steel heavy duty return grilles are great for use in gymnasiums and other areas where rugged construction is required. Available in 0° or angled deflection and standard or filter grille configurations.

PRODUCTS INCLUDE

- Available Border Type:
#1 - Surface Mount
- Countersunk Screw Holes
- #8 x 1¼" Long Phillips Flat Head Sheet Metal Screws, Painted White
- Optional Steel Opposed-Blade Damper

Door Grilles

specialized grilles

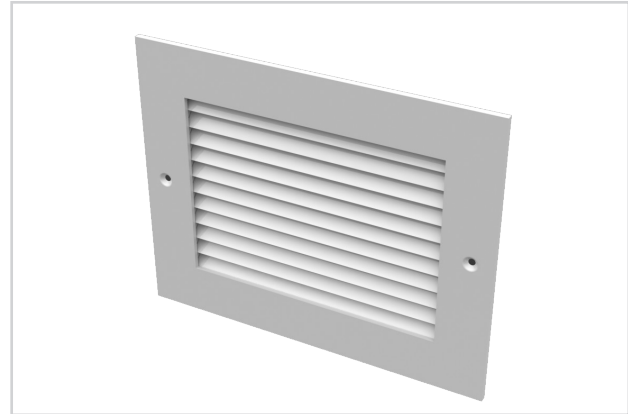
T-700 (L / S)

T-700L

- Sight proof
- Used in doors and partitions
- Included v-blades block vision and provide extra strength
- 20-gauge steel blades
- Blades parallel to the long dimension

T-700S

- Same as T-700L with blades parallel to the short dimension



T-700 (L / S)



metric sizes

doors / partitions

sight proof design



See website for Specifications

MODELS:

T-700L
T-700S

FINISH:

Standard Finish - #26 White

OVERVIEW

Steel

Titus Door return grilles are great for use in doors and partitions. They offer a large free are for great performance yet have a sight proof design. Options include steel or aluminum construction and an auxiliary frame for the reverse side.

PRODUCTS INCLUDE

- Available Border Types:
 - #1 - Surface Mount
 - #7 - Channel Frame
- Countersunk Screw Holes
- #8 x 1¼" long Phillips Flat Head Sheet Metal Screws, Painted White

Submittal Data Sheet

34 ton, 230V, VRV EMERION HR

REYQ408AATJA

FEATURES

- New Simple and Stylish design with expanded line up with single-module units from 6 - 20T and dual-modules up to 40 T
- Space-saving 16 - 20 T single module units provide up to 34% footprint and up to 500 lbs./unit weight reduction compared to previous series
- High energy efficiency with IEERs up to 30.0 delivers up to 30% efficiency increase
- Year-round comfort and energy savings with Daikin's Variable Refrigerant Temperature technology (VRT)
- Heating down to -13°F as standard and high heating capacities at 17°F make it an ideal choice for all-electric heat pump solutions
- Continuous heating during defrost capability with single module (16 T - 20 T) and all dual module systems
- Hot gas defrost circuit allows for installation without base pan heater
- High dust and moisture protection with an IP55 rated sealed E-box
- Dual-fuel ready with connectivity to Daikin communicating gas furnace or all-electric heat pump heating for optimized operational costs based on utility rates
- Design flexibility to enlarge system from single to a dual-module without changes to installed main pipe sizes for phased installation or tenant fit-out buildings
- Local code compliance-ready from factory via alignment with compliance needs, such as OSHPD Seismic, Miami Dade Wind, and Chicago pressure relief codes
- Reduced wiring costs with up to 34% reduction in MCA values compared to previous series
- Engineered for ease of installation and service with three-segment panel design
- Factory ships with increased space for easy field piping connections to service valves.
- Built-in data recorder to store up to 45 minutes of operational data
- Integrates with new Daikin HERO ecosystem, an IoT-based remote monitoring and diagnostics platform. Available Spring of 2022





BUILDING A

Submittal Data Sheet

34 ton, 230V, VRV EMERION HR
REYQ408AATJA

PERFORMANCE

Outdoor Unit Model No.	REYQ408AATJA	Outdoor Unit Name:	34 ton, 230V, VRV EMERION HR
Type:	Heat Recovery	Unit Combination:	REYQ192AATJA + REYQ216AATJA
Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
Rated Piping Length(ft):			
Rated Height Difference (ft):			
Rated Cooling Capacity (Btu/hr):	388,000	Rated Heating Capacity (Btu/hr):	394,000
Nom Cooling Capacity (Btu/hr):	408,000	Nom Heating Capacity (Btu/hr):	459,000
Cooling Input Power (kW):		Heating Input Power (kW):	
EER (Non-Ducted/Ducted):	10.70 / 10.50	Heating COP (Non-Ducted/Ducted):	3.4 / 3.3
IEER (Non-Ducted/Ducted):	21.50 / 18.40	Heating COP 17F (Non-Ducted/Ducted):	2.1 / 2.1
		SCHE (Non-Ducted/Ducted):	21.90 / 18.40

OUTDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 3	Compressor Stage:	
Power Supply Connections:		Capacity Control Range (%):	1 - 100
Min. Circuit Amps MCA (A):	59.8 + 67.2	Capacity Index Limit:	-
Max Overcurrent Protection (MOP) (A):	70 + 80	Airflow Rate (H) (CFM):	13650 + 14505
Max Starting Current MSC(A):		Gas Pipe Connection (inch):	1-5/8
Rated Load Amps RLA(A):	(16.6 + 16.6) + (20.0 + 20.0)	Liquid Pipe Connection (inch):	3/4
Dimensions (Height) (in):	65-3/8	H/L Pressure Connection (inch)	1-3/8
Dimensions (Width) (in):	68-7/8 in+68-7/8	H/L Equalizing Connection (inch)	
Dimensions (Depth) (in):	30-1/8	Sound Pressure (H) (dBA):	71
Net Weight (lb):	957 + 957	Sound Power Level (dBA):	

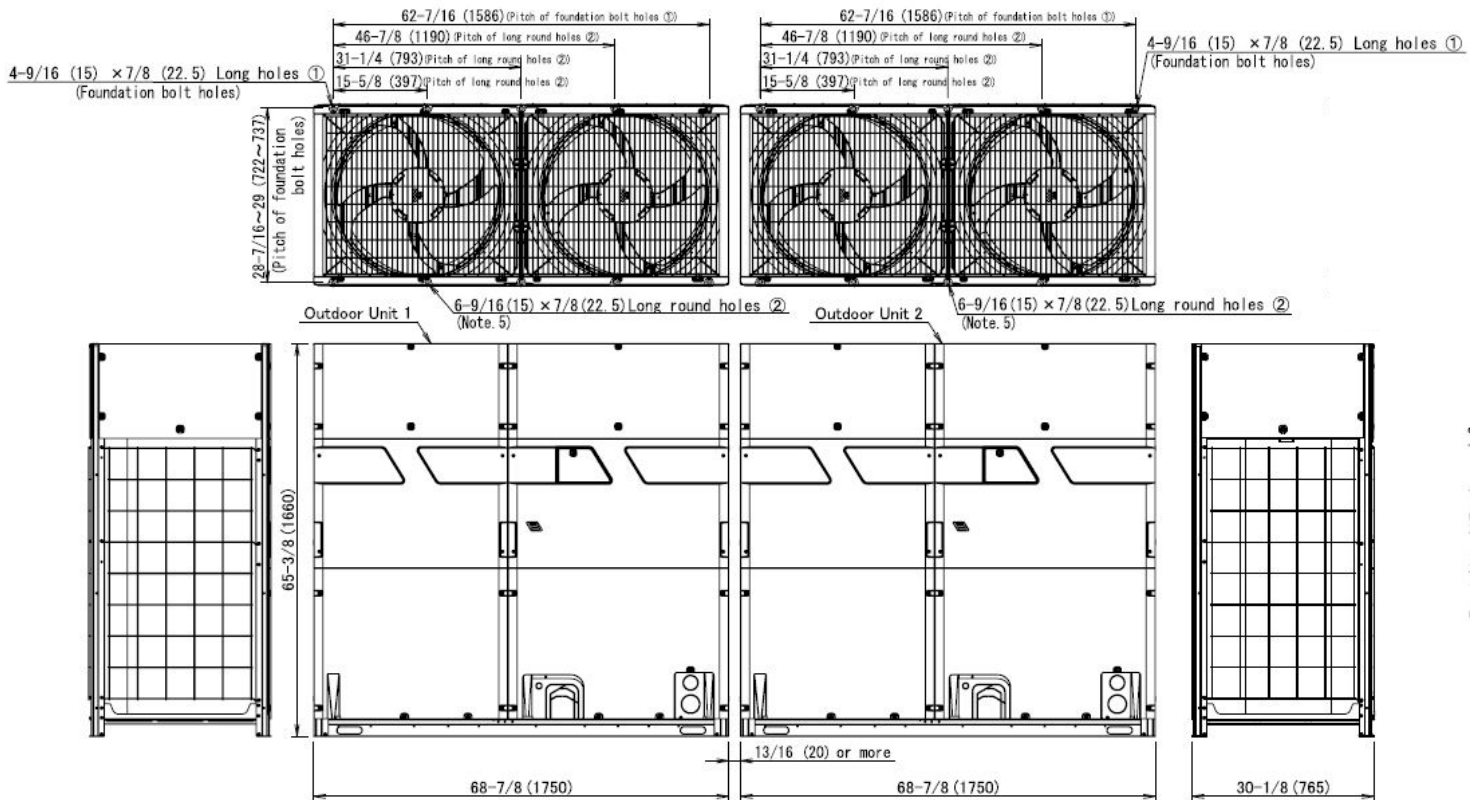
Submittal Data Sheet

34 ton, 230V, VRV EMERION HR

REYQ408AATJA

SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	23 - 122
Holding Refrigerant Charge (lbs):	25.8 + 25.8	Heating Operation Range (°F WB):	-13 - 60
Additional Charge (lb/ft):		Max. Pipe Length (Vertical) (ft):	295
Pre-charge Piping (Length) (ft):		Cooling Range w/Baffle (°F DB):	-
Max. Pipe Length (Total) (ft):	540	Heating Range w/Baffle (°F WB):	-
Max Height Separation (Ind to Ind ft):			

DIMENSIONAL DRAWING


Submittal Data Sheet

30 ton, 230V, VRV EMERION HR

REYQ360AATJA

FEATURES

- New Simple and Stylish design with expanded line up with single-module units from 6 - 20T and dual-modules up to 40 T
- Space-saving 16 - 20 T single module units provide up to 34% footprint and up to 500 lbs./unit weight reduction compared to previous series
- High energy efficiency with IEERs up to 30.0 delivers up to 30% efficiency increase
- Year-round comfort and energy savings with Daikin's Variable Refrigerant Temperature technology (VRT)
- Heating down to -13°F as standard and high heating capacities at 17°F make it an ideal choice for all-electric heat pump solutions
- Continuous heating during defrost capability with single module (16 T - 20 T) and all dual module systems
- Hot gas defrost circuit allows for installation without base pan heater
- High dust and moisture protection with an IP55 rated sealed E-box
- Dual-fuel ready with connectivity to Daikin communicating gas furnace or all-electric heat pump heating for optimized operational costs based on utility rates
- Design flexibility to enlarge system from single to a dual-module without changes to installed main pipe sizes for phased installation or tenant fit-out buildings
- Local code compliance-ready from factory via alignment with compliance needs, such as OSHPD Seismic, Miami Dade Wind, and Chicago pressure relief codes
- Reduced wiring costs with up to 34% reduction in MCA values compared to previous series
- Engineered for ease of installation and service with three-segment panel design
- Factory ships with increased space for easy field piping connections to service valves.
- Built-in data recorder to store up to 45 minutes of operational data
- Integrates with new Daikin HERO ecosystem, an IoT-based remote monitoring and diagnostics platform. Available Spring of 2022





Submittal Data Sheet

30 ton, 230V, VRV EMERION HR
REYQ360AATJA

PERFORMANCE

Outdoor Unit Model No.	REYQ360AATJA	Outdoor Unit Name:	30 ton, 230V, VRV EMERION HR
Type:	Heat Recovery	Unit Combination:	REYQ168AATJA + REYQ192AATJA
Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
Rated Piping Length(ft):			
Rated Height Difference (ft):			
Rated Cooling Capacity (Btu/hr):	342,000	Rated Heating Capacity (Btu/hr):	376,000
Nom Cooling Capacity (Btu/hr):	360,000	Nom Heating Capacity (Btu/hr):	405,000
Cooling Input Power (kW):		Heating Input Power (kW):	
EER (Non-Ducted/Ducted):	11.50 / 10.70	Heating COP (Non-Ducted/Ducted):	3.6 / 3.2
IEER (Non-Ducted/Ducted):	21.00 / 18.20	Heating COP 17F (Non-Ducted/Ducted):	2.1 / 2.1
		SCHE (Non-Ducted/Ducted):	23.00 / 19.40

OUTDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 3	Compressor Stage:	
Power Supply Connections:		Capacity Control Range (%):	1 - 100
Min. Circuit Amps MCA (A):	54.9 + 59.8	Capacity Index Limit:	-
Max Overcurrent Protection (MOP) (A):	70 + 70	Airflow Rate (H) (CFM):	9675 + 13650
Max Starting Current MSC(A):		Gas Pipe Connection (inch):	1-5/8
Rated Load Amps RLA(A):	(12.5 + 20.0) + (16.6 + 16.6)	Liquid Pipe Connection (inch):	3/4
Dimensions (Height) (in):	65-3/8	H/L Pressure Connection (inch)	1-3/8
Dimensions (Width) (in):	48-13/16 in+68-7/8	H/L Equalizing Connection (inch)	
Dimensions (Depth) (in):	30-1/8	Sound Pressure (H) (dBA):	70
Net Weight (lb):	787 + 957	Sound Power Level (dBA):	

Submittal Data Sheet

16 Ton, 230V, VRV IV X HP

RXYQ192XATJA

FEATURES

- Industry's first 3 phase Heat Pump VRF system to integrate with communicating gas furnaces.
- Design flexibility to enlarge system from single to dual module or dual to triple module without changes to installed main pipe sizes.
- Variable Refrigerant Temperature (VRT) control allows the VRV IV to deliver up to 28% of improvement in seasonal cooling efficiency compared to previous Daikin VRV heat pump systems
- New service window provides quick access to multi-functional display and configuration buttons.
- Assembled in the US to increase flexibility and reduce lead times
- Multi-functional display provides refrigerant pressures and temperatures eliminating the need to connect gauges during regular maintenance check.
- Standard Limited Warranty: 10-year limited parts warranty
- Easy commissioning with ability to program settings off site using configurator tool.



BENEFITS

- Modular and lightweight - enables flexibility in system layout and installation
- Integrated inverter technology deliver maximum efficiency during part load conditions and provide precise individual zone control
- Corrosion resistance 1000hr salt spray tested Daikin PE blue fin heat exchanger
- Design flexibility with long piping lengths up to 3,280 ft. total and 100 ft. vertical separation between indoor units
- Choice of gas furnace or heat pump heating for optimizing operational costs based on utility cost.
- Engineered to optimize capital on phased & tenant fit out commercial buildings.
- Year round comfort and energy savings with Variable Refrigerant Temperature technology (VRT).
- Field performable Intermittent outdoor fan operation to help minimize snow accumulation on fan blades when the system is off.



VRV IV





Submittal Data Sheet

16 Ton, 230V, VRV IV X HP

RXYQ192XATJA

PERFORMANCE

Outdoor Unit Model No.	RXYQ192XATJA	Outdoor Unit Name:	16 Ton, 230V, VRV IV X HP
Type:	Heat Pump	Unit Combination:	RXYQ72XATJA + RXYQ120XATJA
Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
Rated Piping Length(ft):			
Rated Height Difference (ft):			
Rated Cooling Capacity (Btu/hr):	184,000	Rated Heating Capacity (Btu/hr):	206,000
Nom Cooling Capacity (Btu/hr):	192,000	Nom Heating Capacity (Btu/hr):	216,000
Cooling Input Power (kW):	15.80	Heating Input Power (kW):	15.40
EER (Non-Ducted/Ducted):	11.10 / 11.60	Heating COP (Non-Ducted/Ducted):	3.6 / 3.3
IEER (Non-Ducted/Ducted):	22.20 / 21.20	Heating COP 17F (Non-Ducted/Ducted):	2.3 / 2.2

OUTDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 3	Compressor Stage:	Inverter
Power Supply Connections:	L1, L2, L3 Ground	Capacity Control Range (%):	17 - 100
Min. Circuit Amps MCA (A):	27.6+36.3	Capacity Index Limit:	96.0 - 249.0
Max Overcurrent Protection (MOP) (A):	35+45	Airflow Rate (H) (CFM):	5544+6286
Max Starting Current MSC(A):		Gas Pipe Connection (inch):	1-1/8
Rated Load Amps RLA(A):	15.7+26.2	Liquid Pipe Connection (inch):	5/8
Dimensions (Height) (in):	66-11/16	H/L Pressure Connection (inch)	
Dimensions (Width) (in):	30-3/16+48-7/8	H/L Equalizing Connection (inch)	
Dimensions (Depth) (in):	30-3/16	Sound Pressure (H) (dBA):	63
Net Weight (lb):	435+528	Sound Power Level (dBA):	
		Max. No. of Indoor Units:	33

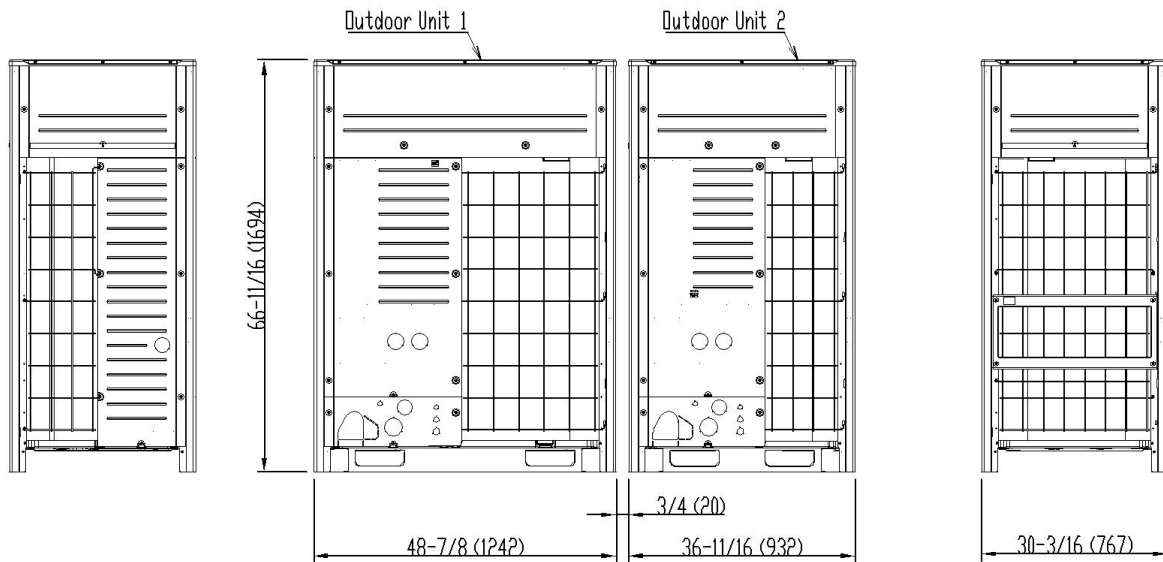
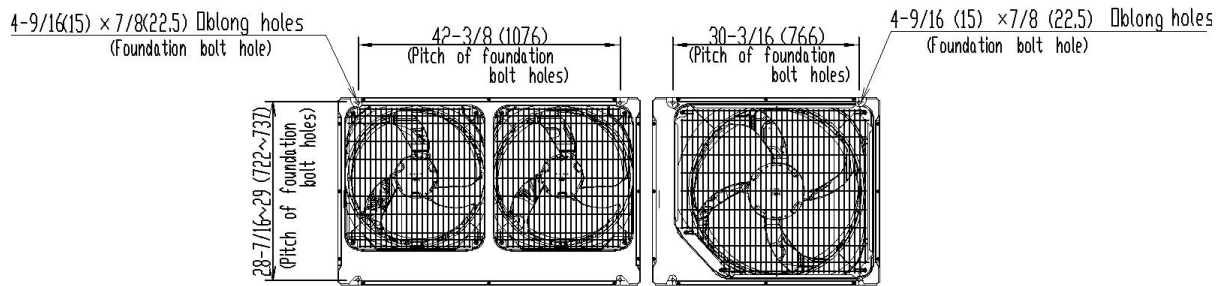
Submittal Data Sheet

16 Ton, 230V, VRV IV X HP

RXYQ192XATJA

SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	23 - 122
Holding Refrigerant Charge (lbs):	13.0+22.9	Heating Operation Range (°F WB):	-4 - 60
Additional Charge (lb/ft):		Max. Pipe Length (Vertical) (ft):	295
Pre-charge Piping (Length) (ft):		Cooling Range w/Baffle (°F DB):	-
Max. Pipe Length (Total) (ft):	540	Heating Range w/Baffle (°F WB):	-
Max Height Separation (Ind to Ind ft):			

DIMENSIONAL DRAWING


FXMQ_PBVJU

HSP DC Concealed Ducted Unit



Condensate Pump as Standard



Outside Air Integration Possible

Powerful, Concealed, Flexible

The ceiling mounted HSP DC concealed ducted unit is ideal for small to large spaces in need of a concealed air-conditioning system. It is extremely powerful and the compact design allows it to be completely concealed. This makes it perfect for retail, classrooms, offices, banks, restaurants, shops and hotels common areas.

Features and Benefits

- » Capacity range up to 54 MBH.
- » Energy efficient due to the DC fan motor
- » Ideal to use together with the optional Daikin Zoning Kit, DZK
- » Configurable auxiliary heater control logic
- » Enhanced indoor air quality and LEED® ready with MERV 13 filter options
- » Ease of installation with auto adjusting airflow at commissioning based on external static pressure
- » Flexible ductwork design with ESP capabilities up to 0.8" W.G.
- » Installation flexibility with a low profile, compact design at less than 12" in height
- » Easy maintenance with complete service access from below
- » Option to permanently turn off the condensate pump via field settings



BRC1E73 (option)



AZAI6WSCDKA (option)



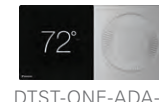
BRC4C82 (option)



BRC1H71W (option)



AZAI6WSPDKC (option)



DTST-ONE-ADA-A (option)

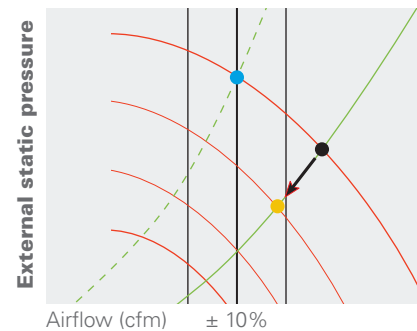


Adaptive Touch Controller (option)

Auto Adjust External Static Pressure

- » After installation, it is possible that the actual duct resistance is lower than expected at the time of designing. As a consequence, the air-flow will be too high.
- » With the automatic air-flow adjustment function the unit can adapt its fan speed to a lower curve, so the air-flow decreases.
- » The air-flow will always be within 10% of the rated air-flow because of the amount of possible fan curves (more than 8 fan curves available per model).
- » Alternatively the installer can manually select a fan curve with the wired remote control.

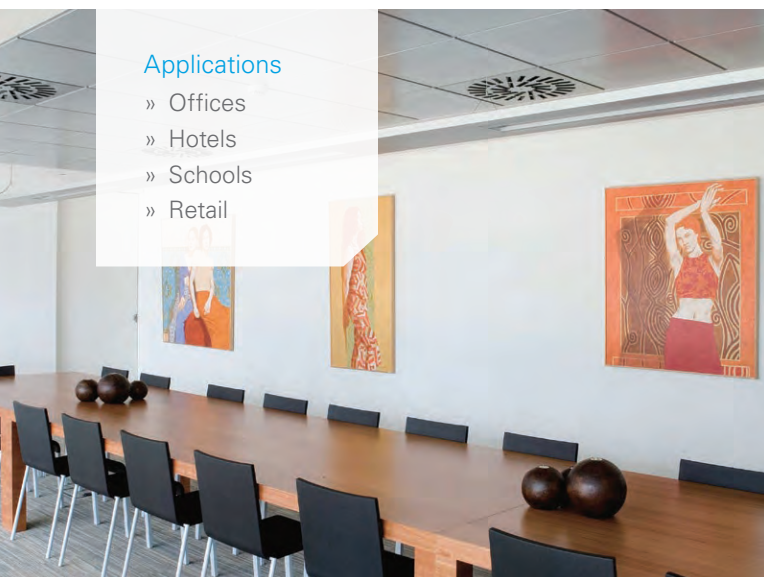
Auto Adjust External Static Pressure



- Fan characteristic curve
- Actual duct resistance curve
- - - Duct resistance curve at the time of designing
- Rated airflow
- Airflow without airflow automatic adjustment
- Actual airflow

Applications

- » Offices
- » Hotels
- » Schools
- » Retail





FXMQ_PBVJU SPECIFICATIONS		0.6 Ton	0.75 Ton	1.0 Ton	1.25 Ton	1.5 Ton	2.0 Ton	2.5 Ton	3.0 Ton	4.0 Ton	4.5 Ton	
Model Name		FXMQ07PBVJU	FXMQ09PBVJU	FXMQ12PBVJU	FXMQ15PBVJU	FXMQ18PBVJU	FXMQ24PBVJU	FXMQ30PBVJU	FXMQ36PBVJU	FXMQ48PBVJU	FXMQ54PBVJU	
Power Supply	V/ph/Hz	208-230/1/60										
Rated Cooling Capacity	BTU/h	7,500	9,500	12,000	15,000	18,000	24,000	30,000	36,000	48,000	54,000	
Rated Heating Capacity	BTU/h	8,500	10,500	13,500	17,000	20,000	27,000	34,000	40,000	54,000	60,000	
Airflow Rate (H/M/L)	CFM	317/264/229		450/410/388	560/530/500	635/582/529	688/618/565	1,094/953/812	1,130/953/812	1,377/1,165/988	1,624/1,377/1,130	
Height	in.	11-3/16										
Width	in.	21-5/8		27-9/16	39-3/8		55-1/8					
Depth	in.	27-9/16										
Weight	lbs.	55 (25)		62 (28)	80 (36)		102 (46)		104 (47)			
Condensate Pump Lift	in.	18-3/8										
Sound Pressure (H/M/L)	dB(A)	33/31/29		39/37/35	40/38/37	41/39/37	42/40/38	43/41/39	44/42/40	46/45/43		
Condensate Pipe Connection	in. O.D.	1-1/4										
Pipe Connections	Gas	in.				1/2 (Flare)		5/8 (Flare)				
	Liquid	in.				1/4 (Flare)		3/8 (Flare)				
Refrigerant		R-410A										
Refrigerant Control		Electronic Expansion Valve										
Maximum Overcurrent Protective Device	A	15										
Minimum Circuit Amps	A	0.6		1.4	1.5	1.6	1.8	2.8	2.9	3.4		
Protection Devices		Fuse and Fan Driver Overload Protector										
External Finish		Galvanized Steel Plate										
External Static Pressure (H/L)	in. Wg	0.40/0.12				0.80/0.20		0.56/0.20				

MERV 13 Filter Kit Option contains a MERV 13 filter, adaptor frame and easy to follow installation instructions and can be installed on the following models only:

Kit Model	Indoor Unit
DACA-FXMQ12131K	FXMQ07-09PBVJU
DACA-FXMQ14131K	FXMQ12PBVJU
DACA-FXMQ30131K	FXMQ15-24PBVJU
DACA-FXMQ48131K	FXMQ30-54PBVJU

ENTHALPY ECONOMIZER (FIELD APPLIED ACCESSORY)

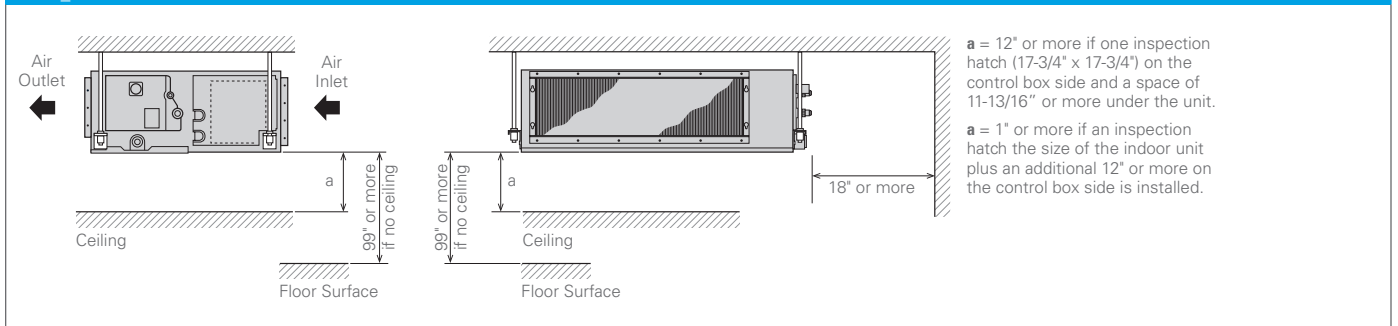
Model	Indoor Unit
ECONMQ12P-8-1K (MERV 8 Filter)	FXMQ07-09PBVJU
ECONMQ12P-13-1K (MERV 13 Filter)	
ECONMQ30P-8-1K (MERV 8 Filter)	
ECONMQ30P-13-1K (MERV 13 Filter)	FXMQ15-24PBVJU
ECONMQ48P-8-1K (MERV 8 Filter)	
ECONMQ48P-13-1K (MERV 13 Filter)	FXMQ30-54PBVJU

FXMQ_PBVJU ACCESSORIES

Model Name	FXMQ07PBVJU	FXMQ09PBVJU	FXMQ12PBVJU	FXMQ15PBVJU	FXMQ18PBVJU	FXMQ24PBVJU	FXMQ30PBVJU	FXMQ36PBVJU	FXMQ48PBVJU	FXMQ54PBVJU
Navigation Remote Controller*	BRC1E73									
DKN Cloud Wi-Fi Adaptor	AZAI6WSCDKA									
Madoka Remote Controller	BRC1H71W									
Button Sensor Kit	KRCSH2018-01w									
Daikin One+ Smart Thermostat	DTST-ONE-ADA-A									
DKN Plus Interface	AZAI6WSPDKC									
Adaptive Touch Controller	BACRC-T-P01/ BACRC-TH-P01/ BACRC-THO-P01/ BACRC-THOC-P01									
Wireless Remote Controller	BRC4C82									
Remote Sensor Kit	KRCS01-4B									
Wiring Adaptor PCB (interface with aux/ primary heater, humidifier, OA damper/fan)	KRP1C74									
Group Control Adaptor PCB (connects to external BMS)	KRP4A71									

*Optional face plates available to provide a more intuitive user interface and disable specific functions

FXMQ_PBVJU INSTALLATION SPACE



INDOOR UNITS

FXSQ_TAVJU

MSP Concealed Ducted Unit



Condensate Pump as Standard



Outside Air Integration Possible

Do more with less

The MSP concealed ducted unit is engineered with impressive static pressure capability in a compact, flexible chassis design to give designers a tool to approach even the most cramped air conditioning applications.

Features and Benefits

- » Powerful static pressure capability, with up to 0.6 in. Wg (150Pa) external static pressure.
- » Ease of installation with auto adjusting airflow at commissioning based on external static pressure.
- » Designed for installation flexibility, with a factory rear-return configuration and field convertible to bottom return.
- » Sound levels as low as 28 dB(A) for quiet operation.
- » Provides a high degree of control for auxiliary heating devices, with independently configurable on/off temperature values.
- » Integral condensate pump with up to 25-5/16" (643mm) of lift from the drain outlet



BRC1E73 (option)



AZAI6WSCDKA (option)



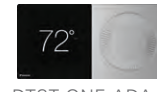
BRC4C82 (option)



BRC1H71W (option)



AZAI6WSPDKC (option)



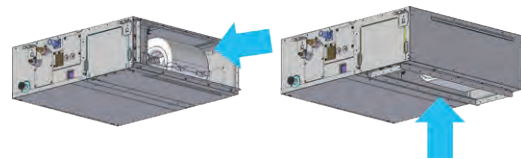
DTST-ONE-ADA-A (option)



Adaptive Touch Controller (option)

Flexible Installation

The FXSQ_TA can easily be converted to a bottom-return configuration to optimize the use of space above the ceiling or bulkhead space.



Applications

- » Offices
- » Hotel Rooms
- » Multi-family residences
- » Single-family residences
- » Schools





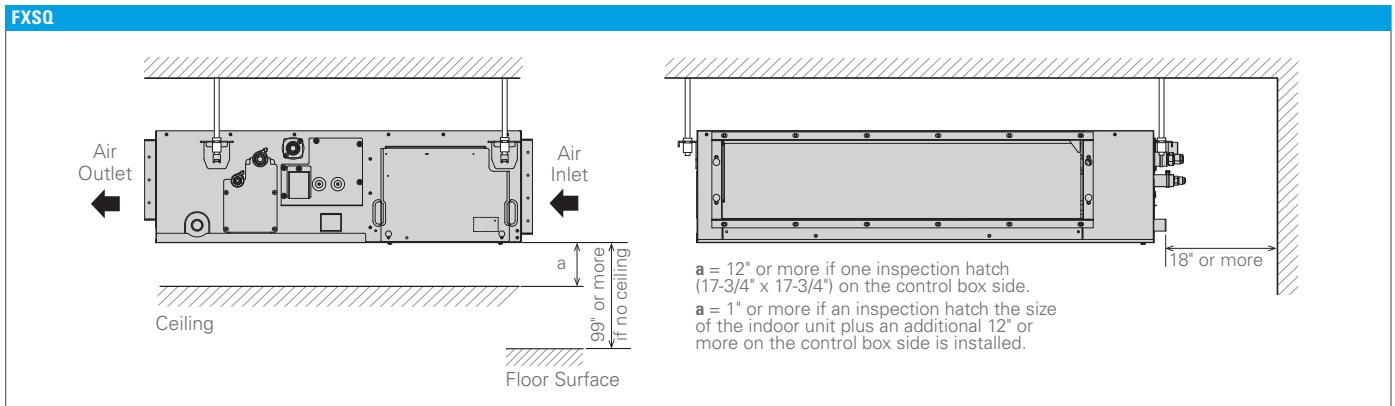
SPECIFICATIONS			0.5 TON	0.6 TON	0.75 TON	1.0 TON	1.25 TON	1.5 TON	
Model Name			FXSQ05TAVJU	FXSQ07TAVJU	FXSQ09TAVJU	FXSQ12TAVJU	FXSQ15TAVJU	FXSQ18TAVJU	
Capacity Index			5.8	7.5	9.5	12	15	18	
Power Supply			208/230VAC, 60Hz, 1 phase						
Nominal Cooling Capacity*1			Btu/h (kW) 5,800 (1.7)	7,500 (2.2)	9,500 (2.8)	12,000 (3.6)	15,000 (4.5)	18,000 (5.6)	
Nominal Heating Capacity*2			Btu/h (kW) 6,500 (1.9)	8,500 (2.5)	10,500 (3.1)	13,500 (4.0)	16,500 (5.6)	20,000 (6.3)	
Fan	Type	Sirocco fan							
	Motor Output	W	78						
	Air Flow Rate (H/M/L)	CFM	281 / 265 / 230	318 / 265 / 230		335 / 283 / 247	530 / 441 / 371	600 / 512 / 406	
	Drive Type	DC Direct Drive							
External Static Pressure (Std./Max)		0.2 / 0.6						0.4 / 0.6	
Height		in.	9-11/16						
Width		in.	21-11/16				27-9/16	39-3/8	
Depth		in.	31-1/2						
Weight		lb.	55 (25)				60 (27)	77 (35)	
Condensate Pump Lift		in.	25-5/16 (643)						
Sound Pressure Level (H/M/L speed)		dB(A)	33 / 30 / 28			34 / 32 / 30		36 / 33 / 30	34 / 32 / 29
Pipe Connections	Liquid	in.	1/4 (Flare)						
	Gas	in.	1/2 (Flare)						
	Condensate Drain	in.	VP25						
Refrigerant Control		Electronic Expansion Valve							
Maximum Overcurrent Protection Device		A	15						
Minimum Circuit Ampacity		A	0.8			1.4		1.6	



SPECIFICATIONS			2.0 TON	2.5 TON	3.0 TON	4.0 TON	4.5 TON
Model Name			FXSQ24TAVJU	FXSQ30TAVJU	FXSQ36TAVJU	FXSQ48TAVJU	FXSQ54TAVJU
Capacity Index			24	30	36	48	54
Power Supply			208/230VAC, 60Hz, 1 phase				
Nominal Cooling Capacity*1			Btu/h (kW) 24,000 (7.1)	30,000 (9.0)	36,000 (11.2)	48,000 (14.0)	54,000 (15.8)
Nominal Heating Capacity*2			Btu/h (kW) 27,000 (8.0)	34,000 (10.0)	40,000 (11.7)	54,000 (16.0)	60,000 (17.6)
Fan	Type	Sirocco fan					
	Motor Output	W	230		300		350
	Air Flow Rate (H/M/L)	CFM	742 / 618 / 512	812 / 689 / 565	1130 / 953 / 795	1307 / 1112 / 918	1377 / 1183 / 989
	Drive Type	DC Direct Drive					
External Static Pressure (Std./Max)		0.4 / 0.6					0.4 / 0.56
Height		in.	9-11/16				
Width		in.	39-3/8	55-1/8		61	
Depth		in.	31-1/2				
Weight		lb.	82 (37)	101 (46)	104 (47)	115 (52)	
Condensate Pump Lift		in.	25-5/16 (643 mm)				
Sound Pressure Level (H/M/L speed)		dB(A)	36 / 32 / 29	37.5 / 34 / 30	39 / 35 / 32	42 / 38.5 / 35	43 / 40 / 36
Pipe Connections	Liquid	in.	3/8 (Flare)				
	Gas	in.	5/8 (Flare)				
	Condensate Drain	in.	VP25				
Refrigerant Control		Electronic Expansion Valve					
Maximum Overcurrent Protection Device		A	15				
Minimum Circuit Ampacity		A	1.8	2.5	2.8	3.3	

Note: *1 Nominal cooling capacities are based on the following conditions: 80°F DB / 67°F WB (26.7°C DB / 19.4°C WB) return air temperature; 95°F DB (35°C DB) outdoor temperature; 25 ft. (7.6 m) equivalent refrigerant piping.

*2 Nominal heating capacities are based on the following conditions: 70°F DB (21.1°C DB) return air temperature; 47°F DB / 43°F WB (8.3°C DB / 6.1°C WB) outdoor temperature; 25 ft. (7.6 m) equivalent refrigerant piping.



INDOOR UNITS

FXTQ_TAVJUA(D)

Multi-Position Air Handling Unit



Outside Air Integration Possible



All Aluminum Coil



Variable Speed ECM Motor

Outstanding flexibility and performance

The FXTQ_TAVJUA(D) air handler features full multi-position* flexibility to meet the most demanding installation conditions. A multitude of features ensure reliable, efficient performance year round.

Features and Benefits

- » Expanded capacity lineup, featuring ten models ranging from ¾ ton to 5 tons, with a redesigned** unit frame for maximum durability.
- » Full multi-position air handler capable of upflow, downflow*, horizontal right, and horizontal left installation.
- » A high efficiency, ECM motor powers the fan to deliver nominal CFM at up to 0.9" in. Wg static. An auto fan speed setting automatically adjusts the fan speed through 5 steps based on the load in the space.
- » Wide line up of electric heat (field installed) options from 3kW to 25kW.
- » An auxiliary heat logic features a reduced heater operation deadband and the ability to run both heat pump and auxiliary heat for maximum comfort and performance in colder climates. The auxiliary heat can be interlocked with the ambient temperature sensed by the outdoor unit.
- » Designed with less than 2% air leakage when tested in accordance with ASHRAE standard 193.
- » New integrated control board reduces** the number of electrical connections required. Quick disconnect control wiring terminals simplify installation.
- » Easily integrate with third party accessories such as a humidifier or economizer with on-board contacts.



- » Up to 200% connection ratio is possible on applicable VRV IV systems.
- » Available with optional factory installed disconnect (Built to order — model FXTQ_TAVJUD.)

*Downflow requires field installed optional downflow accessory. (Part number DFK-B/C/D)
 **Compared to previous model FXTQ_P

Designed for Compact Spaces

With its compact and space saving design, the new FXTQ_TAVJUA(D) air handler units are engineered to suit most light commercial and residential applications.

- » At under 46" tall and only 17-1/2" wide up to 3 tons, the FXTQ_TAVJUA(D) can be installed in tight closet spaces.
- » Designed for zero clearance on three sides and only 24" clearance on the front for service.
- » Sound levels as low as 36 dBA to suit applications in sound sensitive environments.

Applications

- » Multi-family
- » Single-family
- » Hotels
- » Offices

Electric Heater Options

ELECTRICAL HEATER CAPACITY									
Model Name	3kW	5kW	6kW	8kW	10kW	15kW	19kW	20kW	25kW
FXTQ09TAVJUA(D)	■	■							
FXTQ12TAVJUA(D)	■	■	■						
FXTQ18TAVJUA(D)	■	■	■	■	■				
FXTQ24TAVJUA(D)	■	■	■	■	■				
FXTQ30TAVJUA(D)	■	■	■	■	■				
FXTQ36TAVJUA(D)	■	■	■	■	■				
FXTQ42TAVJUA(D)		■	■	■	■	■	■		
FXTQ48TAVJUA(D)		■	■	■	■	■	■		
FXTQ54TAVJUA(D)		■	■	■	■	■		■	■
FXTQ60TAVJUA(D)		■	■	■	■	■		■	■

SPECIFICATIONS			0.75 TON	1 TON	1.5 TON	2 TON	2.5 TON	
Model Name			FXTQ09TAVJUA	FXTQ12TAVJUA	FXTQ18TAVJUA	FXTQ24TAVJUA	FXTQ30TAVJUA	
Model Name (With factory disconnect)			FXTQ09TAVJUD	FXTQ12TAVJUD	FXTQ18TAVJUD	FXTQ24TAVJUD	FXTQ30TAVJUD	
Power Supply		V/ph/Hz	208/230VAC, 60Hz, 1 phase					
Nominal Cooling Capacity*1		Btu/h	9,500	12,000	18,000	24,000	30,000	
Nominal Heating Capacity*2		Btu/h	10,500	13,500	20,000	27,000	34,000	
Fan	Type	Sirocco FC Centrifugal						
	Motor Output	HP	1/2					
	Air Flow Rate (H/M/L)	CFM	300 / 275 / 250	400 / 340 / 280	600 / 510 / 420	800 / 680 / 560	1000 / 850 / 700	
	Static Pressure*3	in. Wg	0.18" / 0.9"					0.23" / 0.9"
Drive Type		Variable speed ECM						
Height		in.	45					
Width		in.	17.5					
Depth		in.	21					
Weight (net) (TAVJUA/TAVJUD)		lbs.	105/108	112/115	111/118	112/115	113/116	
Sound Pressure Level (H speed)		dB(A)	36			45		52
Pipe Connections	Liquid	in.	1/4 (Braze)			3/8 (Braze)		
	Gas	in.	1/2 (Braze)			5/8 (Braze)		
	Condensate Drain	in.	3/4 (fpt)					
Refrigerant Control		Electronic Expansion Valve						
Maximum Overcurrent Protective Device		A	15					
Minimum Circuit Amps		A	4.9					

SPECIFICATIONS			3 TON	3.5 TON	4 TON	4.5 TON	5 TON
Model Name			FXTQ36TAVJUA	FXTQ42TAVJUA	FXTQ48TAVJUA	FXTQ54TAVJUA	FXTQ60TAVJUA
Model Name (With factory disconnect)			FXTQ36TAVJUD	FXTQ42TAVJUD	FXTQ48TAVJUD	FXTQ54TAVJUD	FXTQ60TAVJUD
Power Supply		V/ph/Hz	208/230VAC, 60Hz, 1 phase				
Nominal Cooling Capacity*1		Btu/h	36,000	42,000	48,000	54,000	60,000
Nominal Heating Capacity*2		Btu/h	40,000	46,000	54,000	60,000	66,000
Fan	Type	Sirocco FC Centrifugal					
	Motor Output	HP	1/2	3/4			1.0
	Air Flow Rate (H/M/L)	CFM	1050 / 900 / 750	1400 / 1190 / 980	1520 / 1290 / 1060	1800 / 1530 / 1260	1800 / 1530 / 120
	Static Pressure*3	in. Wg	0.23" / 0.9"				
Drive Type		Variable speed ECM					
Height		in.	45	53.43			58
Width		in.	17.5	21			24.5
Depth		in.	21				
Weight (net) (TAVJUA/TAVJUD)		lbs.	113/116	144/147			165/168
Sound Pressure Level (H speed)		dB(A)	52	54			50
Pipe Connections	Liquid	in.	3/8 (Braze)				
	Gas	in.	5/8 (Braze)				
	Condensate Drain	in.	3/4 (fpt)				
Refrigerant Control		Electronic Expansion Valve					
Maximum Overcurrent Protective Device		A	15				
Minimum Circuit Amps		A	4.9	6.5			8.6

*1 Nominal cooling capacities are based on the following conditions: 80°F DB / 67°F WB (26.7°C DB / 19.4°C WB) return air temperature; 95°F DB (35°C DB) outdoor temperature; 25 ft. (7.6 m) equivalent refrigerant piping.

*2 Nominal heating capacities are based on the following conditions: 70°F DB (21.1°C DB) return air temperature; 47°F DB / 43°F WB (8.3°C DB / 6.1°C WB) outdoor temperature; 25 ft. (7.6 m) equivalent refrigerant piping.

*3 External static pressures are indicated as rated / maximum allowable range.

INDOOR UNITS

FXMQ_MVJU

HSP High Capacity Concealed Ducted Unit



Outside Air
Integration Possible

Concealed, Slim Design, Strong, Comfortable

The FXMQ_MVJU ducted fan coil unit is ideal for larger open space floor plans usually found in offices, retails, hotels, or education facilities. It performs well across multiple spaces that can benefit from the same mode of operation, limiting equipment and installation cost.

Features and Benefits

- » Design flexibility with a capacity range up to 96 MBH
- » Improved ductwork and filtration flexibility with ESP capabilities of up to 1.1" W.G.
- » Low profile design of less than 19" high to reduce required installation space



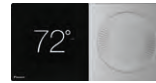
BRC1E73
(option)



AZAI6WSCDKA
(option)



BRC1H71W
(option)



DTST-ONE-ADA-A
(option)



BRC4C82
(option)



Adaptive
Touch Controller
(option)

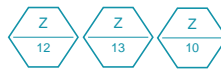


AZAI6WSPDKC
(option)

Applications

- » Hotel/conference centers
- » Schools
- » Retail/shopping centers
- » Large open-plan offices
- » Churches





FXMQ_MVJU SPECIFICATIONS		6 TON		8 TON	
Model Name		FXMQ72MVJU		FXMQ96MVJU	
Power Supply	V/ph/Hz	208-230/1/60			
Rated Cooling Capacity	BTU/h	72,000		96,000	
Rated Heating Capacity	BTU/h	81,000		108,000	
Airflow Rate (H/L)	CFM	2,047/1,764		2,541/2,188	
Weight	lbs.	380			
Height	in.	18-1/8			
Width	in.	54-3/8			
Depth	in.	43-5/16			
Sound Pressure (H/L)	dB(A)	48/45			
Condensate Pipe Connection	in. O.D.	1			
Pipe Connections	Gas	3/4 (Flare)		7/8 (Flare)	
	Liquid	3/8 (Flare)			
Refrigerant		R-410A			
Refrigerant Control		Electronic Expansion Valve			
Maximum Overcurrent Protective Device	A	15			
Minimum Circuit Amps	A	9.5		10.7	
Protection Devices		Fuse and Fan Motor Thermal Protector			
External Finish		Galvanized Steel Plate			
External Static Pressure (Nominal/Maximum)	in. Wg	0.38/0.95		0.43/1.1	

Nominal Conditions:

Cooling Mode
 Indoor: 80°F DB / 67°F WB
 Outdoor: 95°F DB
 Pipe Length: 25 ft.
 Level Difference: 0 ft.

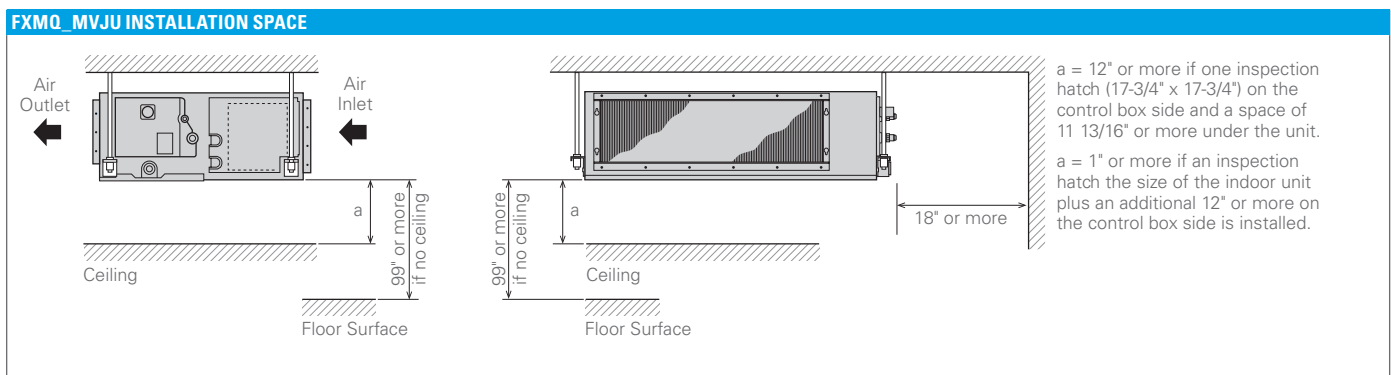
Heating Mode
 Indoor: 70°F DB
 Outdoor: 47°F DB / 43°F WB
 Pipe Length: 25 ft.
 Level Difference: 0 ft.

Note: Specifications are subject to change without notice.

47X13 SUPPLY & RETURN

FXMQ_MVJU ACCESSORIES		FXMQ72MVJU		FXMQ96MVJU	
Model Name		FXMQ72MVJU		FXMQ96MVJU	
Navigation Remote Controller*				BRC1E73	
DKN Cloud Wi-Fi Adaptor				AZAI6WSCDKA	
Madoka Remote Controller				BRC1H71W	
Button Sensor Kit				KRCSH2018-01	
Daikin One+ Smart Thermostat				DTST-ONE-ADA-A	
DKN Plus Interface				AZAI6WSPDKC	
Adaptive Touch Controller		BACRC-T-P01/ BACRC-TH-P01/ BACRC-THO-P01/ BACRC-THOC-P01			
Wireless Remote Controller				BRC4C82	
Remote Sensor Kit				KRCS01-1B	
Wiring Adaptor PCB (interface with aux/primary heater, humidifier, OA damper/fan)				KRP1C74	
Group Control Adaptor PCB (connects to external BMS)				KRP4A71	
High Efficiency Filter Kit (MERV 13)				DACA-MQ96M-13-1K	
High Efficiency Filter Kit (MERV 8)				DACA-MQ96M-8-1K	

* Optional face plates available to provide a more intuitive user interface and disable specific functions



INDOOR UNITS



Optional
Condensate Pump



Filter
Included

Stylish, Compact, Convenient, Comfortable

Daikin's wall-mounted units are ideal for cooling or heating smaller zones such as stores, offices, and restaurants. The compact, stylish design lets the unit blend discreetly into any interior design, and airflow can be supplied in any of five different directions and easily programmed via remote control.

Features and Benefits

- » Auto-swing mechanism ensures efficient air distribution via louvers that automatically close when the unit is turned off
- » Wide air discharge outlet distributes a comfortable airflow throughout the entire space
- » Horizontal louvers and front panel can be easily removed for cleaning
- » Drain pipe can be easily hidden from sight
- » Models range from 7.5 MBH to 24 MBH



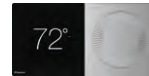
BRC1E73
(option)



AZAI6WSCDKA
(option)



BRC1H71W
(option)



DTST-ONE-ADA-A
(option)



Adaptive
Touch Controller
(option)



BRC7E818
(option)



AZAI6WSPDKC
(option)

Applications

- » Retail
- » Restaurants
- » Offices
- » Hotels
- » Multi-family residences



INDOOR UNITS



FXAQ_PVJU SPECIFICATIONS		0.6 TON	0.75 TON	1 TON	1.5 TON	2 TON
Model Name		FXAQ07PVJU	FXAQ09PVJU	FXAQ12PVJU	FXAQ18PVJU	FXAQ24PVJU
Power Supply	V/ph/Hz			208-230/1/60		
Rated Cooling Capacity	BTU/h	7,500	9,500	12,000	18,000	24,000
Rated Heating Capacity	BTU/h	8,500	10,500	13,500	20,000	27,000
Airflow Rate (H/L)	CFM	260/160	280/175	290/180	500/400	635/470
Weight	lbs.		26			31
Height	in.			11-3/8		
Width	in.		31-1/4			41-3/8
Depth	in.			9		
Sound Pressure (H/L)	dB(A)	36/31	37/31	38/31	43/37	47/41
Condensate Pipe Connection	in. O.D.			11/16		
Pipe Connections	Gas	in.		1/2 (Flare)		5/8 (Flare)
	Liquid	in.		1/4 (Flare)		3/8 (Flare)
Refrigerant				R-410A		
Refrigerant Control				Electronic Expansion Valve		
Maximum Overcurrent Protective Device	A			15		
Minimum Circuit Amps	A		0.4		0.5	0.6
Protection Devices				Fuse and Fan Motor Thermal Protector		
External Finish				White Casing		
Standard Filter Type				Resin Net (washable)		

Nominal Conditions:

Cooling Mode

Indoor: 80°F DB / 67°F WB
 Outdoor: 95°F DB
 Pipe Length: 25 ft.
 Level Difference: 0 ft.

Heating Mode

Indoor: 70°F DB
 Outdoor: 47°F DB / 43°F WB
 Pipe Length: 25 ft.
 Level Difference: 0 ft.

Note: Specifications are subject to change without notice.

FXAQ_PVJU ACCESSORIES					
Model Name	FXAQ07PVJU	FXAQ09PVJU	FXAQ12PVJU	FXAQ18PVJU	FXAQ24PVJU
Navigation Remote Controller*			BRC1E73		
DKN Cloud Wi-Fi Adaptor			AZAI6WSDKA		
Madoka Remote Controller			BRC1H71W		
Button Sensor Kit			KRCSH2018-01		
Daikin One+ Smart Thermostat			DTST-ONE-ADA-A		
DKN Plus Interface			AZAI6WSPDKC		
Adaptive Touch Controller		BACRC-T-P01/ BACRC-TH-P01/ BACRC-THO-P01/ BACRC-THOC-P01			
Wireless Remote Controller			BRC7E818		
Remote Sensor Kit			KRCS01-1B		
Group Control Adaptor PCB (Connects to external BMS)			KRP4A71		
Condensate Pump			DACA-CP1-1		

* Optional face plates available to provide a more intuitive user interface and disable specific functions

FXAQ_PVJU INSTALLATION SPACE

Fig.1

Fig.2

Fig.3

INDOOR UNITS

VAM-GVJU

Energy Recovery Ventilator



Outside Air
Integration Possible

Energy Efficient, Logical, Compact

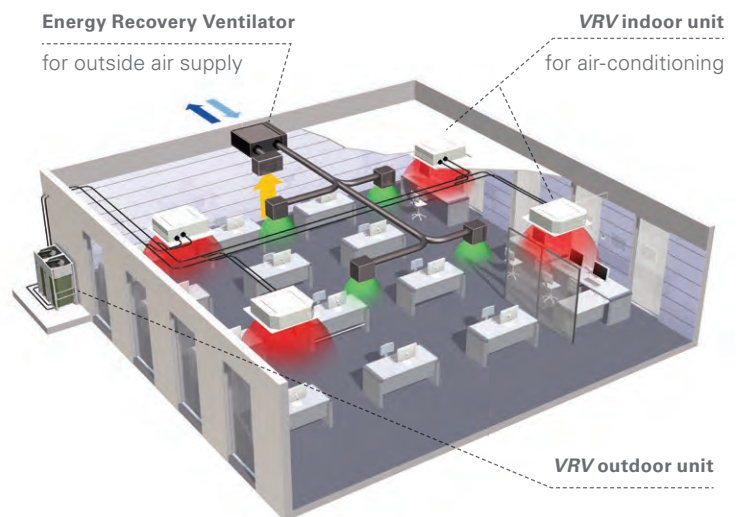
This Energy Recovery Ventilator is designed to maintain good indoor air quality by providing sufficient levels of outside air and recover waste heat from exhaust air leaving the conditioned zone. It is also fully compatible with Daikin's DIII-NET communications.

Features and Benefits

- » Provides energy saving heat recovery ventilation via a heat exchanger with temperature and enthalpy recovery efficiency
- » 0-4% return cross leakage rating
- » Superior performance with a high efficiency fan and the capability for use in a wide range of climates (5 to 122°F DB and 80% RH or less)
- » Unique functions such as independent operation, third party equipment interlocking and automatic night purge to reduce cooling loads and increase energy savings
- » Interlocked simultaneous operation with VRV indoor units
- » Pre-cooling/heating control function to delay the start of ventilation during air conditioner start-up for higher energy savings
- » Supply and exhaust fresh-up operation modes to help control pressure within a space
- » Filter sign and display reset notifies when filter changes are required
- » Temperature recovery efficiency up to 74%
- » Enthalpy recovery efficiency up to 65%
- » ESP as high as 0.76" W.G.
- » Sound levels as low as 25.5 dB(A) for sound sensitive installation locations

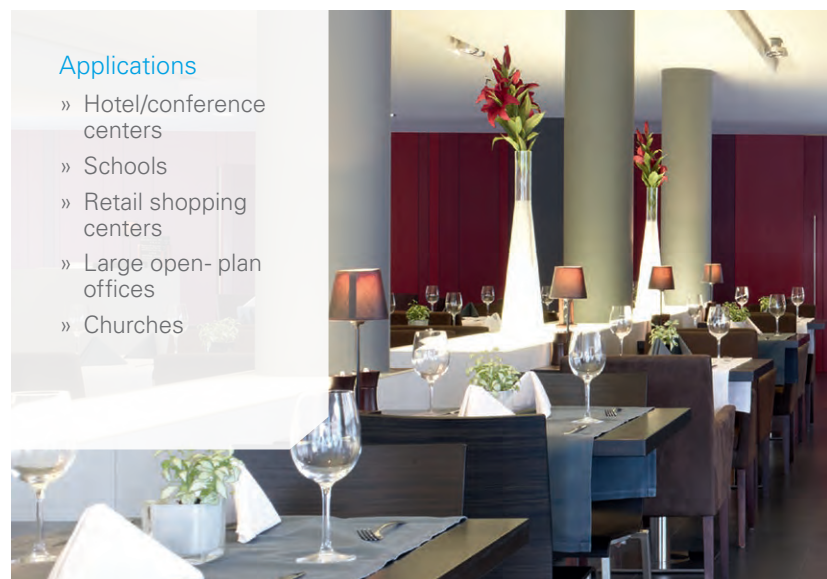


Layout example

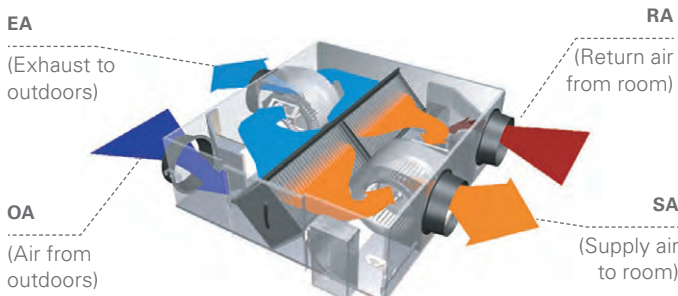


Applications

- » Hotel/conference centers
- » Schools
- » Retail shopping centers
- » Large open-plan offices
- » Churches



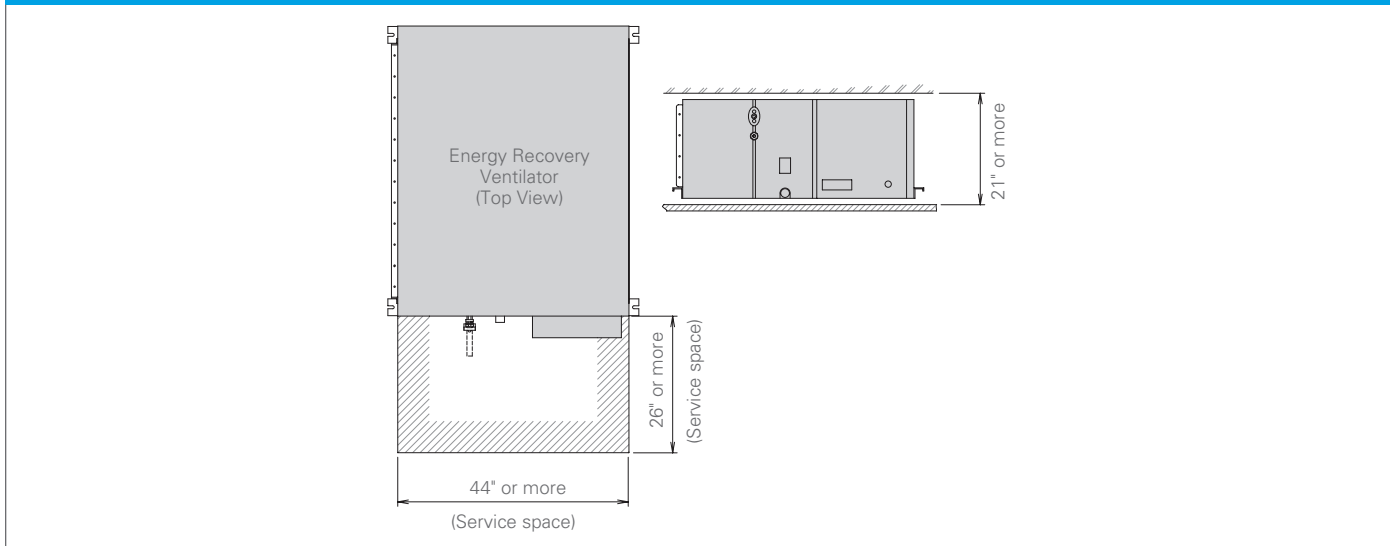
Heat exchanger with high temperature and enthalpy efficiency



VAM SPECIFICATIONS

Model Name		Airflow		VAM300GVJU	VAM470GVJU	VAM600GVJU	VAM1200GVJU
Temperature Recovery Efficiency Percentage	Cooling	100	%	65	68		72
		75	%	70	72		74
	Heating	100	%	65	66		70
		75	%		69		73
Enthalpy Recovery Efficiency Percentage	Cooling	100	%	40	45		49
		75	%	48	50		52
	Heating	100	%	57	59		60
		75	%	63	65		63
Power Supply				208-230/1/60			
Airflow Rate (H/M/L)	Heat Exchange Mode	CFM		300/300/170	470/470/390	600/600/500	1,200/1,200/930
	Bypass Mode			300/300/170	470/470/390	600/600/500	1,200/1,200/930
Weight		lbs.		71	121	148	346
Height		in.		12-1/16	15-1/4	15-1/4	30-7/8
Width		in.		34-5/8	43-11/16		63-3/4
Depth		in.		31-1/2	32-3/4	47-13/16	
Sound Pressure (H/M/L)		dB(A)		37/33.5/25.5	42/38.5/35	42.5/39/36	44.5/41.5/38.5
External Static Pressure (H/M/L)		in. Wg		0.64/0.26/0.16	0.73/0.39/0.33	0.76/0.34/0.32	0.56/0.24/0.16
External Finish	Galvanized Steel Plate						
Insulation Material	Self-Extinguishing Urethane Foam						
Connection Duct Diameter		in.		8	10		14
Ambient Conditions		A	5°F ~ 122°F DB 80% RH or less				

VAM-GVJU INSTALLATION EXAMPLE



VENTILATION

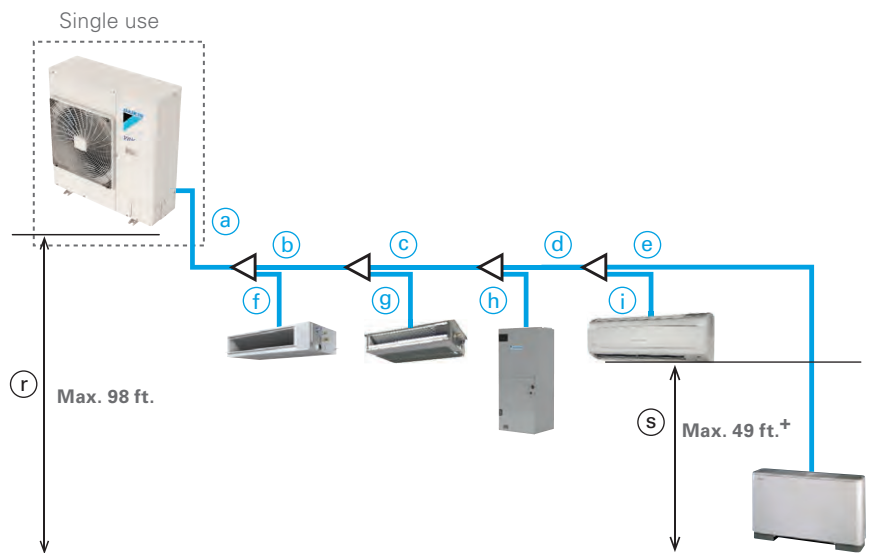
VRV IV X, VRV IV & VRV AURORA, VRV T-Series Water-Cooled & VRV IV-S Piping Length

The long piping length provides more design flexibility, which can match even large-sized buildings.

Air-cooled system piping length

For connection of only VRV indoor units

	VRV IV X, VRV IV & VRV AURORA	VRV IV-S
Max. actual piping length	541 ft.	230 ft. (3-Ton: 164 ft.)
Max. equivalent piping length	623 ft.	295 ft. (3-Ton: 213 ft.)
Max. total piping length	3281 ft. (AURORA: 1640 ft.)	984 ft. (3-Ton: 820 ft.)
Max. level difference between the outdoor units and the indoor units	295 ft. [†]	98 ft.
Max. level difference between the indoor units	100 ft. [*]	49 ft. (3-Ton: 33 ft.)
Max. distance from 1st refrigerant branch joint	295 ft.	130 ft.



Piping for VRV IV X, VRV IV, VRV AURORA, and VRV IV-S

		ACTUAL PIPING LENGTH		EXAMPLE	EQUIVALENT PIPING LENGTH		
		VRV IV X/ VRV IV/ VRV AURORA	VRV IV-S		VRV IV X/ VRV IV/ VRV AURORA	VRV IV-S	VRV IV-S
Maximum allowable piping length	Refrigerant piping length	541 ft.	164 ft. 230 ft.	a+b+c+d+e	623 ft	213 ft	295 ft
	Total piping length	3281 ft. AURORA: 1640 ft.	820 ft. 984 ft.	a+b+c+d+e+f+g+h+i	—	—	—
	Between the first indoor unit branch and the farthest indoor unit	295 ft. [*]	98 ft. 98 ft.	b+c+d+e	—	—	—

		LEVEL DIFFERENCE			EXAMPLE
		VRV IV X/ VRV IV/ VRV AURORA	3-Ton	VRV IV-S	
Maximum allowable level difference	Between the outdoor units (multiple use on the same circuit)	16 ft.	n/a	n/a	—
	Between the indoor units	98 ft.	33	49	s
	Between the outdoor units and the indoor units	If the outdoor unit is above If the outdoor unit is below	295 ft. [†] 295 ft.	98 98	98 98

* No special requirements up to 131 ft. The maximum actual piping length can be 295 ft., depending on conditions. Various conditions and requirements have to be met to allow utilization of 295 ft. piping length. Be sure to refer to the Engineering Data Book for details of these conditions and requirements.

† When level differences are 164 ft. or more, the diameter of the main liquid piping size must be increased and connection ratio must be 80% to 130%. If the outdoor unit is above the indoor unit, a dedicated setting on the outdoor unit is required. Refer to the Engineering Data Book and contact your local dealer for more information.

VRV Accessories

Branch Selector Boxes

New Flex Branch Selector for Ultimate Flexibility

Daikin's new *Flex Branch Selector* boxes are engineered to be compact and provide flexibility in design, installation, maintenance, and service. Packed with Daikin's state of the art technology, the new *Flex Branch Selector* boxes fit in tight mechanical spaces (common in ceilings) combined with flexibility in piping configuration and movable E-box makes the new design an ideal choice for commercial buildings.

Main Features and Benefits

Flexible

- » Design flexibility with versatile piping configurations of Left or Right or Pass through layouts.
- » Engineered for tight ceiling spaces with a compact height of 9½" and 0"¹ service clearance between the slab and the top of the *Flex Branch Selector* box.
- » Flexibility to expand design with up to 121 ports and 230Mbh¹ down stream capacity by connecting multiple boxes in series.
- » Ability to optimize installed system cost by reducing *REFNETs* and braze joints in pass thru configuration vs non-pass through configuration.
- » Simple electrical configurations with flexibility to re-position E-box.²
- » Ability to mix and match Daikin *Flex Branch Selector* boxes and standard branch selector box for ultimate design flexibility.

¹ Refer to engineering manuals for design rules

² Feature available for BSF4Q54TAVJU (4-port) model only

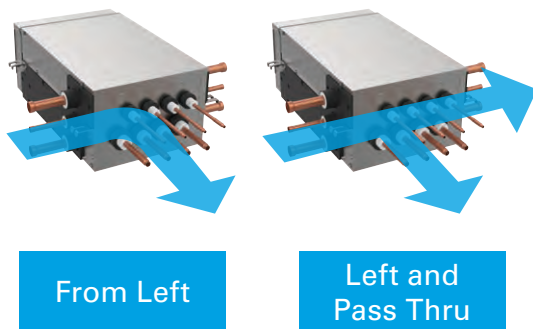


Installation Flexibility

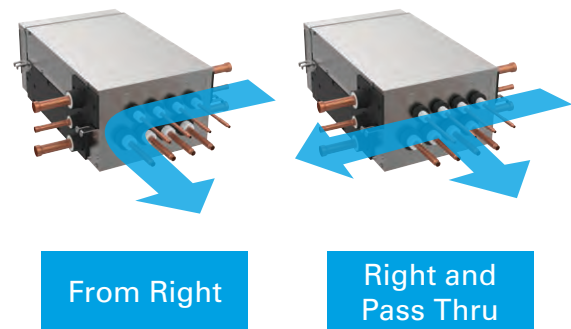
- » Ease of maintenance with access to electronic expansion valve (EEV) heads and motor via side access panel.
- » Eliminate cross piping with refrigerant pipe identification labels.
- » Simple electrical and communication wiring with connection from the front side of E-box.²

Innovative

- » Daikin's high specification EEV enables precise refrigerant control for high comfort in user spaces and reliable system operation.
- » Hermetically sealed to prevent condensate build up within the unit, eliminating the need for a condensate drain pan and plumbing connections for a simple installation.
- » Low ambient cooling down to -4°F¹ for simple and integrated system design.



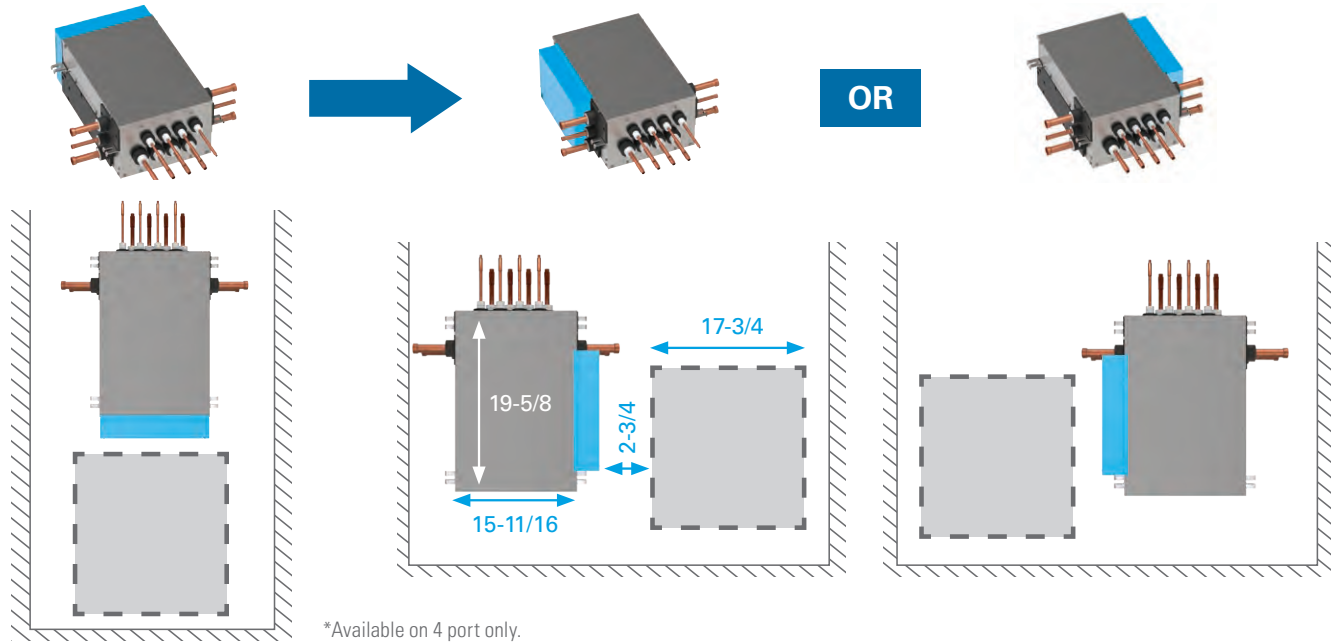
OR



Factory Default Rear E-box

Field Convertible to Left Sided

Field Convertible to Right Sided

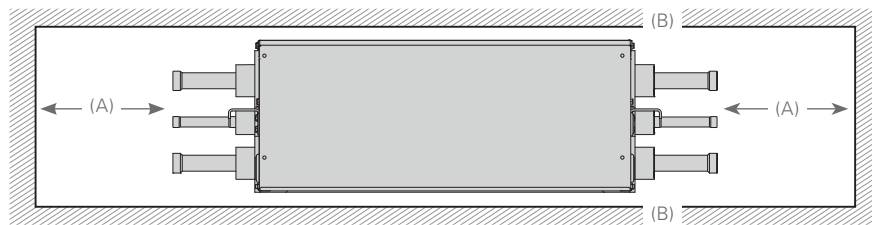


TECHNICAL DATA FOR MULTI-PORT BRANCH SELECTOR BOXES

Model				BSF4Q54TVJ	BSF6Q54TVJ	BSF8Q54TVJ
Number of Branches				4	6	8
Maximum capacity index per branch					54	
Max Total Capacity Index when in Parallel/ when in Series				144	216 / 162	290 / 162
Max Number of Connectable Indoor Units Per Branch					5	
Max total capacity Index under BS Units Connected in Series					230	
Connecting Pipes	Indoor Unit	Liquid	in.	3/8 (1/4) Brazing		
		Gas	in.	5/8 (1/2) Brazing		
	Outdoor unit	Liquid	in.	5/8 Brazing		
		Suction Gas	in.	1-1/8 Brazing		
		HP/LP Gas	in.	1-1/8 Brazing		
Electrical	Power Supply		ph/V/Hz	Single phase / 208-230V / 60Hz		
	Maximum Overcurrent Protection, MOP		A	15		
	Minimum Circuit Amps, MCA		A	0.4	0.6	0.8
Sound Level	Operating sound		dB (A)	37	40.5	40.5
	Max. sound		dB (A)	47	50	50
Weight			lbs.	49	73	81
Dimensions (H x W x D)				in.	9-1/2 x 13-3/4 x 23-3/4	9-1/2 x 23-3/8 x 23-3/4

OUTDOOR UNITS

MULTI-PORT BRANCH SELECTOR BOX INSTALLATION SPACE



MINIMUM CLEARNACE	BSF4Q54TVJ	BSF6Q54TVJ	BSF8Q54TVJ
A	in.	20	
B	in.	3/16	

VRV Accessories

Branch Selector Boxes (cont.)

Branch Selector Boxes for Heat Recovery Systems

Providing flexibility and minimizing mechanical and electrical installation costs, Daikin's branch selector boxes are ideal for spaces that require individual heating and cooling control.

- » New *Flex Branch Selector* models offered in 4, 6, and 8 port.
- » Ability to connect multiple branch selector boxes in series or in parallel when using *Flex Branch Selector* Box
- » Extend phase installation capability of *VRV IV X* by leveraging *Flex Branch Selector* box ability to add on additional boxes in series
- » Wide range of product offerings with 1, 4, 6, 8, 10 and 12 port options
- » No drain or condensate consideration required
- » Unlimited number of unused ports per box or system
- » Reduce electrical and mechanical installation costs
- » Ultimate flexibility – Choose multi-port or single-port styles to customize your design

Branch Selector Boxes Compatibility

Single-Port and Multi-Port Branch Selector Boxes BS-TVJ and BSF-TVJ series are compatible with *VRV IV X*, *VRV IV* and *VRV T-Series* Water-Cooled Heat Recovery Units.



BSQ36TVJ, BSQ60TVJ,
& BSQ96TVJ Single Port



BS4Q54TVJ



BS6Q54TVJ, BS8Q54TVJ



BS10Q54TVJ, BS12Q54TVJ



BSF4Q54TVJ



BSF6Q54TVJ



BSF8Q54TVJ

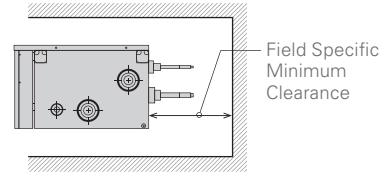
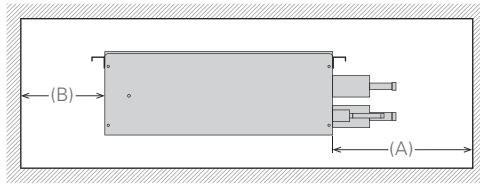
OUTDOOR UNITS

Daikin's branch selector boxes are ideal for spaces that require individual heating and cooling control.

STANDARD MULTI-PORT T-SERIES

TECHNICAL DATA - MULTI-PORT T-SERIES BRANCH SELECTOR BOXES							
Model		BS4Q54TVJ	BS6Q54TVJ	BS8Q54TVJ	BS10Q54TVJ	BS12Q54TVJ	
Number of branches		4	6	8	10	12	
Maximum capacity index per branch		54					
Maximum total capacity index		144	216	290			
Maximum connectable indoor units per branch		5					
Connecting Pipes	IU	Liquid	in.	Ø1/4, Ø3/8			
		Gas	in.	Ø1/2, Ø5/8			
	OU	Liquid	in.	Ø3/8	Ø1/2	Ø5/8	
		Suction Gas	in.	Ø7/8	Ø1-1/8		
	HP/LP Gas	in.	Ø3/4		Ø1-1/8		
Electrical	Power Supply	ph/V/Hz	1/208-230/60				
	Maximum Overcurrent Protection, MOP	A	15				
	Minimum Circuit Amps, MCA	A	0.6	0.8	1	1.2	
Mass (Weight)	lbs.	49	68	73	101	106	
Dimensions (H x W x D)	in.	11-3/4 x 14-9/16 x 18-15/16	11-3/4 x 22-13/16 x 18-15/16		11-3/4 x 32-5/16 x 18-15/16		

STANDARD T-SERIES MULTI PORT BRANCH SELECTOR BOXES INSTALLATION SPACE

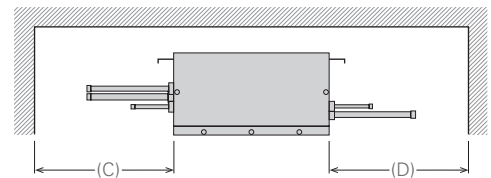
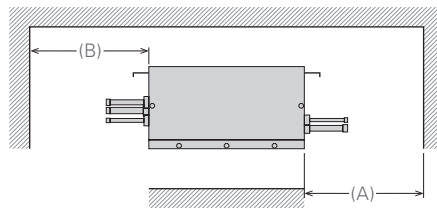
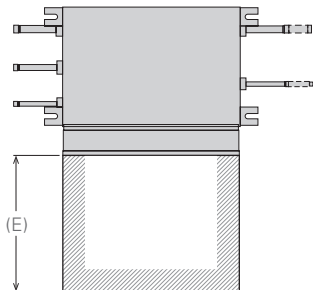


MINIMUM CLEARANCE		BS4Q54TVJ	BS6Q54TVJ	BS8Q54TVJ	BS10Q54TVJ	BS12Q54TVJ
A	in.	20				
B	in.	11-3/4				

SINGLE PORT BRANCH SELECTOR BOXES

TECHNICAL DATA FOR SINGLE-PORT BRANCH SELECTOR BOXES						
Model		BSQ36TVJ	BSQ60TVJ	BSQ96TVJ		
Number of branches		1	1	1		
Maximum capacity index		36	60	96		
Maximum connectable indoor units		4	8	8		
Connecting Pipes	IU	Liquid	in.	Ø3/8		
		Gas	in.	Ø5/8		Ø7/8
	OU	Liquid	in.	Ø3/8		
		Suction Gas	in.	Ø5/8		Ø7/8
	HP/LP Gas	in.	Ø1/2		Ø3/4	
Electrical	Power Supply	ph/V/Hz	1/208-230/60			
	Maximum Overcurrent Protection, MOP	A	15			
	Minimum Circuit Amps, MCA	A	0.1			
Mass (Weight)	lbs.	27	27	33		
Dimensions (H x W x D)	in.	8-1/8 x 15-1/4 x 12-13/16				

SINGLE-PORT BRANCH SELECTOR BOX INSTALLATION SPACE



MINIMUM CLEARANCE		BSQ36TVJ	BSQ60TVJ	BSQ96TVJ
A	in.	10	10	12
B	in.	10	10	12
C	in.	-	13-3/4	15-3/4
D	in.	12	13-3/4	15-3/4
E	in.	12	12	11-13/16

For additional technical information and all equipment installation and application limitations please refer to the specific Engineering Data Books.

VRV Accessories

REFNET

Pipe Joints

REFNET

REFNET joints distribute correct flow of refrigerant in every branch of the piping network.



REFNET Joint



REFNET Header

VRV IV X, VRV IV Heat Pump / VRV AURORA Heat Pump

OPTIONAL ACCESSORIES		RXYQ72T RXYQ96X RXLQ72T RXLQ96T RXYQ72X RXYQ96T	RXYQ120-168T RXYQ120-168X RXLQ120T	RXYQ192-336T RXYQ192-336X RXLQ144-240T	RXYQ360-408T RXYQ360-408X
Distributed piping	REFNET Header	KHRP26M22H (max. 4 branch) KHRP26M33H (max. 8 branch)	KHRP26M22H (max. 4 branch) KHRP26M33H (max. 8 branch) KHRP26M72H (max. 8 branch)	KHRP26M22H (max. 4 branch) KHRP26M33H (max. 8 branch) KHRP26M72H (max. 8 branch) KHRP26M73H (max. 8 branch)	
	REFNET Joint	KHRP26A22T, KHRP26A33T	KHRP26A22T, KHRP26A33T, KHRP26M72TU	KHRP26A22T, KHRP26A33T, KHRP26M72TU, KHRP26M73TU	
Outdoor unit multi connection piping kit			—	BHFP22P100U	BHFP22P151U

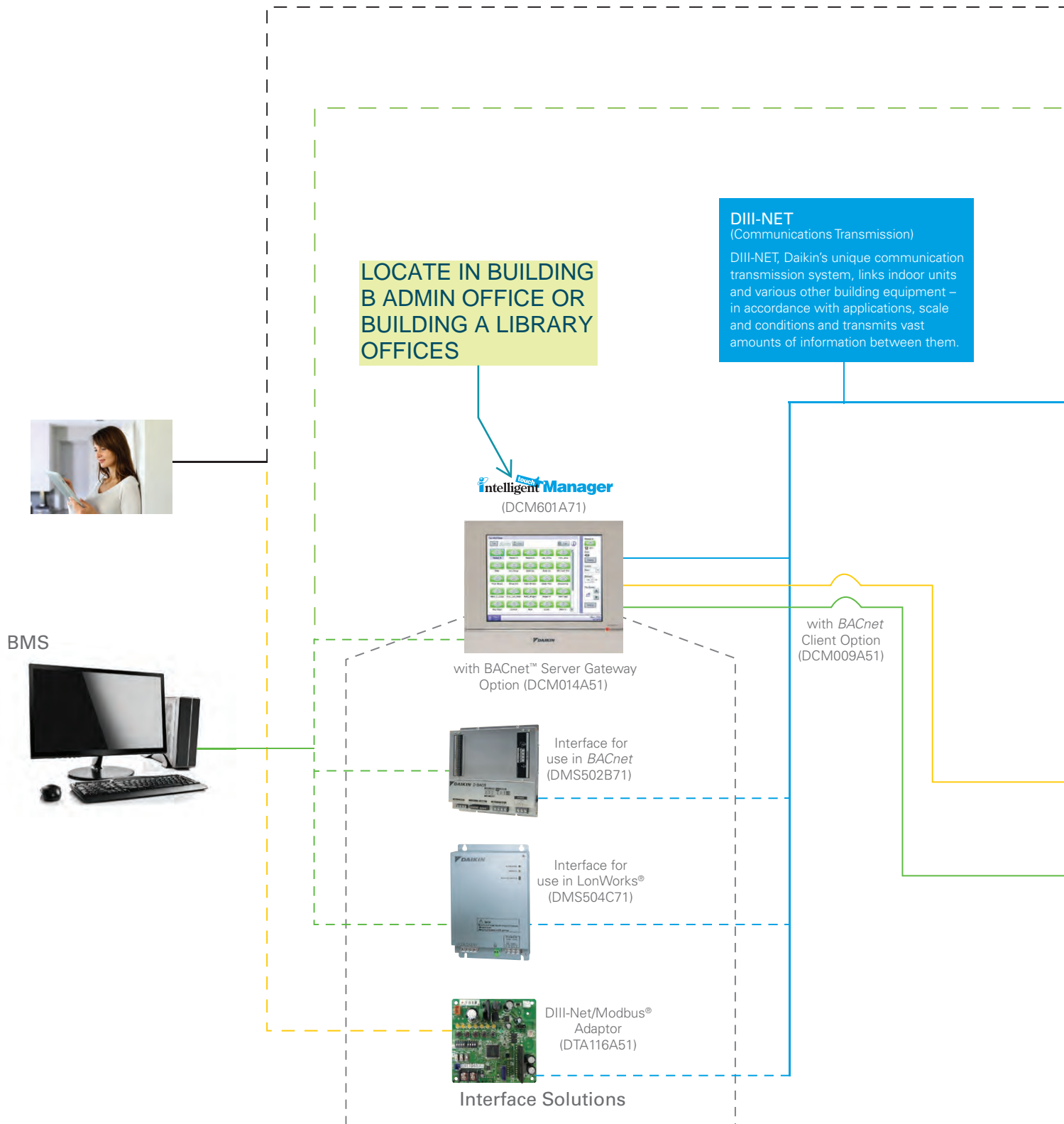
VRV IV X Heat Recovery / VRV IV Heat Recovery / VRV AURORA Heat Recovery

OPTIONAL ACCESSORIES		REYQ72T REYQ96T RELQ72T RELQ96T REYQ72X REYQ96X	REYQ120-168T REYQ120-168X RELQ120T	REYQ192-336T REYQ192-336X RELQ144-240T	REYQ360-456T REYQ360-456T
Distributed piping	REFNET header	KHRP25M33H9 (max. 8 branch)	KHRP25M33H9 (max. 8 branch) KHRP25M72H9 (max. 8 branch)	KHRP25M33H9 (max. 8 branch) KHRP25M72H9 (max. 8 branch) KHRP25M73H9 (max. 8 branch)	
	REFNET joint	KHRP25A22T9 KHRP25A33T9	KHRP25A22T9 KHRP25A33T9 KHRP25M72TU9	KHRP25A22T9 KHRP25A33T9 KHRP25M72TU9 KHRP25M73TU9	
Outdoor unit multi connection piping kit			—	BHFP26P100U	BHFP26P151U

VRV T-Series Water-Cooled Heat Pump / Heat Recovery and VRV-IV-S

UNIT MODEL NUMBER	VRV T-SERIES WATER-COOLED					VRV-IV-S
	RWEQ96TATJA RWEQ96TAYDA	RWEQ120TATJA RWEQ120TAYDA	RWEQ144TATJA RWEQ144TAYDA	RWEQ192,216,240, 264,288TATJA RWEQ192,216,240, 264,288TAYDA	RWEQ312,336,360TATJA RWEQ312,336,360TAYDA	RXTQ36TAVJ9A RXTQ48TAVJUA RXTQ60TAVJUA
REFNET Header	Heat Pump	KHRP26M22HR (Max 4 branch) KHRP26M33H9 (Max 8 branch)	KHRP26M22H9 (Max 4 branch), KHRP26M33H9 (Max 8 branch) KHRP26M72H9 (Max 8 branch)		KHRP26M22H9 (Max. 4 branch) KHRP26M33H9 (Max. 8 branch)	
	Heat Recovery	KHRP26M33H9 (Max 8 branch)	KHRP25M33H9 (Max 8 branch) KHRP25M72H9 (Max 8 branch)		KHRP25M33H9 (Max 8 branch), KHRP25M72H9 (Max 8 branch) KHRP25M73HU9 (Max 8 branch)	
REFNET Joint	Heat Pump	KHRP26A22T9, KHRP26A33T9	KHRP26A22T9, KHRP26A33T9, KHRP26M72TU9		KHRP26A22T9, KHRP26A33T9, KHRP26A72UT9, KHRP26M73TU9	
	Heat Recovery	KHRP25A22T9, KHRP25A33T9	KHRP25A22T9, KHRP25A33T9, KHRP25M72TU9		KHRP25A22T9, KHRP25A33T9, KHRP25A72TU9, KHRP25M73TU9	
Outdoor Unit Multi Piping Connection Kit	Heat Pump	---	---		BHFP22T84U	BHFP22T126U
	Heat Recovery	---	---		BHFP26T84U	BHFP26T126U

VRV Control Systems Overview

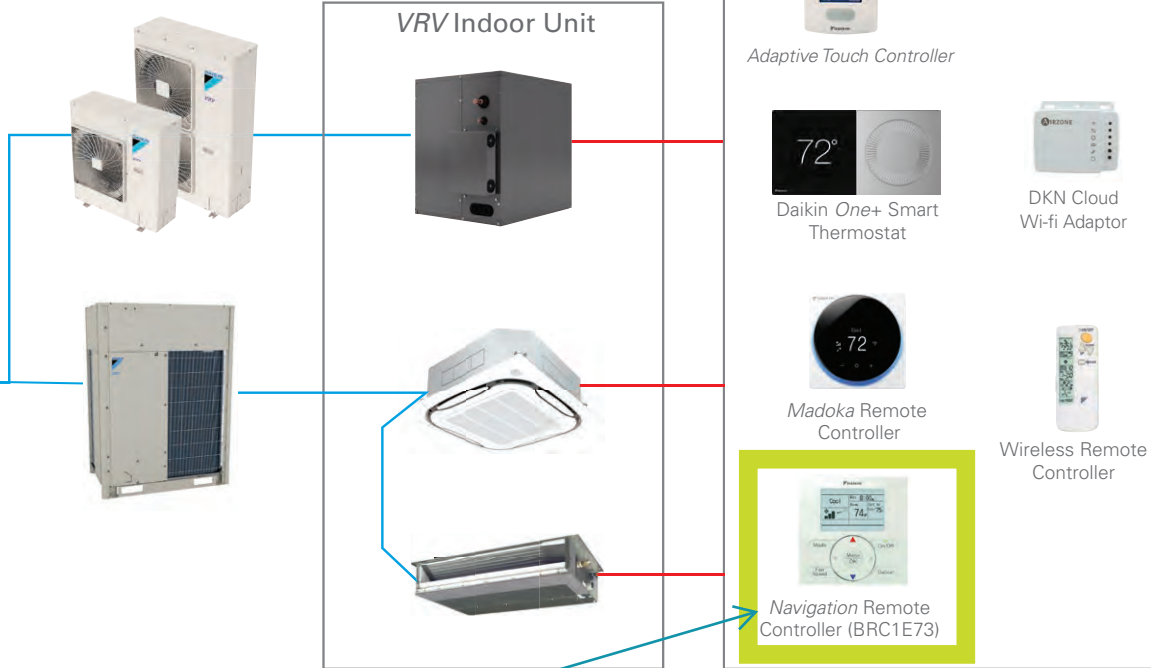


Limitations may apply to some models and functions. Please contact your local sales office for details.

Note: BACnet is a registered trademark of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). LonWorks is a trademark of Echelon Corporation registered in the United States and other countries. Modbus is a registered trademark of Modicon.

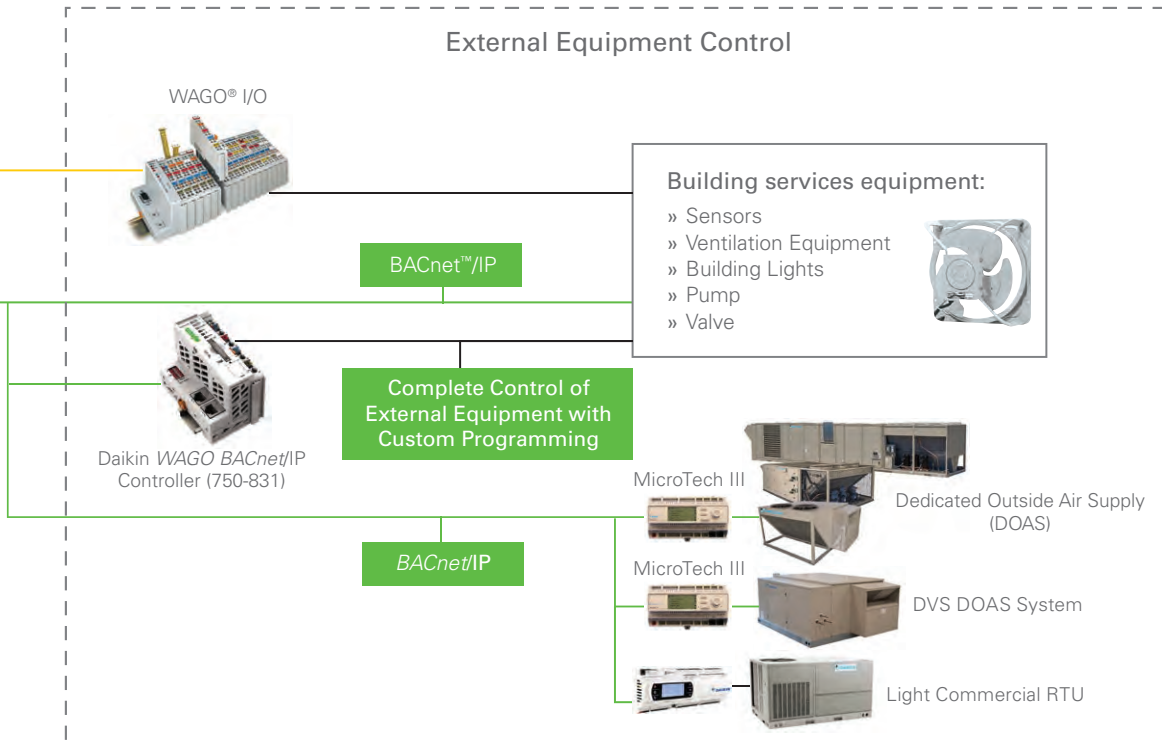
through BACnet™ MS/TP, Modbus®, or cloud integration

Zone Controllers and Integration



STANDARD THERMOSTAT

External Equipment Control





ELF6375DX / ELF6375DXH

Drainable Stationary Louvers
Extruded Aluminum Louver



APPLICATION

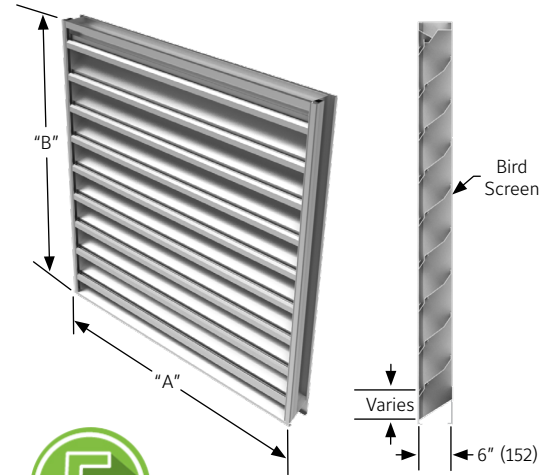
The ELF6375DX/ELF6375DXH are 6" deep, extruded aluminum, architecturally styled, stationary louvers designed to protect air intake and exhaust openings on exterior walls. These louvers are designed with drainable gutter systems that channel water from the blades to downspouts in the jambs. Here, water is exhausted out of the front of the louvers.

STANDARD CONSTRUCTION

Frame	6" (152) deep, 6063T6 extruded aluminum. ELF6375DX - .081" (2.1) nominal wall thickness. ELF6375DXH - .125" (3.2) nominal wall thickness. Downspouts and caulking surfaces provided.
Blades	6063T6 extruded aluminum. ELF6375DX - .081" (2.1) nominal wall thickness. ELF6375DXH - .125" (3.2) nominal wall thickness. Drainable blades are positioned at 37 1/2° angle and spaced approximately 5 29/32" (150) center to center.
Screen	3/4" x .051" (19 x 1.3) expanded, flattened aluminum bird screen in removable frame. Screen adds approximately 1/2" (13) to louver depth.
Finish	Mill.
Minimum Size	12"w x 12"h (305 x 305).
Approximate Shipping Weight	ELF6375DX - 4 lbs./ft. ² (19.5 kg/m ²). ELF6375DXH - 6 lbs./ft. ² (29.3 kg/m ²).
Maximum Factory Assembly Size	Shall be 75 sq. ft. (7m ²) per section, not to exceed 120"w x 90"h (3048 x 2286) or 90"w x 120"h (2286 x 3048). Louvers larger than the maximum factory assembly size will require field assembly of smaller sections.
Supports	Louvers may be provided with rear mounted blade supports that increase overall louver depth depending on louver size, assembly configuration or windload.

FEATURES

- ▶ 57% Free Area
- ▶ Published performance ratings based on testing in accordance with AMCA Publication 511
- ▶ Beginning point of water penetration at .01 oz./sq.ft. is 1023 fpm (312 m/min)
- ▶ Drain gutter in each blade minimizes water cascade between blades
- ▶ Architecturally styled, hidden mullions allowing continuous line appearance up to 120" (3048)
- ▶ Aluminum construction for low maintenance and high resistance to corrosion
- ▶ All welded construction



YEAR LIMITED WARRANTY

ISO9001 CERTIFIED

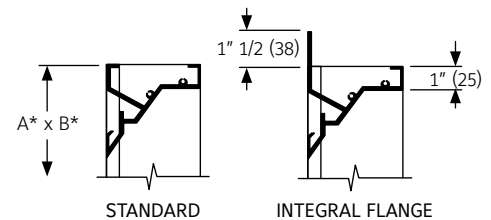
VARIATIONS

Variations to the basic design of these louvers are available at additional cost. They include:

- ▶ Extended sill
- ▶ Hinged frame
- ▶ Front or rear security bars
- ▶ Filter racks
- ▶ Blank off panels
- ▶ Frame caps
- ▶ Integral flange frames
- ▶ A variety of bird and insect screens
- ▶ Optional finishes available at additional cost: Prime coat, 50% PVDF (modified fluoropolymer), Epoxy, Pearledize, 70% PVDF, Clear and Anodized finishes. (Some variation in anodize color consistency is possible)

Consult Ruskin for other special requirements.

FRAME CONSTRUCTION



Note:

- Dimensions in inches, parenthesis () indicate millimeters.
- Units can be furnished actual size or with size deducts.

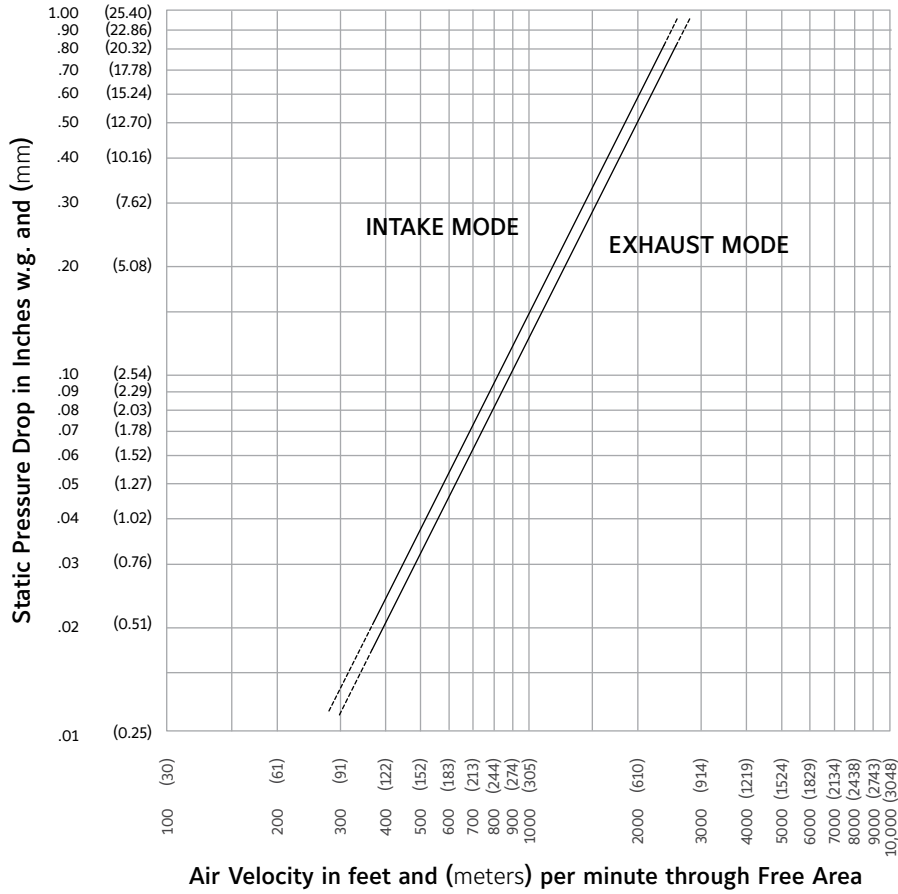
FREE AREA GUIDE

Free Area Guide shows free area in ft² and m² for various sizes of ELF6375DX and ELF6375DXH.

Width – Inches and Meters

HEIGHT	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
12 0.30	0.36 0.03	0.57 0.05	0.79 0.07	1.00 0.09	1.22 0.11	1.43 0.13	1.65 0.15	1.86 0.17	2.08 0.19	2.29 0.21	2.51 0.23	2.72 0.25	2.94 0.27	3.15 0.29	3.37 0.31	3.58 0.33	3.80 0.35	4.01 0.37	4.23 0.39
18 0.45	0.63 0.06	1.00 0.09	1.38 0.13	1.76 0.16	2.13 0.20	2.51 0.23	2.89 0.27	3.26 0.30	3.64 0.34	4.02 0.37	4.39 0.41	4.77 0.44	5.15 0.48	5.52 0.51	5.90 0.55	6.28 0.58	6.65 0.62	7.03 0.65	7.41 0.69
24 0.60	0.90 0.08	1.44 0.13	1.97 0.18	2.51 0.23	3.05 0.28	3.59 0.33	4.13 0.38	4.66 0.43	5.20 0.48	5.74 0.53	6.28 0.58	6.82 0.63	7.36 0.68	7.89 0.73	8.43 0.78	8.97 0.83	9.51 0.88	10.05 0.93	10.58 0.98
30 0.75	1.17 0.11	1.87 0.17	2.57 0.24	3.27 0.30	3.97 0.37	4.67 0.43	5.37 0.50	6.07 0.56	6.76 0.63	7.46 0.69	8.16 0.76	8.86 0.82	9.56 0.89	10.26 0.95	10.96 1.02	11.66 1.08	12.36 1.15	13.06 1.21	13.76 1.28
36 0.90	1.44 0.13	2.30 0.21	3.16 0.29	4.02 0.37	4.88 0.45	5.74 0.53	6.60 0.61	7.47 0.69	8.33 0.77	9.19 0.85	10.05 0.93	10.91 1.01	11.77 1.09	12.63 1.18	13.50 1.26	14.36 1.34	15.22 1.42	16.08 1.50	16.94 1.58
42 1.05	1.71 0.16	2.73 0.25	3.75 0.35	4.77 0.44	5.80 0.54	6.82 0.63	7.84 0.73	8.87 0.82	9.89 0.92	10.91 1.01	11.94 1.11	12.96 1.21	13.98 1.30	15.01 1.40	16.03 1.49	17.05 1.59	18.07 1.68	19.10 1.78	20.12 1.87
48 1.20	1.97 0.18	3.16 0.29	4.34 0.40	5.53 0.51	6.71 0.62	7.90 0.73	9.08 0.84	10.27 0.95	11.45 1.07	12.64 1.18	13.82 1.29	15.01 1.40	16.19 1.51	17.38 1.62	18.56 1.73	19.75 1.84	20.93 1.95	22.11 2.06	23.30 2.17
54 1.35	2.24 0.21	3.59 0.33	4.94 0.46	6.28 0.58	7.63 0.71	8.98 0.83	10.32 0.96	11.67 1.09	13.01 1.21	14.36 1.34	15.71 1.46	17.05 1.59	18.40 1.71	19.75 1.84	21.09 1.96	22.44 2.09	23.79 2.21	25.13 2.34	26.48 2.46
60 1.50	2.51 0.23	4.02 0.37	5.53 0.51	7.04 0.65	8.55 0.79	10.05 0.93	11.56 1.08	13.07 1.22	14.58 1.36	16.09 1.50	17.59 1.64	19.10 1.78	20.61 1.92	22.12 2.06	23.63 2.20	25.13 2.34	26.64 2.48	28.15 2.62	29.66 2.76
66 1.65	2.78 0.26	4.45 0.41	6.12 0.57	7.79 0.72	9.46 0.88	11.13 1.04	12.80 1.19	14.47 1.35	16.14 1.50	17.81 1.66	19.48 1.81	21.15 1.97	22.82 1.12	24.49 2.28	26.16 2.43	27.83 2.59	29.50 2.74	31.17 2.90	32.84 3.05
72 1.80	3.05 0.28	4.88 0.45	6.71 0.62	8.55 0.79	10.38 0.97	12.21 1.14	14.04 1.31	15.87 1.48	17.70 1.65	19.53 1.82	21.36 1.99	23.20 2.16	25.03 2.33	26.86 2.50	28.69 2.67	30.52 2.84	32.35 3.01	34.18 3.18	36.02 3.35
78 1.95	3.32 0.31	5.31 0.49	7.31 0.68	9.30 0.86	11.29 1.05	13.29 1.24	15.28 1.42	17.27 1.61	19.26 1.79	21.26 1.98	23.25 2.16	25.24 2.35	27.24 2.53	29.23 2.72	31.22 2.90	33.22 3.09	35.21 3.27	37.20 3.46	39.19 3.65
84 2.10	3.59 0.33	5.75 0.53	7.90 0.73	10.05 0.94	12.21 1.14	14.36 1.34	16.52 1.54	18.67 1.74	20.83 1.94	22.98 2.14	25.14 2.34	27.29 2.54	29.45 2.74	31.60 2.94	33.75 3.14	35.91 3.34	38.06 3.54	40.22 3.74	42.37 3.94
90 2.25	3.86 0.36	6.18 0.57	8.49 0.79	10.81 1.01	13.13 1.22	15.44 1.44	17.76 1.65	20.07 1.87	22.39 2.08	24.71 2.30	27.02 2.51	29.34 2.73	31.65 2.94	33.97 3.16	36.29 3.37	38.60 3.59	40.92 3.81	43.24 4.02	45.55 4.24
96 2.40	4.13 0.38	6.61 0.61	9.09 0.84	11.56 1.08	14.04 1.31	16.52 1.54	19.00 1.77	21.47 2.00	23.95 2.23	26.43 2.46	28.91 2.69	31.39 2.92	33.86 3.15	36.34 3.38	38.82 3.61	41.30 3.84	43.78 4.07	46.25 4.30	48.73 4.53
102 2.55	4.40 0.41	7.04 0.65	9.68 0.90	12.32 1.15	14.96 1.39	17.60 1.64	20.24 1.88	22.88 2.13	25.51 2.37	28.15 2.62	30.79 2.86	33.43 3.11	36.01 3.35	38.71 3.60	41.35 3.85	43.99 4.09	46.63 4.34	49.27 4.58	51.91 4.83
108 2.70	4.67 0.43	7.47 0.69	10.27 0.96	13.07 1.22	15.87 1.48	18.67 1.74	21.48 2.00	24.28 2.26	27.08 2.52	29.88 2.78	32.68 3.04	35.48 3.30	38.28 3.56	41.05 3.82	43.88 4.08	46.69 4.34	49.49 4.60	52.29 4.86	55.09 5.12
114 2.85	4.94 0.46	7.90 0.73	10.86 1.01	13.83 1.29	16.79 1.56	19.75 1.84	22.71 2.11	25.68 2.39	28.64 2.66	31.60 2.94	34.57 3.21	37.53 3.49	40.49 3.77	43.45 4.04	46.42 4.32	49.38 4.59	52.34 4.87	55.30 5.14	58.27 5.42
120 3.00	5.21 0.48	8.33 0.77	11.46 1.07	14.58 1.36	17.70 1.65	20.83 1.94	23.95 2.23	27.08 2.52	30.20 2.81	33.33 3.10	36.45 3.39	39.58 3.68	42.70 3.97	45.82 4.26	48.95 4.55	52.07 4.84	55.20 5.13	58.32 5.42	61.45 5.71

PRESSURE DROP



Ratings do not include the effect of a bird screen.

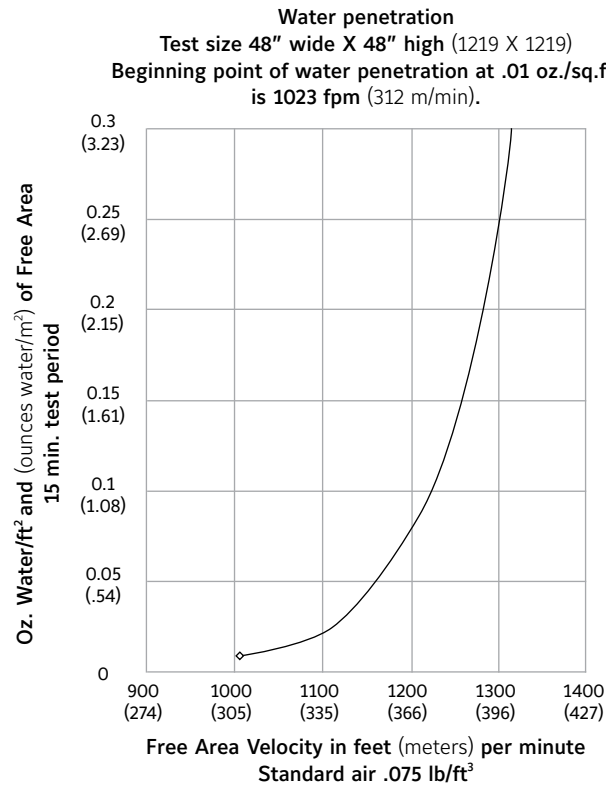


Ruskin Manufacturing Company certifies that the ELF6375DX and ELF6375DXH Louvers shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance ratings and water penetration ratings only.

PERFORMANCE DATA

AMCA Standard 500 provides a reasonable basis for testing and rating louvers. Testing to AMCA 500 is performed under a certain set of laboratory conditions. This does not guarantee that other conditions will not occur in the actual environment where louvers must operate.

The louver system should be designed with a reasonable safety factor for louver performance. To ensure protection from water carryover, design with a performance level somewhat below maximum desired pressure drop and .01 oz./sq. ft. of water penetration.



SUGGESTED SPECIFICATION

Furnish and install louvers as hereinafter specified where shown on plans or as described in schedules. Louvers shall be stationary drainable type with drain gutters in each blade and downspouts in jambs and mullions. Louvers shall have a minimum of 57% free area based on a 48" wide x 48" high (1219 x 1219) size. Stationary drainable blades shall be contained within a 6" (152) frame. Louver components (heads, jambs, sills, blades, & mullions) shall be factory assembled by the louver manufacturer. Louver sizes too large for shipping shall be built up by the contractor from factory assembled louver sections to provide overall sizes required. Louver design shall limit span between visible mullions to 10 feet (3) and shall incorporate structural supports required to withstand a windload of 30 lbs. per sq. ft. (1.44KPa) (equivalent of a 110 mph wind [177 KPH] wind-specifier may substitute any loading required).

Louvers shall be Ruskin model ELF6375DX or ELF6375DXH extruded 6063T6 aluminum construction as follows:

Frame: 6" (152) deep, ELF3675DX - .081" (2.1) wall thickness. ELF6375DXH - .125" (3.2) wall thickness.

Blades: ELF6375DX - .081" (2.1) nominal wall thickness. ELF6375DXH - .125" (3.2) nominal wall thickness. Drainable blades are positioned at 37 1/2° angle and spaced approximately 5 29/32" (150) center to center.

Screen: 3/4" x .051" (19 x 1.3) expanded, flattened aluminum in removable frame.

Finish: Select finish specification from Ruskin Finishes Brochure.

Published louver performance data bearing the AMCA Certified Ratings Seal for Air Performance & Water Penetration must be submitted for approval prior to fabrication and must demonstrate pressure drop and water penetration equal to or less than the Ruskin model specified.

i LINKS TO IMPORTANT DOCUMENTS

Document Title
Paint Finishes and Color Guide
Limited Warranty Document



3900 Doctor Greaves Road
 Grandview, MO 64030
 Website: www.ruskin.com
 Phone: (816) 761-7476

Model: CSP-A510-VG

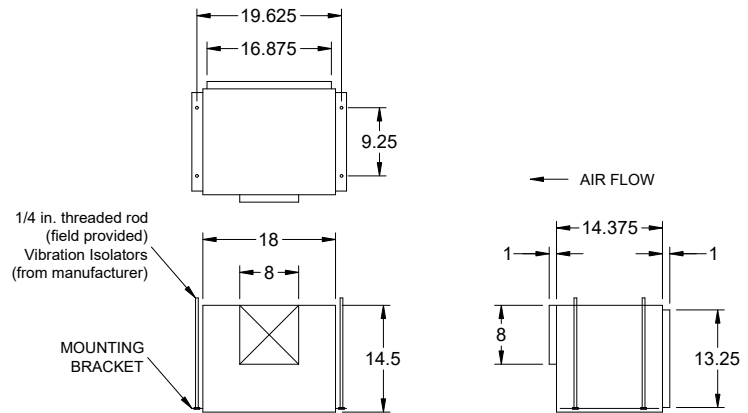
Inline Cabinet Fan

Standard Construction Features:

- Galvanized steel housing - Sound absorbing insulation - Outlet duct collar with integral back draft damper - Forward curved wheel - Plug type disconnect - Adjustable mounting brackets - Square duct connection - Field rotatable discharge

Selected Options & Accessories:

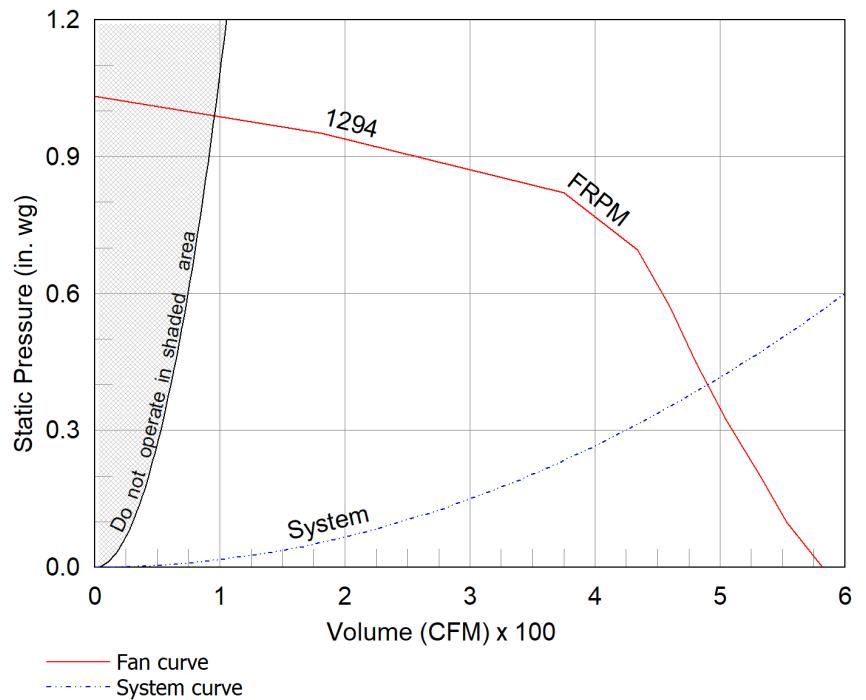
Motor rated for continuous use
Motor - Vari-Green EC motor w/Mounted Potentiometer Dial
UL/cUL 507 Listed - Electric Fan
Roof Cap with Curb Cap, (PN: GRS-10-QD) Shipped Loose
Isolation Kit, (PN: VI KIT-SP/CSP), Shipped Loose
Adjustable easy installation mounting bracket
Polypropylene Wheel Material



Dimensional	
Quantity	1
Weight w/o Acc's (lb)	36
Weight w/ Acc's (lb)	48
Weight w/ Acc's and Curb (lb)	???

Performance	
Requested Volume (CFM)	490
Actual Volume (CFM)	490
Total External SP (in. wg)	0.4
Fan RPM	1294
* FLA (A)	2.45
Elevation (ft)	89
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Sones	1.3

Motor	
Motor Mounted	Yes
** Input Watts (W)	137
Voltage/Cycle/Phase	115/60/1
Enclosure	TENV
Control Input Voltage	8.6



Notes:

All dimensions shown are in units of in.
*FLA is approximate and will vary slightly with the motor.
Sones - calculated using AMCA 301 at 5 ft
** Wattage is approximate and may vary between motors.



Model: SP-80-VG

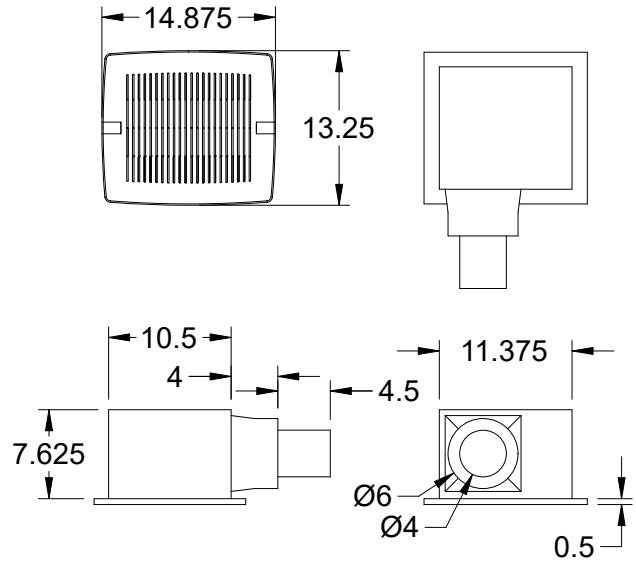
Ceiling Exhaust Fan

Standard Construction Features:

Galvanized steel housing - Outlet duct collar with integral back draft damper - Forward curved wheel - Plug type disconnect - Adjustable mounting brackets - EC Motor

Selected Options & Accessories:

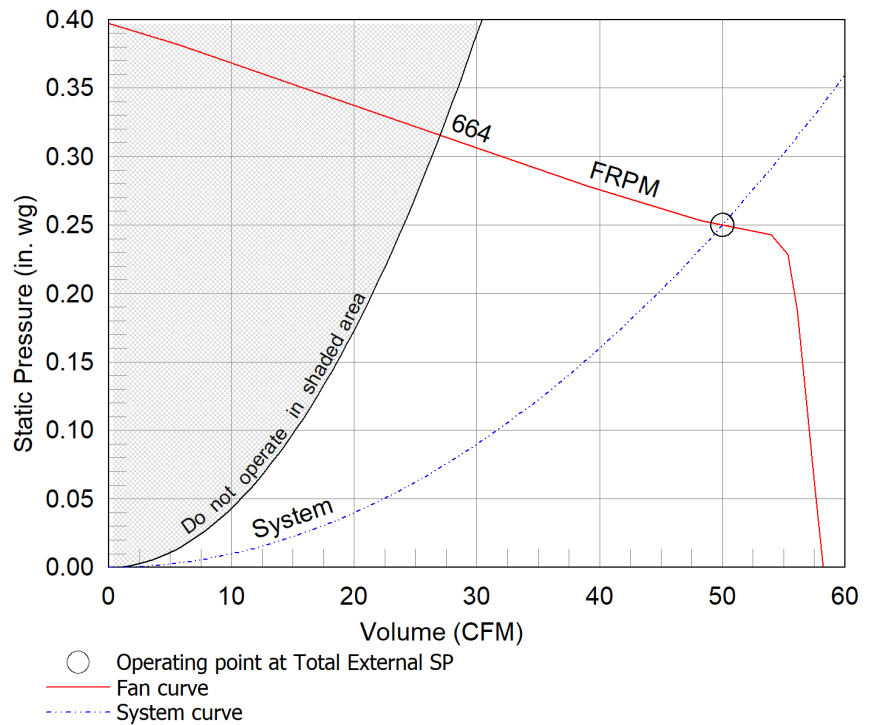
Motor - High Efficiency EC
Motor rated for continuous use
Dial on Fan, 2 Speed with Time Delay
High Efficient Motor - meets Greenheck High Efficiency Table
UL/cUL 507 Listed - Electric Fan
Round Duct Connection
Transition Duct Reducer
Adjustable easy installation mounting bracket
Energy Star Most Efficient
Polypropylene Wheel Material
Can Be Used to Comply with: ASHRAE 62.2, California Title 24, and Washington State Energy Code



Dimensional	
Quantity	1
Weight w/o Acc's (lb)	12
Weight w/ Acc's (lb)	12

Performance	
Requested Volume (CFM)	50
Actual Volume (CFM)	50
Total External SP (in. wg)	0.25
Fan RPM	664
* FLA (A)	0.1
Elevation (ft)	89
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Sones	0.6

Motor	
Motor Mounted	Yes
** Input Watts (W)	6
Voltage/Cycle/Phase	115/60/1
Enclosure	TEAO



Notes:

All dimensions shown are in units of in.
*FLA is approximate and will vary slightly with the motor.
Sones - calculated using AMCA 301 at 5 ft
** Wattage is approximate and may vary between motors.



Model: CUE-070-VG
Direct Drive Upblast Centrifugal Roof Exhaust Fan

- DRAWING ERROR -

An error has occurred in the generation of this drawing file. Please send an e-mail to notify us of the issue...

To: BIM@greenheck.com
 Subject: Drawing Error

Please include your CAPS Job file so we can easily narrow down the issue. Include the Mark Name where the error exists.

We will respond accordingly with a solution soon as possible.

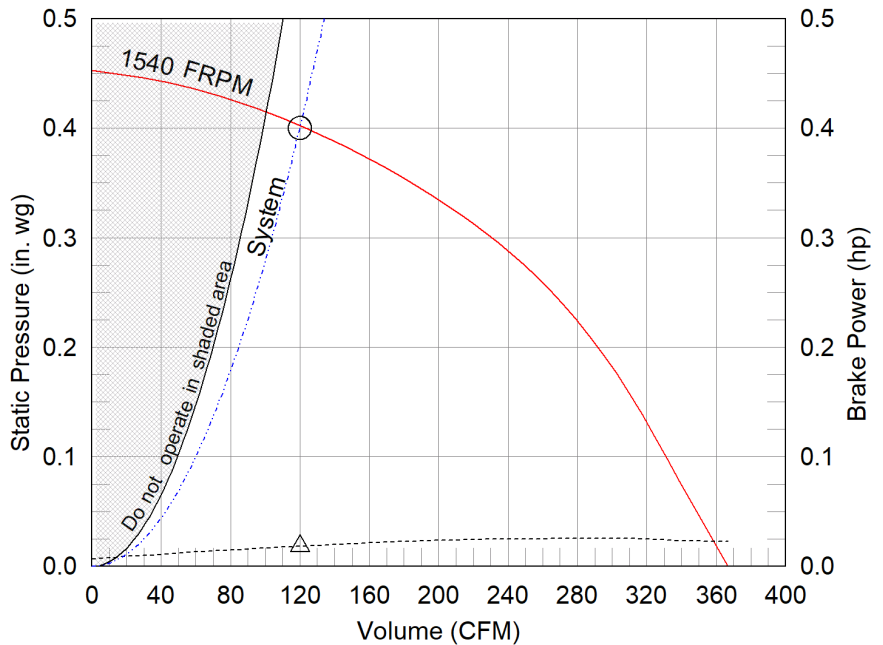
CAPS Version: {QV|FileVersionNumber}
 Reason for error: Unspecified error

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	22
Weight w/ Acc's (lb)	24
Weight w/ Acc's and Curb (lb)	???
Standard Curb Cap Size (in.)	17 x 17
Roof Opening (in.)	10.5 x 10.5

Performance	
Requested Volume (CFM)	120
Actual Volume (CFM)	120
Total External SP (in. wg)	0.4
Fan RPM	1540
Operating Power (hp)	0.02
Elevation (ft)	89
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Tip Speed (ft/min)	3,276
Static Eff. (%)	41

Misc Fan Data	
Fan Eff. Index (FEI)	-
Outlet Velocity (ft/min)	308

Motor	
Motor Mounted	Yes
Size (hp)	1/15
Voltage/Cycle/Phase	115/60/1
Enclosure	TENV
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	1.3
Min. Circuit Ampacity (MCA)	2
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA



- △ Operating Bhp point
- Operating point at Total External SP
- Fan curve
- - - System curve
- - - Brake horsepower curve

Notes:

All dimensions shown are in units of in.
 *NEC FLA, MCA and MOP are for reference only – based on tables 430.248 or 430.25 of National Electric Code 2020. Actual motor FLA may vary, for sizing thermal overload, consult factory. MCA and MOP values shown only account for the motor, not accessories (damper actuator, field supplied VFD, etc).
 LwA - A weighted sound power level, based on ANSI S1.4
 dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International
 Sones - calculated using ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	66	68	61	46	39	37	34	32	56	45	3.7



Model: CUE-070-VG

Direct Drive Upblast Centrifugal Roof Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward curved composite (sizes 60-95) or aluminum (sizes 99-300) wheel - Aluminum curb cap with prepunched mounting holes - Drain trough - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - Motor isolated on shock mounts - Corrosion resistant fasteners

Selected Options & Accessories:

Motor - Vari-Green EC motor with Dial ONLY (Not capable for field conversion to 0-10)

Control - Dial for balancing

Standard Curb Cap Size - 17 Square

UL/cUL 705 Listed - "Power Ventilators"

Switch, NEMA-1, Toggle, Shipped with Unit

Junction Box Mounted & Wired

Foam Curb Seal (Factory Applied)

Composite Wheel Material

Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details

The Vari-Green Motor included in this order has a 'Multi-Voltage' ability. This motor has the ability to accept 115V or 208-230V Single Phase power. The motor has an auto switch and does not require the user to change anything for the listed voltages.

Model: CUE-140-A

Direct Drive Upblast Centrifugal Roof Exhaust Fan

Previously: CUE-141-A

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	79
Weight w/ Acc's (lb)	99
Weight w/ Acc's and Curb (lb)	128
Max T Motor Frame Size	145
Standard Curb Cap Size (in.)	26 x 26
Roof Opening (in.)	18.5 x 18.5

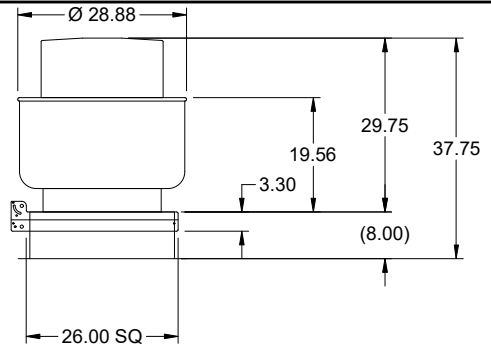
Performance	
Requested Volume (CFM)	2,000
Actual Volume (CFM)	2,029
Total External SP (in. wg)	1.543
Fan RPM	1725
Operating Power (hp)	0.97
Elevation (ft)	89
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Tip Speed (ft/min)	6,605
Static Eff. (%)	51

Misc Fan Data	
Fan Eff. Index (FEI)	1.33
Outlet Velocity (ft/min)	1,180
FEI based on default motor calculation showing lowest efficiency option, for motor specific calculations please contact factory.	

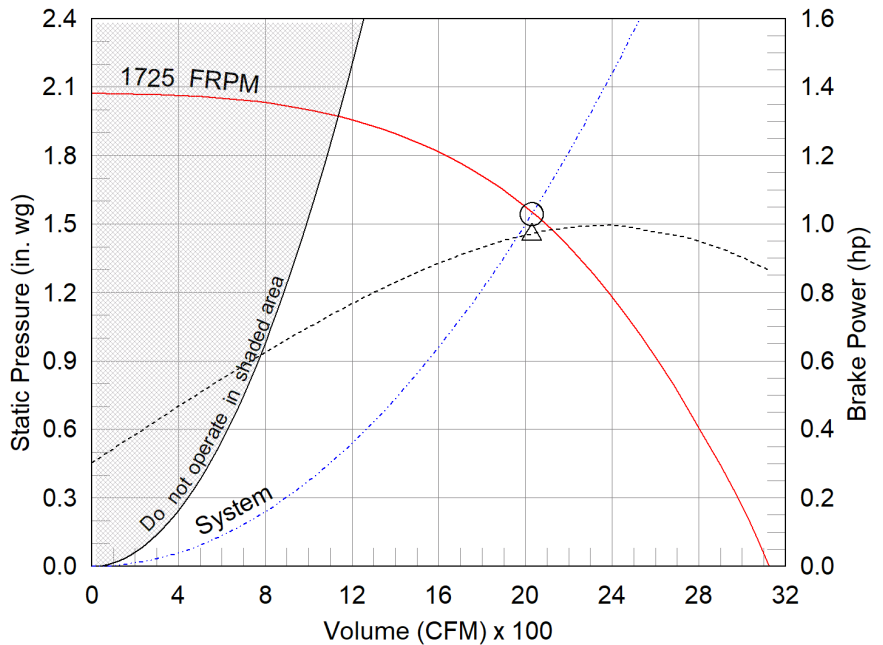
Motor	
Motor Mounted	Yes
Size (hp)	1
Voltage/Cycle/Phase	460/60/3
Enclosure	ODP
Motor RPM	1725
Efficiency Rating	Standard
Windings	1
NEC FLA* (Amps)	2.1
Min. Circuit Ampacity (MCA)	2.63
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	74	53	83	81	64	51	58	60	80	69	13.8



OVERALL HEIGHT MAY BE GREATER DEPENDING ON MOTOR, ADAPTER, AND/OR HINGE BASE.



- △ Operating Bhp point
- Operating point at Total External SP
- Fan curve
- - - System curve
- - - Brake horsepower curve

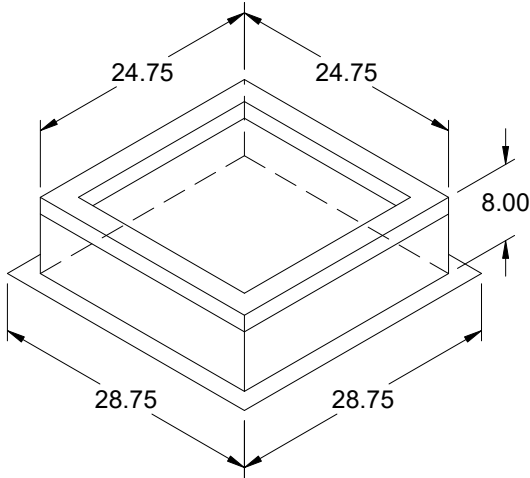
Static Pressure Calculations

External SP	1.5 in. wg
Direct Drive RPM Adjustment	0.043 in. wg
Total External SP	1.543 in. wg

Notes:

All dimensions shown are in units of in.
*NEC FLA, MCA and MOP are for reference only – based on tables 430.248 or 430.25 of National Electric Code 2020. Actual motor FLA may vary, for sizing thermal overload, consult factory. MCA and MOP values shown only account for the motor, not accessories (damper actuator, field supplied VFD, etc).
LwA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International
Sones - calculated using ANSI/AMCA 301 at 5 ft
The motor provided on this fan is inverter ready and meets NEMA MG1 Part 31.4.4.2





Model: GPF

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. or 5 in. mounting flange - 1 in. thick 3 lb density insulation - Height - Available from 8 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

***This curb can be mounted on the roof or wall (with a sidewall mounted CUE or CUBE fan).

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPF-26	Nominal	1.25	29	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
8	26	26	24.75	24.75	21.25	21.25	28.75	28.75	25	25

*May not be applicable

Accessories

Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

Model: CUE-070-VG
Direct Drive Upblast Centrifugal Roof Exhaust Fan

- DRAWING ERROR -

An error has occurred in the generation of this drawing file. Please send an e-mail to notify us of the issue...

To: BIM@greenheck.com
Subject: Drawing Error

Please include your CAPS Job file so we can easily narrow down the issue. Include the Mark Name where the error exists.

We will respond accordingly with a solution soon as possible.

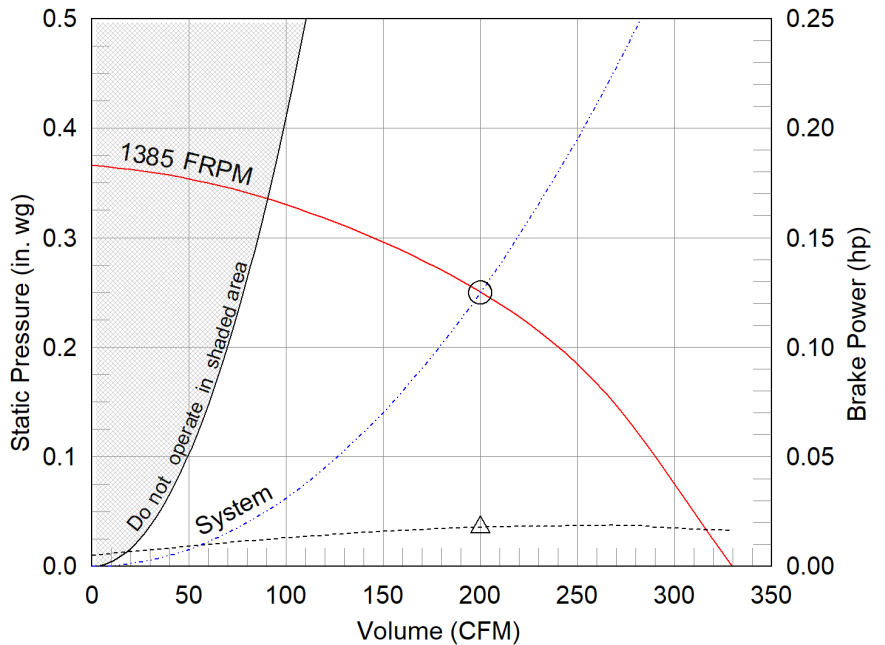
CAPS Version: {QV|FileVersionNumber}
Reason for error: Unspecified error

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	22
Weight w/ Acc's (lb)	24
Weight w/ Acc's and Curb (lb)	???
Standard Curb Cap Size (in.)	17 x 17
Roof Opening (in.)	10.5 x 10.5

Performance	
Requested Volume (CFM)	200
Actual Volume (CFM)	200
Total External SP (in. wg)	0.25
Fan RPM	1385
Operating Power (hp)	0.02
Elevation (ft)	89
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Tip Speed (ft/min)	2,947
Static Eff. (%)	44

Misc Fan Data	
Fan Eff. Index (FEI)	-
Outlet Velocity (ft/min)	513

Motor	
Motor Mounted	Yes
Size (hp)	1/15
Voltage/Cycle/Phase	115/60/1
Enclosure	TENV
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	1.3
Min. Circuit Ampacity (MCA)	2
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA



- △ Operating Bhp point
- Operating point at Total External SP
- Fan curve
- - - System curve
- - - Brake horsepower curve

Notes:

All dimensions shown are in units of in.
*NEC FLA, MCA and MOP are for reference only – based on tables 430.248 or 430.25 of National Electric Code 2020. Actual motor FLA may vary, for sizing thermal overload, consult factory. MCA and MOP values shown only account for the motor, not accessories (damper actuator, field supplied VFD, etc).
LwA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International
Sones - calculated using ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	65	64	60	46	40	39	34	30	54	43	3.2



Model: CSP-B200

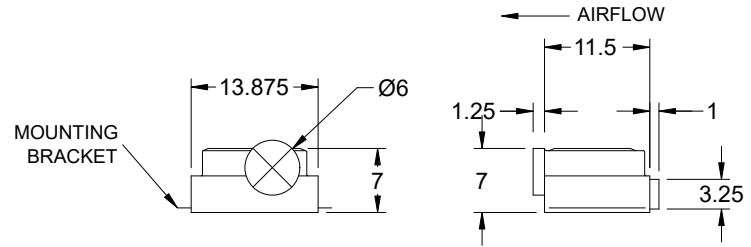
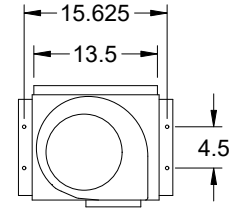
Inline Cabinet Fan

Standard Construction Features:

- Corrosion resistant galvanized steel scroll and housing - Round outlet duct collar with integral back draft damper - Single inlet forward curved wheel - Plug type disconnect - Adjustable mounting brackets

Selected Options & Accessories:

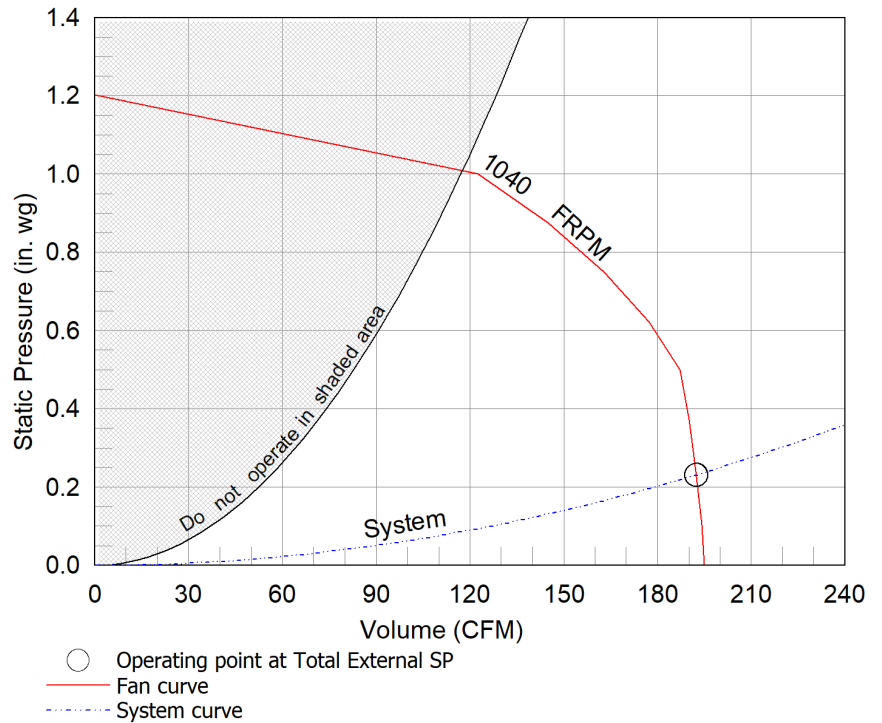
Motor rated for continuous use
 Motor with Thermal Overload
 Motor with CSA Approval
 Motor with 40 Degree C Ambient Temperature
 UL/cUL 507 Listed - Electric Fan
 Solid State Speed Control, 6 Amp, Shipped Loose
 Round Duct Connection
 Adjustable easy installation mounting bracket
 Polypropylene Wheel Material
 Can Be Used to Comply with: ASHRAE 62.2 and Washington State Energy Code



Dimensional	
Quantity	1
Weight w/o Acc's (lb)	11
Weight w/ Acc's (lb)	12

Performance	
Requested Volume (CFM)	200
Actual Volume (CFM)	192
Total External SP (in. wg)	0.231
Fan RPM	1040
* FLA (A)	2.7
Elevation (ft)	89
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Sones	0.7

Motor	
Motor Mounted	Yes
** Input Watts (W)	179
Voltage/Cycle/Phase	115/60/1
Enclosure	ODP



Notes:

All dimensions shown are in units of in.
 *FLA is approximate and will vary slightly with the motor.
 Sones - calculated using AMCA 301 at 5 ft
 ** Wattage is approximate and may vary between motors.





HAIKU[®]

Your space deserves a higher class of comfort with Haiku. Renowned for its award-winning innovation, Haiku outpaces the field with iconic design, unmatched efficiency, and unrivaled functionality. Its silent, powerful performance and range of smart home integrations will transform the way you live and work in your space.



KEY FEATURES

- ▶ **Hand-balanced** Moso bamboo, aircraft-grade aluminum, or matrix composite airfoils
- ▶ **Permanent-magnet motor** for whisper-quiet, energy-efficient airflow
- ▶ **Built-in SenseMe™ technology** for automated convenience and efficiency
- ▶ **Seven speed settings** with Sleep, Whoosh, Timer, and Fan Eco modes
- ▶ **Voice integration** with Amazon Alexa and Google Assistant devices
- ▶ **Indoor and outdoor** models available to fit any space

DIAMETER

52, 60, AND 84 INCHES
(132, 152, AND 213 CM)

MOUNTING

- UNIVERSAL
- LOW PROFILE

CONTROL

- PREMIUM REMOTE
- MOBILE APP
- VOICE INTEGRATION

WARRANTY

UP TO
5 YEARS
INDOOR

UP TO
3 YEARS
OUTDOOR



BIG ASS FANS™

EXCEPTIONALLY
ENGINEERED

DISCOVER MORE ABOUT HAIKU

Learn more at bigassfans.com/haiku
or call **877.BIG.FANS** for a free custom quote.

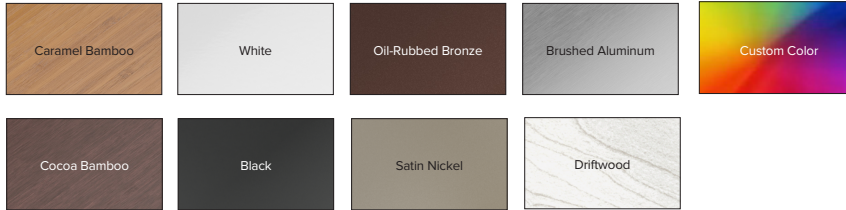


HAIKU INDOOR

THE CEILING FAN, REINVENTED



Airfoil Finishes



Hardware Finishes



Construction Features

Airfoils	Motor ¹	Controls ²	Onboard Sensors ³	Mounting	Environment	Accessories
Bamboo or aircraft-grade aluminum	High-efficiency, brushless DC/EC motor Fan Eco	Handheld remote Haiku mobile app Voice control 0–10 V (optional)	Temperature, humidity, and motion sensors enable SenseME Technology	Flat or sloped ceilings 8 ft (2.4 m) or taller	Indoor use only	Haiku Light Kit 0–10 V Module Optional extension tube lengths and a Stabilizer Kit are available for ceilings over 14 ft (4.3 m)

Ordering Information

Diameter	Mount	Airfoil, Motor Finish	Country	Motor	Gen	Airfoil Finish (Aluminum Only)
52 inch: S3127 60 inch: S3150 84 inch: B3213	52	Aluminum, Black: AB Aluminum, ORB: AO Aluminum, SN: AS Aluminum, White: AW	North America: 04-02 Europe: 05-02 Japan: 06-02 Saudi Arabia, UAE: 08-02	52 inch: C 60 inch: C 84 inch: D	01	Black: F258 White: F259 Brushed Aluminum: F531 Satin Nickel: F470 Oil-Rubbed Bronze: F471 Driftwood: F772
	60	Low Profile: S0 Universal: X2				
	84	Low Profile: S0 Universal: X2				
		Universal: X4				
		Bamboo Caramel, Black: BC Bamboo Caramel, ORB: BCO Bamboo Caramel, SN: BCS Bamboo Caramel, White: BCW Bamboo Cocoa, Black: BW Bamboo Cocoa, ORB: BWO Bamboo Cocoa, SN: BWS Bamboo Cocoa, White: BWW				

Haiku Light Kit



Remote



Handheld remote



Remote with mount

¹ Activate Fan Eco to fully leverage the energy savings from your ceiling fan. Use the Haiku mobile app to enable Fan Eco.
² Voice control requires an Amazon Alexa-enabled device or the Google Assistant.
³ SenseME Technology and the Haiku mobile app are supported by Android™ and iOS®.

Lead times may vary.
 Warranty period and terms vary by country and application.



USA
 BIGASSFANS.COM
 877-244-3267

CANADA
 BIGASSFANS.COM
 844-924-4277

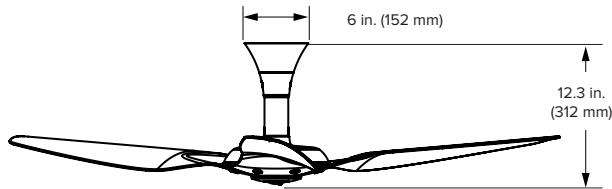
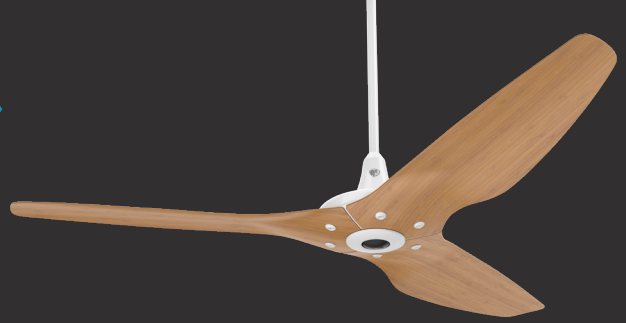
AUSTRALIA
 BIGASSFANS.COM/AU
 1300 244 277

SINGAPORE
 BIGASSFANS.COM/SG
 65 6709 8500



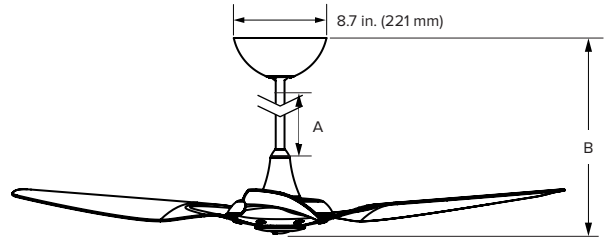
HAIKU INDOOR

THE CEILING FAN, REINVENTED



Low Profile Mount

Flat ceilings as low as 8 ft (2.4 m)



Universal Mount

Sloped or flat ceilings from 10.5 to ≥14 ft (3.2 to ≥4.3 m)

Universal Mount Downrod Lengths

Downrod (A) ¹	Included		Optional		
		20 in. (508 mm)	32 in. (813 mm)	7 in. (178 mm)	48 in. (1219 mm)
Fan Height (B) ²	29 in. (737 mm)	41 in. (1041 mm)	16 in. (406 mm)	57 in. (1448 mm)	69 in. (1753 mm)
Ceiling Height	10.5–11 ft (3.2–3.4 m)	11–13 ft (3.4–4 m)	9–11 ft (2.7–2.9 m)	13–14 ft (4–4.3 m)	>14 ft (>4.3 m)

Aluminum Fan Specifications

Diameter	Mount	Weight ³	Max Speed	Airflow Min/Max	Watts Min/Max	Operating Voltage	Ambient Operational Temperature	Sound Level ⁴
52 in. (132 cm)	Low Profile	16.5 lb (7.5 kg)	177 RPM	1,301 / 5,629 cfm	2.2 / 15.6 W	100–240 VAC, 1 ϕ, 50–60 Hz	32° to 104° F (0° to 40° C)	<35 dba at max speed
	Universal	15.5 lb (7 kg)	200 RPM	1,389 / 6,713 cfm	2.1 / 20.7 W			
60 in (152 cm)	Low Profile	18.5 lb (8.4 kg)	177 RPM	1,070 / 6,698 cfm	1.9 / 18.4 W			
	Universal	17.5 lb (8 kg)	200 RPM	1,194 / 8,629 cfm	1.9 / 26.8 W			
84 in. (213 cm)	Universal	26 lb (11.8 kg)	135 RPM	5,983 / 19,292 cfm	4.2 / 53.7 W			

Bamboo Fan Specifications

Diameter	Mount	Weight ³	Max Speed	Airflow Min/Max	Watts Min/Max	Operating Voltage	Ambient Operational Temperature	Sound Level ⁴
52 in. (132 cm)	Low Profile	14 lb (6.4 kg)	177 RPM	1,483 / 5,866 cfm	2.2 / 19.2 W	100–240 VAC, 1 ϕ, 50–60 Hz	32° to 104° F (0° to 40° C)	<35 dba at max speed
	Universal	13 lb (5.9 kg)	200 RPM	1,427 / 6,597 cfm	2.3 / 26.6 W			
60 in (152 cm)	Low Profile	16 lb (7.3 kg)	177 RPM	876 / 6,165 cfm	1.9 / 15.5 W			
	Universal	15 lb (6.8 kg)	200 RPM	1,038 / 7,673 cfm	1.8 / 21.4 W			
84 in. (213 cm)	Universal	21 lb (9.5 kg)	135 RPM	4,661 / 15,378 cfm	3.8 / 39.2 W			



¹ Optional downrod lengths packaged separately. The 7 in. (178 mm) downrod is not available for 84-inch (2134 mm) fans. 60 in. (1524 mm) is the longest downrod available.
² Fan heights do not include the Haiku Light kit. Add 0.8 in. (20 mm) for 84-inch (2134 mm) diameter fans.
³ The precise fan weight will vary based on individual component weights and finishing.
⁴ Actual results of sound measurements in the field may vary due to sound reflective surfaces and environmental conditions.

Lead times may vary.
 Warranty period and terms vary by country and application.



USA
 BIGASSFANS.COM
 877-244-3267

CANADA
 BIGASSFANS.COM
 844-924-4277

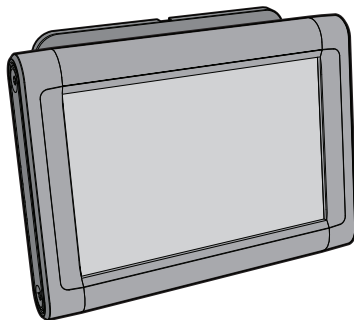
AUSTRALIA
 BIGASSFANS.COM/AU
 1300 244 277

SINGAPORE
 BIGASSFANS.COM/SG
 65 6709 8500



INSTALLATION GUIDE

BAFCon



Manuel d'Installation
Guía de instalación

PRE-INSTALLATION CHECKLIST



Before installing the controller, install the fan according to the fan installation guide.



The controller will be mounted to a flat, readily accessible surface that is free from vibration and away from foreign objects and moving equipment.



A rectangular or square outlet box is installed at the controller mounting location.



If SmartSense will be used, the controller will be mounted so that it is **NOT**:

- Adjacent to or above a radiant heat source
 - Near HVAC ventilation intakes/exhausts
 - On a poorly insulated exterior wall
 - In a different temperature/humidity environment than the fan it will control
- The controller has built-in temperature and humidity sensors that will not provide accurate information for automatic fan control if the controller is mounted in these areas.



If multiple fans will be daisy chained, the multi-fan accessory kit is included.

The accessory kit is included only if ordered. Contact Customer Service to purchase the kit.



Installation Guide
01/28/2022
Rev. J



All trademarks used herein are the properties of their respective owners. No part of this document may be reproduced or translated into a different language without the prior written consent of Big Ass Fans. The information contained in this document is subject to change without notice. For the most up-to-date information, see the online installation guide at www.bigassfans.com

READ AND SAVE THESE INSTRUCTIONS



WARNING: Disconnect power to the installation locations before installing the fan and controller!

WARNING: When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

WARNING: Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction. Incorrect assembly can cause electric shock or damage the fan and the controller.

CAUTION: The Big Ass Fans product warranty will not cover equipment damage or failure that is caused by improper installation or use.

WARNING: The liquid crystal in the controller's LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

CAUTION: The LCD and touch panel are made of plate glass. Do not subject the touch panel to mechanical shock or to excessive force on its surface. Do not handle the controller by holding the touch panel area.

CAUTION: The following information is merely a guide for proper installation. Big Ass Fans cannot assume responsibility for the compliance or non-compliance to any code, national, local, or otherwise for the proper installation of these fan controllers, fans, or associated equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesirable operation.

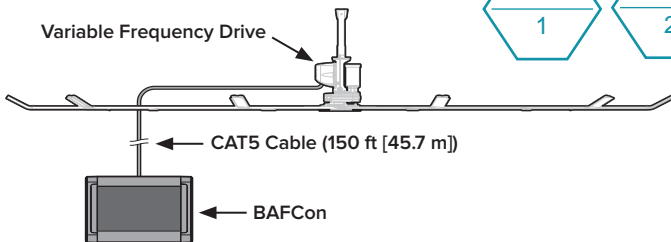
Improper installation, delivery, or maintenance, including, but not limited to, any of the following actions by the customer or agent of the customer will constitute a breach of and will void all warranties:

- Failure to follow the required installation procedures specified in this Installation Guide and in all other documentation supplied with the fans and related equipment including documentation provided by the manufacturers of the individual fan and control components;
- Failure to follow all relevant codes and ordinances, including, but not limited to, the National Electrical Code (United States), applicable national and local electrical codes, and state and local building codes;
- Failure to follow electrical engineering industry standards regarding the approved method of installing solid-state electrical equipment having the characteristics of the fans, the fan controls, and their related components, even if such standards are not specifically referenced in any instructions or literature supplied by Big Ass Fans or provided by manufacturers.

INSTALLATION OVERVIEW

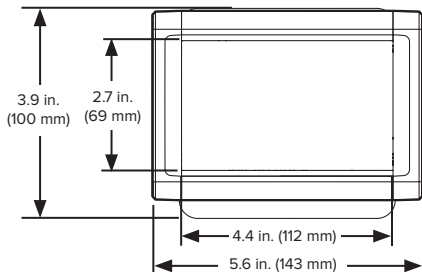


Single fan installation with provided CAT5 cable shown. If multiple fans will be daisy chained, the multi-fan accessory kit is required. The accessory kit is included only if ordered. Contact Customer Service to purchase the kit.

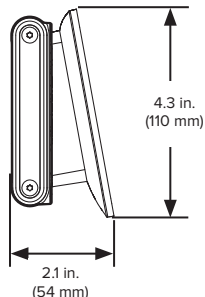


DIMENSIONS

Front View



Side View



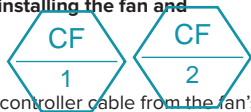
INSTALLATION



WARNING: Disconnect power to the installation locations before installing the fan and controller!

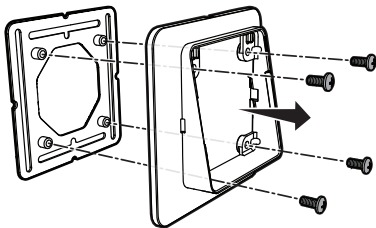
1. Install fan and route cable to controller

Install the fan according to the fan installation guide. Make sure the CAT5 controller cable from the fan's VFD is routed to an outlet box at the controller installation location.



2. Separate mounting bracket and plate

Remove the four screws securing the mounting bracket to the mounting plate and set them aside. You will use them to reattach the bracket to the plate after mounting the plate to the outlet box.

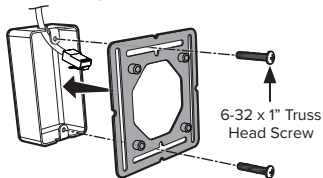


3. Install mounting plate

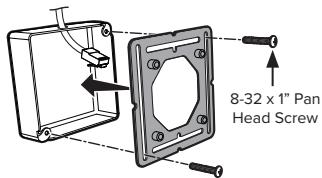
Attach the mounting plate to the outlet box with the provided hardware. Make sure to use the appropriate screw type for your outlet box. *Your outlet box and mounting hole configuration may differ from the illustrations.*

The mounting plate can be installed in any orientation, and any of the mounting slots can be used.

Rectangular Outlet Box

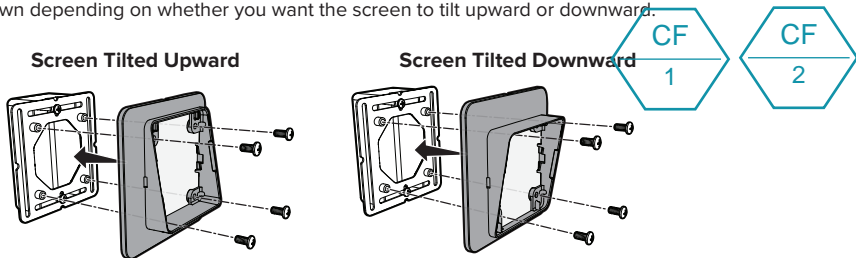


Square Outlet Box



4. Install mounting bracket

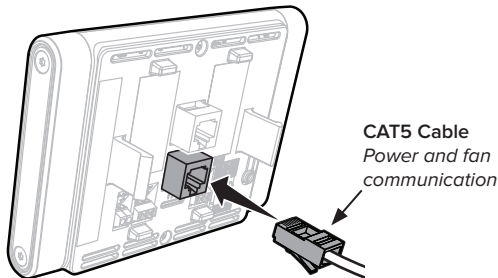
Attach the mounting bracket to the mounting plate with the four 8-32 x 3/8" pan head screws. Orient the bracket as shown depending on whether you want the screen to tilt upward or downward.



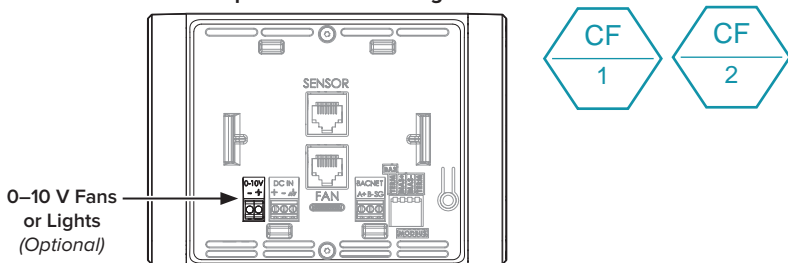
5. Wire controller

Insert the CAT5 cable from the fan into the FAN jack on the back of the controller, and make any additional wiring connections as shown on the following page.

For cable runs longer than 150 ft (45.7 m), use a 568B CAT5 cable.



Optional 0–10 V Wiring



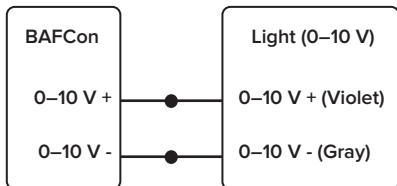
0–10 V Fan Wiring

See the online 0–10 V wiring instructions for details.

bigassfans.com/docs/bafcon/bafcon-0-10-v-installation.pdf



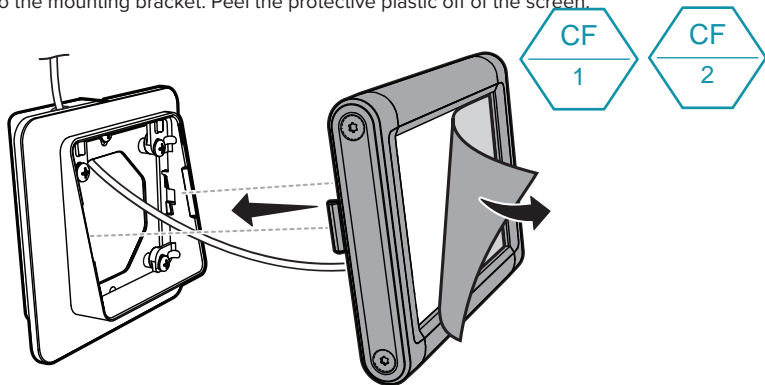
0–10 V Lighting Wiring



Light control type	Maximum current
Sinking	50 mA DC
Sourcing	8 mA DC

6. Mount controller

Snap the controller into the mounting bracket. Peel the protective plastic off of the screen.



7. Apply power

Make sure fan installation is complete, and then apply power to the fan and controller. Use the controller to turn the fan on and adjust the speed.

If you connected lights to the controller, you will need to use the controller to enable them. Visit bigassfans.com/support for information on enabling and controlling your lights.

OPERATION AND MAINTENANCE

CF

1

CF

2

Visit bigassfans.com/support to learn about using BAFCon to control your fans and lights and for maintenance and troubleshooting information.

What is SmartSense?

SmartSense uses BAFCon's built-in temperature and humidity sensors to maintain a consistent year-round temperature from floor to ceiling, maximizing comfort and energy savings. As the temperature rises with warmer weather, SmartSense automatically speeds up your fan to provide cooling. During cooler weather, SmartSense automatically slows down the fan to de-stratify the air, pushing warm air trapped at the ceiling down to the floor without creating a draft.

Firmware updates

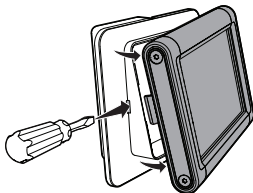
To update the controller's firmware, download the firmware app on your mobile device, and follow the update instructions in the app. The controller will receive the update from the app via Bluetooth®. Make sure Bluetooth is enabled on the controller. Visit bigassfans.com/support for information on enabling and disabling Bluetooth. *Firmware updates may take several minutes. The mobile device on which the app is installed will need to remain within Bluetooth range of the controller during this time.*

Cleaning the screen

Clean the controller screen using a soft cloth dampened with ethanol. Do not use cleaners, solvents, or detergents other than ethanol. To avoid scratches, do not clean the screen with a dry cloth.

Removing the controller from the bracket

To remove the controller from the mounting bracket, insert a flat head screwdriver into the slot on either side of the bracket, and carefully tilt the controller out of the bracket.





GONZALES COMMUNITY CENTER
HVAC Cut Sheets

END OF HVAC CUT SHEETS



GONZALES COMMUNITY CENTER

Plumbing Cut Sheets

Blue Forest Engineering, Inc
3622 Kingsley Street
Oakland, CA 94610-2833

March 31, 2022

**Afwall® Millennium™ FloWise® Elongated
Flushometer Toilet LESS EverClean®**

- Wall-mounted flushometer valve toilet
- Vitreous china
- Conventional glaze
- High Efficiency, Low Consumption. Operates in the range of 1.1 gpf to 1.6 gpf (4.2 Lpf to 6.0 Lpf)
- Meets definition of HET (High Efficiency Toilet) when used with a high efficiency flush valve (1.1 gpf - 1.6 gpf or 1.28/1.1 gpf dual flush)
- Maximum Performance (MaP) score of 1,000 grams at 1.1 gpf - 1.6 gpf
- Condensation channel
- Concealed trapway design
- Elongated bowl
- Powerful direct-fed siphon jet action
- 1-1/2" inlet spud
- Fully-glazed 2-1/8" trapway
- 10" x 12" water surface area
- Tested to support static weight load of 1,000 lbs. (454 kg)

- 2257.101** Elongated bowl only, top spud
- 2633.101** Elongated bowl only, top spud with slotted rim for bedpan holding
- 2634.101** Elongated bowl only, back spud

System MaP* Score:

- 1,000 grams of miso @ 1.1 gpf to 1.6 gpf when used with an American Standard flush valve

* Maximum Performance (MaP) testing performed by IAPMO R&T Lab. MaP Report conducted by Veritec Consulting, Inc. and Koeller and Company.

Component Parts:

- 047007-0070A** Inlet Spud (furnished with bowl)

Nominal Dimensions:

660 x 356 x 381mm
(26" x 14" x 15")

Recommended working pressure—between 25 psi at valve when flushing and 80 psi static

Fixture only, less seat, bolt caps, and flushometer valve

Compliance Certifications -

Meets or Exceeds the Following Specifications:

- ASME A112.19.2/CSA B45.1 for Vitreous China Fixtures



SEE REVERSE FOR ROUGHING-IN DIMENSIONS

To Be Specified:

- Color: White
- Seat:
 - American Standard #5901.100 Heavy duty open front less cover
 - American Standard #5905.100 Extra heavy duty open front less cover
- Flushometer Valve:
 - 1.6 gpf:
 - Sensor-Operated: American Standard Selectronic® DC Power #6065.161.002 (Top Spud)
AC Power #6067.161.002 (Top Spud)
 - Manual: American Standard #6047.161.002 (Top Spud)
 - 1.28 gpf:
 - Sensor-Operated: American Standard Selectronic® DC Power #6065.121.002 (Top Spud)
AC Power #6067.121.002 (Top Spud)
 - Manual: American Standard #6047.121.002 (Top Spud)
 - 1.6 / 1.1 gpf Dual Flush:
 - Sensor-Operated: American Standard Selectronic® DC Power #6065.761.002 (Top Spud)
AC Power #6067.761.002 (Top Spud)
 - 1.28 / 1.1 gpf Dual Flush:
 - Sensor-Operated: American Standard Selectronic® DC Power #6065.721.002 (Top Spud)
AC Power #6067.721.002 (Top Spud)

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 REQUIREMENTS FOR ACCESSIBLE AND USABLE BUILDING FACILITIES - CHECK LOCAL CODES.

- When installed so top of seat is 432 to 483mm (17" to 19") from the finished floor.



ENVIRONMENTAL
PRODUCT
DECLARATION



When used with
1.1 or 1.28 gpf
toilet flush valves

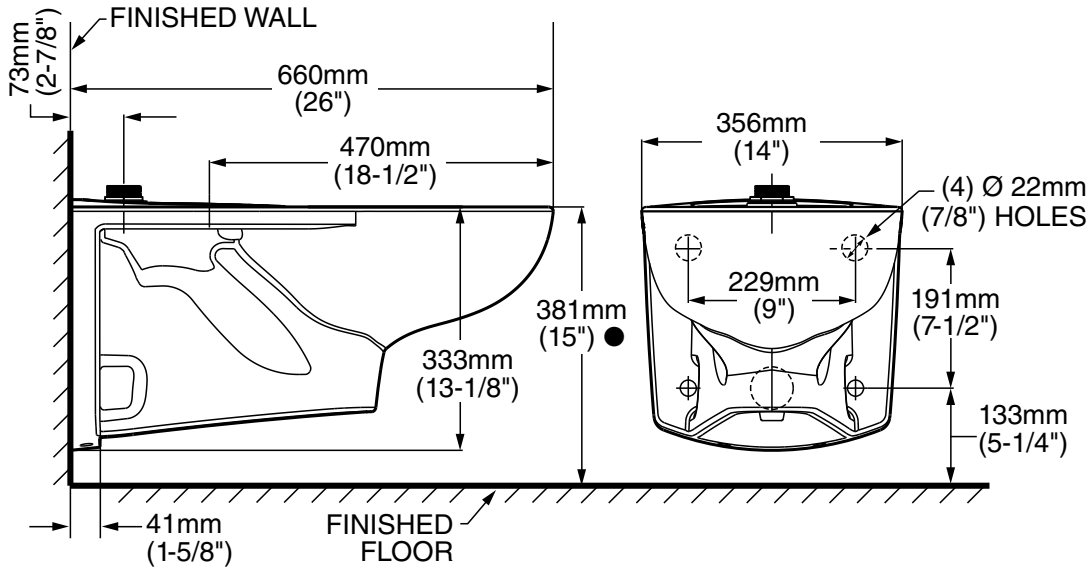


ADA
COMPLIANT

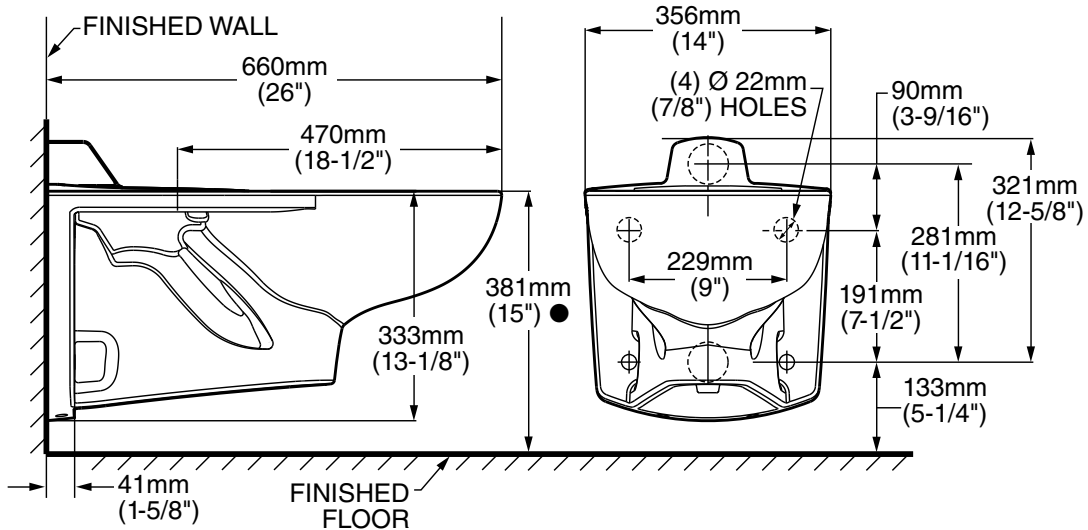


WATER
EFFICIENT

2257.101/2633.101



2634.101



NOTES:

● Toilet designed to meet ADA accessibility standards when top of seat height set at 432 to 483mm (17" to 19") from finished floor.

PRODUCT 2257 SHOWN, 2366 SAME EXCEPT WITH SLOTTED RIM FOR BED PAN HOLDING.

WASTE OUTLET SEAL RING MUST BE NEOPRENE OR GRAPHITE-FELT (WAX RING NOT RECOMMENDED).

SUGGESTED 2mm (1/16) CLEARANCE BETWEEN FACE OF WALL AND BACK OF BOWL.

TO COMPLY WITH AREA CODE GOVERNING THE HEIGHT OF VACUUM BREAKER ON THE FLUSHOMETER VALVE, THE PLUMBER MUST VERIFY DIMENSIONS SHOWN FOR SUPPLY ROUGHING.

FLUSHOMETER VALVE NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.

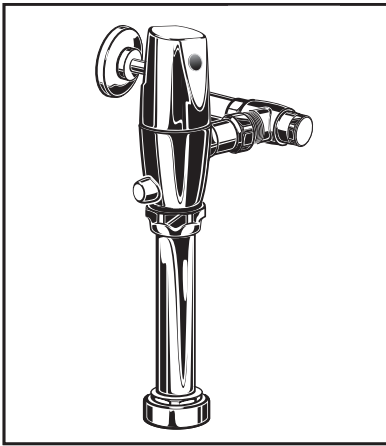
CARRIER FITTING AS REQUIRED TO BE FURNISHED BY OTHERS.

PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORT.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages

SELECTRONIC® SENSOR-OPERATED TOILET FLUSH VALVE

HARD-WIRED AC POWER, BASE MODEL



GENERAL DESCRIPTION:

Exposed, Sensor Operated Selectronic Water Closet Flush Valve for floor-mounted or wall-hung 1-1/2" top spud bowls. Inlet includes 1" I.P.S. angle stop with back-flow protection, vandal-resistant cap, sweat solder kit, cover tube and wall flange. Outlet includes 1-1/2" vacuum breaker, spud coupling and flange.

PRODUCT FEATURES:

- **Self-Cleaning Piston** with integral wiper spring significantly reduces clogging and maintenance
- **No Routine Maintenance:** no diaphragms to replace; no filters to clean
- **Optional Cover Plate** for transformer installation from the front
- **Selectronic Proximity System** with universal sensor provides hygienic, "hands free" operation
- **State-of-the-Art Electronics** prevent ghost flushing
- **Dezincification Resistant** brass alloy
- **Fully Mechanical Manual Override Button** can flush the valve without power
- **Fail-Safe:** Valve automatically closes upon loss of power or water pressure and does not need to be reset
- **Adjustable Sanitary Flush** cleans the fixture & maintains the trap seal.
- **Chemical Resistant EPDM Seals** for extended life
- **High Back Pressure Vacuum Breaker**
- **Adjustable Tailpiece**
- **Range can be adjusted manually or with optional remote control**
- **No external volume adjustment**
- **Can be installed left or right handed**

BASE MODEL: (Does Not Include Power Supply)

606B.161 Base Model, 1.6 gpf/6.0 Lpf
For use with Hard-Wired AC or Multi-AC power kits. 11-1/2" rough-in



606B.121 Base Model, 1.28 gpf/4.8 Lpf
SAME AS ABOVE



606B.111 Base Model, 1.1 gpf/4.2 Lpf
SAME AS ABOVE



606B.761 Base Model, Dual Flush 1.6/1.1 gpf/6.0/4.2 Lpf
SAME AS ABOVE



606B.721 Base Model, Dual Flush 1.28/1.1 gpf/4.8/4.2 Lpf
SAME AS ABOVE

POWER KITS: (Must be Purchased Separately)

PK00.HAC Hard-Wired AC transformer, 10' extension cable and capacitor module

PK00.MAC Multi-AC adapter and 10" extension cable

OPTIONAL Battery Back-up

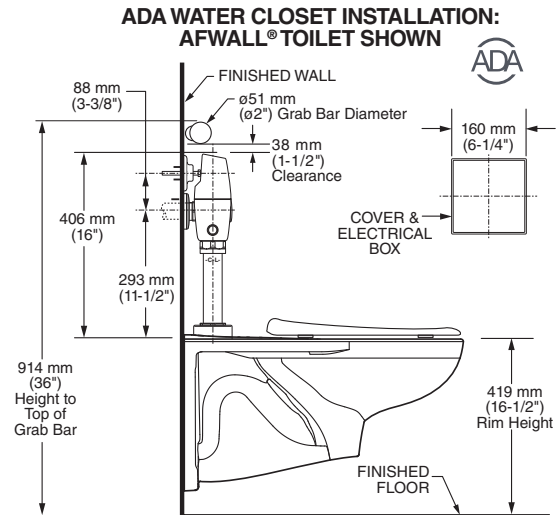
PK00.BBU Allows faucet to continuously operate during a power failure

OPERATING PRESSURE:

25 psi (flowing) - 80 psi (static)

FLOW REQUIREMENT:

25 gpm/94.6 L/min



** Flush Valve can be installed to meet ADA 2010 Section 609 when installed as shown

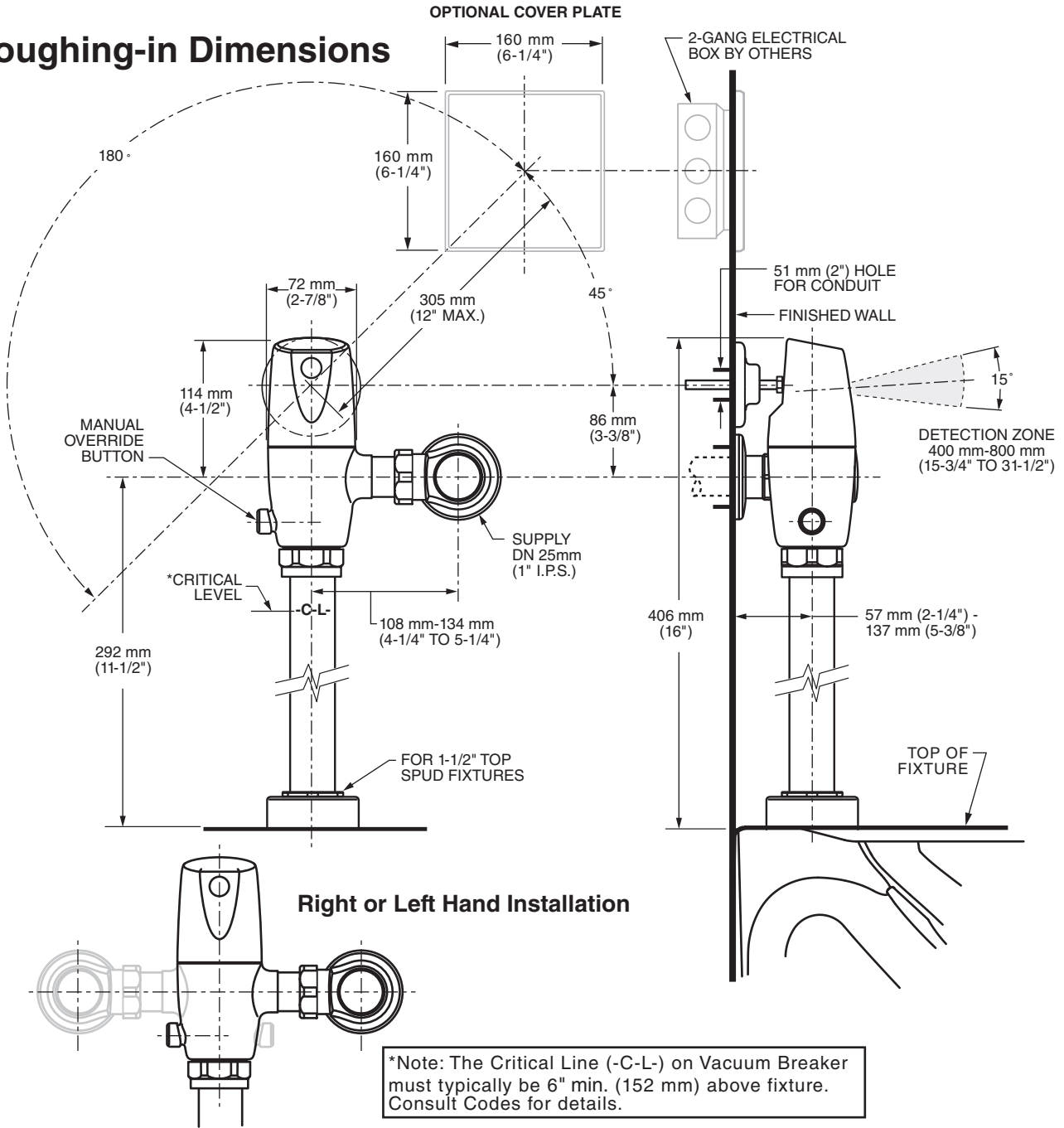
RECOMMENDED SPECIFICATION:

Electronic proximity infrared sensor activated toilet flush valve shall feature self-cleaning piston valve. Includes a fully mechanical manual over-ride that can provide a complete flush without power. Includes dezincification-resistant brass valve body and metal cover with chrome finish and vandal resistant stop cap. Angle stop with back-flow protection and vacuum breaker included. Flush valve shall be American Standard Model # 606B.____.002

LISTINGS:

- ASSE 1037
- ANSI/ASME A112.19.2
- ADA Compliant

Roughing-in Dimensions



Washbrook® FloWise® 0.5 gpf High Efficiency Urinal System

- ❑ **6590.510** 0.5 gpf Exposed Top Spud Urinal and Selectronic® Exposed AC Urinal Flush Valve

URINAL:

- Vitreous china
- Ultra High Efficiency. Operates in the range of 0.125 gpf to 1.0 gpf (0.5 Lpf to 3.8 Lpf)
- Flushing rim
- Elongated 14" rim from finished wall
- Washout flush action
- Extended sides for privacy
- 3/4" inlet spud
- Outlet connection threaded 2" inside (NPTF)
- Strainer included
- Meets ASME flush requirements at 0.125 to 1.0 gpf
- Model 6590.001 top spud

SELECTRONIC® FLUSH VALVE:

- Pressure Compensation feature ensures accurate flush volume regardless of inlet water pressure
- Self-Cleaning Piston with integral wiper spring significantly reduces clogging and maintenance
- Selectronic® Proximity System with universal sensor provides hygienic, "hands free" operation
- State-of-the-Art Electronics prevent ghost flushing
- Dezincification Resistant semi-red brass alloy
- Fully Mechanical Manual Override Button can flush the valve without power
- Fail-Safe: Valve automatically closes upon loss of power or water pressure and does not need to be reset
- Adjustable Sanitary Flush cleans the fixture & maintains the trap seal
- Stadium Feature: Valve automatically switches to water savings mode during periods of heavy usage
- Chemical Resistant EPDM Seals for extended life
- Adjustable Tailpiece for rough-in flexibility
- Can be installed left or right handed
- Includes Class 2 UL certified universal hard-wired AC transformer
- Universal input voltage: 100 - 240 VAC, 50/60 Hz
- Optional cover plate only required for installation from the front
- Model 6062.051



SEE REVERSE FOR ROUGHING-IN DIMENSIONS

High-Efficiency Urinal System

- 50% water savings when compared to 1.0 gpf urinal systems

Operating Pressure:

20 psi (flowing) - 80 psi (static)

Flow Requirement:

10 gpm (37.9 L/min.)

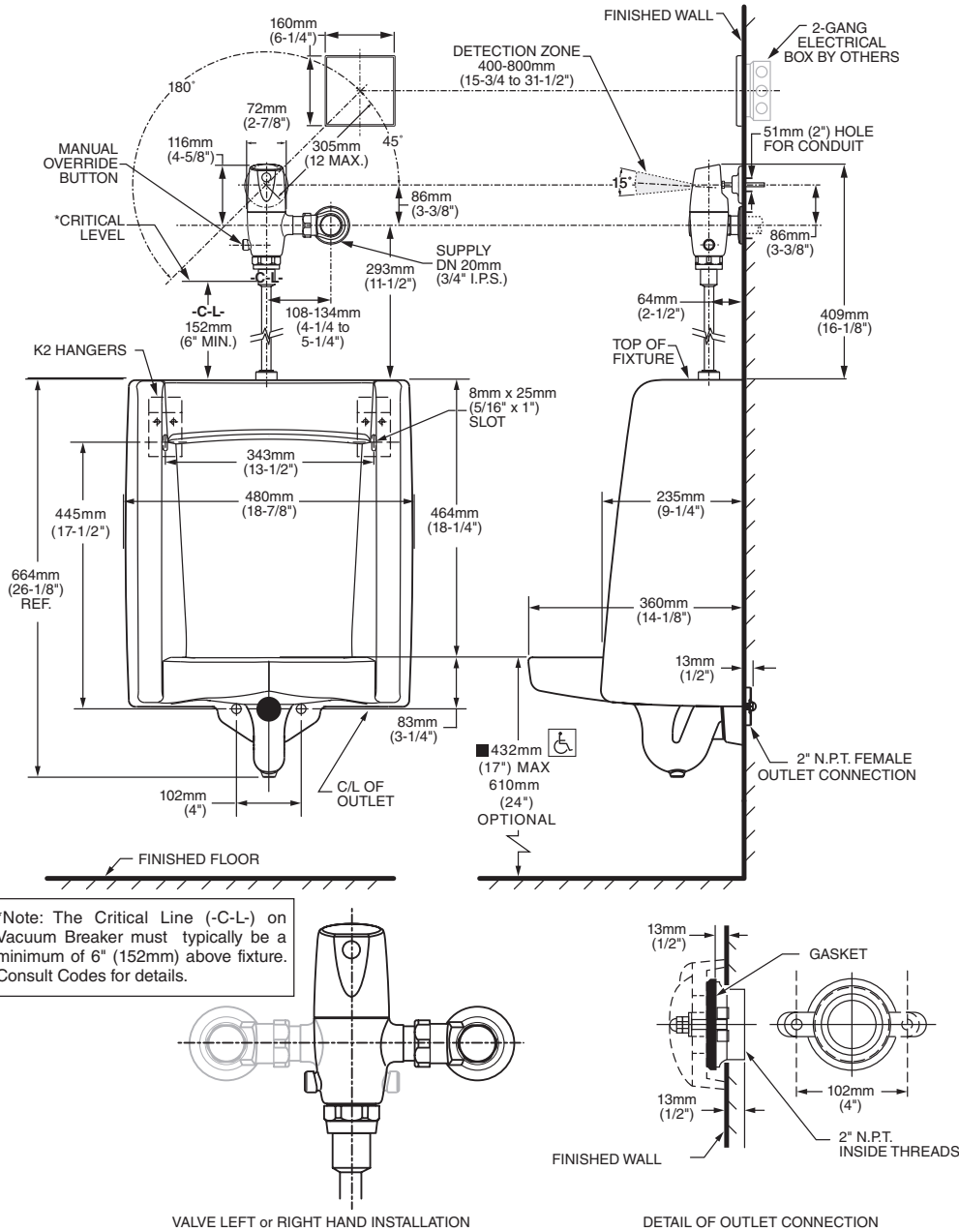
Nominal Fixture Dimensions:

360 x 480 x 664mm (14-1/8" x 18-7/8" x 26-1/8")

Includes:

- 3/4" I.P.S. angle stop with back-flow protection and vandal resistant cap
- 3/4" Sweat solder kit including cover tube and wall flange
- 3/4" High back pressure vacuum breaker, spud coupling and flange





Fixture Compliance Certifications - Meets or Exceeds the Following Specifications:

- ASME A112.19.2-2008/CSA B45.1-08 for Vitreous China Fixtures

Valve Listings:

- ASSE 1037
- ANSI/ASME A112.19.2
- ADA Compliant



MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.

• When installed so top of rim is 432mm (17") MAXIMUM from finished floor.

NOTES:
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

KOHLER®



Vault™ Top-/Under-Mount Kitchen Sink K-3894-4

Features

- 27-inch minimum base cabinet width.
- Single bowl.
- 6-inch depth.
- Three faucet holes with one accessory hole to the right.
- Rear drain increases workspace in the sink and storage space underneath.
- SilentShield® sound-absorption technology offers quieter performance.
- For under-mount installation, countertop thickness cannot be greater than 1 inch (25 mm) for ADA compliance.
- Includes installation hardware.

Material

- Handcrafted from 18-gauge stainless steel.

Installation

- Top-mount or under-mount.

Recommended Accessories

- K-8801 Sink Strainer
- K-8799 Sink Strainer

Optional Accessories

- 1177161 Installation Clip Kit

Components

Product includes:

- 1130570 Hardware Kit, Self-Rimming



ADA

Codes/Standards

ASME A112.19.3/CSA B45.4
ADA
ICC/ANSI A117.1

KOHLER® One-Year Limited Warranty

See website for detailed warranty information.

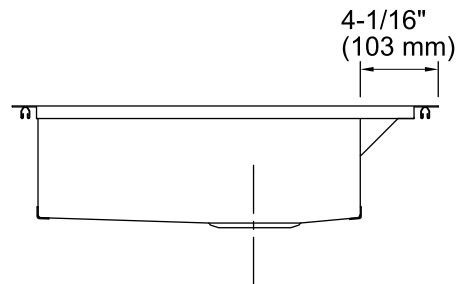
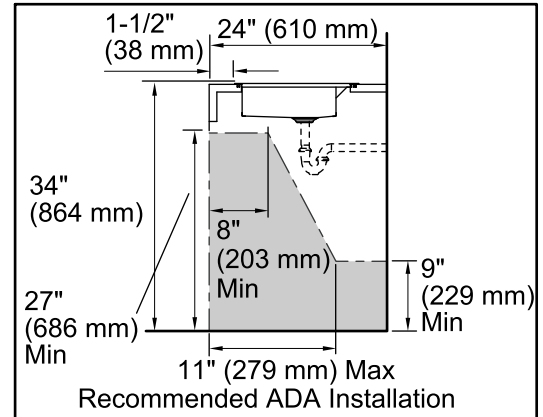
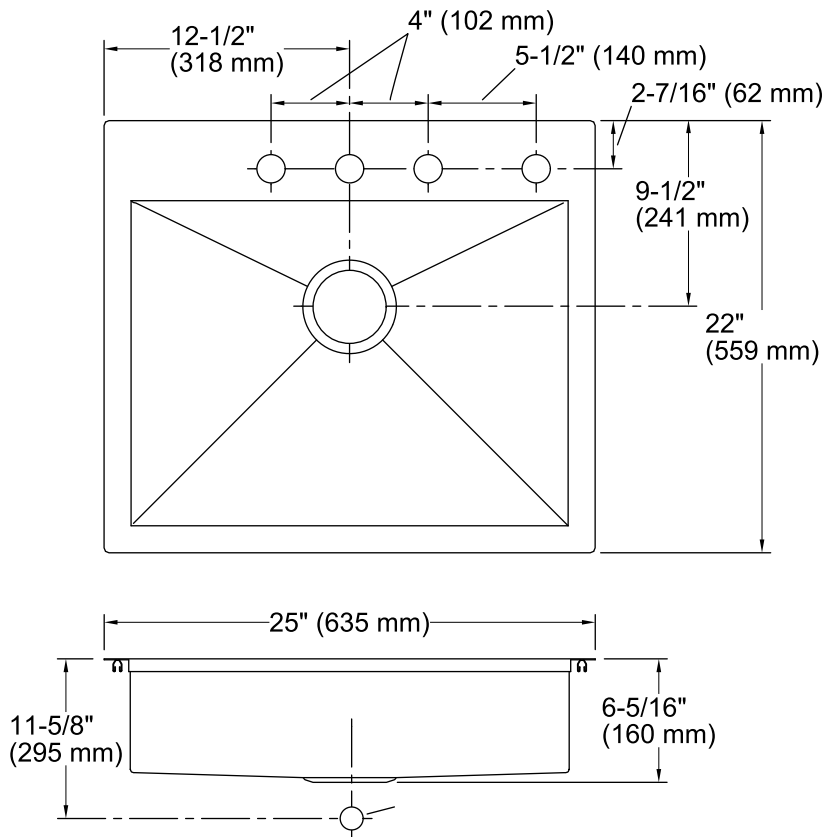
1-800-4KOHLER (1-800-456-4537)

Kohler Co. reserves the right to make revisions without notice to product specifications.

For the most current Specification Sheet, go to www.kohler.com.

12-4-2018 13:01 - US/CA

THE BOLD LOOK
OF **KOHLER**®



Technical Information

All product dimensions are nominal.

Bowl configuration:	Single
Installation:	Top-mount, Under-mount
Min. base cabinet width:	27" (686 mm)
Bowl area (Only):	Length: 22-1/4" (565 mm) Width: 16-9/16" (420 mm) Bowl depth: 6" (152 mm) Water depth: 6" (152 mm)
Number of deck holes:	4
Faucet hole(s):	1-7/16" (37 mm)
Soap/Lotion hole:	1-7/16" (37 mm)
Drain hole:	3-3/4" (94 mm)
Template:	1130822-7, required, included

Notes

Install this product according to the installation instructions.

Hardward Kit 1177161 needed for countertops with a 2-1/2" (64 mm) thickness or less.

For under-mount installation, counter top thickness can not be greater than 1" (25 mm) for ADA compliance.

ADA compliant when installed to the specific requirements of these regulations.

DESCRIPTION

AER-DEC® 2-Station Wall-Mounted Sink.

DETAILS

- Material: Corian/Quartz/Silestone
- Width: 60" (1,524mm)

FEATURES

Two Station Lavatory System with the following features:

- Built in air dam technology that eliminates backsplash and updrafts
- A monolithic console available in Corian or quartz
- Basins can be sized to project requirements
- Many customization options - see architectural worksheet for all options
- Easy installation
- ADA compliant if properly installed
- Comes with deck mounted BASYS style hand dryers standard
- Pairs great with Sloan faucets and soap dispensers

COLORS

- For a complete list of Corian® colors:
<http://www.corian.com/-colors-of-corian-r->
- For a complete list of Corian® quartz colors:
<http://www.corianquartz.com/-colors-of-zodiaq-r->
- For a complete list of Silestone® quartz colors:
<http://www.silestoneusa.com/colors/>

VIDEOS

- ▶ AER-DEC Integrated Sink

**COMPLIANCES & CERTIFICATIONS**

IGC156

(ADA Compliant, cUPC Certified, BAA Compliant, IGC156)

RECOMMENDED SPECIFICATION

Sloan AER-DEC Integrated Sink System model no. AD 8X000. Product to be fabricated out of Corian or quartz. Supplied with Sloan deck mounted hand dryer EHD-510, Sloan automated sensor faucet EFX Series and Sloan sensor operated foam soap dispenser ESD-400 or ESD-500. Sink design to be ADA compliant. Supplied with enclosure.

DOWNLOADS

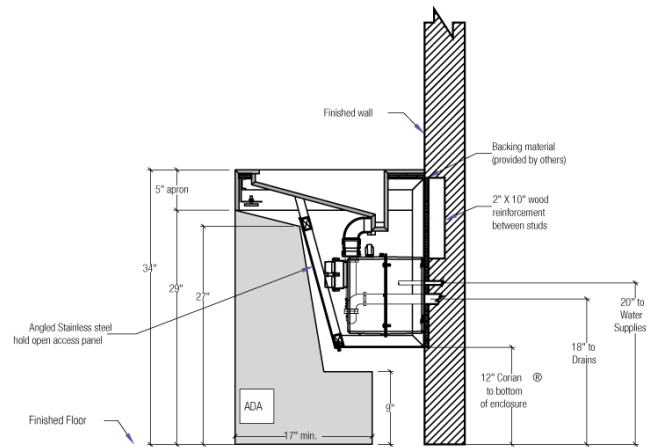
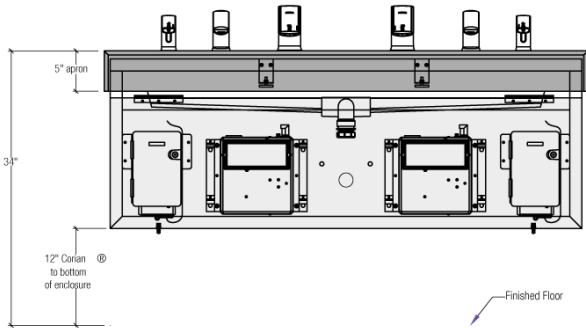
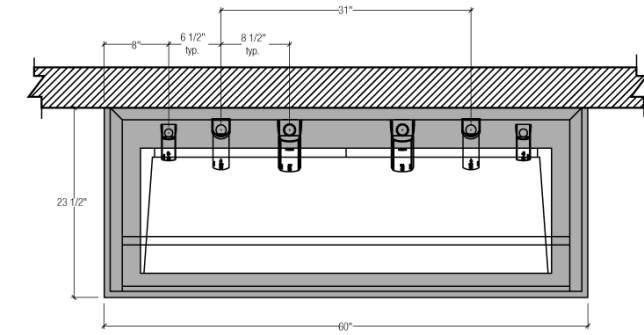
- [AER-DEC® Installation Instructions](#)
- [Hand Dryer EHD-511 Installation Instructions](#)
- [AER-DEC® 80000 Series Repair and Maintenance Guide](#)
- [Additional Downloads](#)

NOTES

All information contained within this document subject to change without notice.

Many customization options - see [architectural worksheet](#) for all options

ROUGH-IN



INSTALLATION INSTRUCTIONS FOR COMPLETE SLOAN HAND DRYER SPOUT



EHD-511 SPOUT

LIMITED WARRANTY

Unless otherwise noted, Sloan Valve Company warrants this product, manufactured and sold for commercial or industrial uses, to be free from defects in material and workmanship for a period of three (3) years (one (1) year for special finishes, SF faucets, PWT electronics and 30 days for PWT software) from date of first purchase. During this period, Sloan Valve Company will, at its option, repair, replace, or refund the purchase price of any product which fails to conform with this warranty under normal use and service. This shall be the sole and exclusive remedy under this warranty. Products must be returned to Sloan Valve Company, at customer's cost. No claims will be allowed for labor, transportation or other costs. This warranty extends only to persons or organizations who purchase Sloan Valve Company's products directly from Sloan Valve Company for purpose of resale. This warranty does not cover the life of the batteries.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. IN NO EVENT IS SLOAN VALVE COMPANY RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY MEASURE WHATSOEVER.

IMPORTANT



Read this entire installation manual to ensure proper installation. When finished with the installation, file this manual with the owner or maintenance department. Compliance and conformity to local codes and ordinances is the responsibility of the installers.



Separate parts from packaging and make sure all parts are accounted for before discarding any packaging material. If any parts are missing, do not begin installation until you obtain the missing parts.



Turn OFF electrical power to the electrical outlets, then unplug all electrical units prior to installation. Electrical power **MUST** remain off until installation is complete.



Wear all proper safety equipment prior to installation.

TOOLS REQUIRED FOR INSTALLATION

- Slotted screwdriver
- Wire stripper/crimping tool

PRIOR TO INSTALLATION

Prior to installing the Hand Dryer spout install the items listed below.

IMPORTANT:

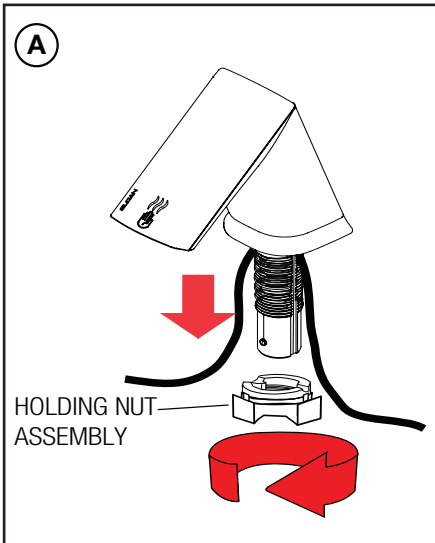
- **INSTALL ALL ELECTRICAL WIRING IN ACCORDANCE WITH NATIONAL/LOCAL CODES AND REGULATIONS.**
- **INSTALL ALL PLUMBING IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.**
- **A 24 VAC STEP-DOWN TRANSFORMER MUST BE USED.**
- **USE APPROPRIATE PRECAUTIONS WHILE CONNECTING THE POWER SOURCE.**

!!! IMPORTANT !!!

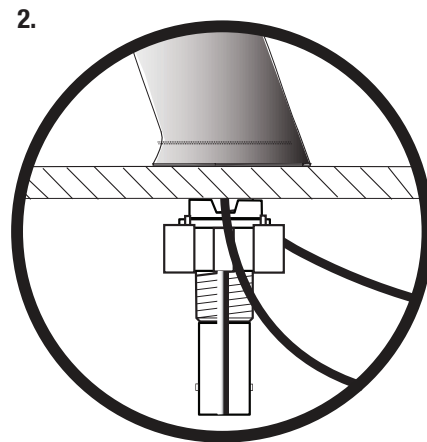
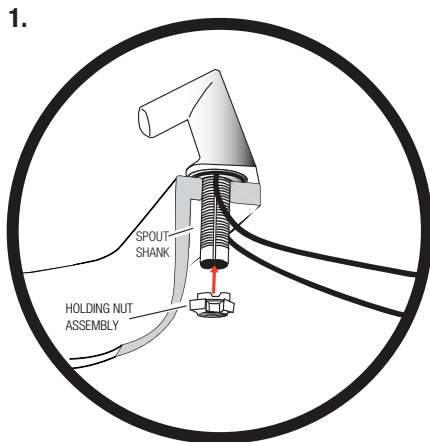
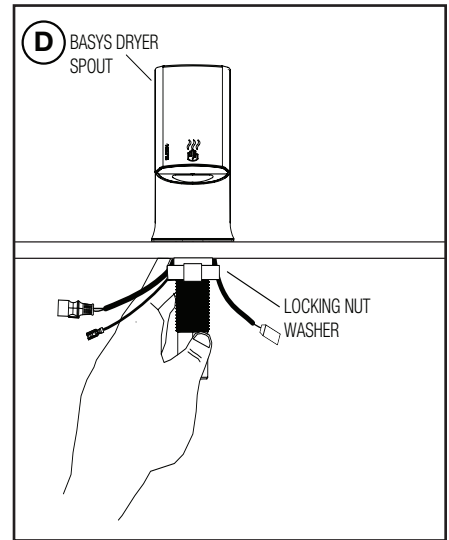
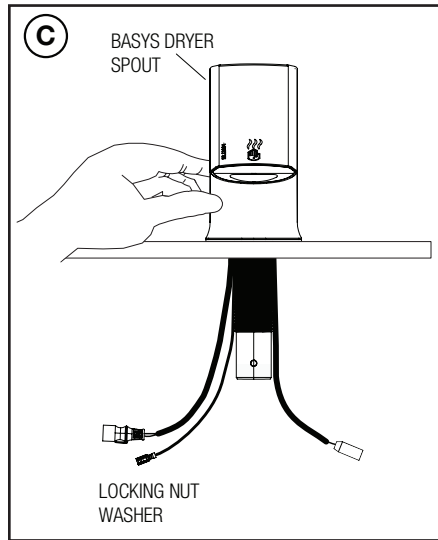
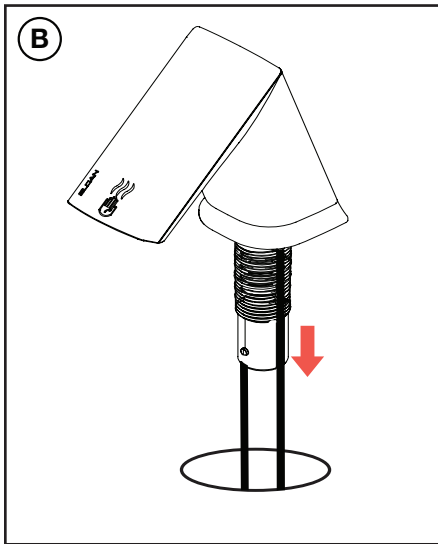
THIS PRODUCT CONTAINS MECHANICAL AND/OR ELECTRICAL COMPONENTS THAT ARE SUBJECT TO NORMAL WEAR. THESE COMPONENTS SHOULD BE CHECKED ON A REGULAR BASIS AND REPLACED AS NEEDED TO MAINTAIN THE VALVES PERFORMANCE.

If you have questions about how to install your hand dryer, consult your local Sloan Representative or call Sloan Technical Support at:
1-888-SLOAN-14 (1-888-756-2614)

1 - INSTALL SPOUT

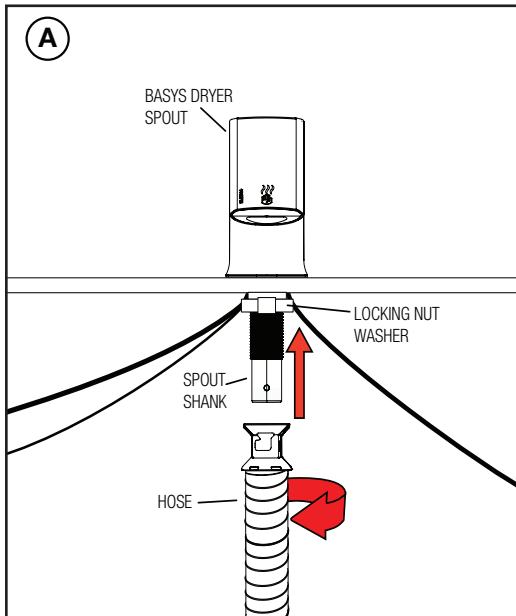


- A** Remove holding nut assembly from the spout shank. Unscrew counterclockwise.
- B** Ensure the wires are located inside corresponding slots on the sides of the spout shank. Insert spout shank into the deck hole.
- C** Holding the spout down on the sink deck, Spread wires away from spout shank, align wires into grooves on locking nut washer **(1)**. Turn the locking nut until it makes contact with the wires. Align spread wires in corresponding relief grooves on top of the locking nut washer.
- D** **(2)** Spread the wires horizontally. Turn the locking nut until snug making sure the wires are in the corresponding wire relief grooves on the locking nut washer. Align the spout as desired and tighten the locking nut until the spout is firmly locked into place.

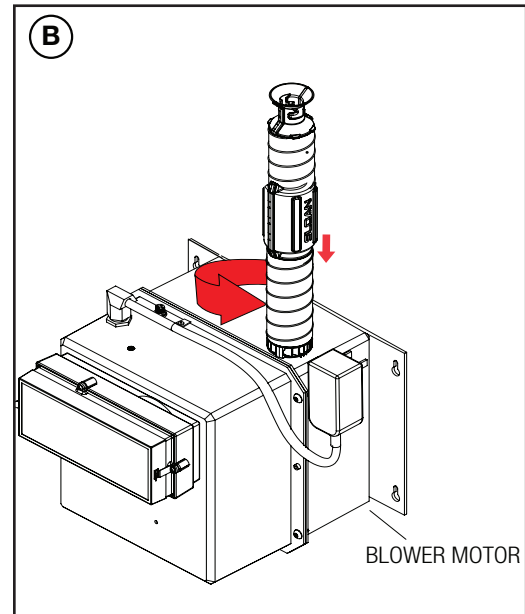


2 - CONNECT HOSE

- A** Align slots in flared connector end of hose with shank guides. Slide over the spout shank until it stops. Rotate the flared connector clockwise until it locks into place (will feel it snap into place).

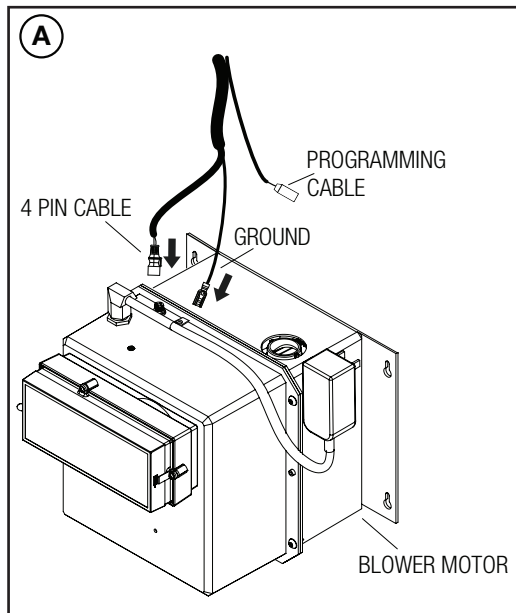


- B** Align slots of round squared connector end of hose to opening guides on hand dryer motor into the opening until it stops, rotate the connector counterclockwise until it locks into place.

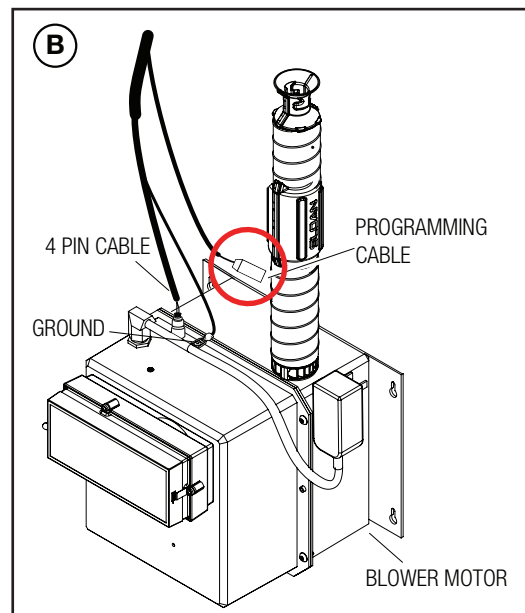


3- CONNECT WIRES

- A** Plug the four (4) pin cable from the spout into the Four (4) pin socket on the Hand Dryer Motor. Plug the ground cable into the ground tab on the Blower Motor.



- B** Leave the Programming Cable unattached. Do not remove or cut-off cable. Cord can be bundled.



CARE AND CLEANING

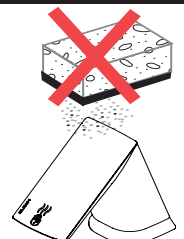
Important:

DISCONNECT ELECTRICAL SUPPLY TO DRYER PRIOR TO SERVICING.


Gently wash spout using a soft cloth or sponge and a mild soap or detergent with lukewarm water to loosen dirt and grime.

CLEANING SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL

With normal use, dryer will require cleaning once a year. Heavier usage requires more frequent cleaning. Use a small, soft brush to gently clean all parts.



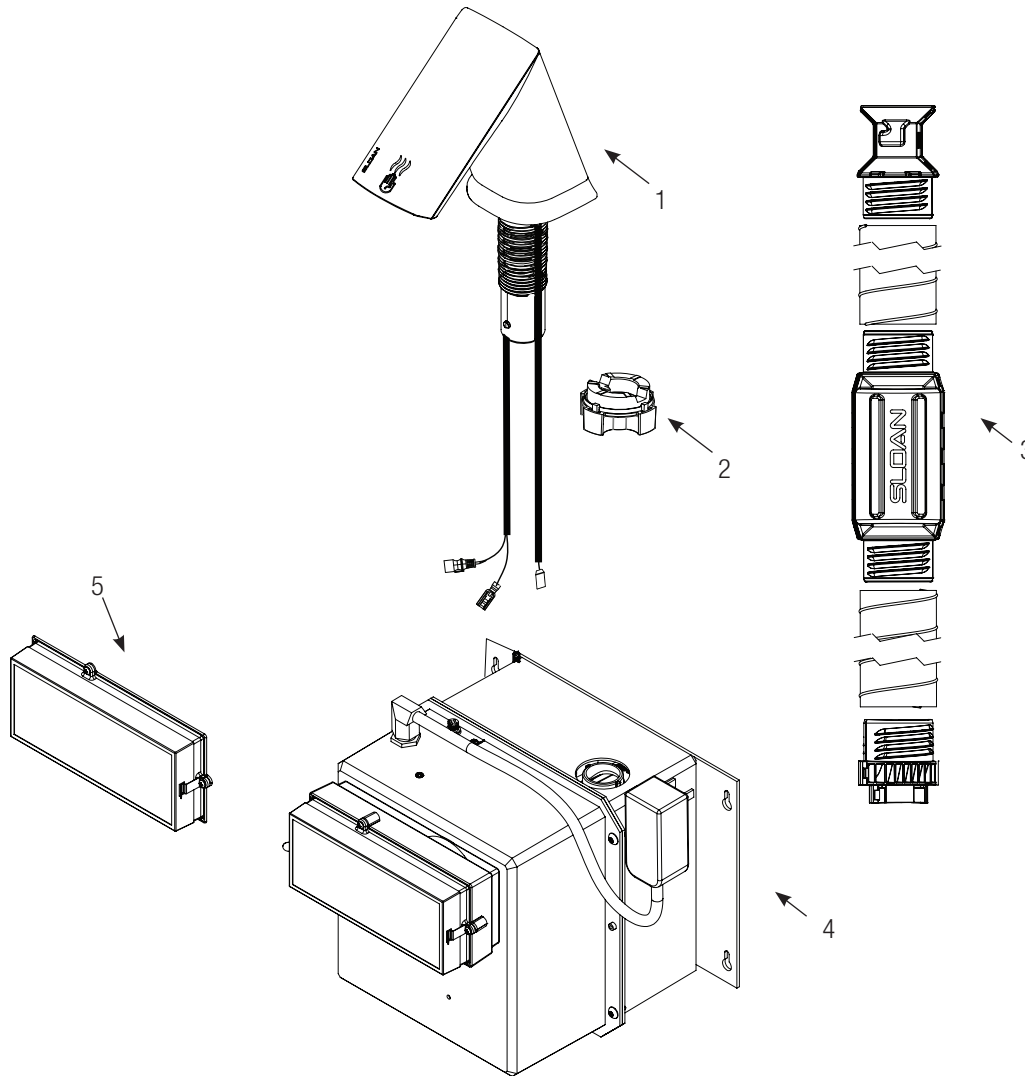
ERROR CODES AND SOLUTIONS

DRYER STATE	ERROR MESSAGE	1st FLASH	2nd FLASH	DRYER OPERATION	POSSIBLE SOLUTION
OFF	No error or condition, user absent	No flash, steady OFF (at dryer box) and No flash, steady ON (at spout)	–	Dryer ready for operation	 Normal
ON	No error or condition, user presenting hands	No flash, steady OFF (at dryer box) and No flash, steady ON (at spout)	–	Dryer running	Dryer running while hands are under unit. Normal
ON	Time to clean prefilter or change HEPA Filter	1 Short	1 long	Dryer still runs	Check and clean prefilter. Code should reset after repowering unit. If code reappears then HEPA filter may need replacing.
OFF	Motor over current severe	1 long	3 short	dryer stops running until power is removed, fault has been repaired and power reapplied	Motor is drawing much more current than normal. Motor could be failing. Replace motor. Call Sloan Tech Support 1-888-756-2614.
OFF	Motor quick over current	1 long	3 short	dryer stops running until power is removed, fault has been repaired and power reapplied	Motor drew a quick over current than normal. Could have been caused by a quick over voltage condition or something blocking motor. Motor could be failing. Replace motor. Call Sloan Tech Support 1-888-756-2614.
ON	Heater open condition	2 long	4 short	Dryer still runs. Code clears when power is removed and fault is repaired.	Heating element had opened during operation (thermostat tripped). check for clogged filter, blocked or kinked hose and blocked muffler. If problem persists heating element may be broken or disconnected. Replace or reconnect. Call Sloan Tech Support 1-888-756-2614.
ON	Notification of recent mains over voltage	3 long	1 short	Dryer still runs	Dryer had a spike of higher voltage than normal. Code is for information purposes. Code will clear if unit power is removed and reapplied.
ON	Notification of recent mains under voltage	3 long	2 short	Dryer still runs	Dryer had a spike of lower voltage than normal. Code is for information purposes. Code will clear if unit power is removed and reapplied.
Off	Mains over voltage in progress	3 long	3 short	Dryer stops running until mains voltage returns to a safe level. When safe level returns, dryer runs. The code changes to notification of recent mains over voltage.	Dryer has unsafe voltage applied. Check voltage source. Code will reset when voltage is back to normal.
OFF	Mains under voltage in progress	3 long	4 short	Dryer stops running until mains voltage returns to a safe level. When safe level returns, dryer runs. The code changes to notification of recent mains under voltage.	Dryer has unsafe voltage applied. Check voltage source. Code will reset when voltage is back to normal.
OFF	Control Temperature over temp severe	4 long	3 short	Dryer stops running until power is removed, fault has been repaired and power reapplied.	Dryer control is running very hot. Filter clog may have been disregarded. Check filter and reapply power. If continues Call Sloan Tech Support 1-888-756-2614.

PARTS LIST



Item	Code No.	Part No.	Description
1.	0366050	EHD-511A	BASYS Style Dryer Spout Repair Kit
2.	0366015	EHD-515A	Holding Nut Assembly Repair Kit
3.	0366008	EHD-512A	Hose and Muffler Repair Kit
4.	0366009	EHD-513A	Motor Assembly 110/120V w/HEPA Filter
5.	0366014	EHD-514A	HEPA Filter Repair Kit (filter with screen)



If further assistance is required, please contact Sloan Technical Support at: 1-888-SLOAN-14 or visit us online at: www.sloanvalve.com

The information contained in this document is subject to change without notice.

SLOAN • 10500 SEYMOUR AVENUE • FRANKLIN PARK, IL 60131

Phone: 1-888-SLOAN-14 (1-888-756-2614) • Fax: 1-800-447-8329 • www.sloanvalve.com

CODE NUMBER

3324463

DESCRIPTION

Hardwired Less Plug Power Supply, Below Deck Thermostatic Mixing Valve, Polished Chrome Finish, 0.5 gpm, Multi-Laminar Spray, Infrared Sensor, BASYS® Hardwired-Powered Deck-Mounted Mid Body Faucet.

DETAILS

- Flow Rate: 0.5 gpm (2 Lpm) (0.5GPM)
- Spray Type: Multi-Laminar (MLM)
- Sensor Type: Infrared (IR)
- Mounting Type: Single Hole
- Power Supply: Hardwired Less Plug (HLP)
- Temperature Mixer: Below Deck Thermostatic Mixing Valve (BDT)
- Finish: Polished Chrome (CP)
- Factory Default Timeout: 10s
- Factory Default GPC: 0.083

FEATURES

Commercial Grade, ADA Compliant, Electronic, Sensor-Activated, Die-Cast Metal Hand Washing Faucet with the following features:

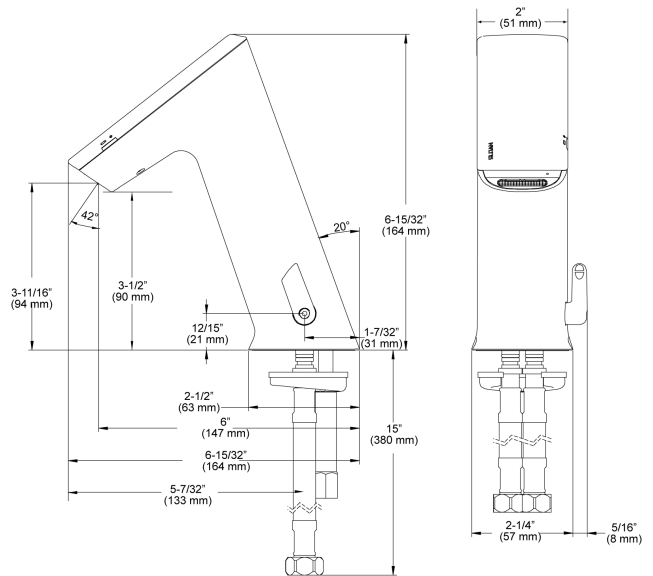
- One tool service
- All wetted components to be stainless steel, engineered thermoplastic, EPDM, and copper or copper alloy
- Solenoid housed in removable carrier that includes supply strainer
- Integral water supply shut off
- Supply strainer serviceable from above deck
- Vandal resistant spray insert, key housed inside faucet body
- All electronics sealed to IP-136
- Gold plated electrical contacts
- Above deck individual diagnostic indicators for battery life, solenoid condition, and power up mode
- Flexible, high pressure supply hoses, 3/8" compression connections
- Bi-stable magnetic solenoid
- Four (4) "AA" alkaline batteries as backup
- Double infrared sensors with automatic setting feature Includes all mounting hardware
- Line purge mode, eliminates stagnant water
- Adjustable time-outs
- Standard Bowed Crown

ELECTRICAL SPECIFICATIONS

- Timeout Adjustment Settings: 10s

VIDEOS

- ▶ BASYS® Faucet Installation and Features
- ▶ BASYS® Faucet Installation Mid Height Model



COMPLIANCES & CERTIFICATIONS



(ADA Compliant, ASME A112.18.1 Compliant, CalGreen Compliant, CEC Compliant, cUPC Certified, cUPC Low Lead Compliant, GPC 0.25 or less, NYC604.4, Proposition 65, Satisfies LEED Credits, TAS, UPC Certified, UPC Low Lead Compliant)

RECOMMENDED SPECIFICATION

Sloan BASYS Model No. EFX-200-HLP-BDT-CP-0.5GPM-MLM-IR-FCT Infrared Sensor Activated Electronic Handwashing Faucet for pretempered or hot/cold water supplies. Product to have double infrared sensors with automatic setting feature. Solenoid valve housed in removable carrier that closes water supply upon removal eliminating need to access control stops.

Sloan 10500 Seymour Ave, Franklin Park, IL 60131
 Phone: 800.982.5839 • Fax: 800.447.8329 • sloan.com

DOWNLOADS

- [EFX 1Xx/2Xx Installation Instructions](#)
- [EFX 1Xx/2Xx \(SP\) Installation Instructions](#)
- [EFX 1Xx/2Xx Caddy Replacement Installation Instructions](#)
- [Trim Plates Repair and Maintenance Guide](#)
- [IR FAQs Repair and Maintenance Guide](#)
- [IR FAQs SP Repair and Maintenance Guide](#)
- [EFX-2XX Repair and Maintenance Guide](#)
- [Additional Downloads](#)

Solenoid carrier includes strainer for easy above deck service. Thermostatic mixer ordered separately to comply with ASSE 1070 requirements. The product shall be tested and certified to industry standards: ASME A112.18.1M, CSA B125.1, California Health and Safety Code 116875

NOTES

All information contained within this document subject to change without notice.

Looking for other variations of the EFX-200 product? [View the general spec sheet with all options.](#)

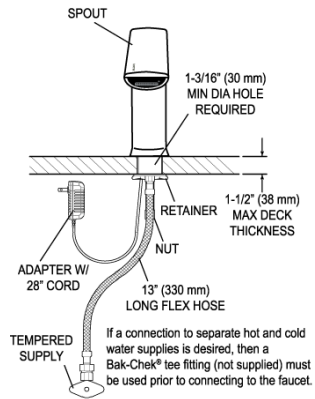
[Find a matching soap dispenser](#) for this faucet.
[Find a compatible sink](#) for this faucet.

WARRANTY

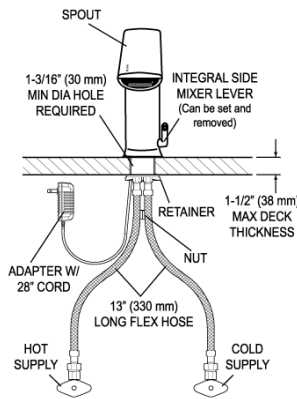
3 Year

ROUGH-IN

EFX-200.00X.0X1X Faucet
with Single Line Water Supply

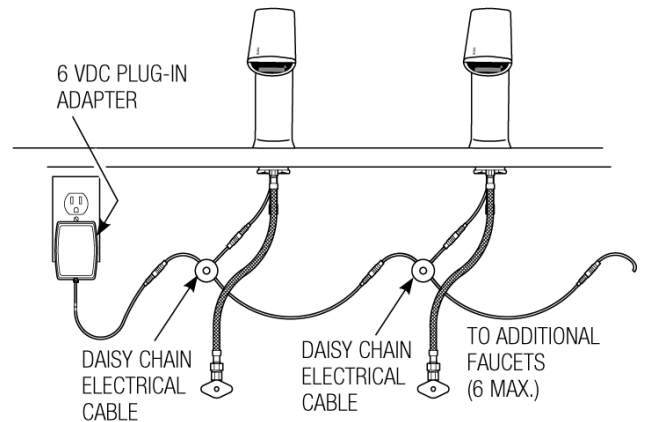


EFX-200.50X.0X1X Faucet
with Hot & Cold Water Supply



Electrical Connection for up to 6 Faucets

Can combine up to six (6) faucets using one adapter



CODE NUMBER

3346087

DESCRIPTION

Polished Chrome Finish, Sloan® Deck-Mounted Foam Soap Dispenser.

DETAILS

- Finish: Polished Chrome (CP)
- Power Type: Battery
- Height: 197/1000" (5mm)
- Width: 79/1000" (2mm)
- Depth: 41/200" (5mm)
- Sensor Type: IR

FEATURES

Sensor Activated, Electronic, Chrome Plated Die Cast Body, Hand Washing Foam Soap Dispenser with the following features:

- Modular one-piece construction easily attaches to deck surface
- All electronics in spout are sealed
- Designed for drip free foam dispensing operation
- Motor Assembly suspended under counter connected to soap dispenser spout
- Motor Assembly rotates 360 degrees for easy installation
- Battery life of 45,000 activations
- 1,500 dispenses per foam soap bottle
- Ships with 2 bottles of non-scented, non-colored foam soap (1500ml per bottle)
- Additional foam soap can be purchased through Sloan (ESD-321) or GOJO distribution (8565-02-N6300GN)
- Ships with battery pack (4 "D" Alkaline batteries included)
- Sensor range - nominal 5"
- GFI outlet suggested per code
- 120V/15 Amp
- Optional AC adaptor can be purchased separately (part number 0346090)
- Select the ESD-501 to combine ESD-500 soap dispenser, 2 bottles of soap and the EFX.250.500.0000 faucet

SOAP REFILLS

- ESD-321 (1500mL)

**COMPLIANCES & CERTIFICATIONS**

(ADA Compliant)

RECOMMENDED SPECIFICATION

Sloan Foam Soap Dispenser model number ESD-500. Chrome Plated Dispenser. Supplied with 2 bottles of 1500ml soap.

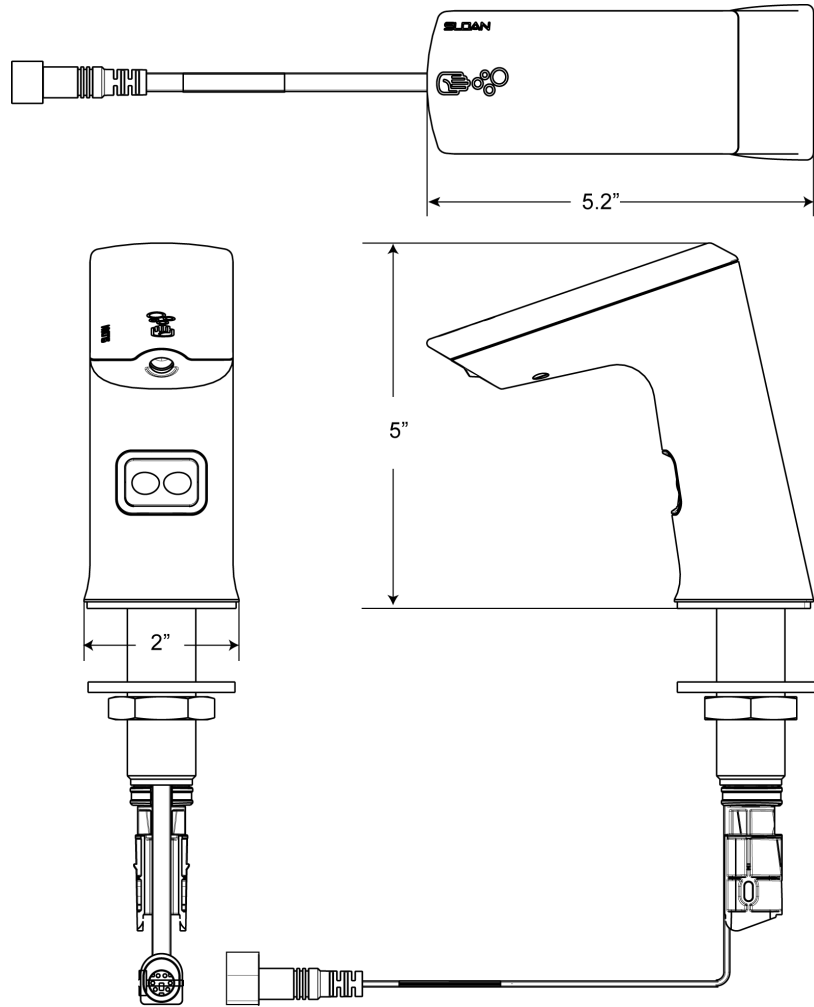
DOWNLOADS

- [ESD Series Installation Instructions](#)
- [ESD-500/600/700/800/1500/2000/2100 Repair and Maintenance Guide](#)
- [Additional Downloads](#)

NOTES

All information contained within this document subject to change without notice.

ROUGH-IN



MATCHING FAUCETS

This soap dispenser is compatible with [BASYS[®] faucets](#).

DESCRIPTION

AER-DEC® 1-Station Wall-Mounted Sink.

DETAILS

- Material: Corian/Quartz/Silestone
- Width: 30" (762mm)

FEATURES

One Station Lavatory System with the following features:

- Built in air dam technology that eliminates backsplash and updrafts
- A monolithic console available in Corian or quartz
- Basins can be sized to project requirements
- Many customization options - see architectural worksheet for all options
- Easy installation
- ADA compliant if properly installed
- Comes with deck mounted BASYS style hand dryer standard
- Pairs great with Sloan faucets and soap dispensers

COLORS

- For a complete list of Corian® colors:
<http://www.corian.com/-colors-of-corian-r->
- For a complete list of Corian® quartz colors:
<http://www.corianquartz.com/-colors-of-zodiaq-r->
- For a complete list of Silestone® quartz colors:
<http://www.silestoneusa.com/colors/>

VIDEOS

- ▶ AER-DEC Integrated Sink

**COMPLIANCES & CERTIFICATIONS**

IGC156

(ADA Compliant, cUPC Certified, BAA Compliant, IGC156)

RECOMMENDED SPECIFICATION

Sloan AER-DEC Integrated Sink System model no. AD 8X000. Product to be fabricated out of Corian or quartz. Supplied with Sloan deck mounted hand dryer EHD-510, Sloan automated sensor faucet EFX Series and Sloan sensor operated foam soap dispenser ESD-400 or ESD-500. Sink design to be ADA compliant. Supplied with enclosure.

DOWNLOADS

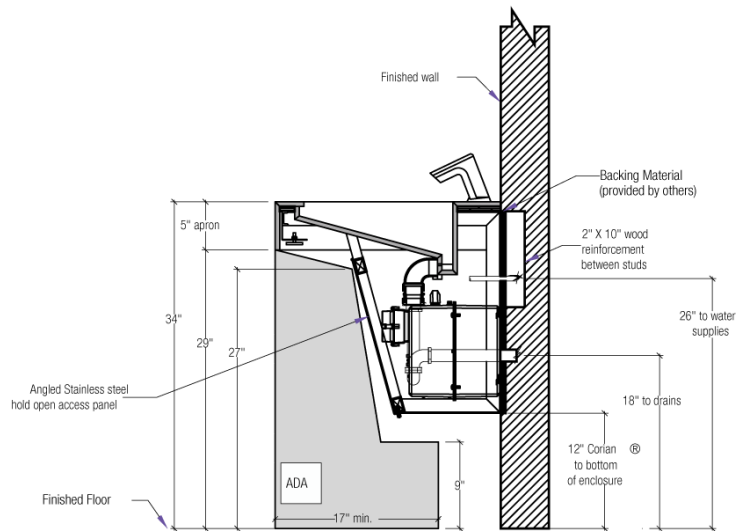
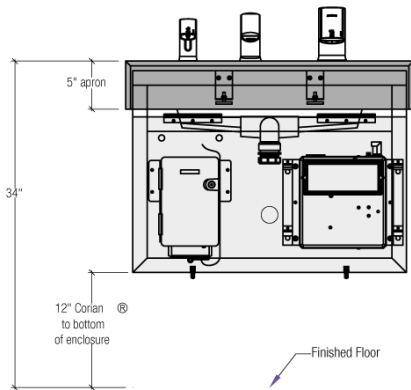
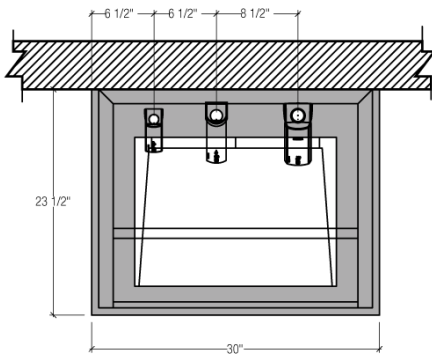
- [AER-DEC® Installation Instructions](#)
- [Hand Dryer EHD-511 Installation Instructions](#)
- [AER-DEC® 80000 Series Repair and Maintenance Guide](#)
- [Additional Downloads](#)

NOTES

All information contained within this document subject to change without notice.

Many customization options - see [architectural worksheet](#) for all options

ROUGH-IN



Sloan 10500 Seymour Ave, Franklin Park, IL 60131
Phone: 800.982.5839 • Fax: 800.447.8329 • sloan.com

INSTALLATION INSTRUCTIONS FOR COMPLETE SLOAN HAND DRYER SPOUT



EHD-511 SPOUT

LIMITED WARRANTY

Unless otherwise noted, Sloan Valve Company warrants this product, manufactured and sold for commercial or industrial uses, to be free from defects in material and workmanship for a period of three (3) years (one (1) year for special finishes, SF faucets, PWT electronics and 30 days for PWT software) from date of first purchase. During this period, Sloan Valve Company will, at its option, repair, replace, or refund the purchase price of any product which fails to conform with this warranty under normal use and service. This shall be the sole and exclusive remedy under this warranty. Products must be returned to Sloan Valve Company, at customer's cost. No claims will be allowed for labor, transportation or other costs. This warranty extends only to persons or organizations who purchase Sloan Valve Company's products directly from Sloan Valve Company for purpose of resale. This warranty does not cover the life of the batteries.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. IN NO EVENT IS SLOAN VALVE COMPANY RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY MEASURE WHATSOEVER.



IMPORTANT



Read this entire installation manual to ensure proper installation. When finished with the installation, file this manual with the owner or maintenance department. Compliance and conformity to local codes and ordinances is the responsibility of the installers.



Separate parts from packaging and make sure all parts are accounted for before discarding any packaging material. If any parts are missing, do not begin installation until you obtain the missing parts.



Turn OFF electrical power to the electrical outlets, then unplug all electrical units prior to installation. Electrical power **MUST** remain off until installation is complete.



Wear all proper safety equipment prior to installation.

TOOLS REQUIRED FOR INSTALLATION

- Slotted screwdriver
- Wire stripper/crimping tool

PRIOR TO INSTALLATION

Prior to installing the Hand Dryer spout install the items listed below.

IMPORTANT:

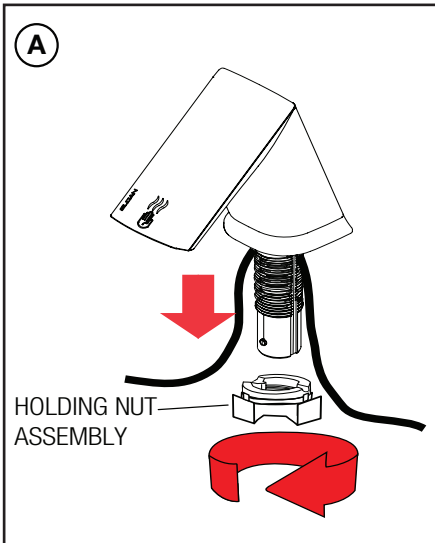
- **INSTALL ALL ELECTRICAL WIRING IN ACCORDANCE WITH NATIONAL/LOCAL CODES AND REGULATIONS.**
- **INSTALL ALL PLUMBING IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.**
- **A 24 VAC STEP-DOWN TRANSFORMER MUST BE USED.**
- **USE APPROPRIATE PRECAUTIONS WHILE CONNECTING THE POWER SOURCE.**

!!! IMPORTANT !!!

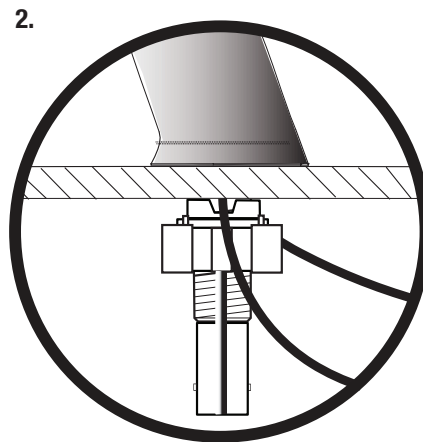
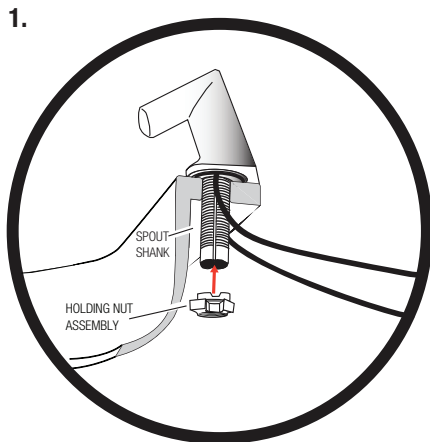
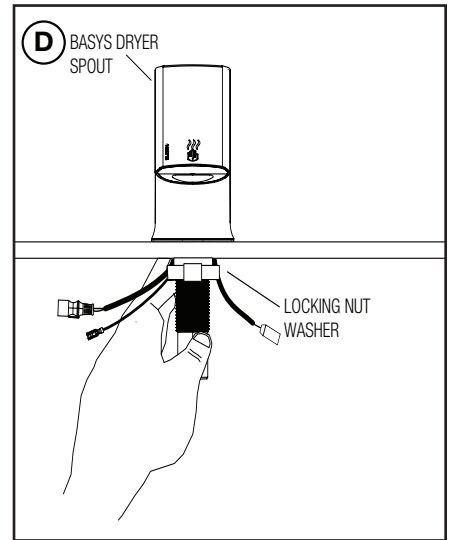
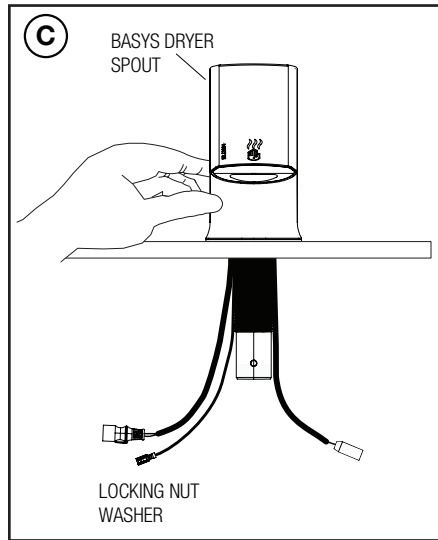
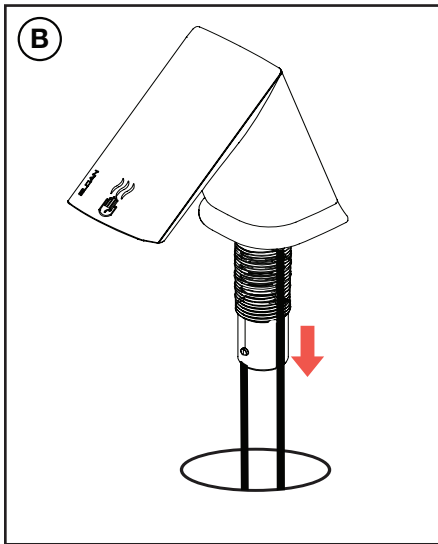
THIS PRODUCT CONTAINS MECHANICAL AND/OR ELECTRICAL COMPONENTS THAT ARE SUBJECT TO NORMAL WEAR. THESE COMPONENTS SHOULD BE CHECKED ON A REGULAR BASIS AND REPLACED AS NEEDED TO MAINTAIN THE VALVES PERFORMANCE.

If you have questions about how to install your hand dryer, consult your local Sloan Representative or call Sloan Technical Support at:
1-888-SLOAN-14 (1-888-756-2614)

1 - INSTALL SPOUT

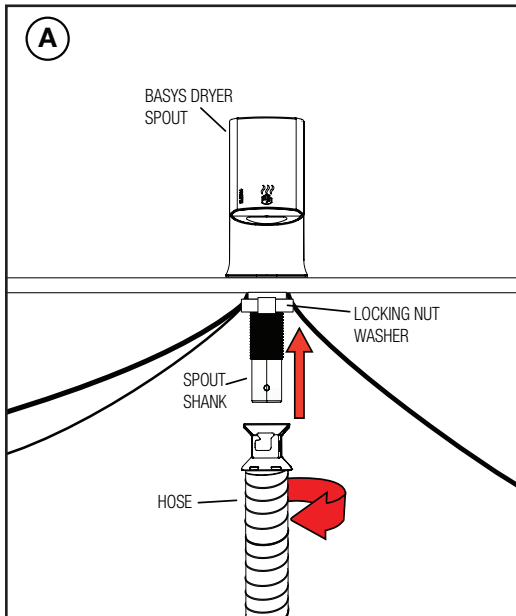


- A** Remove holding nut assembly from the spout shank. Unscrew counterclockwise.
- B** Ensure the wires are located inside corresponding slots on the sides of the spout shank. Insert spout shank into the deck hole.
- C** Holding the spout down on the sink deck, Spread wires away from spout shank, align wires into grooves on locking nut washer **(1)**. Turn the locking nut until it makes contact with the wires. Align spread wires in corresponding relief grooves on top of the locking nut washer.
- D** **(2)** Spread the wires horizontally. Turn the locking nut until snug making sure the wires are in the corresponding wire relief grooves on the locking nut washer. Align the spout as desired and tighten the locking nut until the spout is firmly locked into place.

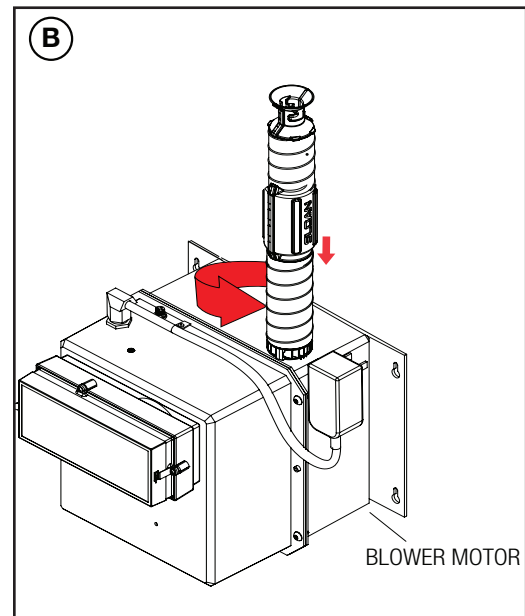


2 - CONNECT HOSE

- A** Align slots in flared connector end of hose with shank guides. Slide over the spout shank until it stops. Rotate the flared connector clockwise until it locks into place (will feel it snap into place).

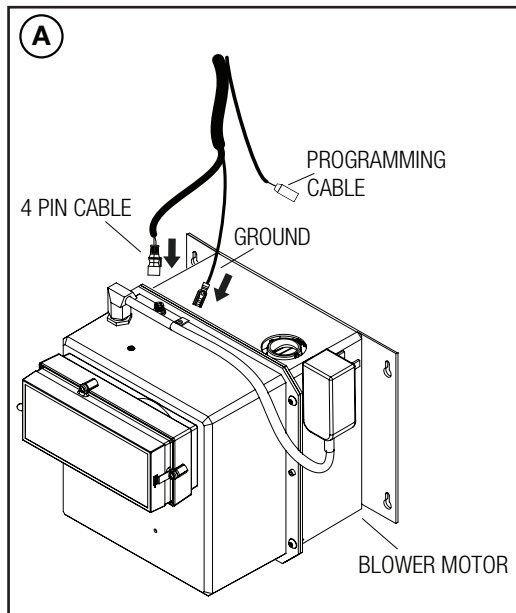


- B** Align slots of round squared connector end of hose to opening guides on hand dryer motor into the opening until it stops, rotate the connector counterclockwise until it locks into place.

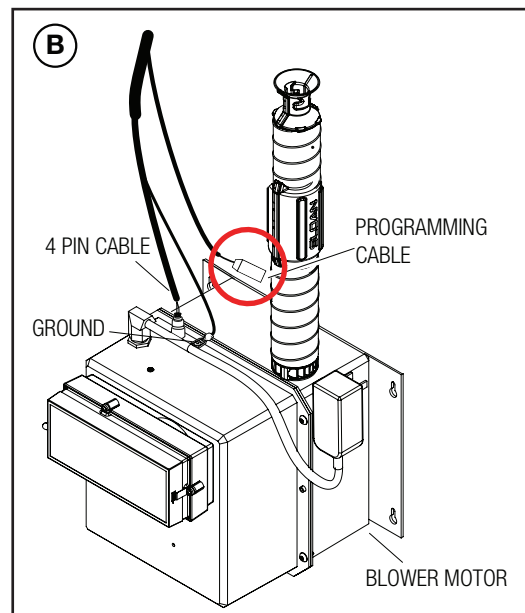


3- CONNECT WIRES

- A** Plug the four (4) pin cable from the spout into the Four (4) pin socket on the Hand Dryer Motor. Plug the ground cable into the ground tab on the Blower Motor.



- B** Leave the Programming Cable unattached. Do not remove or cut-off cable. Cord can be bundled.



CARE AND CLEANING

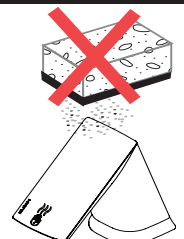
Important:

DISCONNECT ELECTRICAL SUPPLY TO DRYER PRIOR TO SERVICING.


Gently wash spout using a soft cloth or sponge and a mild soap or detergent with lukewarm water to loosen dirt and grime.

CLEANING SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL

With normal use, dryer will require cleaning once a year. Heavier usage requires more frequent cleaning. Use a small, soft brush to gently clean all parts.

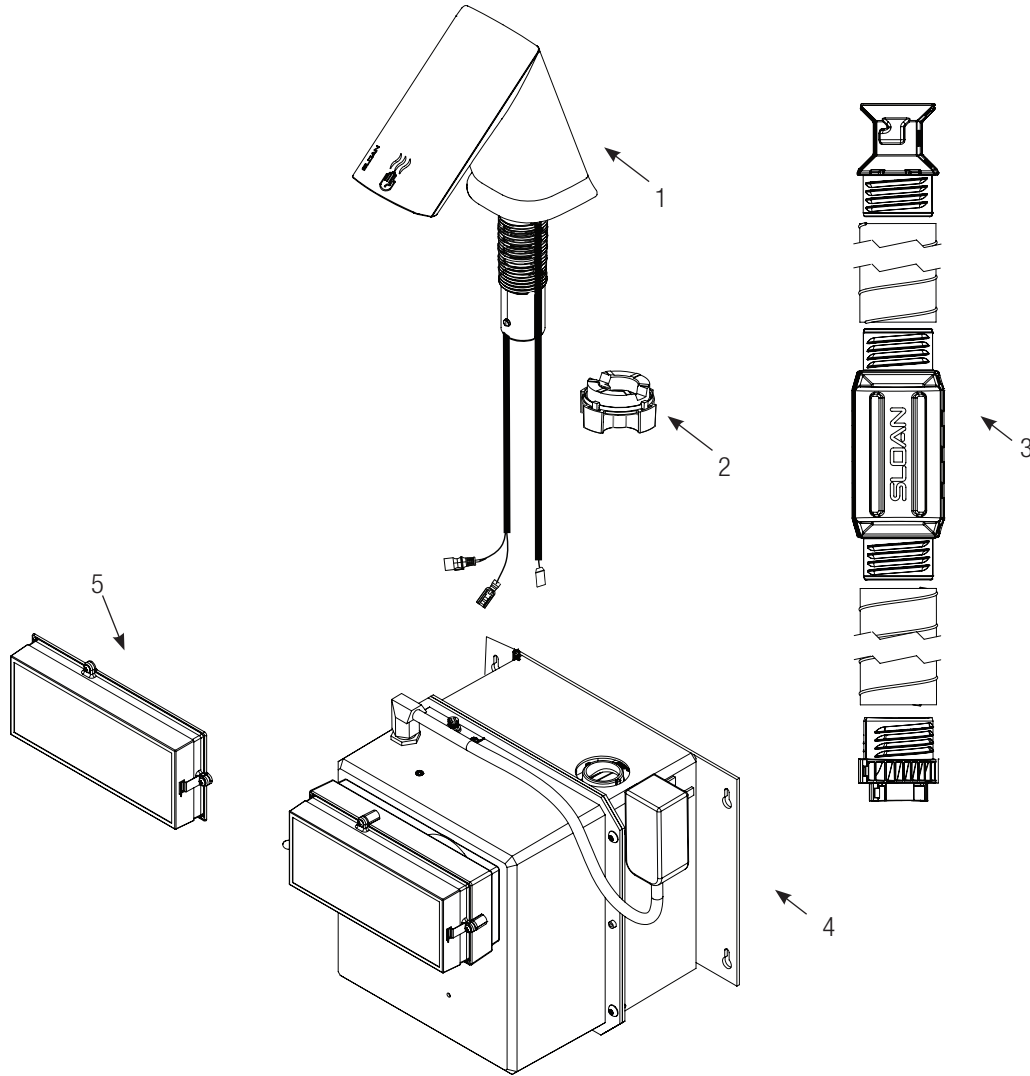


ERROR CODES AND SOLUTIONS

DRYER STATE	ERROR MESSAGE	1st FLASH	2nd FLASH	DRYER OPERATION	POSSIBLE SOLUTION
OFF	No error or condition, user absent	No flash, steady OFF (at dryer box) and No flash, steady ON (at spout)	–	Dryer ready for operation	 <p>Normal</p>
ON	No error or condition, user presenting hands	No flash, steady OFF (at dryer box) and No flash, steady ON (at spout)	–	Dryer running	Dryer running while hands are under unit. Normal
ON	Time to clean prefilter or change HEPA Filter	1 Short	1 long	Dryer still runs	Check and clean prefilter. Code should reset after repowering unit. If code reappears then HEPA filter may need replacing.
OFF	Motor over current severe	1 long	3 short	dryer stops running until power is removed, fault has been repaired and power reapplied	Motor is drawing much more current than normal. Motor could be failing. Replace motor. Call Sloan Tech Support 1-888-756-2614.
OFF	Motor quick over current	1 long	3 short	dryer stops running until power is removed, fault has been repaired and power reapplied	Motor drew a quick over current than normal. Could have been caused by a quick over voltage condition or something blocking motor. Motor could be failing. Replace motor. Call Sloan Tech Support 1-888-756-2614.
ON	Heater open condition	2 long	4 short	Dryer still runs. Code clears when power is removed and fault is repaired.	Heating element had opened during operation (thermostat tripped). check for clogged filter, blocked or kinked hose and blocked muffler. If problem persists heating element may be broken or disconnected. Replace or reconnect. Call Sloan Tech Support 1-888-756-2614.
ON	Notification of recent mains over voltage	3 long	1 short	Dryer still runs	Dryer had a spike of higher voltage than normal. Code is for information purposes. Code will clear if unit power is removed and reapplied.
ON	Notification of recent mains under voltage	3 long	2 short	Dryer still runs	Dryer had a spike of lower voltage than normal. Code is for information purposes. Code will clear if unit power is removed and reapplied.
Off	Mains over voltage in progress	3 long	3 short	Dryer stops running until mains voltage returns to a safe level. When safe level returns, dryer runs. The code changes to notification of recent mains over voltage.	Dryer has unsafe voltage applied. Check voltage source. Code will reset when voltage is back to normal.
OFF	Mains under voltage in progress	3 long	4 short	Dryer stops running until mains voltage returns to a safe level. When safe level returns, dryer runs. The code changes to notification of recent mains under voltage.	Dryer has unsafe voltage applied. Check voltage source. Code will reset when voltage is back to normal.
OFF	Control Temperature over temp severe	4 long	3 short	Dryer stops running until power is removed, fault has been repaired and power reapplied.	Dryer control is running very hot. Filter clog may have been disregarded. Check filter and reapply power. If continues Call Sloan Tech Support 1-888-756-2614.

PARTS LIST

Item	Code No.	Part No.	Description
1.	0366050	EHD-511A	BASYS Style Dryer Spout Repair Kit
2.	0366015	EHD-515A	Holding Nut Assembly Repair Kit
3.	0366008	EHD-512A	Hose and Muffler Repair Kit
4.	0366009	EHD-513A	Motor Assembly 110/120V w/HEPA Filter
5.	0366014	EHD-514A	HEPA Filter Repair Kit (filter with screen)



If further assistance is required, please contact Sloan Technical Support at: 1-888-SLOAN-14 or visit us online at: www.sloanvalve.com

The information contained in this document is subject to change without notice.

SLOAN • 10500 SEYMOUR AVENUE • FRANKLIN PARK, IL 60131

Phone: 1-888-SLOAN-14 (1-888-756-2614) • Fax: 1-800-447-8329 • www.sloanvalve.com

CODE NUMBER

3324463

DESCRIPTION

Hardwired Less Plug Power Supply, Below Deck Thermostatic Mixing Valve, Polished Chrome Finish, 0.5 gpm, Multi-Laminar Spray, Infrared Sensor, BASYS® Hardwired-Powered Deck-Mounted Mid Body Faucet.

DETAILS

- Flow Rate: 0.5 gpm (2 Lpm) (0.5GPM)
- Spray Type: Multi-Laminar (MLM)
- Sensor Type: Infrared (IR)
- Mounting Type: Single Hole
- Power Supply: Hardwired Less Plug (HLP)
- Temperature Mixer: Below Deck Thermostatic Mixing Valve (BDT)
- Finish: Polished Chrome (CP)
- Factory Default Timeout: 10s
- Factory Default GPC: 0.083

FEATURES

Commercial Grade, ADA Compliant, Electronic, Sensor-Activated, Die-Cast Metal Hand Washing Faucet with the following features:

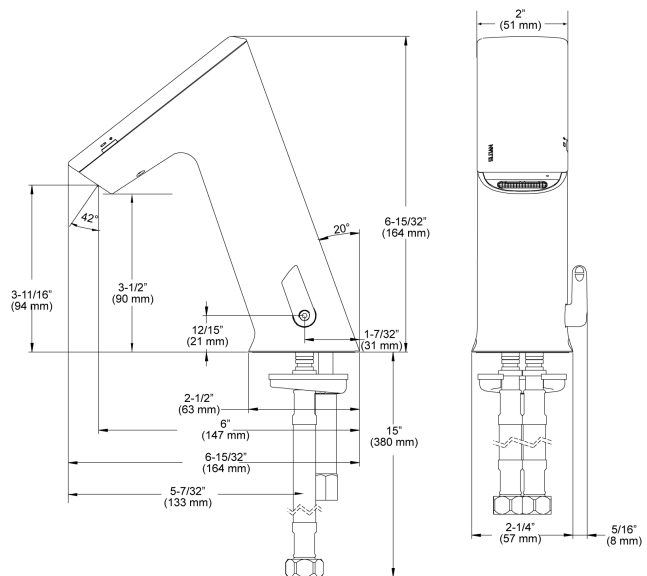
- One tool service
- All wetted components to be stainless steel, engineered thermoplastic, EPDM, and copper or copper alloy
- Solenoid housed in removable carrier that includes supply strainer
- Integral water supply shut off
- Supply strainer serviceable from above deck
- Vandal resistant spray insert, key housed inside faucet body
- All electronics sealed to IP-136
- Gold plated electrical contacts
- Above deck individual diagnostic indicators for battery life, solenoid condition, and power up mode
- Flexible, high pressure supply hoses, 3/8" compression connections
- Bi-stable magnetic solenoid
- Four (4) "AA" alkaline batteries as backup
- Double infrared sensors with automatic setting feature Includes all mounting hardware
- Line purge mode, eliminates stagnant water
- Adjustable time-outs
- Standard Bowed Crown

ELECTRICAL SPECIFICATIONS

- Timeout Adjustment Settings: 10s

VIDEOS

- ▶ BASYS® Faucet Installation and Features
- ▶ BASYS® Faucet Installation Mid Height Model



COMPLIANCES & CERTIFICATIONS



(ADA Compliant, ASME A112.18.1 Compliant, CalGreen Compliant, CEC Compliant, cUPC Certified, cUPC Low Lead Compliant, GPC 0.25 or less, NYC604.4, Proposition 65, Satisfies LEED Credits, TAS, UPC Certified, UPC Low Lead Compliant)

RECOMMENDED SPECIFICATION

Sloan BASYS Model No. EFX-200-HLP-BDT-CP-0.5GPM-MLM-IR-FCT Infrared Sensor Activated Electronic Handwashing Faucet for pretempered or hot/cold water supplies. Product to have double infrared sensors with automatic setting feature. Solenoid valve housed in removable carrier that closes water supply upon removal eliminating, need to access control stops.

Sloan 10500 Seymour Ave, Franklin Park, IL 60131
 Phone: 800.982.5839 • Fax: 800.447.8329 • sloan.com

DOWNLOADS

- [EFX 1Xx/2Xx Installation Instructions](#)
- [EFX 1Xx/2Xx \(SP\) Installation Instructions](#)
- [EFX 1Xx/2Xx Caddy Replacement Installation Instructions](#)
- [Trim Plates Repair and Maintenance Guide](#)
- [IR FAQs Repair and Maintenance Guide](#)
- [IR FAQs SP Repair and Maintenance Guide](#)
- [EFX-2XX Repair and Maintenance Guide](#)
- [Additional Downloads](#)

Solenoid carrier includes strainer for easy above deck service. Thermostatic mixer ordered separately to comply with ASSE 1070 requirements. The product shall be tested and certified to industry standards: ASME A112.18.1M, CSA B125.1, California Health and Safety Code 116875

NOTES

All information contained within this document subject to change without notice.

Looking for other variations of the EFX-200 product? [View the general spec sheet with all options.](#)

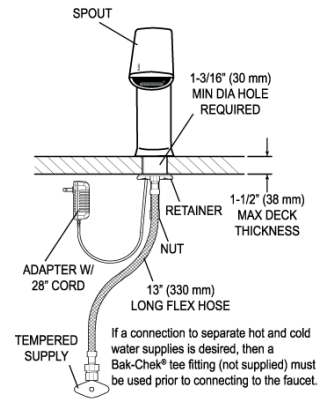
[Find a matching soap dispenser](#) for this faucet.
[Find a compatible sink](#) for this faucet.

WARRANTY

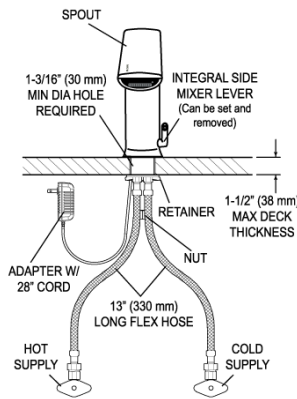
3 Year

ROUGH-IN

EFX-200.00X.0X1X Faucet
with Single Line Water Supply

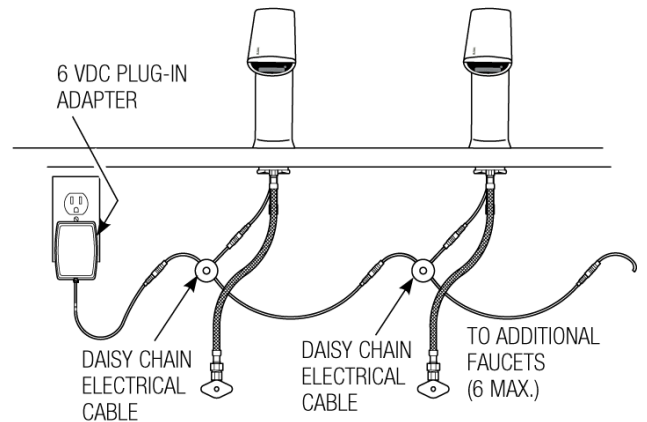


EFX-200.50X.0X1X Faucet
with Hot & Cold Water Supply



Electrical Connection for up to 6 Faucets

Can combine up to six (6) faucets using one adapter



CODE NUMBER

3346087

DESCRIPTION

Polished Chrome Finish, Sloan® Deck-Mounted Foam Soap Dispenser.

DETAILS

- Finish: Polished Chrome (CP)
- Power Type: Battery
- Height: 197/1000" (5mm)
- Width: 79/1000" (2mm)
- Depth: 41/200" (5mm)
- Sensor Type: IR

FEATURES

Sensor Activated, Electronic, Chrome Plated Die Cast Body, Hand Washing Foam Soap Dispenser with the following features:

- Modular one-piece construction easily attaches to deck surface
- All electronics in spout are sealed
- Designed for drip free foam dispensing operation
- Motor Assembly suspended under counter connected to soap dispenser spout
- Motor Assembly rotates 360 degrees for easy installation
- Battery life of 45,000 activations
- 1,500 dispenses per foam soap bottle
- Ships with 2 bottles of non-scented, non-colored foam soap (1500ml per bottle)
- Additional foam soap can be purchased through Sloan (ESD-321) or GOJO distribution (8565-02-N6300GN)
- Ships with battery pack (4 "D" Alkaline batteries included)
- Sensor range - nominal 5"
- GFI outlet suggested per code
- 120V/15 Amp
- Optional AC adaptor can be purchased separately (part number 0346090)
- Select the ESD-501 to combine ESD-500 soap dispenser, 2 bottles of soap and the EFX.250.500.0000 faucet

SOAP REFILLS

- ESD-321 (1500mL)

**COMPLIANCES & CERTIFICATIONS**

(ADA Compliant)

RECOMMENDED SPECIFICATION

Sloan Foam Soap Dispenser model number ESD-500. Chrome Plated Dispenser. Supplied with 2 bottles of 1500ml soap.

DOWNLOADS

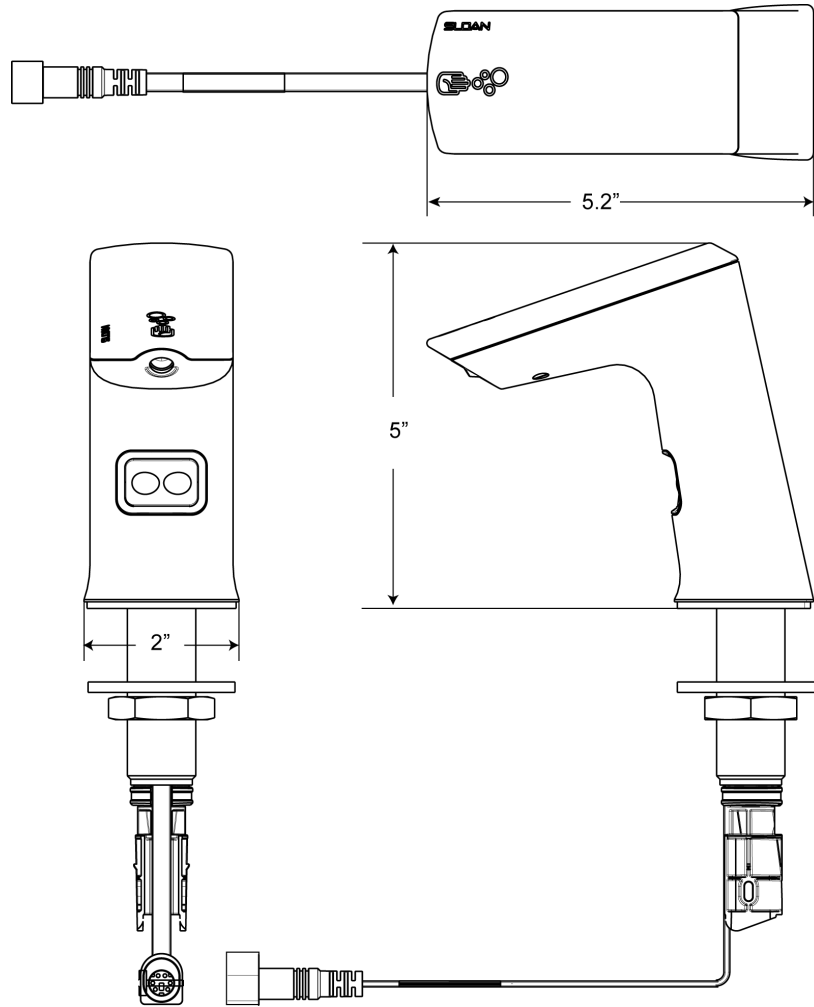
- [ESD Series Installation Instructions](#)
- [ESD-500/600/700/800/1500/2000/2100 Repair and Maintenance Guide](#)
- [Additional Downloads](#)

NOTES

All information contained within this document subject to change without notice.



ROUGH-IN



MATCHING FAUCETS

This soap dispenser is compatible with [BASYS® faucets](#).

**TERRAZZO
12" MOP SERVICE BASIN**

- One piece, precast terrazzo made of black and white marble chips in gray portland cement to produce a compressive strength not less than 3000 P.S.I. seven days after casting.
- Terrazzo surface shall be ground and polished with all air holes or pits grouted and excess removed.
- Shoulders shall be not less than 12" high outside and 10" inside at lowest wall. Shoulder width not less than 2" on all sides with a 1/4" pitch towards the inside.
- Standard drain body is stainless steel cast integrally and provides for a caulked lead connection not less than 1" deep to a 3" pipe.
- Stainless steel strainer # 1453BB

Options

- QDC quick drain connectors
- Integral galvanized tiling flanges available at no additional charge.
- Stainless steel tiling flanges available with up-charge. Must be custom order.
- Chrome plated brass drain or Vandal proof drain. Must be custom order.

- TSB100, TSB300, TSB500, TSB700 Series** with stainless steel caps on all curbs
- TSB200, TSB400, TSB600, TSB800 Series** with plain curbs
- TSBC6000, TSBC6001, TSBC6002 Neo-corner Series** with plain curbs
- TSBC6010, TSBC6011, TSBC6012 Neo-corner Series** with stainless steel caps on all curbs

Optional Components:

- 830AA** Mop Service Basin Fitting
- 832AA** Hose & Hose Bracket
- 1239BB** Aluminum Bumperguard with Vinyl Insert
- 833AA** Silicone Sealant
- MSG** Wall Guards - Stainless Steel
 - Wall Guards are manufactured of heavy gauge stainless steel and help protect walls adjacent to Mop Basin. Two panels are required for corner installations. Optional third panel is required for a recessed installation. (MSG2424; MSG2828; MSG3232; MSG3624; MSG3636)

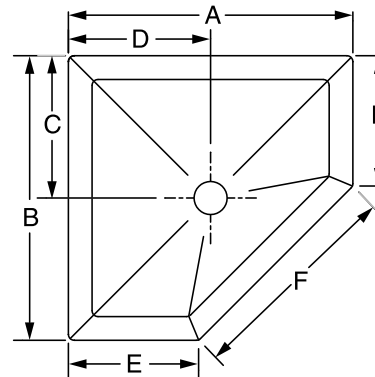
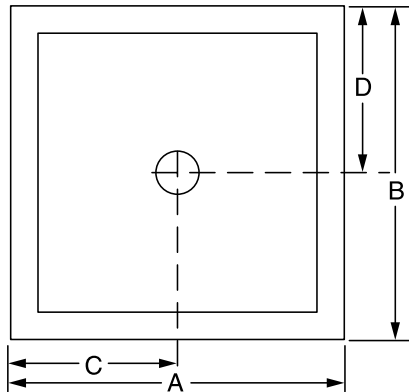


Shown: TSB500

SEE REVERSE FOR ROUGHING-IN DIMENSIONS

NOTES: Terrazzo Mop Basins **must** be installed on a 1/2" layer of mortar in order that the mop basin be level and to prevent cracking. Failure to install terrazzo without a mortar bed will void the warranty. Installations require a 1/4" clearance between mop basin and wall.

CERTIFICATIONS:

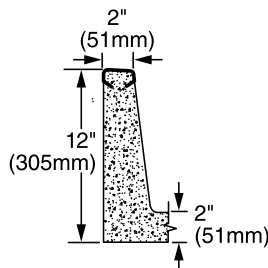


Series TSB100
With Stainless Steel Caps On All Curbs

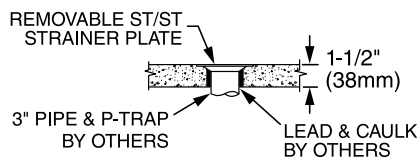
MODEL	SIZE	A	B	C	D
TSB100	24" x 24" x 12"	24	24	12	12
TSB300	32" x 32" x 12"	32	32	16	16
TSB500	36" x 36" x 12"	36	36	18	18
TSB700	36" x 24" x 12"	36	24	18	12

Series TSBC6010
With Stainless Steel Caps On All Curbs

MODEL	SIZE	A	B	C	D	E	F
TSBC6010	24" x 24" x 12"	24	24	12	12	11	18-1/4
TSBC6011	32" x 32" x 12"	32	32	12	12	14	25-3/8
TSBC6012	36" x 36" x 12"	36	36	12	12	18	25-3/8



ST/ST CAP DETAIL



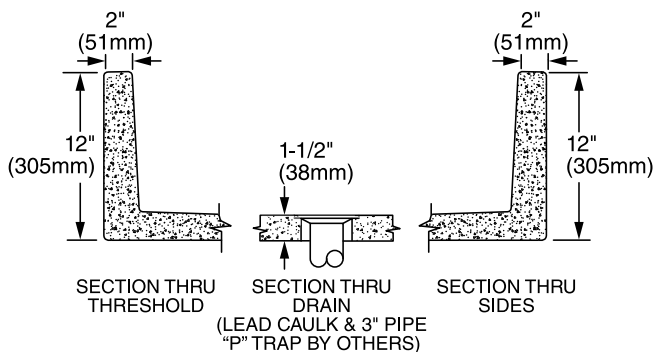
SECTION THRU DRAIN

Series TSB200
With Plain Curbs

MODEL	SIZE	A	B	C	D
TSB200	24" x 24" x 12"	24	24	12	12
TSB400	32" x 32" x 12"	32	32	16	16
TSB600	36" x 36" x 12"	36	36	18	18
TSB800	36" x 24" x 12"	36	24	18	12

Series TSBC6000
With Plain Curbs

MODEL	SIZE	A	B	C	D	E	F
TSB6000	24" x 24" x 12"	24	24	12	12	11	18-1/4
TSB6001	32" x 32" x 12"	32	32	12	12	14	25-3/8
TSB6002	36" x 36" x 12"	36	36	12	12	18	25-3/8

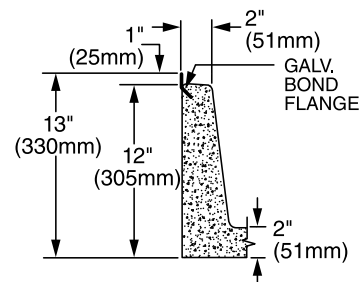


SECTION THRU THRESHOLD

SECTION THRU DRAIN

SECTION THRU SIDES

(LEAD CAULK & 3" PIPE "P" TRAP BY OTHERS)



OPTIONAL GALV. TILING FLANGE

IMPORTANT: Roughing in dimensions may vary 1/2" and are subject to change or cancellation without prior notice.



Option -KFC



Utility Faucet w/Chrome Finish (H&C)-

This mop sink option provides a two handle, 8" centerset, wall mounted, utility faucet. Faucet features brass construction with rough chrome finish, pail hook with 9-1/4" reach, wall brace, vacuum breaker, threaded spout & 1/2" NPTF supply inlets.

Please visit www.acorneng.com for most current specifications.

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov



PRODUCT SPECIFICATIONS

Elkay ezH2O[®] Bottle Filling Station, & Bi-Level High Efficiency Vandal-Resistant Cooler, Filtered Refrigerated Stainless. Chilling Capacity of 8.0 GPH (gallons per hour) of 50° F drinking water, based on 80° F inlet water and 90° F ambient, per ASHRAE 18 testing. Features shall include Antimicrobial, Filtered, Green Ticker™, Hands Free, High Efficiency, Laminar Flow, Real Drain, Vandal Resistant, Visual Filter Monitor. Furnished with Vandal Resistant StreamSaver™ bubbler. Electronic Bottle Filler Sensor with Mechanical Front Bubbler Button activation. Product shall be Wall Mount (On Wall), for Indoor applications, serving 2 station(s). Unit shall be certified to UL 399 and CAN/CSA C22.2 No. 120. Unit shall be lead-free design which is certified to NSF/ANSI 61 & 372 (lead free) and meets Federal and State low-lead requirements.



Special Features:	Antimicrobial, Filtered, Green Ticker™, Hands Free, High Efficiency, Laminar Flow, Real Drain, Vandal Resistant, Visual Filter Monitor
Finish:	Stainless Steel
Power:	115V/60Hz
Bubbler Style:	Vandal Resistant StreamSaver™
Activation by:	Electronic Bottle Filler Sensor with Mechanical Front Bubbler Button
Mounting Type:	Wall Mount (On Wall)
Chilling Capacity*:	8.0 GPH
Full Load Amps	1
Rated Watts:	260
Dimensions (L x W x H):	36-1/8" x 18-5/8" x 46-1/4"
Approx. Shipping Weight:	115 lbs.
Installation Location:	Indoor
No. of Stations Served:	2

*Based on 80° F inlet water & 90° F ambient air temp for 50° F chilled drinking water.

- Mechanically-Activated bubbler continues to supply water in event of service disruptions.
- Visual Filter Monitor: LED Filter Status Indicator for when filter change is necessary.
- Filter is certified to NSF 42 and 53 for lead, particulate, chlorine, taste and odor reduction. 3,000 gal. capacity.
- High-performance compressor and insulation greatly reduce energy consumption.
- Green Ticker: Informs user of number of 20 oz. plastic water bottles saved from waste.
- Laminar flow provides clean fill with minimal splash.
- Silver Ion Antimicrobial protection on key plastic components to inhibit the growth of mold and mildew.
- Real Drain System eliminates standing water.

PART: _____ QTY: _____

PROJECT: _____

CONTACT: _____

DATE: _____

NOTES: _____

APPROVAL: _____

Included with Product: Water Cooler (LVRCGRNTL8WSC), Bottle Filler (LZWSR), Filter

▼ Ships in multiple boxes.

AMERICAN PRIDE. A LIFETIME TRADITION. Like your family, the Elkay family has values and traditions that endure. For almost a century, Elkay has been a family-owned and operated company, providing thousands of jobs that support our families and communities.



PRODUCT COMPLIANCE

- ADA & ICC A117.1
- ASME A112.19.3/CSA B45.4
- Buy American Act
- CAN/CSA C22.2 No. 120
- GreenSpec[®]
- NSF/ANSI 42, 53, 61, & 372 (lead free)
- UL 399



Complies with ADA & ICC A117.1 accessibility requirements when installed according to the requirements outlined in these standards. Installation may require additional components and/or construction features to be fully compliant. Consult the local Authority Having Jurisdiction if necessary.

[Installation Instructions \(PDF\)](#)

5 Year Limited Warranty on the refrigeration system of the unit. Electrical components and water system are warranted for 12 months from date of installation. **Warranty pertains to drinking water applications only. Non-drinking water applications are not covered under warranty.**

[Warranty \(PDF\)](#)

COOLING SYSTEM

- Compressor: Hermetically-sealed, reciprocating type, single phase. Sealed-in lifetime lubrication.
- Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated.
- Cooling Unit: Combination tube-tank type. Continuous copper tubing with is fully insulated with EPS foam that meets UL requirements for self-extinguishing material.
- Refrigerant Control: Refrigerant HFC-134a is controlled by accurately calibrated capillary tube for positively trouble-free operation.
- Temperature Control: Easily accessible enclosed adjustable thermostat is factory preset. Requires no adjustment other than for altitude requirements.

Optional Accessories		
51300C	Elkay WaterSentry Plus Replacement Filter (Bottle Fillers) Spec Sheet (PDF)	
98324C	Accessory - Cane Apron for HAC, HVR, EMABF & VRC Models (Stainless) Spec Sheet (PDF)	
36292C	Accessory - Power Block for Multistation Bottle Filling Stations Spec Sheet (PDF)	
WSF6000R-2PK	WaterSentry Fresh 6000 CTO Replacement Filter (2pack) Spec Sheet (PDF)	

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

IMPORTANT! INSTALLER PLEASE NOTE :

This water cooler has been designed and built to provide water to the user which has not been altered by materials in the cooler waterways. The grounding of electrical equipment such as telephone, computer, etc. to water lines is a common procedure. The grounding may be in the building but may also occur away from the building. This grounding can cause electrical feedback into a water cooler creating an electrolysis which creates a metallic taste or causes an increase in the metal content of the water. This condition is avoidable by installing the cooler using the proper materials as shown below.

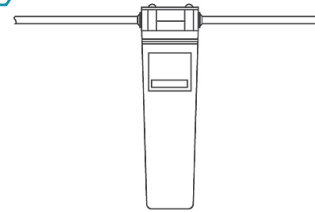
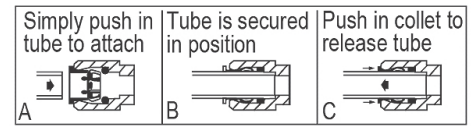
NOTICE

This water cooler must be connected to the water supply using a dielectric coupling. The cooler is furnished with a non-metallic strainer which meets this requirement. The drain trap which is provided by the installer should also be plastic to completely isolate the cooler from the building plumbing system.

Bottle filler unit on bracket attached to wall by 6 holes (as shown). Water and electrical will connect through pre-punched hole in basin.

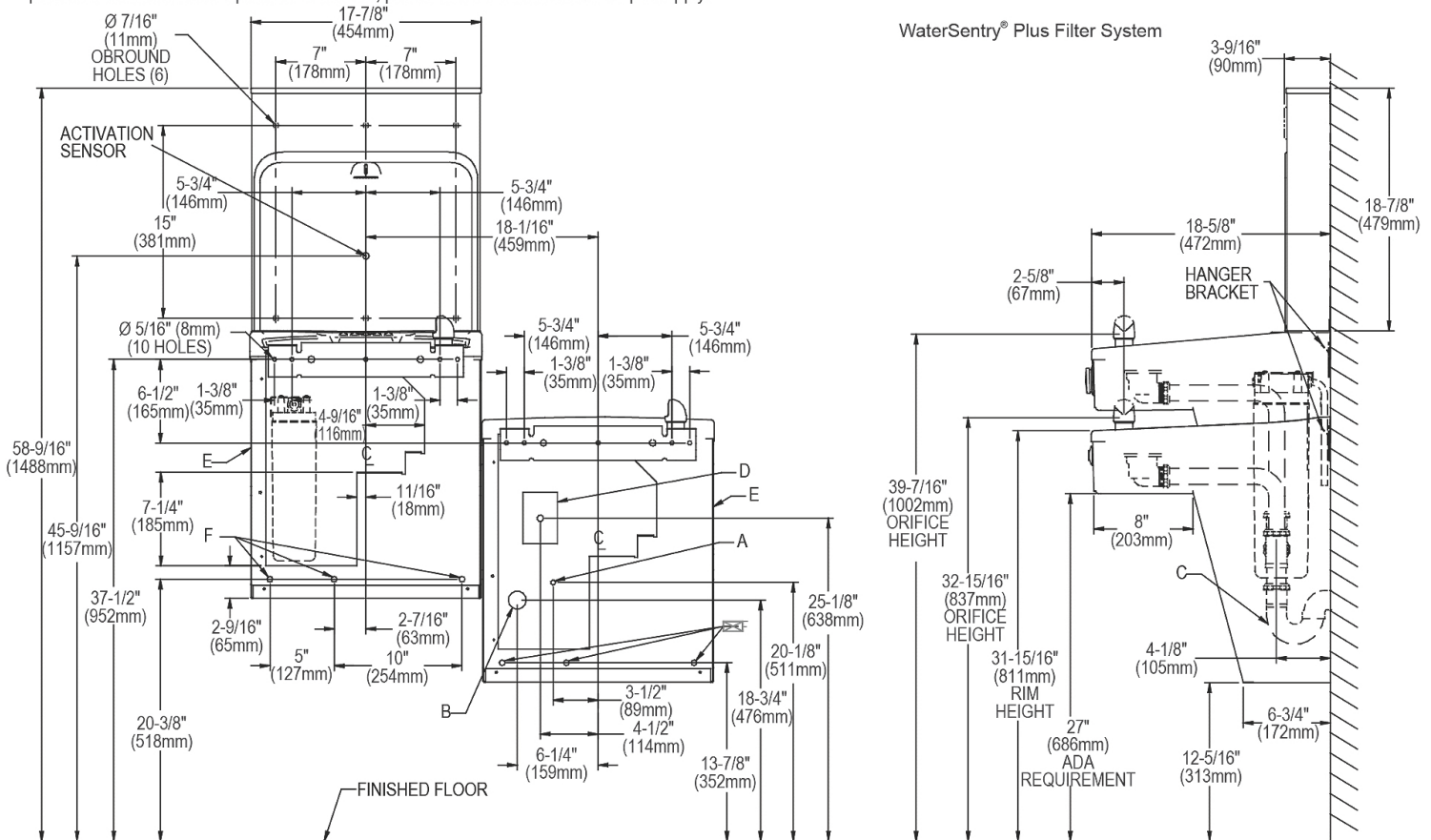
These products are designed to operate on 20 psi to 105 psi supply line pressure. Simultaneous operation of both bubblers on a bi-level unit may not be possible depending on water supply pressure. If simultaneous operation is desired, please ensure a minimum of 50 psi supply.

OPERATION OF QUICK CONNECT FITTINGS



Pushing tube in before pulling it out helps to release tube

WaterSentry[®] Plus Filter System



LEGEND: REDUCE HEIGHT BY 3 INCHES FOR INSTALLATION OF CHILDRENS ADA COOLER

- A = Recommended Water Supply location. Shut-off Valve (not furnished) to accept 3/8" O.D. unplated copper tube. Up to 3" (76mm) maximum out from wall.
- B = Recommended Waste Outlet location. To accommodate 1-1/2" nominal drain. Drain stub 2" (51mm) out from wall.
- C = 1-1/2" Trap (not furnished).
- D = Electrical Supply (3) Wire Recessed Box Duplex Outlet.
- E = Insure proper ventilation by maintaining 6" (152mm) minimum clearance from cabinet louvers to wall.
- F = 7/16" (11mm) Bolt Holes for fastening to wall.

Note : New Installations Must Use Ground Fault Circuit Interrupter (GFCI). It is highly recommended that the circuit be dedicated and the load protection be sized for 20 amps.

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

ELKAY®



www.GreenSpec.com

INSTALLATION & USE MANUAL

Manual de instalación y uso

Manuel d'installation et d'utilisation

EZH2O® Bottle Filling Station and Cooler

Estación de llenado de botella EZH2O® y enfriador

Station de remplissage de bouteille EZH2O® et refroidisseur



Note: Danger! Electric shock hazard. Disconnect power before servicing unit.
Nota: peligro! Peligro de descarga eléctrica. Desconecte antes de reparar la unidad.
Remarque : Danger ! Risque d'électrocution. Débrancher avant de réparer l'appareil.

Pictured is unit only without bottle filler.

Uses HFC-134A refrigerant
 Usa refrigerante HFC-134A
 Utilise du fluide frigorigène HFC-134A

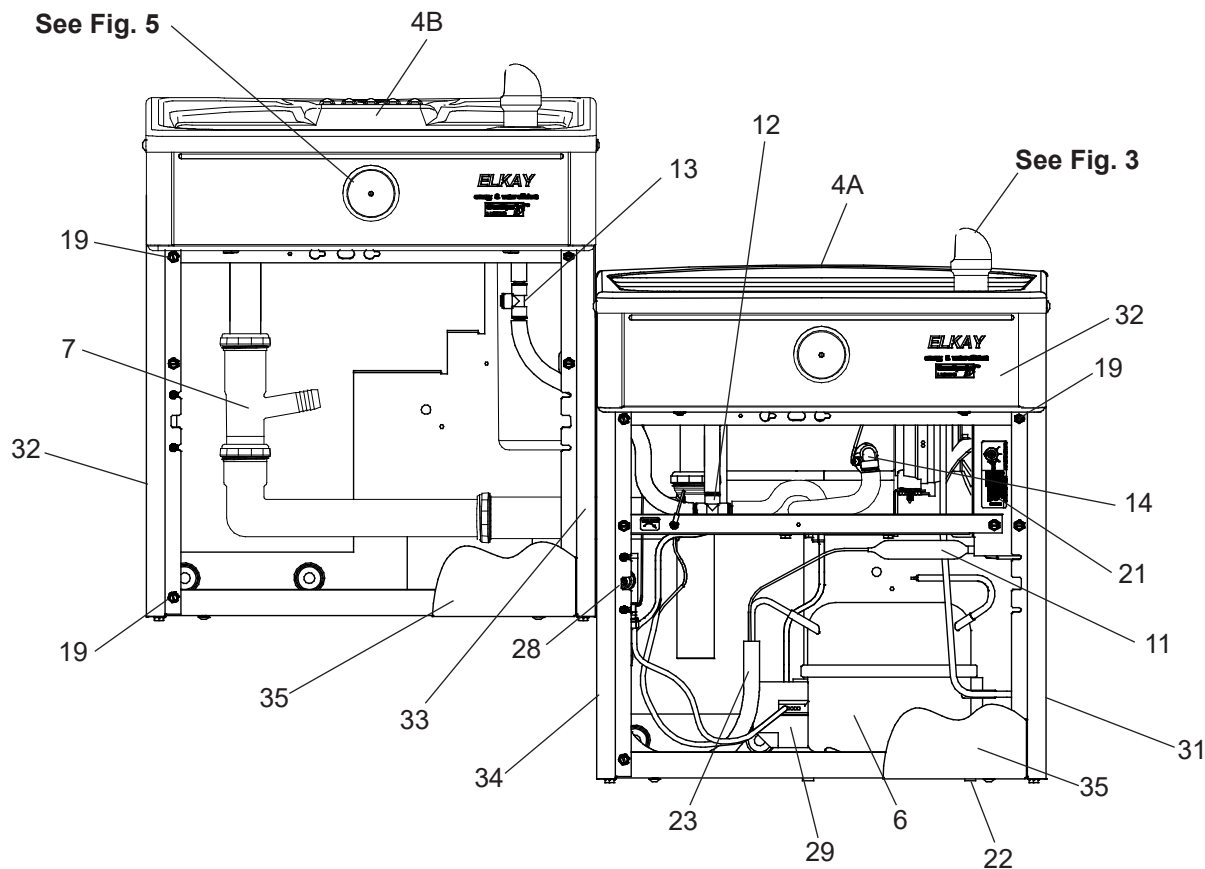
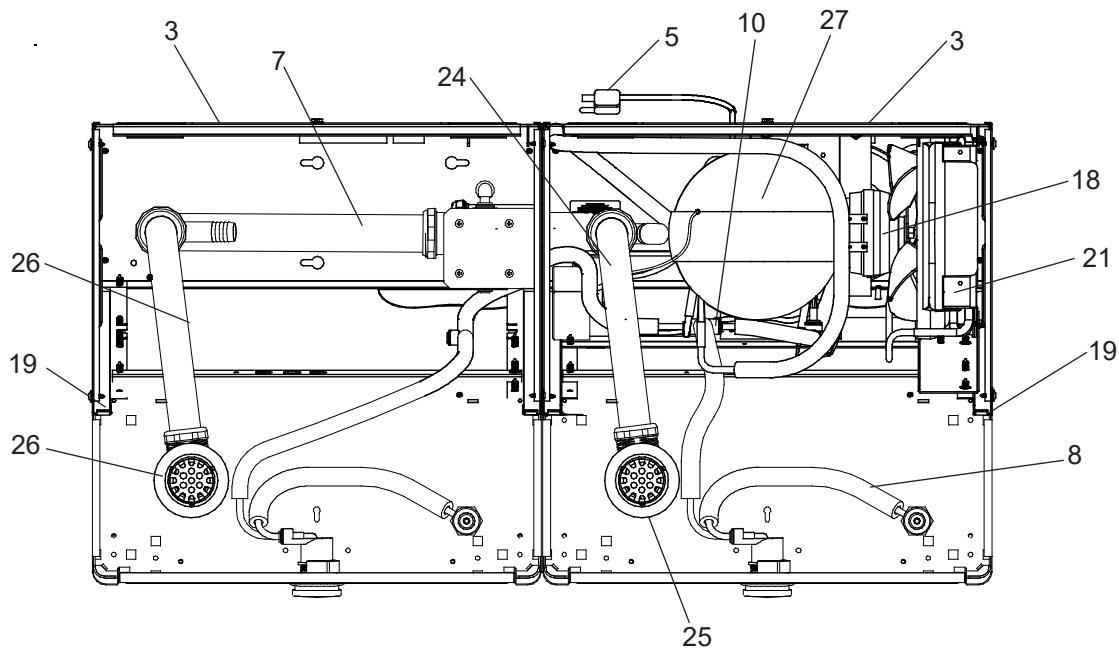
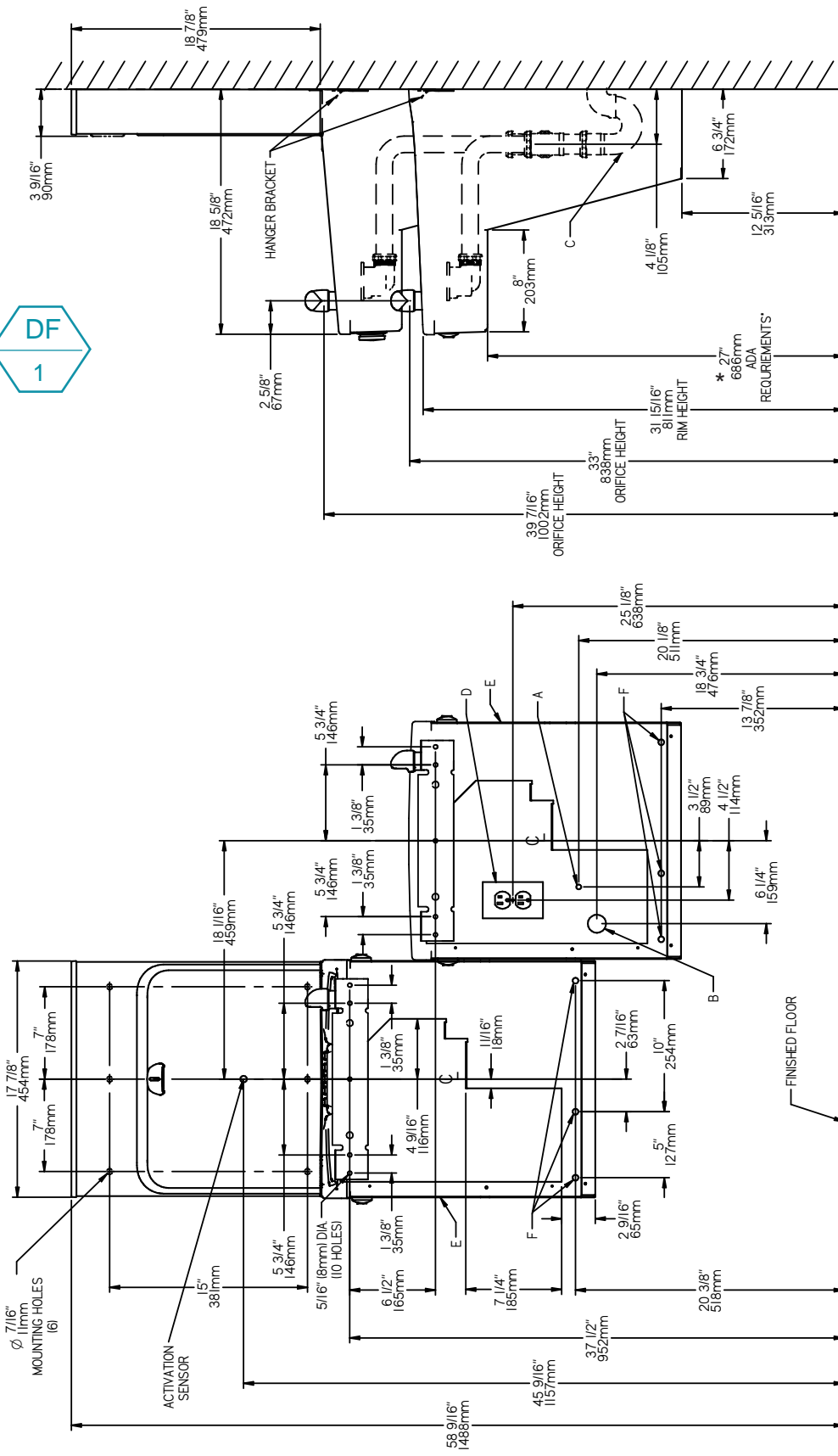


Fig. 1



STANDARD TWO-LEVEL INSTALLATION

Fig. 2

* REDUCE HEIGHT BY 3" FOR INSTALLATION OF CHILDREN'S ADA COOLER

*ADA REQUIREMENT
*REQUISITO DE A.D.A.
*EXIGENCE ADA

LEGEND/LEYENDA/LEGENDE
A = RECOMMENDED WATER SUPPLY LOCATION 3/8 O.D. UNPLATED COPPER TUBE CONNECT STUB WITH SHUT OFF (BY OTHERS) 3 IN. (76mm) MAXIMUM OUT FROM WALL
 La UBICACION 3/8 O RECOMENDADA de ABASTECIMIENTO DE AGUA. D. El TUBO del COBRE de UNPLATED CONECTA TALONARIO CON APAGO (POR OTROS) 3 in. (76 mm) al MAXIMO FUERA DE LA PARED.
 L.O.D de 3/8 d'EMPLACEMENT DE PROVISION D'EAU RECOMMANDE. LE TUBE DE CUIVRE DE UNPLATED CONNECTE STUB AVEC ETEINT (PAR LES AUTRES) 3, dans. (76 mm) la MAXIMUM HORS DU MUR.
B = RECOMMENDED LOCATION FOR WASTE OUTLET 1-1/2" O.D. DRAIN STUB 2 IN. OUT FROM WALL
 UBICACION RECOMENDADA PARA EL DRENAJE DE SALIDA DE AGUA DE 1-1/2" DE DIAMETRO. El TALONARIO 2 FUERA DE PARED
 EMPLACEMENT RECOMMANDE POUR LE DRAIN DE D.E. 1-1/2" DE SORTIE D'EAU. STUB 2 HORS DU MUR
C = 4-1/2" TRAP NOT FURNISHED
 PURGADOR DE 4-1/2" NO PROPORCIONADO
 SIPHON 1-1/2" NON FOURNI

LEGEND/LEYENDA/LEGENDE

D = ELECTRICAL SUPPLY (3) WIRE RECESSED BOX DUPLEX OUTLET**

SUMINISTRO ELECTRICO (3) CALA ENCHUFE DE ALAMBRE SALIDA DÚPLEX

E = INSURE PROPER VENTILATION BY MAINTAINING 6" (152 mm) (MIN.) CLEARANCE FROM CABINET LOUVERS TO WALL. ASEGURE UNA VENTILACION ADECUADA MANTENIENDO UN ESPACIO E 6" (152 mm) (MIN.) DE HOLEGURA ENTRE LA REJILLA DE VENTILACION DEL MUEBLE Y LA PARED.

ASSUREZ-VOUS UNE BONNE VENTILATION EN GARDANT 6" (152 mm) (MIN.) ENTRE LES ÉVÉNENTS DE L'ENCEINTE ET LE MUR.

F = 7/16 BOLT HOLES FOR FASTENING UNIT TO WALL. TROUS D'ÉCROUS 7/16 POUR FIXER L'APPAREIL AU MUR

**NEW INSTALLATIONS MUST USE GROUND FAULT CIRCUIT INTERRUPTER (GFCI)

**Las nuevas instalaciones deben utilizar el interruptor de circuito de tierra de la avería (GFCI)

**Les nouvelles installations doivent employer l'interrupteur de circuit modu de défaut (GFCI)

IMPORTANT
ALL SERVICE TO BE PERFORMED BY AN
AUTHORIZED SERVICE PERSON

IMPORTANTE
TODO EL SERVICIO DEBERÁ SER EFECTUADO POR
UNA PERSONA DE SERVICIO AUTORIZADA

IMPORTANT
TOUT ENTRETIEN DOIT ÊTRE EFFECTUÉ PAR
UN REPRÉSENTANT AUTORISÉ

HANGER BRACKETS & TRAP
INSTALLATION

- 1) Remove hanger bracket fastened to back of cooler by removing one (1) screw.
- 2) Mount the hanger bracket and trap as shown in Figure 2.

NOTE: Hanger Bracket **MUST** be supported securely. Add fixture support carrier if wall will not provide adequate support.

IMPORTANT:

- 6 1/4 in. (159mm) dimension from wall to center-line of trap must be maintained for proper fit.
 - Anchor hanger securely to wall using all five (5) 7/16" dia. mounting holes.
- 3) Install straight valve for 3/8" O.D. tube.

INSTALLATION OF COOLER

- 4) Hang the cooler on the hanger bracket. Be certain the hanger bracket is engaged properly in the slots on the cooler back as shown in Fig. 4.
- 5) Loosen the two (2) screws holding the lower front panel at the bottom of cooler base and two (2) screws at the top. Remove the front panel and set aside.
- 6) Connect water inlet line--See Note 4 of General Instructions.
- 7) Remove the slip nut and gasket from the trap and install them on the cooler waste line making sure that the end of the waste line fits into the trap. Assemble the slip nut and gasket to the trap and tighten securely.

START UP

Also See General Instructions

- 8) Stream height is factory set for 45-50 PSI supply. If supply pressure varies greatly from this, readjust stream height to approximately 1-1/2" (38mm) above the bubbler guard by turning adjustment screw, accessible by removing front push panel, (see Fig. 3 & 5).
- 9) Replace the front panel and secure by retightening four (4) screws.
- 10) If a taste, odor or sediment problem is prevalent, try installing our water filter module.

INSTALACIÓN DE FIJADOR DE
SUSPENSIÓN Y DEL PURGADOR

- 1) Quite el fijador de suspensión sujetados a la parte posterior del enfriador quitando un (1) tornillo.
- 2) Monte el fijador de suspensión y quite el purgador como se muestra en la Fig. 2.

NOTA: El fijador de suspensión **DEBE** de ser sostenido con seguridad. Coloque portadores de soporte de instalaciones fijas si la pared no proveerá un soporte adecuado.

IMPORTANTE:

- Se debe mantener una dimensión de 6 1/4 pulgadas (159mm) desde la pared hasta la línea central del purgador para que calce de forma adecuada.
 - Ancle el suspensor de forma segura a la pared usando todos los cinco (5) agujeros de montaje de 7/16" de diámetro.
- 3) Instale la válvula directa para el tubo de 3/8" de diámetro externo.

INSTALACIÓN DEL ENFRIADOR DE AGUA

- 4) Suspenda el enfriador en el fijador de suspensión. Asegúrese que el fijador de suspensión calce correctamente en las ranuras de la parte posterior del enfriador como se indica en la figura 4.
- 5) Afloje los dos (2) tornillos que sostienen la parte inferior del panel en la parte inferior de la base del enfriador y los dos (2) tornillos en la parte superior. Quite el panel frontal y póngalo a un lado.
- 6) Conectar el tubo de entrada de agua. Ver la Nota 4 en las Instrucciones Generales.
- 7) Quite la tuerca de retención y el obturador del purgador y instáelos en el tubo de desagüe asegurándose que la parte final del tubo de desagüe calce en el purgador. Ensamble la tuerca de la ranura y el obturador y apriete en forma segura.

PUESTA EN MARCHA

Vea Manual de los Instrucciones Generales

- 8) Altura del chorro viene configurado de fábrica para el suministro de 45-50 PSI. Si la presión del suministro varía demasiado de este valor, reajuste la altura del chorro a aproximadamente 1-1/2" por encima del protector del boboteador dando vuelta al tornillo de ajuste sacando el panel frontal de empuje, (vea Fig. 3 y 5).
- 9) Vuelva a colocar el panel frontal y asegúrelo apretando nuevamente los cuatro (4) tornillos.
- 10) Si se suscita un problema de sabor, olor o sedimentación, trate de instalar nuestro módulo de filtro de agua.

INSTALLATION DU SIPHON ET DU
SUPPORT DE SUSPENSION

- 1) Retirez le support de suspension à l'arrière du refroidisseur en enlevant une (1) vis.
- 2) Installez le support et le siphon tel qu'indiqué à la fig. 2.

NOTE : Le support de suspension **DOIT** être bien retenu en place. Ajoutez des ferrures de fixation si le mur n'offre pas le soutien voulu.

IMPORTANT :

- Pour avoir une bonne position, on doit garder une dimension de 6 1/4 po. (159mm) du mur à l'axe central du siphon.
 - Ancrez solidement le support au mur à l'aide des five (5) trous de fixation d'un diam. 7/16 po.
- 3) Installez la soupape droite dans le tuyau de D.E. 3/8".

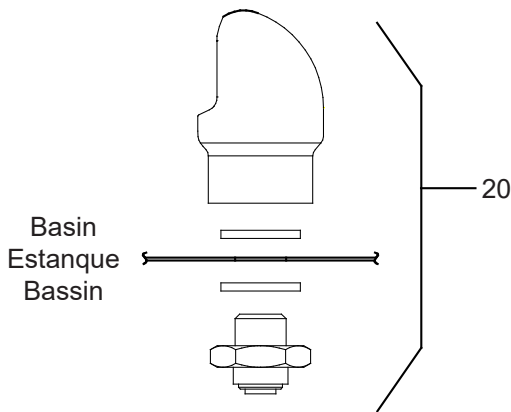
INSTALLATION DU REFROIDISSEUR

- 4) Installez le refroidisseur sur les supports en vous assurant que ceux-ci sont bien installés dans les fentes à l'arrière du refroidisseur tel qu'indiqué à la figure 4.
- 5) Dégagez les deux (2) vis retenant le panneau inférieur avant au bas de la base du refroidisseur ainsi que deux (2) vis sur le dessus. Retirez le panneau avant et mettez-le de côté.
- 6) Connectez l'alimentation en eau. - Voir note 4 des instructions générales.
- 7) Retirez l'écrou coulissant et le joint du siphon et installez-les sur la conduite résiduaire du refroidisseur en vous assurant que le bout de la conduite entre bien dans le siphon. Installez l'écrou coulissant et le joint au siphon et resserrez bien.

MISE EN MARCHÉ

Voir Manuel de les Directives Generales

- 8) Hauteur de flux est réglé en usine pour la fourniture de 45 à 50 lb/po². Si la pression varie beaucoup de ce point, ajustez le niveau à nouveau à environ 1-1/2" (38mm) au-dessus du protège-barboteur en tournant la vis de réglage du régulateur que l'on trouve en retirant le panneau, (voir fig. 3 et 5).
- 9) Remplacez le panneau avant et fixez le en place en resserrant les quatre (4) vis.
- 10) S'il existe un problème de goût, d'odeur ou de sédiment, essayez d'installer notre module filtre d'eau.



VANDAL RESISTANT BUBBLER DETAIL
 DETALLE DEL GRIFO RESISTENTE AL VANDALISMO
 DESCRIPTION DU BARBOTEUR RESISTANT AU VANDALISME

Fig. 3

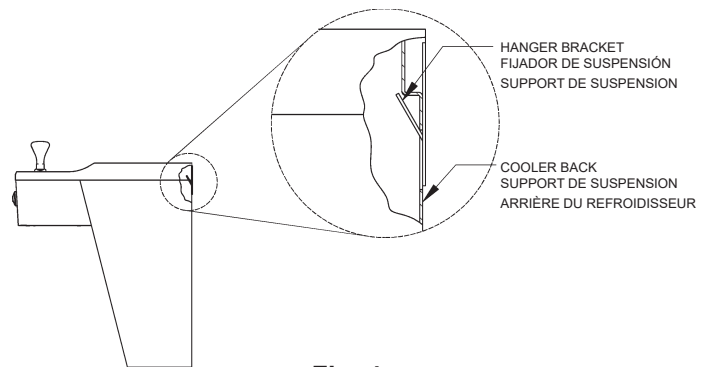


Fig. 4



PUSH BUTTON MECHANISM
 MECANISMO DE BARRA DE EMPUJE
 MÉCANISME DU BOUTON-POUSOIR

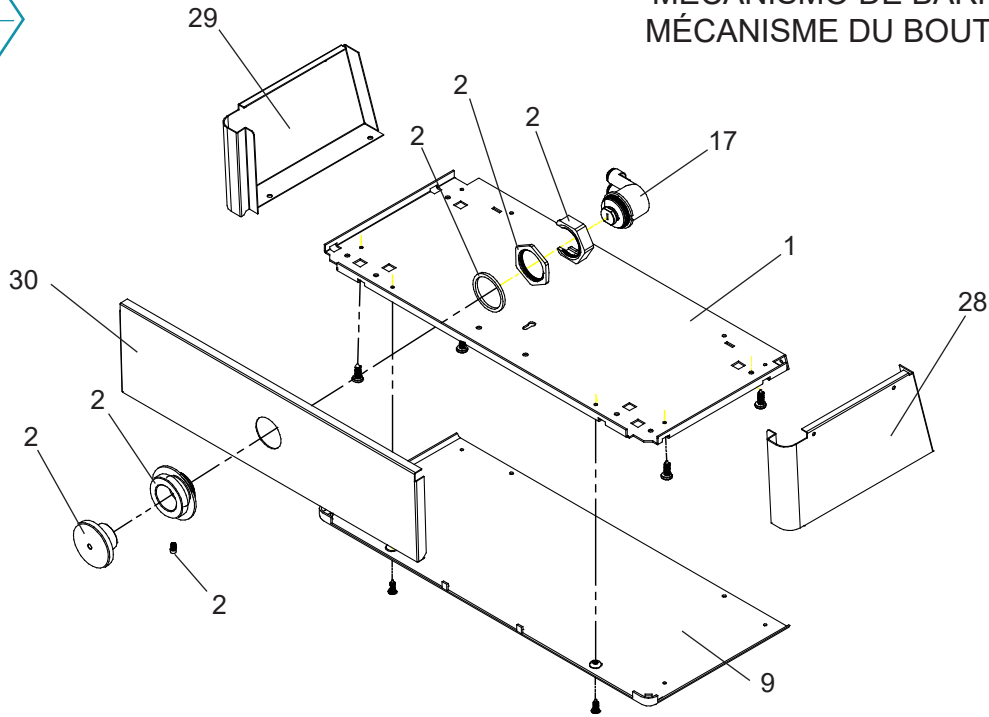


Fig. 5

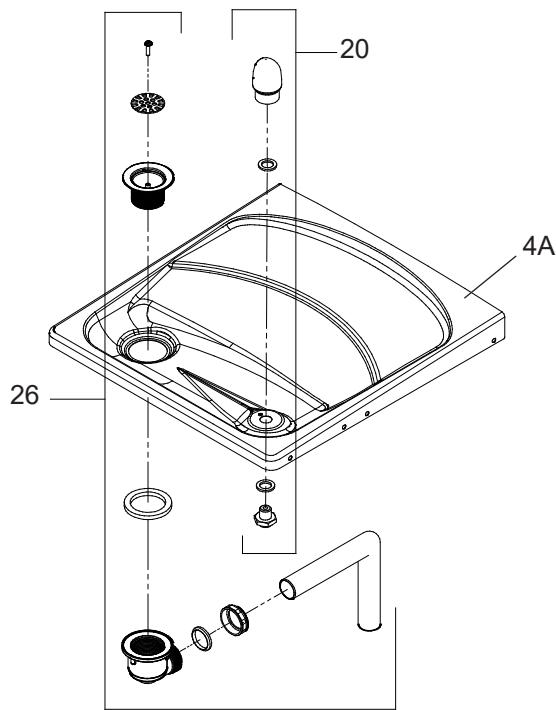


Fig. 6

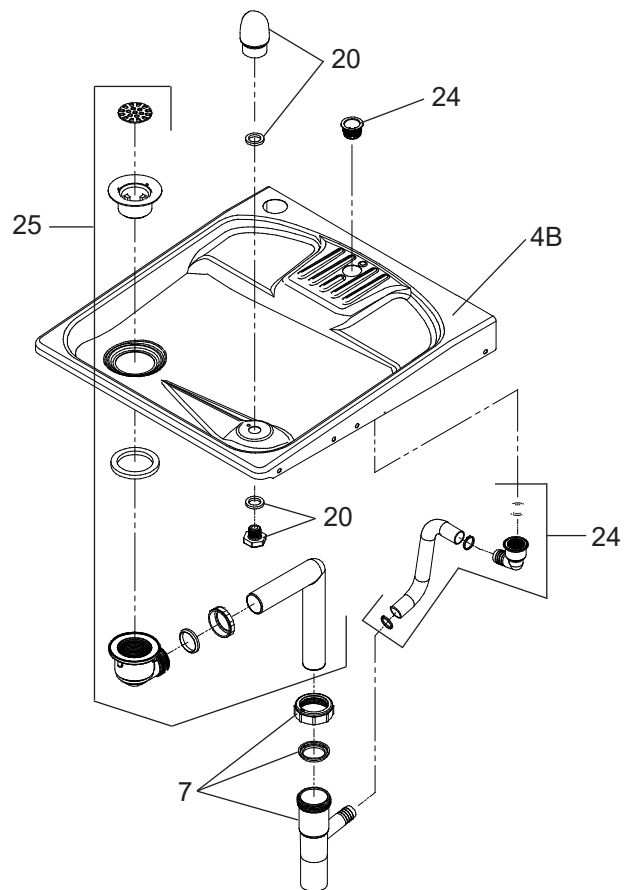


Fig. 7

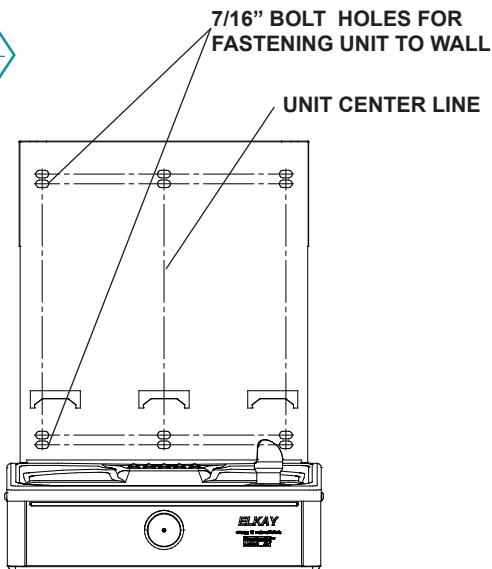


Fig 8

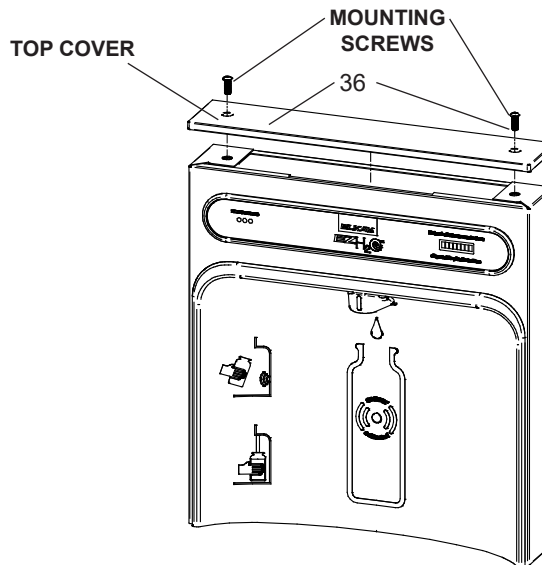


Fig 9

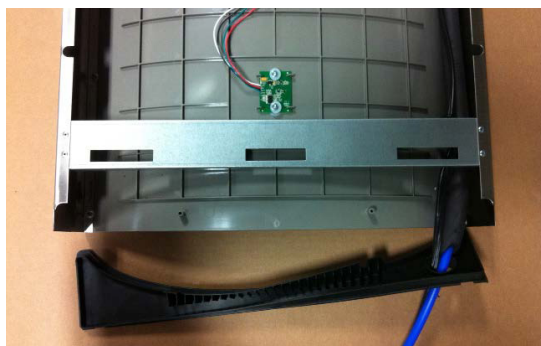


Fig 10

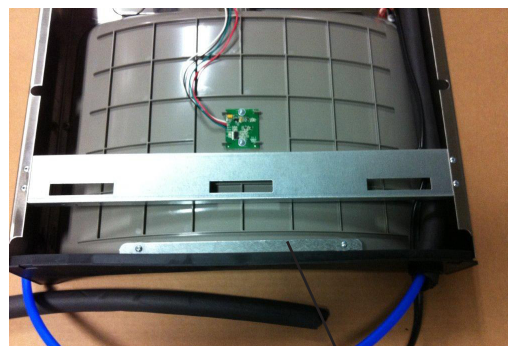


Fig 11

Bottle Filler Installation Instructions

- 1) **Remove two (2) mounting screws** with 5/32" Allen wrench holding top cover to Bottle Filler (See Fig. 9). Remove top cover. Note do not discard mounting screws, they will be needed to reinstall top cover.
- 2) **Remove wall mounting plate from Bottle Filler.** Place wall plate against wall on top of basin. Center the wall plate side to side with the basin. Mark the six (6) mounting holes with a pencil (See Fig. 8).
- 3) **Remove wall mounting plate from wall.** NOTE: Mounting plate **MUST** be supported securely. Add fixture support carrier if wall will not provide adequate support.
- 4) **Install wall mounting plate to wall** using six (6) 7/16" obround mounting holes (mounting bolts not included) (See Fig. 8). Use appropriate fasteners for your wall type.
- 5) **Feed power cord & 3/8" water line** through hole in tower/basin gasket (See Fig 10).
- 6) **Install gasket on bottom of bottle filler tower** with gasket support bracket & (2) screws (See Fig 11).
- 7) **Lay Bottle Filler on water cooler basin** and cut insulation from tube even with bottom of gasket, remove this insulation from the 3/8" tube, but do not discard. Feed the power cord and waterline through the hole on top of water cooler. NOTE: To prevent scratching the basin place a towel or soft cloth over the entire basin when working above it.
- 8) **With the power cord and waterline through hole** on top of water cooler place Bottle Filler on the three (3) angled tabs protruding from the wall mounting plate installed on wall. Make sure round boss in gasket fits in hole of basin. (See Fig. 12).
- 9) **Once Bottle Filler is installed on wall plate tabs,** water line and power cord are installed properly, push top of Bottle Filler toward wall and line up top cover two (2) holes.
- 10) **Reinstall Top Cover on Bottle Filler** (See Fig. 9) with two mounting screws from step 1 above. Caution, do not over tighten screws.
- 11) **Install remaining tube insulation** to the water line from bottle filler, connect Bottle Filler waterline inside of the water cooler by connecting the 3/8" water line to the tee.
- 12) **Install filter cartridge,** remove filter from carton, remove protective cap, attach filter to filter head by firmly inserting into head and rotating filter clockwise. NOTE: If existing plumbing rough in locations (Drain, Water In, and Electric Supply) do not allow the filter to be mounted inside the cooler cabinet the filter can be installed horizontally below the unit. A retrofit kit is available to mount the filter beneath the cooler.
- 13) **Turn water supply on** and inspect for leaks. Fix all leaks before continuing.
- 14) **Once unit has been inspected for leaks** and any leaks found corrected, plug Bottle Filler and unit into wall. Be sure to reinstall fuse to the circuit or switch the circuit breaker back to the "ON" position.
- 15) **Once power is applied to Bottle Filler,** the GREEN LED light should illuminate showing good filter status along with the LCD Bottle Counter.
- 16) **Verify proper dispensing by placing cup,** hand, or any opaque object in front of sensor area and verify water dispenses. Note: the first initial dispenses might have air in line which may cause a sputter. This will be eliminated once all air is purged from the line.
- 17) **Once unit tests out,** install Lower Panel back on water cooler(s). Unit is now ready for use.



BF11 - BF12 PROGRAM

SETTING THE CONTROL BOARD

VERIFY CONTROL BOARD SOFTWARE

- 1) To verify the software program of the control board the unit will need to be shut down and restarted. The chiller (if present) does not need to be shut down and restarted.
- 2) The units lower panel must be open to access the power cord and wall outlet.
- 3) Shut down the unit by unplugging the power cord from the wall outlet.
- 4) Restart the unit by plugging the power cord back into the wall outlet.
- 5) Upon start up, the bottle count display will show the software designation of BF11 or BF12.

ACCESSING THE PROGRAMMING BUTTON

- 1) To access the program button, remove the top cover of the bottle-filler. Remove the two (2) screws holding top cover to bottle-filler with a 5/32" allen wrench. Remove top cover. Do not discard mounting screws, they will be needed to reinstall the top cover after programming operations are completed. The programming button is located at the top right side of the unit on the control board.

NOTE: When applicable, there is also an alternate reset button located on the lower part of the water cooler. After removing the bottom cover, the reset button will be located on the left side of the cooler, mounted on the side panel support.

RESET THE FILTER MONITOR

- 1) Instructions apply to filtered units only.
- 2) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Monitor
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 3) When the display changes to "RST FLTR", depress the button again. The display will change to show "FLTR =". Depress the button again and the display will show "FLTR =0"
- 4) The Green LED should be illuminated indicating that the visual filter monitor has been reset.

SETTING RANGE OF THE IR SENSOR WHERE APPLICABLE

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show
"RNG SET" - Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
- 3) When display shows "RNG SET" push program button once the display will show current value (can be 1 – 10) e.g. "RNG = 3".
- 4) Once display shows current value push the program button to scroll through value of 1 – 10. Select the desired range setting, "1" being closest to sensor and "10" being farthest away.
- 5) Once range is selected allow approximately 4 seconds to pass and then the display will go back to bottle counter and be in run mode.
- 6) Test bottle filler by placing bottle or hand in front of sensor to make sure water is dispensed.

SETTING UNIT TYPE

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.

Continued from below:

- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show
"RNG SET" - Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
- 3) When display shows "UNIT TYPE" push program button once the display will show current value. Can be REFRIG or NON-RFRG
- 4) Push button once to change value. Once value is selected the display will show the new value. (Can be REFRIG or NON-RFRG)
"REFRIG" - stands for refrigerated product. In this setting the flow rate is estimated at 1.0 gallon per minute.
"NON-RFRG" - stands for nonrefrigerated product. In this setting the flow rate is estimated at 1.5 gallons per minute. Both "REFRIG" and "NON-RFRG" simulate 1 bottle equal to 20 oz.
- 5) Allow approximately 4 seconds to pass and the display will return to bottle counter and be in run mode.

RESETTING BOTTLE COUNT

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show:
"RNG SET"- Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
If the button is not pushed again the display will scroll through the four messages above for three cycles and return to run mode.
- 3) When display shows "RST BCNT" push program button once the display will show current value, e.g. "0033183".
- 4) Once display shows current value push the program button once more to reset back to 0. The display will show BTLCT = 0 for approximately 2 seconds and then return to run mode showing 00000000 bottles.
NOTE: Once the bottle count is reset to zero there is no way to return to the previous bottle count.
- 5) Testing the bottle counter:
REFRIG units: Place bottle or hand in front of sensor for approximately 9 seconds to see bottle counter count 00000001,
(This is based on filling a 20 oz. bottle).
NON-RFRG units: Place bottle or hand in front of sensor for approximately 6 seconds to see bottle counter count 00000001,
(This is based on filling a 20 oz bottle).

SETTING FILTER CAPACITY

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show:
"RNG SET"- Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
If the button is not pushed again the display will scroll through the four messages above for three cycles and return to run mode.
- 3) When display shows "FLT SIZE" push program button once. The display will show current value. Can be 3000GAL or 6000GAL.
- 4) Push program button again to display the desired "FLT SIZE".
- 5) Allow approximately 4 seconds to pass and the display will return to bottle counter and be in run mode.

DF
1

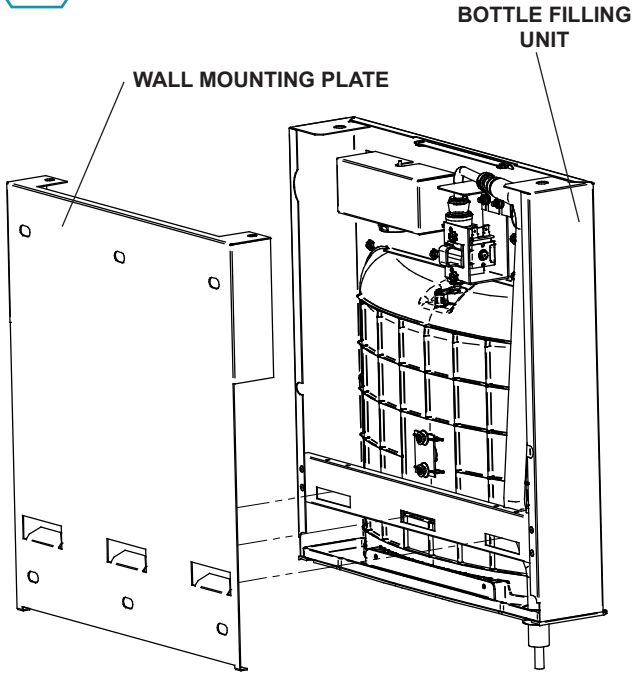
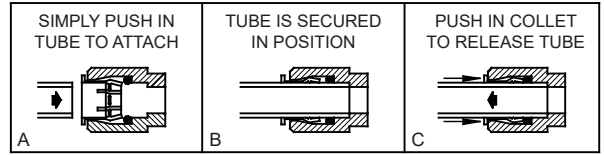


Fig. 12

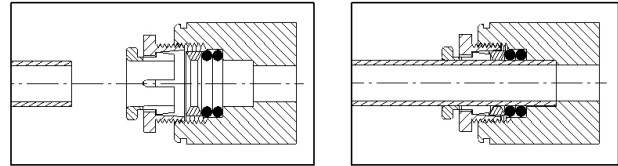
OPERATION OF QUICK CONNECT FITTINGS



PUSHING TUBE IN BEFORE PULLING IT OUT HELPS TO RELEASE TUBE

Fig. 13

Superseal Fitting Assembly
Supersello Accesorio de Montaje
Superseal Montage Assemblage



Note: Screw the locknut hand tight to seal.
Nota: Apriete la mano de la contratuerca para sellar.
Remarque : Visser la main de l'écrou de blocage pour assurer l'étanchéité.

Fig. 14

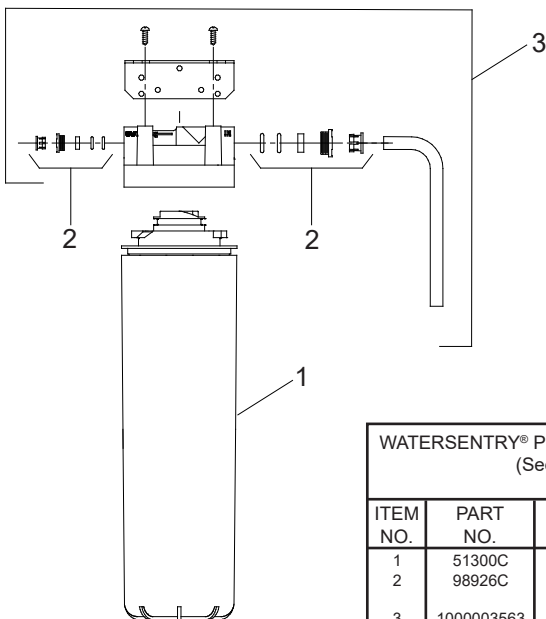


Fig. 15

WATERSENTRY® PLUS FILTER PARTS LIST (See Fig. 15)			LISTA DE PIEZAS DEL FILTRO (Vea la Fig. 15)	LISTE DES PIÈCES DU FILTRE (Voir Fig. 15)
ITEM NO.	PART NO.	DESCRIPTION	DESCRIPCIÓN	DESCRIPTION
1	51300C	Filter Assy-3000 Gal.	Ensamblado del Filtro-3000 Galón	Ens. filtre-3000 Gallon
2	98926C	Kit-Filter Head Fittings-includes John Guest Fittings	Cabeza Kit-Filter-Accesorios incluye John Guest Herrajes	Head-Filter Kit Raccords-Raccords comprend John Guest
3	1000003563	Assy-Filter Head & Bracket includes John Guest Ftgs/ Screws	Montaje filtro cabeza y soporte incluye tornillos y accesorios John Guest	Assemblée-filtre tête & Support inclut John Guest/vis

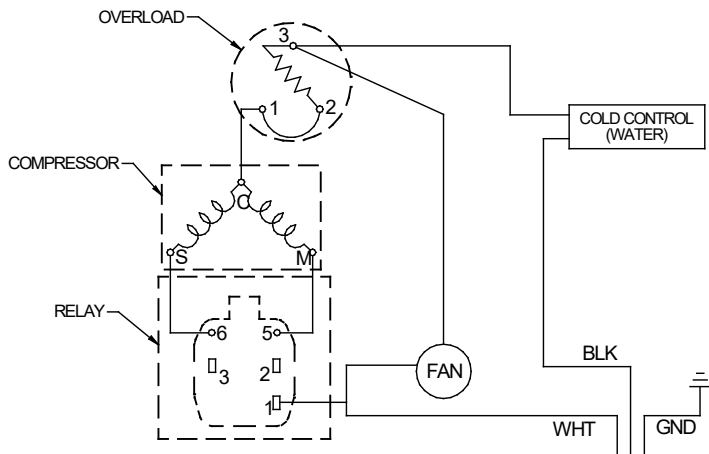


Fig. 16
115V Wiring Diagram

Diagrama de cableado de 115 voltios
schéma de câblage de 115 volts

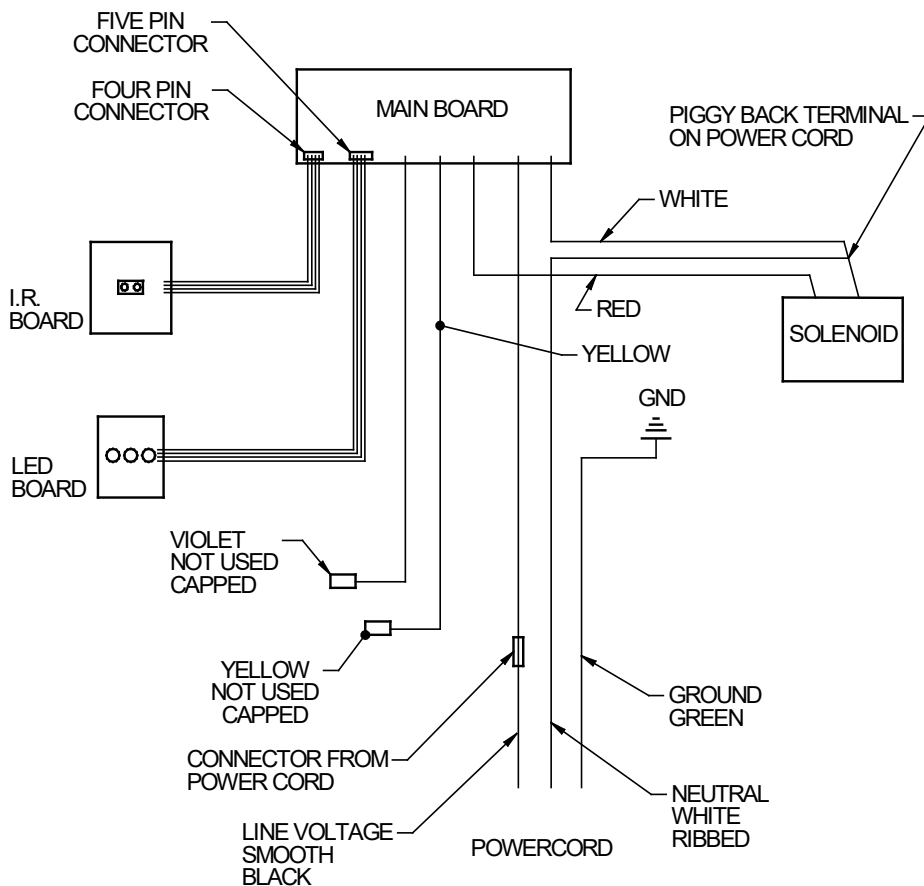


Fig. 17

BOTTLE FILLER WIRING DIAGRAM 115 VOLT & 220 VOLT SINGLE & BI-LEVEL
DIAGRAMA DE CABLEADO DE RELLENADORES DE BOTELLAS DE 115 VOLTIOS Y 220 VOLTIOS SOLA Y DOS NIVELES
REPLISSAGE DE BOUTEILLE DE CÂBLAGE DIAGRAMME 115 VOLTS & 220 VOLT UNIQUE & DEUX NIVEAUX

PARTS LIST/ LISTA DE PIEZAS/ LISTE DES PIÈCES				
ITEM NO.	PART NO	DESCRIPTION	DESCRIPCIÓN	DESCRIPTION
1	22897C	Panel - Bottom Dispenser	Panel - Dispensador Inferior	Panneau - Distributeur Inferieur
2	1000001906	Kit - Push Button Assy/Button/Sleeve/ Nuts/Spacer	Kit - botón montaje/botón/manga/tuercas/ separador	Kit - bouton poussoir Cpl/bouton/manchon/noix/ entretoise
3	28551C	Hanger Bracket	Fijador de Suspensión	Support de Suspension
4A	28960C	Basin - Stainless Steel	Estanque - Acero Inoxidable	Bassin - Acier Inoxydable
4B	1000001676	Basin - Stainless Steel (BF)	Estanque - Acero Inoxidable (BF)	Bassin - Acier Inoxydable (BF)
5	36208C	Power Cord	Cable Eléctrico	Cordon d'Alimentation
6	*0000000768	Compressor Serv. Pak EM 65 HHC	Paquete de Serv. del Compresor EM 65 HHC	Trousse D'entr. Surpresseur EM 65 HHC
7	1000002055	Kit - Drain Tube Assembly	Kit - Montaje del Tubo de Desagüe	Kit - Assemblage de Tube de Vidange
8	56092C	Tubing - Poly (Cut To Length)	Tubería de Polietileno (Corte a la Longitud)	Tubes - Polyéthylène (Couper à la Longueur)
9	55931C	Cover - Dispenser Bottom	Cubierta - Dispensador Inferior	Couvercle - Distributeur Inferieur
10	55996C	Strainer (See "General Instructions")	Filtro Bifurcado (Vea "Instrucciones Generales")	Grille (Voir "Directives Générales")
11	66703C	Drier	Secador	Déshydrateur
12	1000001994	Kit - Tee - 1/4" (3 Pack)	Kit - La te 1/4 (Paquete de 3)	Kit - Tee 1/4" (Pack de 3)
13	1000002062	Kit - Tee 1/4 x 1/4 x 3/8 (3 Pack)	Kit - Tee 1/4 x 1/4 x 3/8 (Paquete de 3)	Kit Tee 1/4 x 1/4 x 3/8 (Pack de 3)
14	1000001602	Kit-75583C Elbow 5/16" - 1/4" (3 Pack)	Kit - 75583C Codo 5/16 " - 1/4" (Paquete de 3)	Coude Kit - 75583C 5/16" - 1/4" (Pack de 3)
15	98773C	Kit - Cold Control/Screws	Kit - Control del Enfriamiento/Tornillo	Kit - Contrôle de Refroidissement/Vis
16	98750C	Kit - Capacitor/Relay/ Overload/Cover	Kit - Condensador del Compresor/ Relé/Sobrecarga/Cubierta	Kit - Condensateur de Compresseur/ Relais/Surcharge/Relais Coiffe
17	98730C	Kit - Regulator - Spring	Kit - Regulator - Primavera	Kit - Régulateur - Printemps
18	98775C	Kit - Fan Motor Assy/Blade/Motor/ Shroud/Screws/Nut	Kit - Ventilador Motor Montaje/Hoja/Motor Cubierta/Tornillos/Tuerca	Kit - Ventilateur Moteur Assemblée/Lame/ Moteur/Cache/Vis/écrou
19	98899C	Kit - Hardware	Kit - Juego de Accesorios	Kit - De Visserie
20	98481C	Kit - VR Bubbler/Nipple/Gasket	Kit - VR Junta de boquilla de boboteador	Kit - VR barboteur/mamelon/joint
21	98776C	Kit - Condenser/Drier	Kit - Condensador/Secador	Kit - Condensateur/Déshydrateur
22	98777C	Kit - Compr Mtg Hdwe/Grommets/ Clips/Studs	Kit - Compresor Hardware/Arandelas/Clips/Per- nos de Montaje	Kit - Compresseur Matériel/Oeilets/Clips/Tiges Filetées de Fixation
23	98778C	Kit - Heat Exchanger/Drier	Kit - Intercambiador de Calor/Secador	Kit - Échangeur Thermique/Déshydrateur
24	1000001812	Kit - Bottle Filler Drain	Kit - de Drenaje de Llenada de la Botella	Kit - de Remplissage de Bouteille de Vidange
25	1000001900	Kit - Drain/Plate/Plug/Elbow/Nut	Kit - De Desagüe/Placa/Enchufe/Codo/Tuerca	Kit - Plaque/Plug/Coude/écrou de Vidange
26	0000000966	Kit - Drain/Plate/Plug/Elbow/Nut	Kit - De Desagüe/Placa/Enchufe/Codo/Tuerca	Kit - Plaque/Plug/Coude/écrou de Vidange
27	0000000745	Kit - Evaporator Assembly	Kit - Ensamblado del Evaporizador	Kit - Ens. D'évaporateur
28	28519C	Panel - Right Side (SS)	Panel-Lado Derecho (SS)	Panneau - Côté Droit (SS)
29	28522C	Panel - Left Side (SS)	Panel-Lado Izquierdo (SS)	Panneau - Côté Gauche (SS)
30	1000003511	Panel - Front Push (SS)	Panel-Presión Frontal (SS)	Panneau - Avant (SS)
31	28525C	Panel - Right Rear (SS)	Panel-Retrovisor Derecho (SS)	Panneau - Arrière Droit (SS)
32	28528C	Panel - Left Rear (SS)	Panel-Retrovisor Izquierdo (SS)	Panneau - Arrière Gauche (SS)
33	28539C	Panel - Right Rear TL (SS)	Panel-Retrovisor Derecho TL (SS)	Panneau - Arrière Droit TL (SS)
34	28536C	Panel - Left Rear TL (SS)	Panel-Retrovisor Izquierdo TL (SS)	Panneau - Arrière Gauche TL (SS)
35	28858C	Panel - Front Lower (SS)	Panel-Frontal Inferior (SS)	Panneau - Front Bas (SS)
-	See Filter Table	Water Filter Kit (When Provided)	Kit de Filtro de Agua (Cuando Provisto)	Kit de Filtrage d'Eau (Si Fourni)

***REPLACE WITH SAME COMPRESSOR USED IN ORIGINAL ASSEMBLY.**
NOTE: All correspondence pertaining to any of the above water coolers or orders for repair parts **MUST** include Model No. and Serial No. of cooler, name and part number of replacement part.



***REEMPLAZA CON EL MISMO COMPRESOR USADO EN EL ENSAMBLADO INICIAL.**
NOTA: Toda la correspondencia relacionada con el enfriador de agua anterior o con una orden de reparación piezas **DEBERÁ** incluir el número de modelo y número de serie del enfriador, el nombre y número de pieza de la pieza de repuesto.

***REPLACEZ AVEC LE MÊME SURPRESSEUR QUE CELUI UTILISÉ ORIGINALEMENT.**
NOTE : Toute correspondance au sujet des refroidisseurs d'eau courante ou toute commande de pièce de rechange **DOIT** inclure le numéro de modèle et le numéro de série du refroidisseur ainsi que le nom et le numéro de pièce à remplacer.

BOTTLEFILLER REPLACEMENT PART KITS

ITEM NO.	PART NO.	DESCRIPTION	DESCRIPCIÓN	DESCRIPTION
NS	98543C	Kit - Electrical Package	Paquete Kit - Eléctrico	Forfait Kit - Electricos
NS	98544C	Kit - IR Sensor	Sensor Kit - IR	Kit - Rcepteur IR
NS	1000004573	Kit - Solenoid Valve Replacement	Reemplazo de la Válvula de Solenoide Kit	Remplacement de la Valve Solénoïde - Kit
NS	98546C	Kit - Aerator Replacement	Reemplazo Kit - Aireador	Remplacement du Kit - Aéreur
36	98666C	Kit - Top Cover Replacement	Kit - Tapa Cubierta Reemplazo	Remplacement du Kit - Top Couvercle
NS	98549C	Kit - Hardware & Waterway Parts	Piezas del Kit - De Hardware y Por Vía Navegable	Pièces Kit - Matériel et Voie Navigable
NS	98669C	Kit - Filter Mounting Cover SS	Cubierta del Filtro de Kit - De Montaje SS	Couvercle de Filtre - Kit Montage SS
NS	98670C	Kit - Retro Filter Mounting	Montaje de Filtro Kit - Retro	Montage de Retro - Kit Filtre
NS	1000001813	Kit - Tower/Basin Gasket	Kit - Torre/Cuenca Junta	Kit - Tour/Collecteur

NS = NOT SHOWN

FOR PARTS, CONTACT YOUR LOCAL DISTRIBUTOR OR CALL 1.800.834.4816
PARA PIEZAS, CONTACTE A SU DISTRIBUIDOR LOCAL O LLAME AL 1.800.834.4816
POUR OBTENIR DES PIÈCES, CONTACTEZ VOTRE DISTRIBUTEUR LOCAL OU COMPOSEZ LE 1.800.834.4816

REPAIR SERVICE INFORMATION TOLL FREE NUMBER 1.800.260.6640
NÚMERO GRATIS DE SERVICIO 1.800.260.6640
INFORMATIONS POUR LE SERVICE PAR NUMERO SANS FRAIS 1.800.260.6640

PRINTED IN U.S.A.
 IMPRESO EN LOS E.E.U.U.
 IMPRIME AUX E.-U.

ELKAY MANUFACTURING COMPANY • 2222 CAMDEN COURT • OAK BROOK, IL 60523 • 630.574.8484 • www.elkay.com

PRODUCT SPECIFICATIONS

Elkay ezH2O[®] Vandal-Resistant Bottle Filling Station, & Bi-Level Reverse Cooler, Non-Filtered Refrigerated Stainless. Chilling Capacity of 8.0 GPH (gallons per hour) of 50° F drinking water, based on 80° F inlet water and 90° F ambient, per ASHRAE 18 testing. Features shall include Green Ticker™, Laminar Flow, Real Drain, Vandal Resistant. Furnished with Vandal Resistant bubbler. Electronic Bottle Filler Button with Mechanical Front Bubbler Button activation. Product shall be Wall Mount (On Wall), for Indoor + Outdoor applications, serving 2 station(s). Unit shall be certified to UL 399 and CAN/CSA C22.2 No. 120. Unit shall be lead-free design which is certified to NSF/ANSI 61 & 372 (lead free) and meets Federal and State low-lead requirements.



Special Features:	Green Ticker™, Laminar Flow, Real Drain, Vandal Resistant
Finish:	Stainless Steel
Power:	115V/60Hz
Bubbler Style:	Vandal Resistant
Activation by:	Electronic Bottle Filler Button with Mechanical Front Bubbler Button
Mounting Type:	Wall Mount (On Wall)
Chilling Capacity*:	8.0 GPH
Full Load Amps	1
Rated Watts:	370
Dimensions (L x W x H):	36-1/8" x 18-5/8" x 38-13/16"
Approx. Shipping Weight:	118 lbs.
Installation Location:	Indoor + Outdoor
No. of Stations Served:	2
*Based on 80° F inlet water & 90° F ambient air temp for 50° F chilled drinking water.	
**When used in non-temperature controlled environments, unit(s) must be adequately winterized and/or protected from extreme heat to prevent damage where climates dictate.	

- Mechanically-Activated bubbler continues to supply water in event of service disruptions.
- Green Ticker: Informs user of number of 20 oz. plastic water bottles saved from waste.
- Laminar flow provides clean fill with minimal splash.
- Real Drain System eliminates standing water.

COOLING SYSTEM

- Compressor: Hermetically-sealed, reciprocating type, single phase. Sealed-in lifetime lubrication.
- Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated.
- Cooling Unit: Combination tube-tank type. Continuous copper tubing with is fully insulated with EPS foam that meets UL requirements for self-extinguishing material.
- Refrigerant Control: Refrigerant R-134a is controlled by

PART: _____ QTY: _____
 PROJECT: _____
 CONTACT: _____
 DATE: _____
 NOTES: _____
 APPROVAL: _____

Included with Product: Water Cooler (VRCTLR8WSC), Bottle Filler (VRCWS)

▼ Ships in multiple boxes.

AMERICAN PRIDE. A LIFETIME TRADITION. Like your family, the Elkay family has values and traditions that endure. For almost a century, Elkay has been a family-owned and operated company, providing thousands of jobs that support our families and communities.



PRODUCT COMPLIANCE

- ADA & ICC A117.1
- ASME A112.19.3/CSA B45.4
- Buy American Act
- CAN/CSA C22.2 No. 120
- GreenSpec[®]
- NSF/ANSI 61 & 372 (lead free)
- UL 399



Complies with ADA & ICC A117.1 accessibility requirements when installed according to the requirements outlined in these standards. Installation may require additional components and/or construction features to be fully compliant. Consult the local Authority Having Jurisdiction if necessary.

[Installation Instructions \(PDF\)](#)

5 Year Limited Warranty on the refrigeration system of the unit. Electrical components and water system are warranted for 12 months from date of installation. **Warranty pertains to drinking water applications only. Non-drinking water applications are not covered under warranty.**

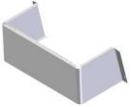

[Warranty \(PDF\)](#)

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

accurately calibrated capillary tube.

- Temperature Control: Easily accessible enclosed adjustable thermostat is factory preset. Requires no adjustment other than for altitude requirements.



Optional Accessories		
98324C	Accessory - Cane Apron for HAC HVR EMABF & VRC Models (Stainless) Spec Sheet (PDF)	
36292C	Accessory - Power Block for Multistation Bottle Filling Stations Spec Sheet (PDF)	

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

ELKAY®



INSTALLATION and USE MANUAL

VRC8TLWS™ Series Water Coolers with ezH2O® Bottle Filling Stations

Refrigeradores de agua serie VRCTL8WS™ con estaciones de llenado de botellas ezH2O®

Les refroidisseurs d'eau de la série VRCTL8WS™ avec des stations de remplissage de bouteilles ezH2O®



Model VRCTL8WS



Model VRCTLR8WS

TOOLS REQUIRED

BUT NOT PROVIDED:

SAFETY GLASSES
GLOVES
ELECTRIC DRILL
3/4" WRENCH OR CRESCENT WRENCH
UTILITY KNIFE
TAPE MEASURE
PENCIL
CENTER PUNCH
1/2" SOCKET & RATCHET WRENCH
5/32" ALLEN WRENCH

HERRAMIENTAS NECESARIAS

PERO NO SUMINISTRADO:

LENTES DE SEGURIDAD
GUANTES
TALADRO ELÉCTRICO
3/4" LLAVE AJUSTABLE
CUCHILLO PARA USO GENERAL
CINTA MÉTRICA
LÁPIZ
SACADOR DE CENTRO
TOMA DE 1/2" Y LLAVE DE TRINQUETE
5/32" LLAVE ALLEN

OUTILS NÉCESSAIRES

MAIS NON FOURNI:

LUNETTES DE PROTECTION
GANTS
PERCEUSE ÉLECTRIQUE
3/4" CLÉ À MOLETTE
COUPEAU UTILITAIRE
RUBAN À MESURER
CRAYON
OUTIL CENTER PUNCH
DOUILLE 1/2"& CLÉ À CLIQUET
5/32" CLÉ ALLEN



IMPORTANT! INSTALLER PLEASE NOTE

THE GROUNDING OF ELECTRICAL EQUIPMENT SUCH AS TELEPHONE, COMPUTERS, ETC. TO WATER LINES IS A COMMON PROCEDURE. THIS GROUNDING MAY BE IN THE BUILDING OR MAY OCCUR AWAY FROM THE BUILDING. THIS GROUNDING CAN CAUSE ELECTRICAL FEEDBACK INTO A FOUNTAIN, CREATING AN ELECTROLYSIS WHICH CAUSES A METALLIC TASTE OR AN INCREASE IN THE METAL CONTENT OF THE WATER. THIS CONDITION IS AVOIDABLE BY USING THE PROPER MATERIALS AS INDICATED. ANY DRAIN FITTINGS PROVIDED BY THE INSTALLER SHOULD BE MADE OF PLASTIC TO ELECTRICALLY ISOLATE THE FOUNTAIN FROM THE BUILDING PLUMBING SYSTEM. WE SUGGEST THAT THE BOTTLE FILLING STATION AND WATER COOLER BE PROTECTED BY A GROUND FAULT CIRCUIT INTERRUPTER (GFCI).

LA PUESTA A TIERRA DE EQUIPOS ELÉCTRICOS COMO TELÉFONO, ORDENADORES, ETC. A LAS LÍNEAS DE AGUA ES UN PROCEDIMIENTO COMÚN. ESTA PUESTA A TIERRA PUEDE ESTAR EN EL EDIFICIO O PUEDE OCURRIR LEJOS DEL EDIFICIO. ESTA PUESTA A TIERRA PUEDE CAUSAR REACCIÓN ELECTRICA EN UNA FUENTE, CREANDO UN ELECTRÓLISIS QUE CAUSA UN GUSTO METÁLICO O UN AUMENTO EN EL CONTENIDO METÁLICO DEL AGUA. ESTA CONDICIÓN ES EVITABLE UTILIZANDO LOS MATERIALES APROPIADOS COMO SE INDICA. CUALQUIER ACOPLAMIENTO DE DRENAJE PROPORCIONADO POR EL INSTALADOR DEBE SER HECHO DE PLÁSTICO PARA AISLAR ELÉCTRICAMENTE LA FUENTE DEL SISTEMA DE PLOMERÍA DE CONSTRUCCIÓN. SUGERIMOS QUE LA ESTACIÓN DE LLENADO DE BOTELLAS Y EL REFRIGERADOR DE AGUA ESTÉ PROTEGIDA POR UN INTERRUPTOR DE CIRCUITO DE FALLA DE TIERRA (GFCI).

LA MISE À LA TERRE D'ÉQUIPEMENT ÉLECTRIQUE COMME TELEPHONE, COMPUTERS, ETC. AUX LIGNES D'EAU EST UNE PROCÉDURE COMMUNE. CETTE MISE À LA TERRE PEUT ETRE DANS LE BÂTIMENT OU PEUT DÉCOURIR LE BÂTIMENT. CETTE MISE À LA TERRE PEUT CAQUER UN RÉTROACEMENT ÉLECTRIQUE DANS UNE FONTAINE, CRÉANT UNE ÉLECTROLYSE QUI CAUSE UN GOUT MÉTALLIQUE OU UNE AUGMENTATION DU CONTENU MÉTALLIQUE DE L'EAU. CETTE CONDITION EST ÉVALUABLE EN UTILISANT LES MATÉRIELS PROPRES COMME INDIQUÉS. TOUS LES RACCORDS DE SERRAGE FOURNIS PAR L'INSTALLATEUR DEVRAIENT ÊTRE FABRIQUES EN PLASTIQUE POUR ISOLER À L'ÉLECTRICITÉ LA FONTAINE DU SYSTÈME DE PLOMBERIE DU BÂTIMENT. Nous souhaitons que la station de remplissage de la bouteille et le refroidisseur d'eau soient protégés par un INTERRUPTEUR DE CIRCUIT DE DÉFAUT DE TERRE (GFCI).

(L)VRC8WS Bottle Fillers are among the easiest to install on the market today. To insure you install these models easily and correctly, PLEASE READ THESE SIMPLE INSTRUCTIONS BEFORE STARTING THE INSTALLATION. CHECK YOUR INSTALLATION FOR COMPLIANCE WITH PLUMBING, ELECTRICAL, AND OTHER APPLICABLE CODES. After installation, leave these instructions with the Fountain for future reference.

(L)VRC8WS rellenos de botella están entre los más fáciles de instalar en el mercado hoy en día. Para asegurar que instale estos modelos fácilmente y correctamente, POR FAVOR LEA ESTAS SIMPLS INSTRUCCIONES ANTES DE INICIAR LA INSTALACIÓN. COMPRUEBE SU INSTALACIÓN PARA CUMPLIR CON LA PLOMERÍA, ELÉCTRICO, Y OTROS CÓDIGOS APLICABLES. Después de la instalación, deje estas instrucciones con la fuente para futuras referencias.

Les garnitures de bouteilles (L)VRC8WS sont parmi les plus faciles à installer sur le marché aujourd'hui. Pour vous assurer d'installer ces modèles facilement et correctement, VEUILLEZ LIRE CES INSTRUCTIONS SIMPLS AVANT DE DÉMARRER L'INSTALLATION. VÉRIFIEZ VOTRE INSTALLATION POUR CONFORMITÉ AVEC PLOMBERIE, ÉLECTRIQUE ET AUTRES CODES APPLICABLES. Après l'installation, laissez ces instructions avec la fontaine pour référence ultérieure.

Note: Danger! Electric shock hazard. Disconnect power before servicing unit.

Nota: peligro! Peligro de descarga eléctrica. Desconecte antes de reparar la unidad.

Remarque : Danger ! Risque d'électrocution. Débrancher avant de réparer l'appareil.

Pictured is unit only without bottle filler.

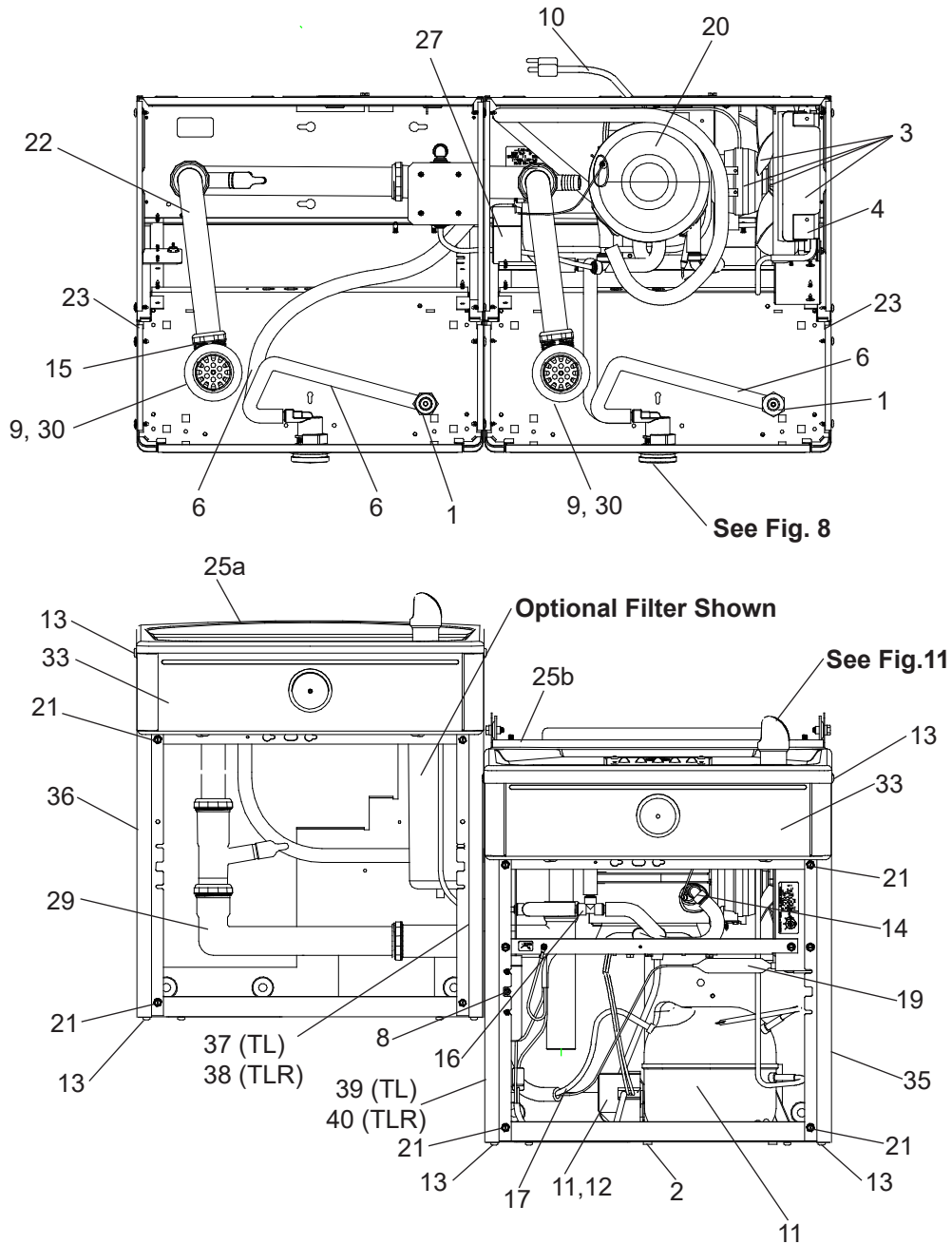
En la foto, la unidad sólo sin relleno botella.

Sur la photo, est une unité seulement sans remplissage de la bouteille.

Uses HFC-134A refrigerant

Usa refrigerante HFC-134A

Utilise du fluide frigorigène HFC-134A



NOTE: Non-refrigerated units do not include all electrical and refrigeration components shown above.

Other components and rough-in are the same as shown.

NOTA: Las unidades no frigorificadas no incluyen todos los componentes eléctricos y de la refrigeración demostrados arriba. Otros componentes y a'spero-en son iguales según lo demostrado.

NOTE: Les unités non frigorifiées n'incluent pas tous les composants électriques et de réfrigération montrés ci-dessus. D'autres composants et rugueux-dans sont identiques que montrés.

FIG. 1
LVRCTL8 SHOWN

VRCTLR8

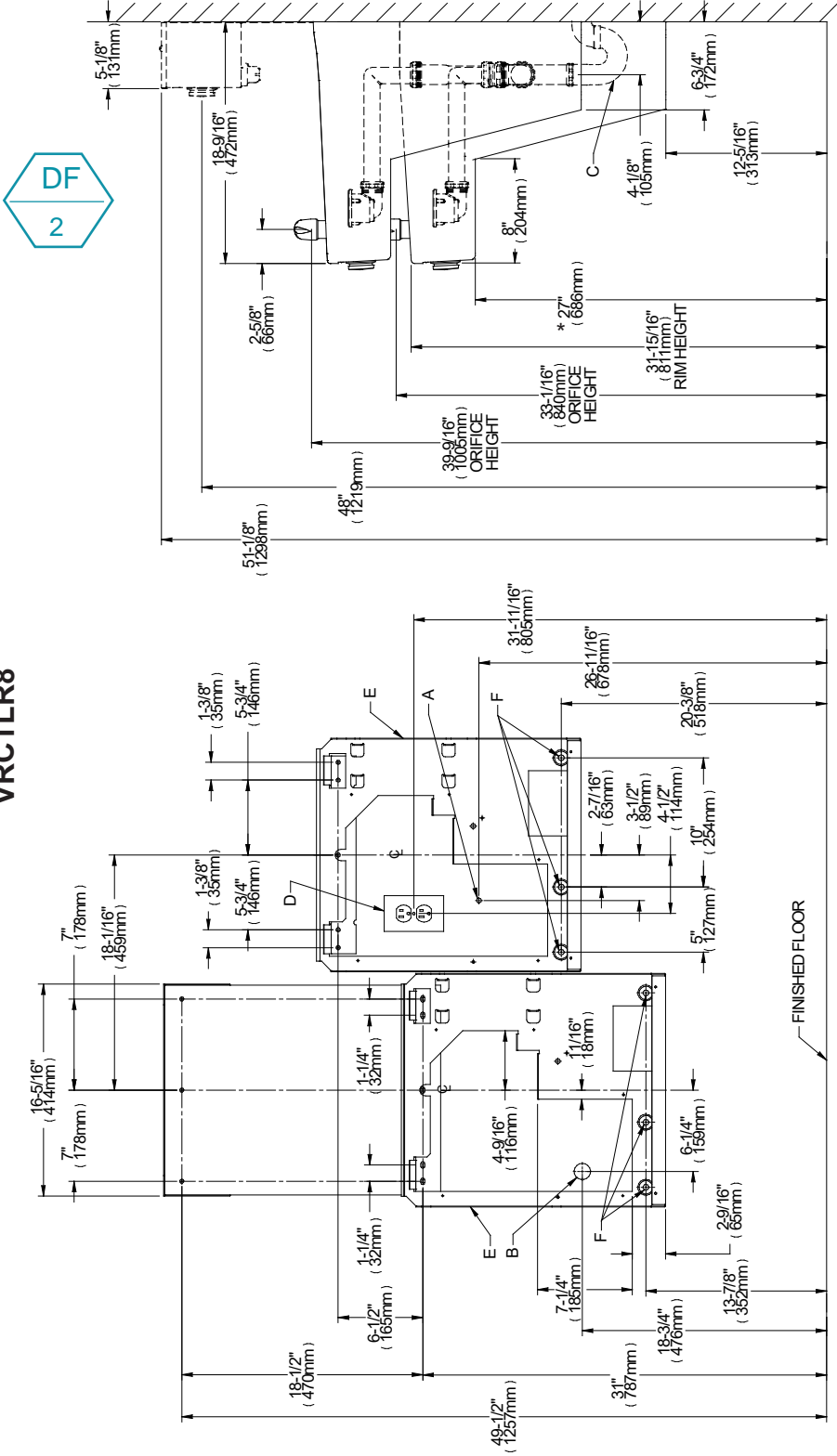


FIG. 3

* REDUCE HEIGHT BY 3" FOR INSTALLATION OF CHILDREN'S ADA COOLER

- LEGEND/LEYENDA/LÉGENDE**
A = RECOMMENDED WATER SUPPLY LOCATION 3/8 O.D. UNPLATED COPPER TUBE CONNECT STUB WITH SHUT OFF (BY OTHERS) 3 IN. (76mm) MAXIMUM OUT FROM WALL
 UBICACION RECOMENDADA PARA EL DRENAJE DE SALIDA DE AGUA. D. EI TUBO DEL COBRE DE UNPLATED CONECTA TALONARIO CON APAGO (POR OTROS) 3 en. (76 Mm) el MAXIMO FUERA DE PARED
 L.O.D de 3/8 d'EMPLACEMENT DE PROVISION D'EAU RECOMMANDE. LE TUBE DE CUIVRE DE UNPLATED CONNECTE STUB AVEC ETEINT (PAR LES AUTRES) 3 dans. (76 mm) le MAXIMUM HORS DU MUR
B = RECOMMENDED LOCATION FOR WASTE OUTLET 1-1/2" O.D. DRAIN STUB 2 IN. OUT FROM WALL
 UBICACION RECOMENDADA PARA EL DRENAJE DE SALIDA DE AGUA. DE 1-1/2" DE DIAMETRO. EI TALONARIO 2 FUERA DE PARED
 EMPLACEMENT RECOMMANDE POUR LE DRAIN DE D.E. 1-1/2" DE SORTIE D'EAU. STUB 2 HORS DU MUR
C = 1-1/2" TRAP NOT FURNISHED
 PURGADOR DE 1-1/2" NO PROPORCIONADO
 SIPHON 1-1/2" NON FOURNI
D = ELECTRICAL SUPPLY (3) WIRE RECESSED BOX
 CAJA RECESADA DE ALAMBRES (3) DE SUMINISTRO ELECTRICO
 BOÎTE ENCASTRÉE D'ALIMENTATION ÉLECTRIQUE (3) FILS
E = INSURE PROPER VENTILATION BY MAINTAINING 6" (152 mm) (MIN.) CLEARANCE FROM CABINET LOUVERS TO WALL.
 ASEGURE UNA VENTILACION ADECUADA MANTENIENDO UN ESPACIO E 6" (152 mm) (MIN.) DE HOLLGURAE NTR E LA REJILLA DE VENTILACION DEL MUEBLE Y LA PARED
 ASSUREZ-VOUS UNE BONNE VENTILATION EN GARDANT 6" (152 mm) (MIN.) ENTRE LES ÉVENTS DE L'ENGEINTE ET LE MUR.
F = 7/16 BOLT HOLES FOR FASTENING UNIT TO WALL
 AGUJEROS DE LAS TUERCAS DE 7/16 PARA SUJETAR LA UNIDAD A LA PARED
 TROUS D'ECROUS 7/16 POUR FIXER L'APPAREIL AU MUR
****NEW INSTALLATIONS MUST USE GROUND FAULT CIRCUIT INTERRUPTER (GFCI)**
 **Las nuevas instalaciones deben utilizar el interruptor de tierra de la avería (GFCI)
 **Les nouvelles installations doivent employer l'interrupteur de circuit moulu de défaut (GFCI)

* ADA REQUIREMENT
 * REQUISITO DE A.D.A.
 * EXIGENCE ADA

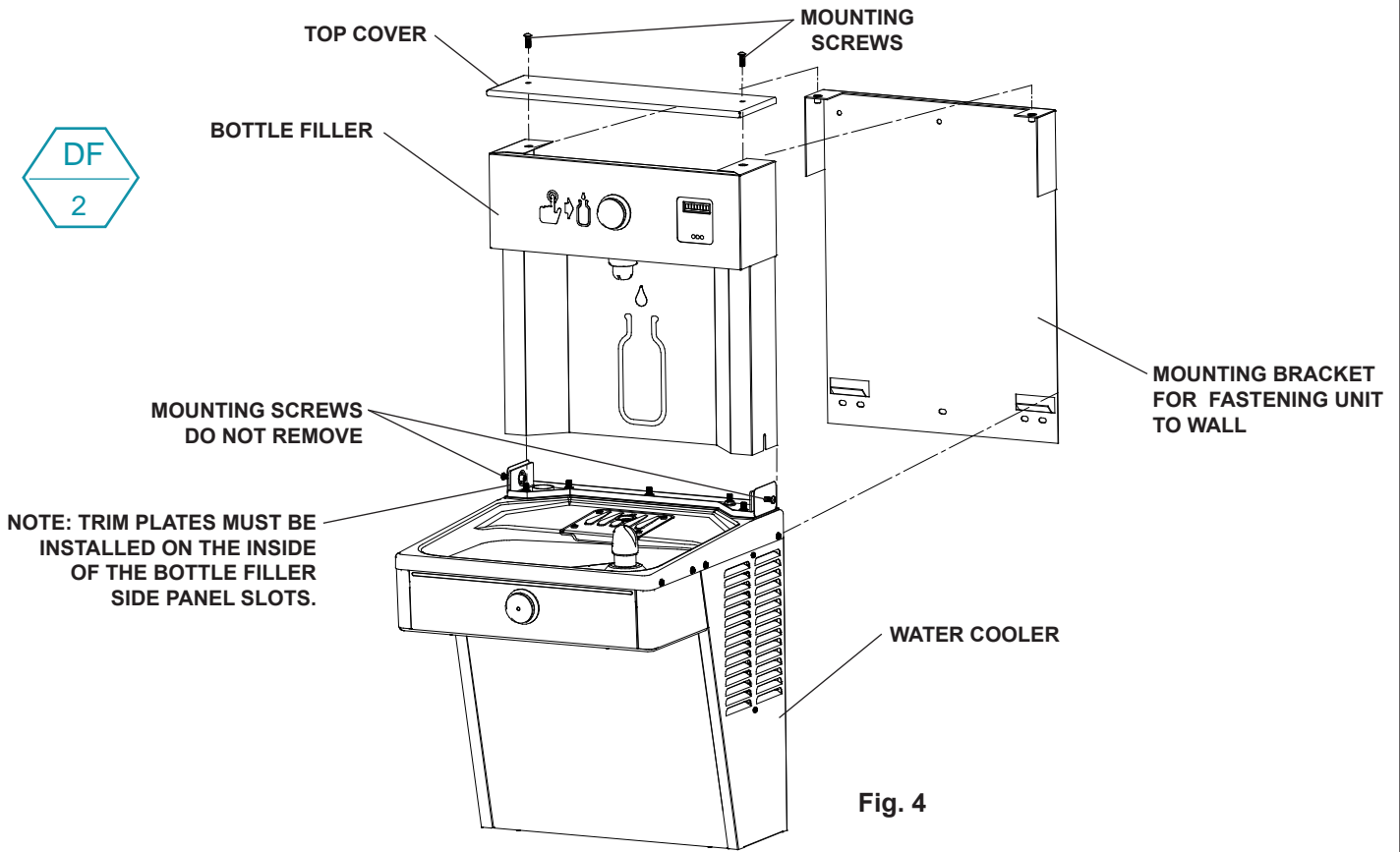
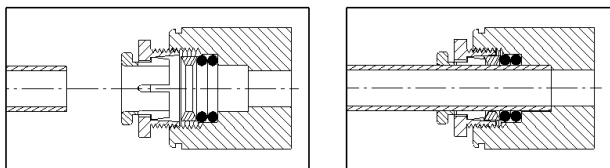


Fig. 4

BOTTLE FILLER INSTALLATION

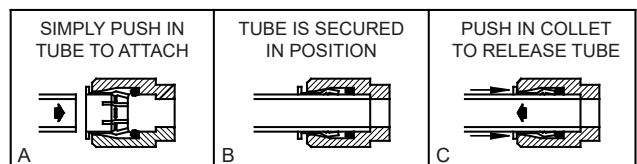
- 1) **Remove wall mounting plates from Coolers.** Install Wall Mounting Plates as per rough-in diagrams on Page 4 or 5 of this instruction.
NOTE: Mounting plates MUST be supported securely. Add fixture support carrier if wall will not provide adequate support.
- 2) **Install lower water cooler only** at this time onto bracket as per rough-in diagram (See rough-in on Page 4 or 5). **DO NOT** connect power to cooler at this time or turn water supply on.
- 3) **Remove (L)VRCTL Bottle Filler from carton.** Lay Bottle Filler on water cooler basin and cut insulation from tube even with bottom of unit, remove this insulation from the 3/8" tube, but do not discard. Feed the powercord and waterline through the hole on top of water cooler.
NOTE: To prevent scratching the basin place a towel or soft cloth over the entire basin when working above it.
- 4) **With the power cord and waterline** on top of water cooler, place Bottle Filler onto mounting bracket on basin. (See Fig. 4). Make sure bottle filler is installed properly on the basin gasket.
- 5) **Once Bottle Filler is installed on basin mounting bracket,** tighten the two screws (supplied) one on each side of the bottle filler. Install Top Cover on Bottle Filler (See Fig. 4) with two mounting screws (supplied). **Caution do not over tighten screws.**
- 6) **Secure non-refrigerated unit to wall,** connect drains and water inlet.
- 7) **Install the 1/4" poly tubing and insulation** from the outlet of the filter to the union on top of the evaporator. Install the 1/4" poly tubing and insulation from the regulator in the non-refrigerated cooler to one of the tees at the evaporator outlet. Install remaining tube insulation to the water line from bottle filler, connect Bottle Filler waterline inside of the water cooler by connecting the 3/8" water line to the tee.
- 8) **For Model LVRCTL Install filter cartridge, remove filter from carton,** remove protective cap, attach filter to filter head by firmly inserting into head and rotating filter clockwise.
NOTE: If existing plumbing rough-in locations (Drain, Water In, Electric Supply) do not allow the filter to be mounted inside the cooler cabinet the filter can be installed horizontally below the unit. A retrofit kit is available to mount the filter beneath the cooler.
- 9) **Turn water supply on and inspect for leaks.** Fix all leaks before continuing.
- 10) **Once unit has been inspected for leaks** and any leaks that are found are corrected, plug Bottle Filler and (L)VRCTL unit into wall. Be sure to reinstall fuse to the circuit or switch the circuit breaker back to the "ON" position.
- 11) **Once power is applied to Bottle Filler,** the GREEN LED light should illuminate showing good filter status along with the LCD Bottle Counter.
- 12) **Verify proper dispensing by depressing the button** at the top of the Bottle Filler and verify water dispenses. Note: the first initial dispenses might have air in line which may cause a sputter. This will be eliminated once all air is purged from the line.
- 13) **Once unit tests out,** install Lower Panel back on (L)VRCTL water coolers. Unit is now ready for use.



Note: Screw the locknut hand tight to seal

Fig. 5

OPERATION OF QUICK CONNECT FITTINGS



PUSHING TUBE IN BEFORE PULLING IT OUT HELPS TO RELEASE TUBE

Fig. 6

REMOVAL OF BOTTLE FILLER FOR SERVICING

- 1) **Turn off the water supply** to the Water Coolers. Unplug and/or turn off Circuit Breaker to Cooler(s) and Bottle Filler. **NOTE:** the Lower Front Panel of the coolers may need to be removed. To prevent scratching the basin place a towel or soft cloth over the entire basin when working above it.
- 2) **Loosen but DO NOT remove the Pinned Torx Head Screw** from the outer side of the Bottle Filler and loosen but **DO NOT** remove the 1/4" hex. head bolt from between the two cooler (See Figs 7 or 8). Remove the two (2) Pinned Torx Head Screws from the Top Cover & remove the Top Cover. The Bottle Filler may then be lifted up and off the Water Cooler (The water line will still be connected from the Water Cooler to the Bottle Filler.)



1/4" HEX. HEAD BOLT THIS LOCATION ONLY

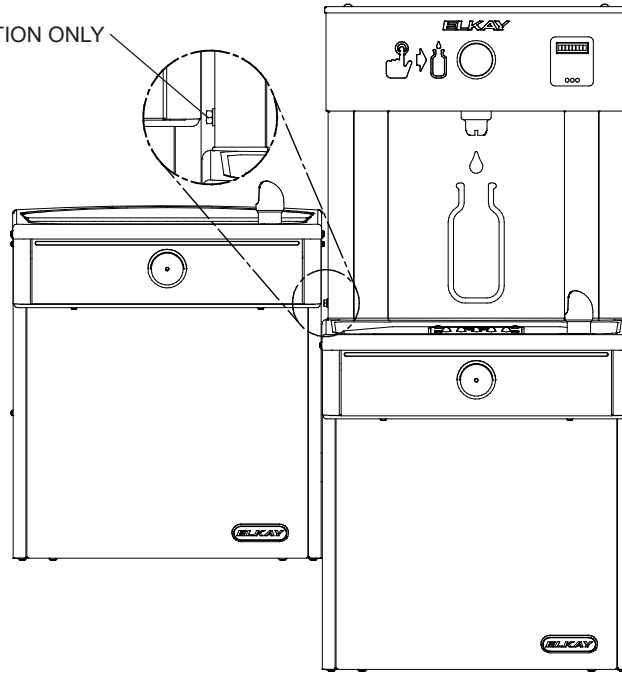


Fig. 7

STANDARD TWO-LEVEL CONFIGURATION

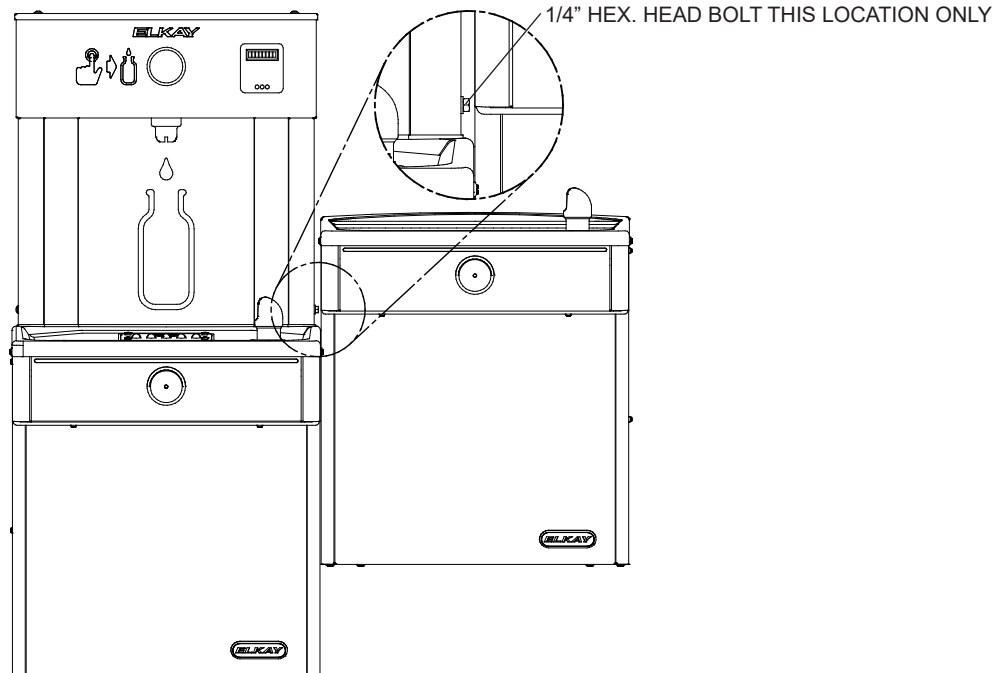


Fig. 8

STANDARD TWO-LEVEL REVERSED CONFIGURATION

IMPORTANT
ALL SERVICE TO BE PERFORMED BY AN AUTHORIZED SERVICE PERSON

HANGER BRACKETS & TRAP INSTALLATION

- 1) Remove hanger bracket fastened to back of cooler by removing one (1) screw.
- 2) Mount the hanger bracket and trap as shown in Figure 2 or 3.

NOTE: Hanger Bracket **MUST** be supported securely. Add fixture support carrier if wall will not provide adequate support.

IMPORTANT:

- 4 1/8 in. (121mm) dimension from wall to centerline of trap must be maintained for proper fit.
 - Anchor hanger securely to wall using all five (5) 1/4 in. dia. mounting holes.
- 3) Install straight valve for 3/8" O.D. tube.

INSTALLATION OF COOLER

- 4) Hang the cooler on the hanger bracket. Be certain the hanger bracket is engaged properly in the slots on the cooler back as shown in Figure 2 or 3.
- 5) Loosen the two (2) screws holding the lower front panel at the bottom of cooler base and two (2) screws at the top (**Use torx bits sold separately**). Remove the front panel and set aside.
- 6) Connect water inlet line--See Note 4 of General Instructions.
- 7) Remove the slip nut and gasket from the trap and install them on the cooler waste line making sure that the end of the waste line fits into the trap. Assemble the slip nut and gasket to the trap and tighten securely.

START UP

Also See General Instructions

- 8) Stream height is factory set at 45-50 PSI. If supply pressure varies greatly from this, adjust screw using the access hole in the pushbutton (insert screwdriver). CW adjustment will raise stream and CCW adjustment will lower stream. For best adjustment, stream should hit basin approximately 6-1/2" (165mm) from bubbler.

IMPORTANTE
TODO EL SERVICIO DEBERÁ SER EFECTUADO POR UNA PERSONA DE SERVICIO AUTORIZADA

INSTALACIÓN DE FIJADOR DE SUSPENSIÓN Y DEL PURGADOR

- 1) Quite el fijador de suspensión sujetados a la parte posterior del enfriador quitando un (1) tornillo.
- 2) Monte el fijador de suspensión y quite el purgador como se muestra en la Fig. 2 o 3.

NOTA: El fijador de suspensión **DEBE** de ser sostenido con seguridad. Coloque portadores de soporte de instalaciones fijas si la pared no proveerá un soporte adecuado.

IMPORTANTE:

- Se debe mantener una dimensión de 4 1/8 pulgadas (121mm) desde la pared hasta la línea central del purgador para que calce de forma adecuada.
 - Ancle el suspensor de forma segura a la pared usando todos los cinco (5) agujeros de montaje de 1/4" de diámetro.
- 3) Instale la válvula directa para el tubo de 3/8" de diámetro externo.

INSTALACIÓN DEL ENFRIADOR DE AGUA

- 4) Suspense el enfriador en el fijador de suspensión. Asegúrese que el fijador de suspensión calce correctamente en las ranuras de la parte posterior del enfriador como se indica en la figura 2 o 3.
- 5) Afloje los dos (2) tornillos que sostienen la parte inferior del panel en la parte inferior de la base del enfriador y los dos (2) tornillos en la parte superior (**Utilice los pedacitos torx vendidos por separado**). Quite el panel frontal y póngalo a un lado.
- 6) Conectar el tubo de entrada de agua. Ver la Nota 4 en las Instrucciones Generales.
- 7) Saque la tuerca deslizante y empaquetadura del colector e insértelos en la manquera de residuos de la nevera, asegurándose que el extremo de la manquera encaje en el colector. Coloque la tuerca deslizante y la empaquetadura en el colector y apriete firmemente.

PUESTA EN MARCHA

Ver también las Instrucciones Generales

- 8) La altura del chorro se ajusta en la fábrica a 45-50 PSI. Si la presión de suministro varía mucho de esta valor, ajustar el tornillo usar el agujero de acceso en el botón. El ajuste en sentido horario elevará el chorro y en sentido contrahorario lo bajará (inserte el destornillador). Para un ajuste mejor, el chorro debe chocar con el depósito aproximadamente a 6-1/2"(165mm) del borboteador.

IMPORTANT
TOUT ENTRETIEN DOIT ÊTRE EFFECTUÉ PAR UN REPRÉSENTANT AUTORISÉ

INSTALLATION DU SIPHON ET DU SUPPORT DE SUSPENSION

- 1) Retirez le support de suspension à l'arrière du refroidisseur en enlevant une (1) vis.
- 2) Installez le support et le siphon tel qu'indiqué à la fig. 2 ou 3.

NOTE : Le support de suspension **DOIT** être bien retenu en place. Ajoutez des ferrures de fixation si le mur n'offre pas le soutien voulu.

IMPORTANT :

- Pour avoir une bonne position, on doit garder une dimension de 4 1/8 po. (121mm) du mur à l'axe central du siphon.
 - Ancrez solidement le support au mur à l'aide des five (5) trous de fixation d'un diam. 1/4 po.
- 3) Installez la soupape droite dans le tuyau de D.E. 3/8".

INSTALLATION DU REFRIGÉRISEUR

- 4) Installez le refroidisseur sur le support en vous assurant que ceux-ci sont bien installés dans les fentes à l'arrière du refroidisseur tel qu'indiqué à la figure 2 ou 3.
- 5) Dégagez les deux (2) vis retenant le panneau inférieur avant au bas de la base du refroidisseur ainsi que deux (2) vis sur le dessus (**Employez le peu Torx vendu séparément**). Retirez le panneau avant et mettez-le de côté.
- 6) Connectez l'alimentation en eau. - Voir note 4 des instructions générales.
- 7) Retirez l'écrou coulissant et le joint du siphon et les installer sur la conduite de vidange de la fontaine en s'assurant que l'extrémité de la conduite de vidange s'ajuste dans le siphon. Assembler l'écrou coulissant et le joint sur le siphon et serrer fermement.

MISE EN MARCHÉ

Voir aussi les Instructions Générales

- 8) La pression de jet est réglée en usine 3,1 et 3,4 bars. Si la pression d'alimentation varie fortement de cette valeur employer l'ouverture d'accès dans le bouton-poussoir. Un réglage dans le sens des aiguilles d'une montre relève le jet, et un réglage dans le sens contraire l'abaisse (insérez le tournevis). Pour un réglage optimum, le jet doit frapper le bassin à environ 165 mm du barboteur.



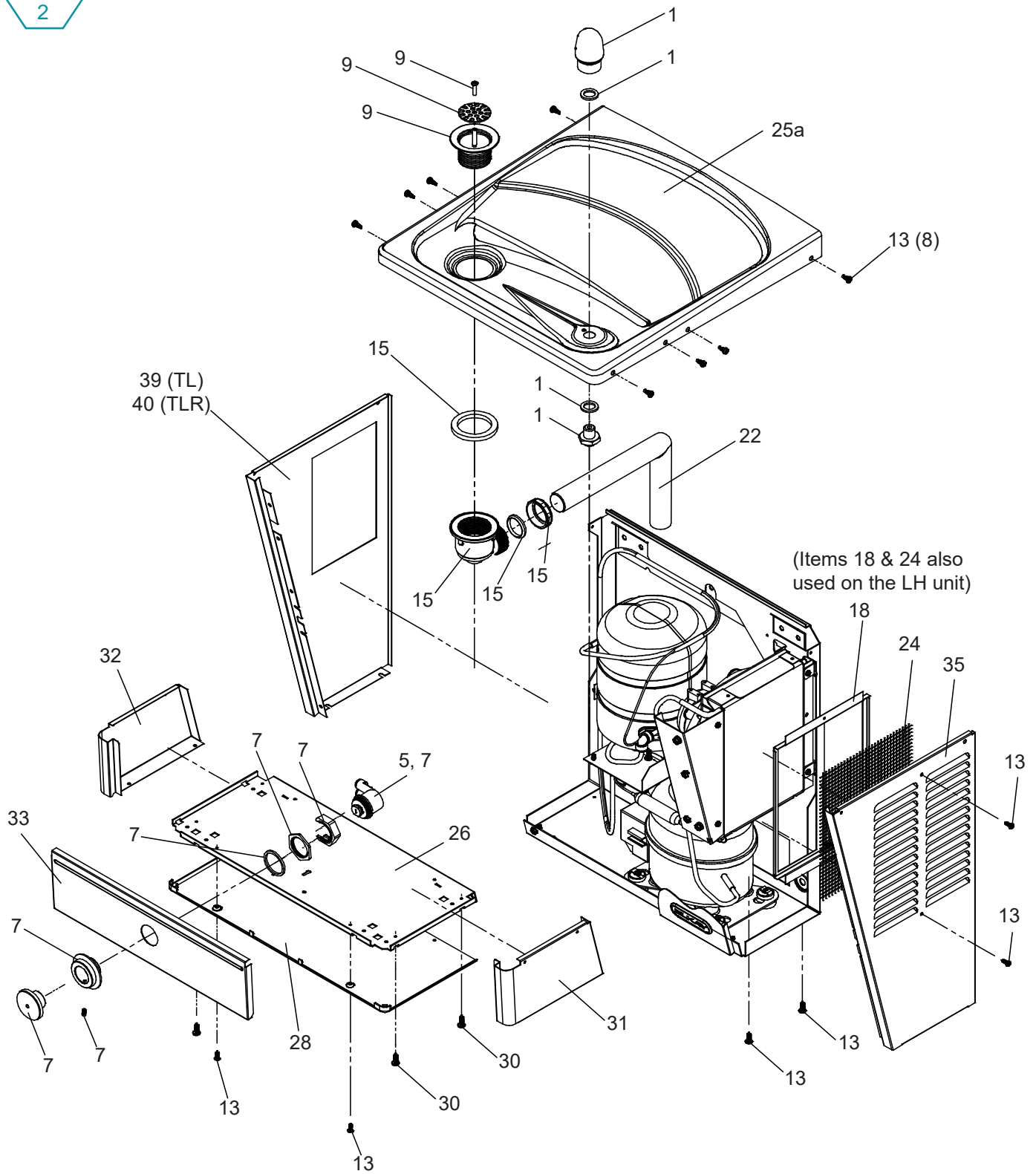


FIG. 9
(Refrigerated side shown)

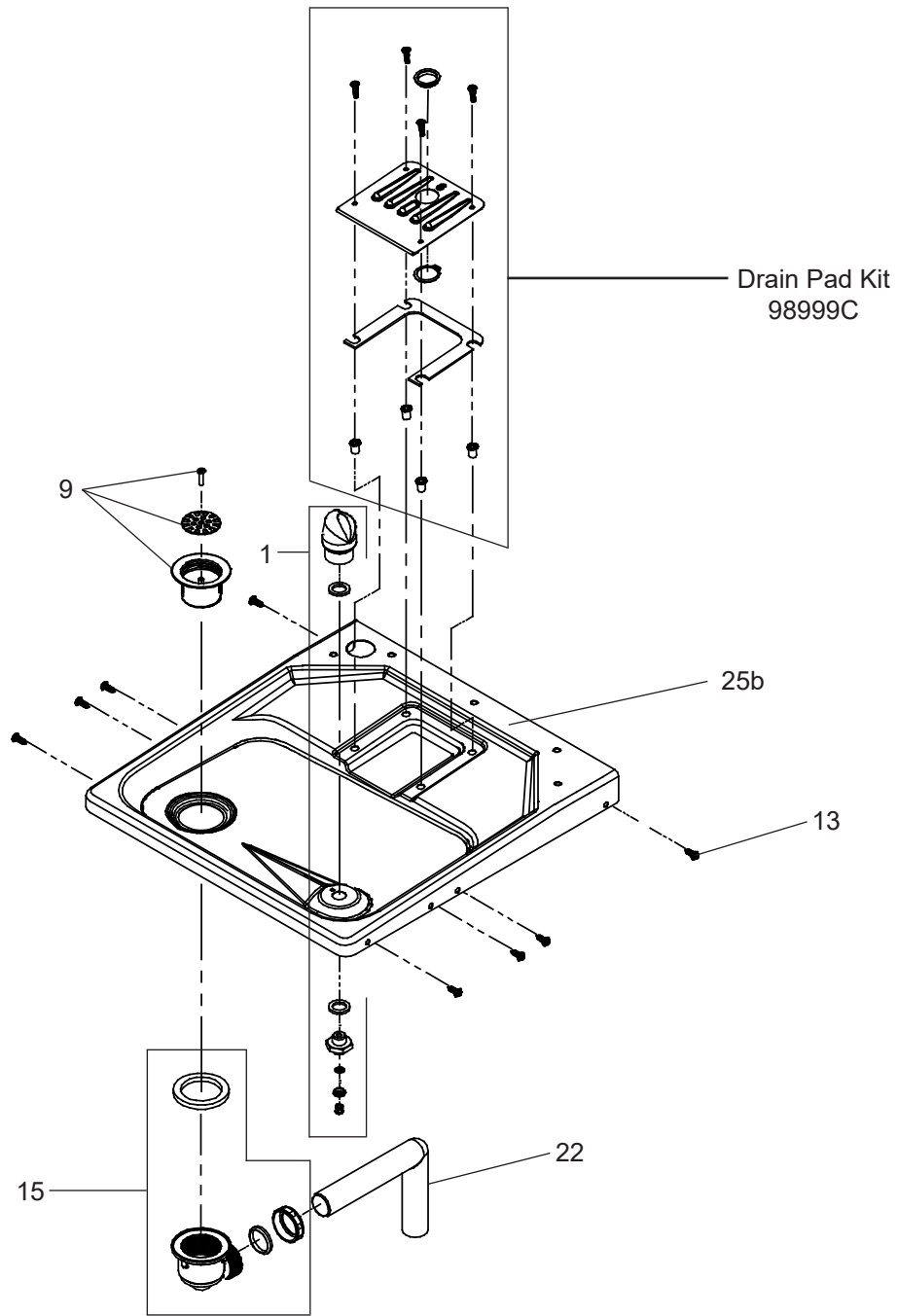


FIG. 10
(Bottle Filler side shown)

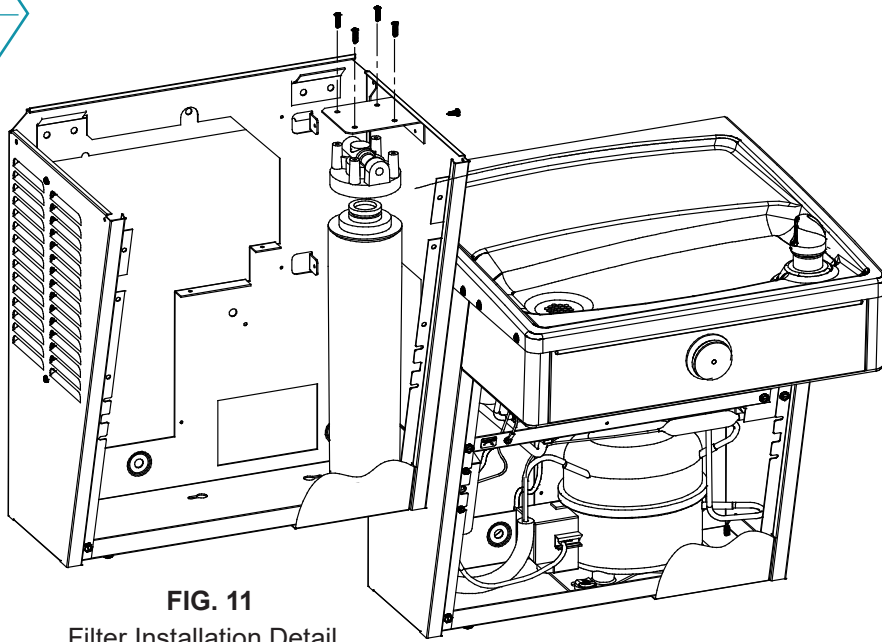


FIG. 11
 Filter Installation Detail
 Detalle de instalación del filtro
 Détail de l'installation du filtre

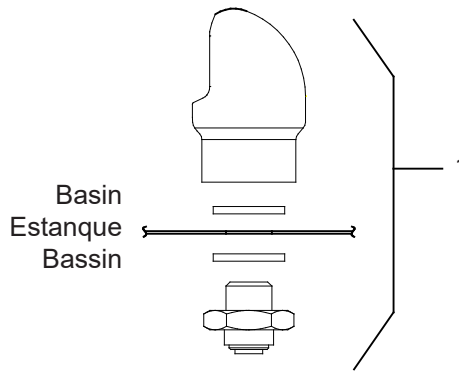
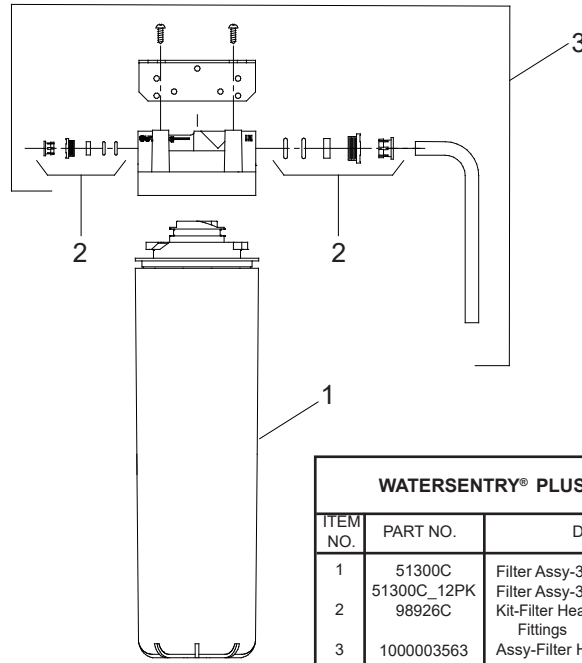


FIG.12
 VANDAL RESISTANT BUBBLER DETAIL
 DETALLE DEL GRIFO RESISTENTE AL VANDALISMO
 DESCRIPTION DU BARBOTEUR RESISTANT AU VANDALISME

Refrig. Unit Unidad de refrigeración Réfrigérateur	COLOR TABLE PANEL COLOR	TABLA DE LOS COLORES COLOR DEL PANEL	TABLE DE COULEURS COULEUR DU PANNEAU	Item No. 31 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 32 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 33 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 34 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 35 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 39 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 40 Part No. Artículos No. No. de Pieza Article Pièce
	Stainless Steel	Acero inoxidable	Acero inoxidable	28519C	28522C	28516C	22955C	28525C	28536C	28562C

Left Unit Unidad Izquierda élément de gauche	COLOR TABLE PANEL COLOR	TABLA DE LOS COLORES COLOR DEL PANEL	TABLE DE COULEURS COULEUR DU PANNEAU	Item No. 31 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 32 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 33 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 34 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 36 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 37 Part No. Artículos No. No. de Pieza Article Pièce	Item No. 38 Part No. Artículos No. No. de Pieza Article Pièce
	Stainless Steel	Acero inoxidable	Acero inoxidable	28519C	28522C	28516C	22955C	28528C	28539C	28559C



WATERSENTRY® PLUS FILTER PARTS LIST		
ITEM NO.	PART NO.	DESCRIPTION
1	51300C 51300C_12PK	Filter Assy-3000 Gallon (Single) Filter Assy-3000 Gallon (12 Pack)
2	98926C	Kit-Filter Head Fittings-includes John Guest Fittings
3	1000003563	Assy-Filter Head & Brkt includes Filter Head/ Mtg Brkt/John Guest Ftgs/Screws

FIG. 13

Water Filter Exploded View
Filtro de agua despiece
Vue éclatée de l'eau filtre

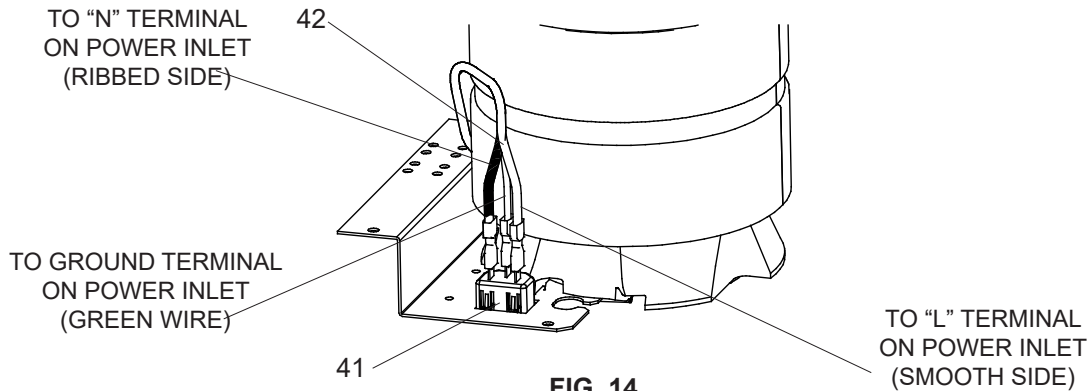


FIG. 14

220V/240V Power Inlet Detail
220V/240V potencia entrada detalle
220V/240V alimentation détail

PARTS LIST 220/240V - LISTA DE PIEZAS 220/240V - LISTE DES PIÈCES 220/240V

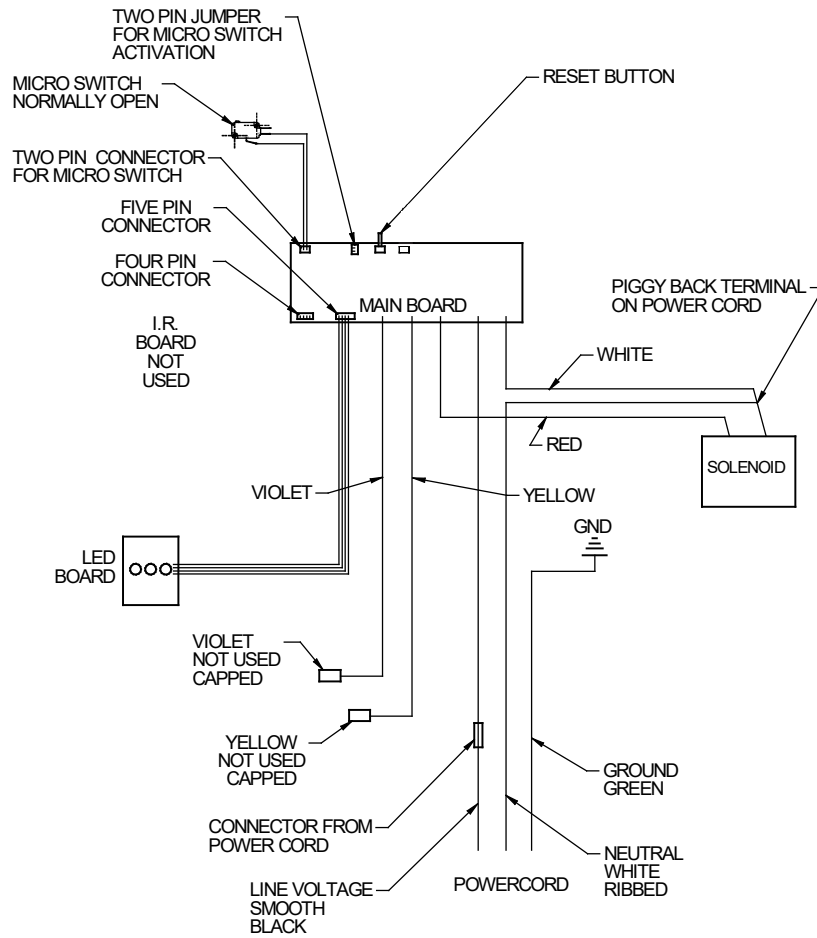
ITEM NO.	PART NO.	DESCRIPTION	DESCRIPCIÓN	DESCRIPTION
3	0000000245	Kit - Fan Motor/Blade/Shroud/Nut/Screws	Kit - ventilador Motor/Cuchilla/cubierta/tuerca/tornillos	Kit - ventilateur moteur/lame/carénage/écrou/vis
*11	1000002147	Compressor Service Pak (50Hz)	Paquete de Servicio del Compresor (50 Hz)	Trousse d'entr. supresseur (50Hz)
	1000002146	Compressor Service Pak (60Hz)	Paquete de Servicio del Compresor (60 Hz)	Trousse d'entr. supresseur (60Hz)
12	98751C	Kit - Relay/Overload/Cover (50Hz)	Kit - Relay/sobrecarga/cubierta (50Hz)	Kit - Relais/surcharge/Cover (50 Hz)
	98752C	Kit - Relay/Overload/Cover (60Hz)	Kit - Relay/sobrecarga/cubierta (60Hz)	Kit - Relais/surcharge/Cover (60 Hz)
41	35826C	Power Inlet	Entrada De Eléctrico	Entrée d'alimentation
42	35827C	Wire Assembly	Montaje del alambre	Fil assemblée

***REPLACE WITH SAME COMPRESSOR USED IN ORIGINAL ASSEMBLY.**
NOTE: All correspondence pertaining to any of the above water coolers or orders for repair parts **MUST** include Model No. and Serial No. of cooler, name and part number of replacement part.

***REEMPLAZA CON EL MISMO COMPRESOR USADO EN EL ENSAMBLADO INICIAL.**
NOTA: Toda la correspondencia relacionada con el enfriador de agua anterior o con una orden de reparación piezas **DEBERÁ** incluir el número de modelo y número de serie del enfriador, el nombre y número de pieza de la pieza de repuesto.

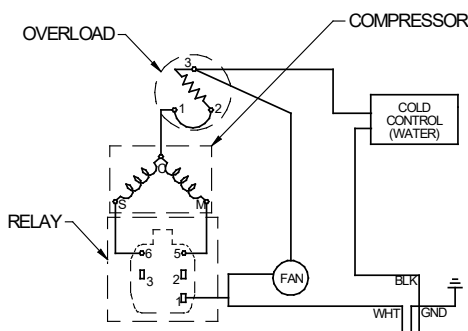
***REMPLECEZ AVEC LE MÊME SURPRESSEUR QUE CELUI UTILISÉ ORIGINALEMENT.**
NOTE : Toute correspondance au sujet des refroidisseurs d'eau courante ou toute commande de pièce de rechange **DOIT** inclure le numéro de modèle et le numéro de série du refroidisseur ainsi que le nom et le numéro de pièce à remplacer.

DF
2



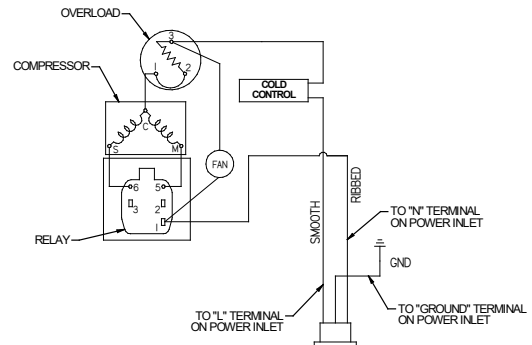
WIRING DIAGRAM 120 VOLT & 220 VOLT SINGLE & BI-LEVEL MICRO SWITCH ACTIVATION
 DIAGRAMA DE CABLEADO DE 120 VOLTIOS Y 220 VOLTIOS SOLO Y BIPAP MICRO INTERRUPTOR ACTIVACIÓN
 SCHÉMA DE CÂBLAGE 120 VOLTS & 220 VOLT SINGLE & VNDP MICRO INTERRUPTEUR D'ACTIVATION

FIG. 15



115V Wiring Diagram
 Esquema eléctrico 115V
 Diagramme de câblage 115V

FIG. 16



220V Wiring Diagram
 Esquema eléctrico 220V
 Diagramme de câblage 220V

FIG. 17



BF9 PROGRAM

SETTING THE CONTROL BOARD

VERIFY CONTROL BOARD SOFTWARE

- 1) To verify the software program of the control board the unit will need to be shut down and restarted. The chiller (if present) does not need to be shut down and restarted.
- 2) The units lower panel must be open to access the power cord and wall outlet.
- 3) Shut down the unit by unplugging the power cord from the wall outlet.
- 4) Restart the unit by plugging the power cord back into the wall outlet.
- 5) Upon start up the bottle count display will show the software designation of BF9.

ACCESSING THE PROGRAMMING BUTTON

- 1) To access the program button remove the bottom cover of the water cooler. The reset button is located on the left side of the cooler near the cold control. Replace the bottom cover after programming operations are completed.
NOTE: There is a reset button located under the top cover on the left hand side of the bottle filler also.

RESET THE FILTER MONITOR

- 1) Instructions apply to filtered units only.
- 2) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Monitor
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 3) When the display changes to "RST FLTR", depress the button again. The display will change to show "FLT =". Depress the button again and the display will show "FLTR =0"
- 4) The Green LED should be illuminated indicating that the visual filter monitor has been reset.

SETTING UNIT TYPE

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show "RNG SET"- Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-REFRIG)
"RST BCNT" - Reset bottle count
- 3) When display shows "UNIT TYPE" push program button once the display will show current value
Can be REFRIG or NON-REFRIG
- 4) Push button once to change value. Once value is selected the display will show the new value.
(Can be REFRIG or NON-REFRIG)
"REFRIG" - stands for refrigerated product. In this setting the flow rate is estimated at 1.0 gallon per minute.
"NON-REFRIG" - stands for non-refrigerated product. In this setting the flow rate is estimated at 1.5 gallons per minute.
Both "REFRIG" and "NON-REFRIG" simulated
1 bottle equal to 20 oz.
- 5) Allow approximately 4 seconds to pass and the display will return to bottle counter and be in run mode.

RESETTING BOTTLE COUNT

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show "RNG SET"- Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-REFRIG)
"RST BCNT" - Reset bottle count
If the button is not pushed again the display will scroll through the three messages above for three cycles and return to run mode.
- 3) When display shows "RST BCNT" push program button once the display will show current value e.g. "00033183".
- 4) Once display shows current value push the program button once more to reset back to 0. The display will show BTLCT = 0 for approximately 2 seconds and then return to run mode showing 00000000 bottles.
- 5) To test bottle counter:
REFRIG units: Push and hold Bottle Filler Button for 9.4 seconds to see bottle counter count 00000001.
(This is based on filling a 20 oz. bottle).
NON-REFRIG units: Push and hold Bottle Filler Button for 6.25 seconds to see bottle counter count 00000001.
(This is based on filling a 20 oz. bottle)

DF

2

BF11 - BF12 PROGRAM SETTING THE CONTROL BOARD

VERIFY CONTROL BOARD SOFTWARE

- 1) To verify the software program of the control board the unit will need to be shut down and restarted. The chiller (if present) does not need to be shut down and restarted.
- 2) The units lower panel must be open to access the power cord and wall outlet.
- 3) Shut down the unit by unplugging the power cord from the wall outlet or switching off the circuit breaker to the unit.
- 4) Restart the unit by plugging the power cord back into the wall outlet or by switching on the circuit breaker to the unit.
- 5) Upon start up, the bottle count display will show the software designation of BF11 or BF12.

ACCESSING THE PROGRAMMING BUTTON

- 1) To access the program button, remove the top cover of the bottle-filler. Remove the two (2) screws holding top cover to bottle-filler with a 5/32" allen wrench. Remove top cover. Do not discard mounting screws, they will be needed to reinstall the top cover after programming operations are completed. The programming button is located at the top right side of the unit on the control board.

RESET THE FILTER MONITOR

- 1) Instructions apply to filtered units only.
- 2) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Monitor
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 3) When the display changes to "RST FLTR", depress the button again. The display will change to show "FLTR =". Depress the button again and the display will show "FLTR =0"
- 4) The Green LED should be illuminated indicating that the visual filter monitor has been reset.

SETTING RANGE OF THE IR SENSOR WHERE APPLICABLE

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show
"RNG SET" - Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
- 3) When display shows "RNG SET" push program button once the display will show current value (can be 1 – 10) e.g. "RNG = 3".
- 4) Once display shows current value push the program button to scroll through value of 1 – 10. Select the desired range setting, "1" being closest to sensor and "10" being farthest away.
- 5) Once range is selected allow approximately 4 seconds to pass and then the display will go back to bottle counter and be in run mode.
- 6) Test bottle filler by placing bottle or hand in front of sensor to make sure water is dispensed.

SETTING UNIT TYPE

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.

Continued from below:

- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show
"RNG SET" - Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
- 3) When display shows "UNIT TYPE" push program button once the display will show current value. Can be REFRIG or NON-RFRG
- 4) Push button once to change value. Once value is selected the display will show the new value. (Can be REFRIG or NON-RFRG)
"REFRIG" - stands for refrigerated product. In this setting the flow rate is estimated at 1.0 gallon per minute.
"NON-RFRG" - stands for nonrefrigerated product. In this setting the flow rate is estimated at 1.5 gallons per minute. Both "REFRIG" and "NON-RFRG" simulate 1 bottle equal to 20 oz.
- 5) Allow approximately 4 seconds to pass and the display will return to bottle counter and be in run mode.

RESETTING BOTTLE COUNT

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show:
"RNG SET"- Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
If the button is not pushed again the display will scroll through the four messages above for three cycles and return to run mode.
- 3) When display shows "RST BCNT" push program button once the display will show current value, e.g. "0033183".
- 4) Once display shows current value push the program button once more to reset back to 0. The display will show BTLCT = 0 for approximately 2 seconds and then return to run mode showing 00000000 bottles.
NOTE: Once the bottle count is reset to zero there is no way to return to the previous bottle count.
- 5) Testing the bottle counter:
REFRIG units: Place bottle or hand in front of sensor for approximately 9 seconds to see bottle counter count 00000001,
(This is based on filling a 20 oz. bottle).
NON-RFRG units: Place bottle or hand in front of sensor for approximately 6 seconds to see bottle counter count 00000001,
(This is based on filling a 20 oz bottle).

SETTING FILTER CAPACITY

- 1) Depress the program button for approximately 2 seconds until the display changes then release. The display will change and scroll through two messages:
"RST FLTR" – Reset Filter Status LED
"SETTINGS" – System Settings Sub Menu
If the program button is not pushed again the display will scroll through the two messages above for three cycles and then default back to bottle count and be back in run mode.
- 2) When the display changes to "SETTINGS", depress the button again. The display will change to show:
"RNG SET"- Range set for IR sensor.
"UNIT TYP" - Type of unit (REFRIG or NON-RFRG)
"FLT SIZE" - Select filter capacity
"RST BCNT" - Reset bottle count
If the button is not pushed again the display will scroll through the four messages above for three cycles and return to run mode.
- 3) When display shows "FLT SIZE" push program button once. The display will show current value. Can be 3000GAL or 6000GAL.
- 4) Push program button again to display the desired "FLT SIZE".
- 5) Allow approximately 4 seconds to pass and the display will return to bottle counter and be in run mode.

115V PARTS LIST/ 115V LISTA DE PIEZAS/ 115V LISTE DES PIÈCES

ITEM NO.	PART NO.	DESCRIPTION	DESCRIPCIÓN	DESCRIPTION
1	97446C	Bubbler Assy-VR	Conjunto de Pelele - resistente al vandalismo	Barboteur Assemblée-anti-vandale
2	98777C	Kit - Compr Hardware/Clips/Studs/Grommets	Kit - compresor Hardware/Clips/espárragos/ojales	Kit - compresseur matériel/Clips/goujons/oeillets
3	98775C	Kit - Fan Motor/Blade/Shroud/Nut/Screws	Kit - ventilador Motor/Cuchilla/cubierta/tuerca/tornillos	Kit - ventilateur moteur/lame/carénage/écrou/vis
4	98776C	Kit - Condenser/Drier	Kit - secador de condensador	Kit - condenseur/séchoir
5	98530C	Kit - Regulator/Holder/Nut	Kit - tuerca de soporte de regulado	Kit - régulateur/titulaire/noix
6	56092C	Tubing - Poly (Cut To length)	Tubería de polietileno (Corte a la longitud)	Tubes - Polyéthylène (Couper à la longueur)
7	98693C	Kit - PushButton/Sleeve/Screws/Nuts/Wshrs	Kit - pulsador/manga/tornillos/tuercas/arandelas	Kit - bouton poussoir/manchon/vis/écrous/rondelles
8	98773C	Kit - Cold Control/Screws	Kit - tornillos de Control de frío	Kit - froids/vis de réglage
9	60098551640	Kit - Drain Plug/Strainer/Adapter/Screw	Kit - enchufe/filtro/adaptador/tornillo de drenaje	Kit - fiche/filtre/adaptateur/vis de purge
10	35870C	Power Cord	Cable Eléctrico	Cordon d'alimentation
*11	36322C	Compressor Serv. Pak	Paquete de Serv. del Compresor	Trousse d'entr. Supreieur
12	000000238	Kit - Relay/OverLoad/Cover	Kit - Relay/sobrecarga/cubierta	Kit - Relais/surcharge/Cover
13	000000190	Kit - #10 Pinned Torx Screws/T-25 Bit	Kit - Torx #10 cubrió tornillos/T-25 bit	Kit - #10 épinglé Torx vis/T-25 bit
14	1000001602	Kit - Elbow 5/16" - 1/4" (3 Pack)	Kit - codo 5/16" - 1/4" (paquete de 3)	Kit - coude 5/16" - 1/4" (Pack de 3)
15	98684C	Kit - Drain Elbow/Gasket/Nut/Washer	Kit - desagüe Codo/Empaque/Tuerca/Arandela	Kit - vidange coude/joint/Écrou/Rondelle
16	1000001994	Kit - Tee 1/4" (3 Pack)	Kit - t 1/4" (paquete de 3)	Kit - Tee 1/4" (Pack de 3)
17	98778C	Kit - Heat Exchanger/Drier	Kit - secador de intercambiador de calor	Kit - échangeur thermique/séchoir
18	28596C	Panel - Screen	Panel - Pantalla	Panneau - Écran
19	66703C	Drier	Secador	Déshydrateur
20	98724C	Evaporator Replacement Assembly	Conjunto de repuesto evaporador	Ensemble de rechange évaporateur
21	70002C	Screw - #10 x 1/2" Lg. HHSM	Tornillo - #10 x 1/2" Lg. HHSM	Vis - #10 x 1/2 Lg. HHSM
22	45929C	Tube - Drain	Tube de drenaje-	Tube - Drain
23	75524C	Clip (Front & Rear Panels)	Brida (Paneles frontales y posteriores)	Pince (panneaux avant et arrière)
24	28617C	Screen - VR	Pantalla - VR	Écran - VR
25a	0000000966	Kit - Basin - Stainless Steel	Kit - La palangana - Acero que no se Mancha	Kit - Le bassin - l'Acier de Stainless
25b	29014C	Basin - Stainless Steel (BF)	Cuenca - rellenadores de botellas de acero inoxidable (BF)	Bassin - remplisseur de bouteille en acier inoxydable (BF)
26	22897C	Panel - Bottom Dispenser	Panel - Dispensador Inferior	Panneau - distributeur inférieur
27	27124C	Cover - Cold Control	Cubierta de Control del Frío	Couvercle de Commande d'eau froide
28	55931C	Cover - Dispenser Bottom	Cubierta-Dispensador Inferior	Couvercle - distributeur inférieur
29	1000004447	Kit - Drain Tube Assy.	Kit - Conjunto de tubo de desagüe	Kit - Tube de vidange
30	70864C	Screw - #8 x .62 Torx/Slot	Tornillo - #8 x .62 Torx/Slot	Vis - #8 x .62 Torx/Slot
31	See Color Table	Panel - RH Dispenser Side	Panel - Lado derecho	Panneau - côté droit
32	See Color Table	Panel - LH Dispenser Side	Panel - Lado izquierdo	Panneau - côté gauche
33	See Color Table	Panel - Dispenser Front	Panel - Dispensador Frontal	Panneau - avant
34	See Color Table	Panel - Front Lower (Not Shown)	Panel - Frente Inferior (No mostrada)	Panneau - avant inférieur (Pas montré)
35	See Color Table	Panel - RH Rear	Panel - Retrovisor Derecho	Panneau - arrière droit
36	See Color Table	Panel - LH Rear	Panel - Retrovisor Izquierdo	Panneau - arrière gauche
37	See Color Table	Panel - RH Rear TL	Panel - Retrovisor Derecho TL	Panneau - arrière droit TL
38	See Color Table	Panel - RH Rear TLR	Panel - Retrovisor Derecho TLR	Panneau - arrière droit TLR
39	See Color Table	Panel - LH Rear TL	Panel - Retrovisor Izquierdo TL	Panneau - arrière gauche TL
40	See Color Table	Panel - LH Rear TLR	Panel - Retrovisor Izquierdo TLR	Panneau - arrière gauche TLR
NS	55996C	Strainer (See "General Instructions")	Filtro Bifurcado (Vea "Instrucciones Generales")	Grille (Voir "Directives Générales")
NS	28551C	Hanger Bracket	El Paréntesis del gancho	Crochet de cintre

NS - NOT SHOWN

***REPLACE WITH SAME COMPRESSOR USED IN ORIGINAL ASSEMBLY.**

NOTE: All correspondence pertaining to any of the above water coolers or orders for repair parts MUST include Model No. and Serial No. of cooler, name and part number of replacement part.

***REEMPLAZAR CON EL MISMO COMPRESOR USADO EN EL ENSAMBLADO INICIAL.**

NOTA: Toda la correspondencia relacionada con el enfriador de agua anterior o con una orden de reparación piezas DEBERÁ incluir el número de modelo y número de serie del enfriador, el nombre y número de pieza de la pieza de repuesto.

***REPLACEZ AVEC LE MÊME SURPRESSEUR QUE CELUI UTILISÉ ORIGINALEMENT.**

NOTE : Toute correspondance au sujet des refroidisseurs d'eau courante ou toute commande de pièce de rechange DOIT inclure le numéro de modèle et le numéro de série du refroidisseur ainsi que le nom et le numéro de pièce à remplacer.

BOTTLE FILLER REPLACEMENT PART KITS BOTELLA RELLENO REEMPLAZO PARTE KITS BOUTEILLE DE REMPLISSAGE REMPLACEMENT PARTIE KITS

PART NO.	DESCRIPTION	DESCRIPCIÓN	DESCRIPTION
98543C	Kit - Electrical Package	Kit - paquete eléctrico	Kit - Package électrique
1000004770	Kit - Solenoid Valve Replacement 115V	Kit - reemplazo de la válvula de solenoide 115V	Kit - remplacement de la Valve solénoide 115V
98546C	Kit - Aerator Replacement	Kit - reemplazo de aireador	Kit - aérateur Remplacement
98549C	Kit - Hardware & Waterway Parts	Kit - Hardware y partes de la canal	Kit - matériel & Waterway pièces
98552C	Kit - Retro Filter Mounting	Kit - Retro montaje del filtro	Kit - rétro montage du filtre
98631C	Kit - Electrical Package 220V	Kit - paquete eléctrico 220V	Kit - Package électrique 220V
1000004771	Kit - Solenoid Valve Replacement 220V	Kit de reemplazo de la válvula de solenoide 220V-	Kit - remplacement de la Valve solénoide 220V
98668C	Kit - Filter Mounting Cover	Kit de montaje tapa del filtro-	Kit - couverture de montage du filtre
98999C	Kit - Drain Pad	Kit de drenaje de Pad-	Kit - Drain Pad
99000C	Kit - Button Assembly	Kit - conjunto de botón	Kit de montage de bouton
1000001907	Kit - Top Cover Replacement	Kit - reemplazo de la cubierta superior	Kit - remplacement du capot supérieur
99002C	Kit - Gasket VR BF Tower/Basin	Kit - junta resistente al vandalismo botella relleno torre/cuenca	Kit - joint anti-vandalisme tour de remplissage de bouteille/bassin
99003C	Kit - Reset Switch	Kit - interruptor de reinicio	Kit - interrupteur de réinitialisation
99004C	Kit - Micro Switch	Kit - interruptor Micro	Kit - Micro interrupteur

FOR PARTS, CONTACT YOUR LOCAL DISTRIBUTOR OR CALL 1.800.834.4816

PARA PIEZAS, CONTACTE A SU DISTRIBUIDOR LOCAL O LLAME AL 1.800.834.4816

POUR OBTENIR DES PIÈCES, CONTACTEZ VOTRE DISTRIBUTEUR LOCAL OU COMPOSEZ LE 1.800.834.4816

REPAIR SERVICE INFORMATION TOLL FREE NUMBER 1.800.260.6640

NÚMERO GRATIS DE SERVICIO 1.800.260.6640

INFORMATIONS POUR LE SERVICE PAR NUMERO SANS FRAIS 1.800.260.6640

PRINTED IN U.S.A.
IMPRESO EN LOS E.E.U.U.
IMPRIME AUX É.-U.

ELKAY MANUFACTURING COMPANY • 2222 CAMDEN COURT • OAK BROOK, IL 60523 • 630.574.8484 • www.elkay.com

IMPORTANT! INSTALLER PLEASE NOTE :

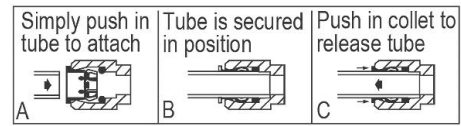
This water cooler has been designed and built to provide water to the user which has not been altered by materials in the cooler waterways. The grounding of electrical equipment such as telephone, computer, etc. to water lines is a common procedure. The grounding may be in the building but may also occur away from the building. This grounding can cause electrical feedback into a water cooler creating an electrolysis which creates a metallic taste or causes an increase in the metal content of the water. This condition is avoidable by installing the cooler using the proper materials as shown below.

NOTICE

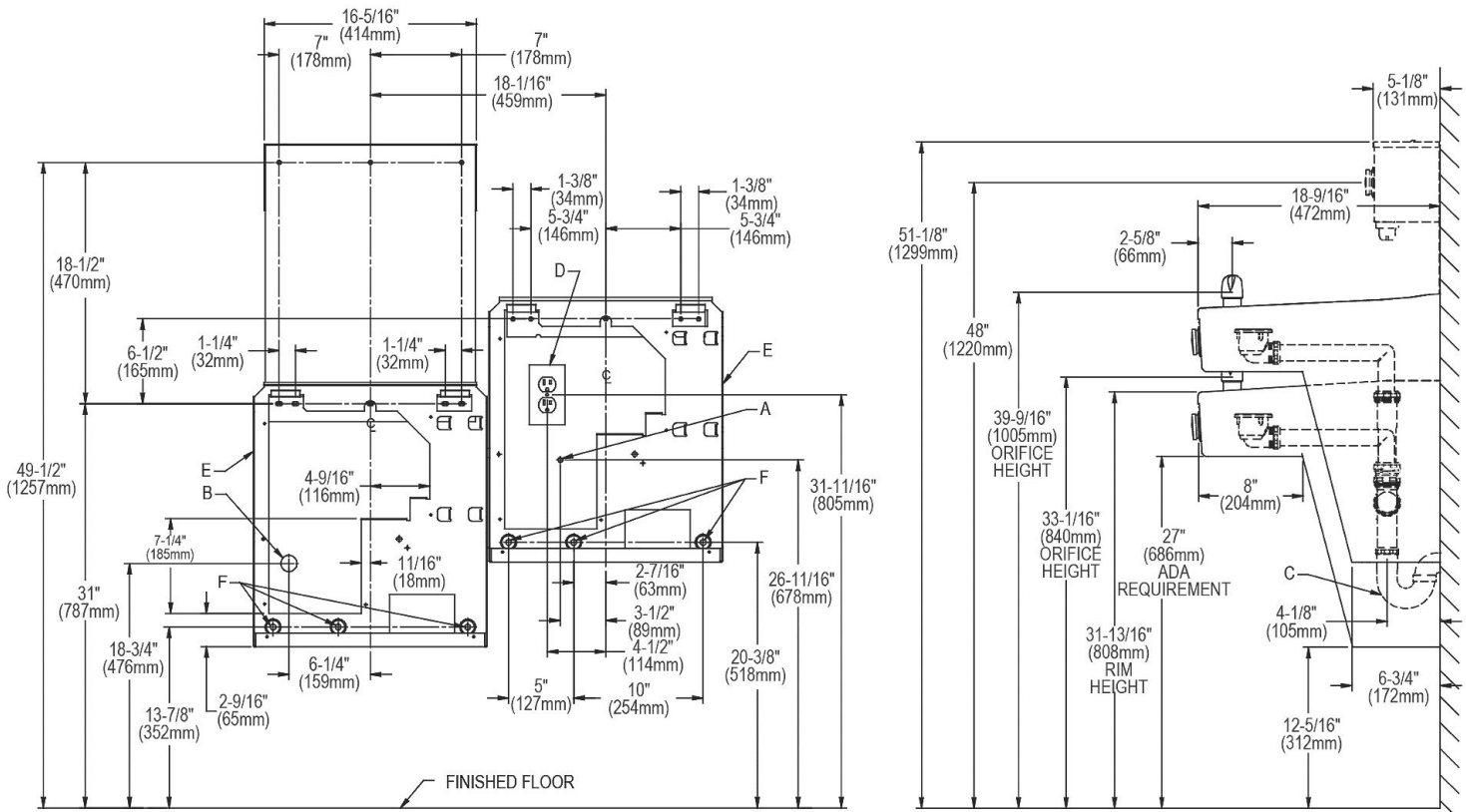
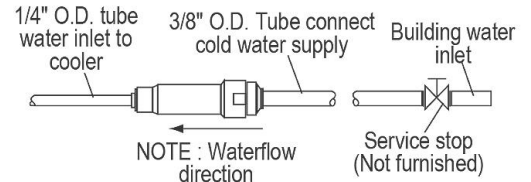
This water cooler must be connected to the water supply using a dielectric coupling. The cooler is furnished with a non-metallic strainer which meets this requirement. The drain trap which is provided by the installer should also be plastic to completely isolate the cooler from the building plumbing system. Bottle filler unit on bracket attached to wall by 6 holes (as shown). Water and electrical will connect through pre-punched hole in basin.



OPERATION OF QUICK CONNECT FITTINGS



Pushing tube in before pulling it out helps to release tube



REDUCE HEIGHT BY 3" FOR INSTALLATION OF CHILDREN'S ADA COOLER

LEGEND:

- A = Recommended Water Supply location. Shut-off Valve (not furnished) to accept 3/8" O.D. unplated copper tube. Up to 3" (76mm) maximum out from wall.
- B = Recommended Waste Outlet location. To accommodate 1-1/2" nominal drain. Drain stub 2" (51mm) out from wall.
- C = 1-1/2" Trap (not furnished).
- D = Electrical Supply (3) Wire Recessed Box Duplex Outlet.
- E = Insure proper ventilation by maintaining 6" (152mm) minimum clearance from cabinet louvers to wall.
- F = 7/16" (11mm) Bolt Holes for fastening to wall.

Note : New Installations Must Use Ground Fault Circuit Interrupter (GFCI). It is highly recommended that the circuit be dedicated and the load protection be sized for 20 amps.

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.



Z415B

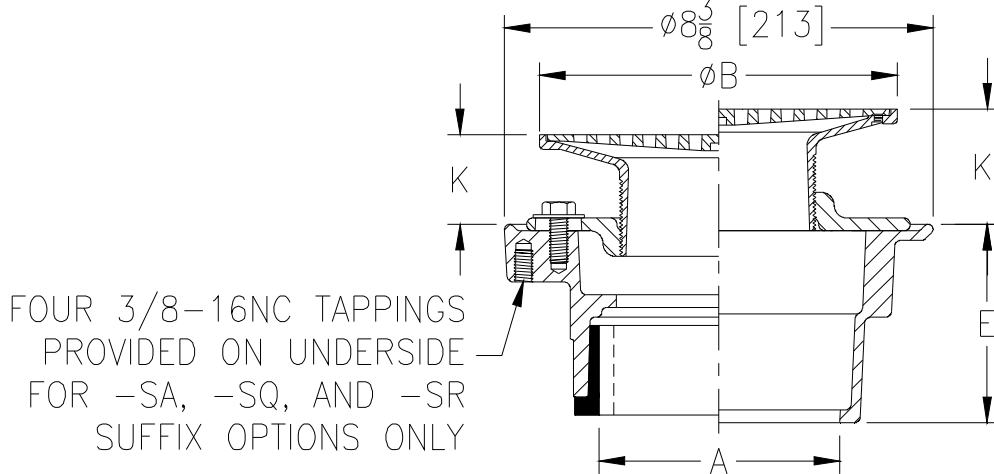
BODY ASSEMBY W/ "TYPE B" STRAINER



SPECIFICATION SHEET

TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Dimensions in In [mm]						Approx. Wt. Lbs. [kg]	Strainer Open Area Sq. In. [cm ²]
A Pipe Size	B Strainer Dia.	K		K'			
		Min.	Max.	Min.	Max.		
2,3 [51,76]	5 [127]	1 [25]	1-1/2 [38]	1-3/32 [28]	2-1/4 [57]	11 [5]	6-1/4 [40]
2,3,4 [51,76,102]	6 [152]	1 [25]	1-25/32 [45]	1-13/32 [36]	2-17/32 [64]	13 [6]	9 [58]
2,3,4 [51,76,102]	7 [178]	1 [25]	2-1/8 [54]	1-23/32 [44]	2-7/8 [73]	14 [6]	12 [77]
3,4 [76,102]	8 [203]	1-5/32 [30]	2-1/8 [54]	1-3/4 [44]	2-7/8 [73]	16 [7]	19 [123]
6 [152]	8 [203]	1-5/32 [30]	2-1/8 [54]	1-3/4 [44]	2-7/8 [73]	18 [8]	19 [123]
6 [152]	10 [254]	1-7/16 [37]	2-1/2 [64]	2 [51]	3-1/4 [83]	22 [10]	23 [148]

ENGINEERING SPECIFICATION: ZURNZN415B

Floor and shower drain, Dura-Coated cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with seepage slots and "TYPE B" polished nickel bronze, light-duty strainer.

OPTIONS (Check/specify appropriate options)

PIPE SIZE

- 2,3,4 [51,76,102]
- 2 [51]
- 3 [76]
- 4 [102]
- 6 [152]
- 2,3,4 [51,76,102]
- 2,3,4 [51,76,102]

(Specify size/type) OUTLET

- _____ IC Inside Caulk
- _____ IP Threaded
- _____ IP Threaded
- _____ IP Threaded
- _____ IP Threaded
- _____ NH No-Hub
- _____ NL Neo-Loc

'E' BODY HT. DIM.

- 4-3/16 [106]
- 2-7/16 [62]
- 2-3/4 [70]
- 2-13/16 [71]
- 2-7/8 [73]
- 3-13/16 [97]
- 3-7/8 [98]

PREFIXES

- _____ ZB D.C.C.I. Body Assembly w/ Polished Bronze Top
- _____ ZN D.C.C.I. Body Assembly w/ Polished Nickel Bronze Top*

SUFFIXES

- _____ -AR Acid Resisting Epoxy Coated Cast Iron
- _____ -CP Chrome-Plated Bronze Top
- _____ -G Galvanized Cast Iron
- _____ -HD Heavy-Duty Slotted Grate (ZN 5,6 [127,152] Sizes Only)
- _____ -OF Oval Funnel (Z329-7) (6,7,8,10 [152,178,203,254] Strainers Only)
- _____ -P Trap Primer Connection (Specify 1/2 [13] or 3/4 [19])
- _____ -PC Protective Cover
- _____ -SA Stabilizer Assembly (See Z1035)
- _____ -SQ Stabilizer Q-Deck (See Z1035-Q)
- _____ -SR Stabilizer Ring
- _____ -TC Neo-Loc Test Cap Gasket (2,3,4 [51,76,102] NL Outlet Only)
- _____ -U 1-3 [25-76] High Extension Adapter
- _____ -V Backwater Valve
- _____ -VP Vandal-Proof Secured Top
- _____ -Y Sediment Bucket
- _____ -4 4 [102] Diameter Funnel (Z328)
- _____ -90 90° Threaded Side Outlet Body Assembly (2,3 [51,76] Only)

* Regularly furnished unless otherwise specified.



Z415BL

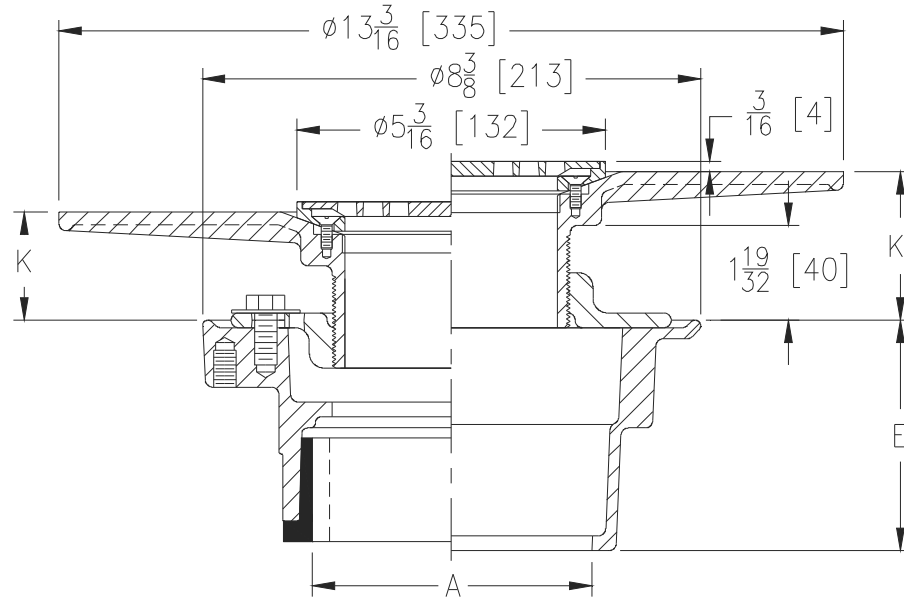
BODY ASSEMBLY W/ "TYPE BL" STRAINER



SPECIFICATION SHEET

TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Strainer Designated	Dimensions in In [mm]				Approx. Wt. Lbs. [kg]	Strainer Open Area Sq. In. [cm ²]	
	A - Pipe Size	K		K'			
		Min.	Max.	Min.			Max.
-5BL	2,3,4,6 [51,76,102,152]	7/8 [22]	2-1/4 [57]	1-11/16 [43]	3 [76]	6-1/4 [40]	

ENGINEERING SPECIFICATION: ZURNZN415BL

Floor and shower drain, Dura-Coated cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with seepage slots and "TYPE BL" D.C.C.I. wide flanged head and polished nickel bronze, light-duty strainer.

OPTIONS (Check/specify appropriate options)

PIPE SIZE

- 2,3,4 [51,76,102]
- 2 [51]
- 3 [76]
- 4 [102]
- 6 [152]
- 2,3,4 [51,76,102]
- 2,3,4 [51,76,102]

(Specify size/type) **OUTLET**

- _____ IC Inside Caulk
- _____ IP Threaded
- _____ IP Threaded
- _____ IP Threaded
- _____ IP Threaded
- _____ NH No-Hub
- _____ NL Neo-Loc

'E' BODY HT. DIM.

- 3-7/8 [98]
- 2-3/8 [60]
- 2-5/8 [67]
- 2-7/8 [73]
- 2-3/4 [70]
- 3-7/8 [98]
- 3-3/4 [95]

PREFIXES

- _____ ZB D.C.C.I. Body Assembly w/ Polished Bronze Top
- _____ ZN D.C.C.I. Body Assembly w/ Polished Nickel Bronze Top*

SUFFIXES

- _____ -AR Acid Resisting Epoxy Coated Cast Iron
- _____ -CP Chrome-Plated Bronze Top
- _____ -G Galvanized Cast Iron
- _____ -P Trap Primer Connection (Specify 1/2 [13] or 3/4 [19])
- _____ -PC Protective Cover
- _____ -SA Stabilizer Assembly (See Z1035)
- _____ -TC Neo-Loc Test Cap Gasket (2,3,4 [51,76,102] NL Bottom Outlet Only)
- _____ -U 1 thru 3 [25 thru 76] High Extension Adapter
- _____ -VP Vandal-Proof Secured Top
- _____ -Y Sediment Bucket
- _____ -90 90° Threaded Side Outlet Body Assembly (2 [51], 3 [76] Only)

* Regularly furnished unless otherwise specified.



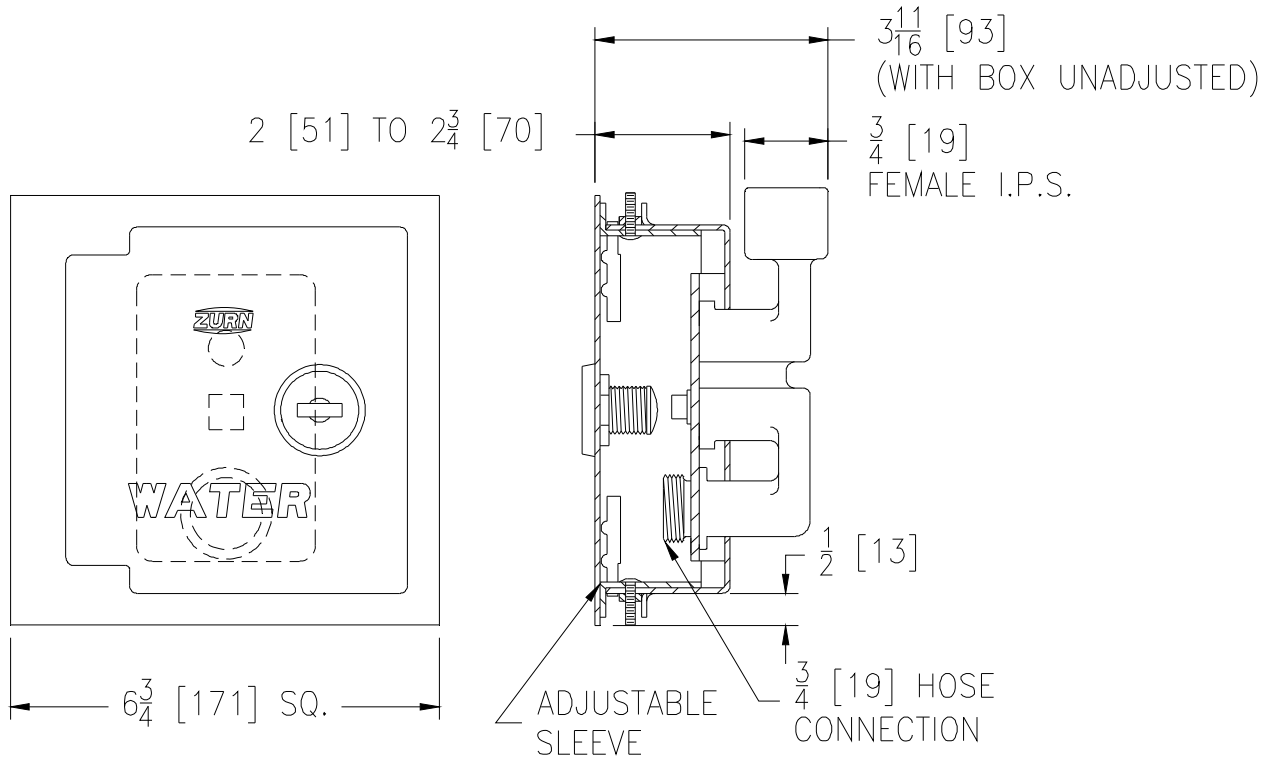
Z1350
NARROW WALL HYDRANT
Encased, Moderate Climate



SPECIFICATION SHEET

TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Wall Thickness Inches	Approx. Wt. Lbs. [kg]
4 [102]	4 [2]

ENGINEERING SPECIFICATION: ZURN Z1350 Encased moderate climate wall hydrant for narrow wall installation. Complete with bronze body, all bronze interior parts, replaceable seat washer, screwdriver operated stop valve in supply, key operated control valve, and 3/4 [19] IP female inlet and 3/4 [19] male hose connection standard. Adjustable stainless steel box furnished with hinged cover, cylinder lock and "WATER" stamped on cover.

OPTIONS (Check/specify appropriate options)

SUFFIXES

- ___ -RK Hydrant Parts Repair Kit
- ___ -VB 3/4 [19] Adapter Vacuum Breaker
- ___ -34EL 3/4 [19] IP 90° Inlet Elbow Adapter
- ___ -34FS 3/4 [19] Solder Female Inlet Adapter

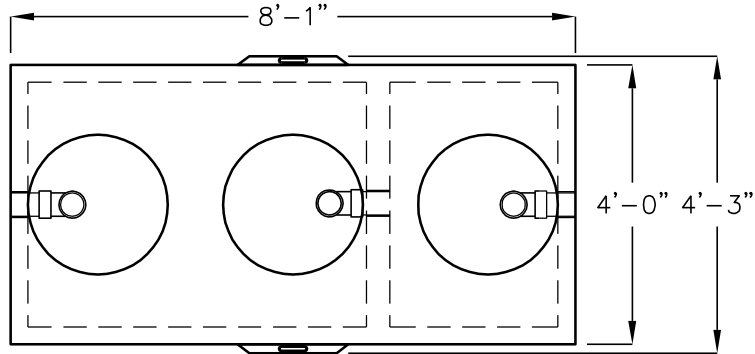
****NOTE:** The adjustable sleeve on the stainless steel box is provided with a gasket as standard, but additional caulking of all inside joints is required (by others) after the hydrant box has been properly set. Caulking should be performed on all open seams, including the seams where the gasket is present.

REV. J	DATE: 10/22/10	C.N. NO. 111945
DWG. NO. 58877		PRODUCT NO. Z1350

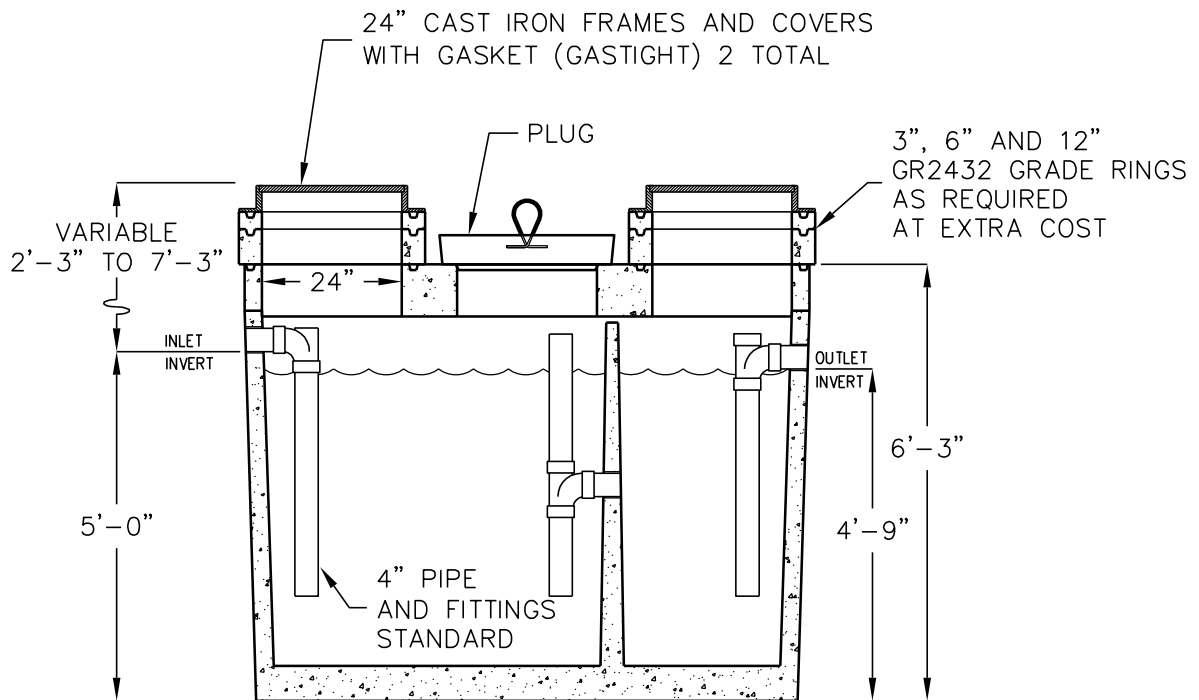


750 GALLON GREASE INTERCEPTOR

MODEL JP750EPE-G
LISTED BY UPC®
NORTHERN CALIFORNIA



TOP VIEW
(COVERS & RINGS REMOVED)



SIDE SECTION VIEW

OPERATING CAPACITY: 750 GALLONS.

DESIGN LOAD: H-20 TRAFFIC WITH DRY SOIL CONDITIONS
(WATER LEVEL BELOW TANK) AND 1'-6' EARTH COVER.

SUITABLE SUB-BASE BEDDED WITH GRANULAR MATERIAL SHALL BE
PREPARED TO HANDLE ANTICIPATED LOADS.

FOR COMPLETE DESIGN AND PRODUCT INFORMATION
CONTACT JENSEN PRECAST.

MINIMUM EXCAVATION
5'-3" x 9'-1"
x REQ'D DEPTH

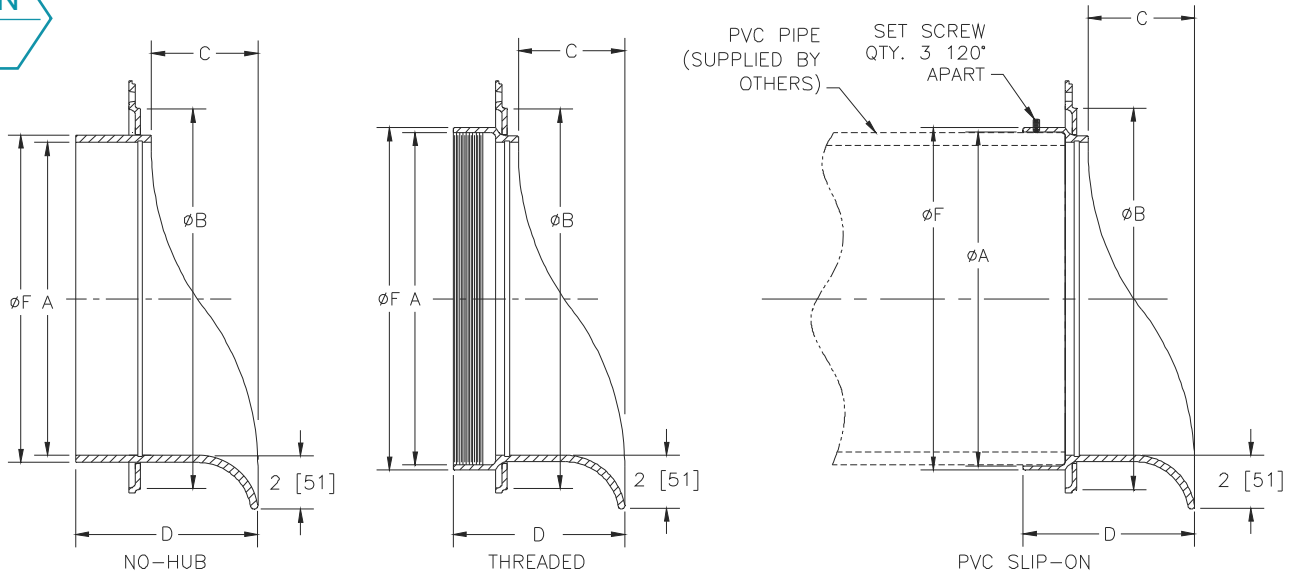


Z199 DOWNSPOUT NOZZLE

SPECIFICATION SHEET

TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Dimensions in inches [mm]							Approx. Wt. Lbs. [kg]
A- Pipe Size	B	C	D		F		
			IP / PVC	NH	IP / PVC	NH	
2 [51]	4-1/2 [114]	2-5/8 [67]	4-1/2 [114]	4-1/2 [114]	2-13/16 [71]	2-3/8 [60]	5 [2]
3 [76]	5-1/2 [140]	2-5/8 [67]	4-1/2 [114]	4-1/2 [114]	3-15/16 [100]	3-3/8 [86]	6 [3]
4 [102]	6-5/8 [168]	2-43/64 [69]	4-1/2 [114]	4-1/2 [114]	4-15/16 [125]	4-3/8 [121]	7 [3]
5 [127]	7-5/8 [194]	3-1/16 [78]	4-59/64 [125]	5-15/32 [139]	6-1/16 [154]	5-5/16 [135]	12 [5]
6 [152]	8-5/8 [219]	3-3/32 [79]	4-59/64 [125]	5-15/32 [139]	7-1/8 [181]	6-5/16 [160]	13 [6]
8 [203]	10-5/8 [270]	2-31/32 [75]	4-59/64 [125]	5-25/32 [147]	9-1/8 [232]	8-3/8 [213]	14 [6]
10 [254]	12-5/8 [321]	3-1/2 [89]	5-53/64 [148]	6-5/16 [160]	11-5/32 [283]	10-9/16 [268]	15 [7]
12 [305]	14-5/8 [371]	4-5/64 [104]	6-13/32 [163]	6-57/64 [175]	13-5/32 [334]	12-1/2 [318]	18 [8]

ENGINEERING SPECIFICATION: ZURN ZANB199

Downspout Nozzle, All nickel bronze body, optional threaded, PVC slip-on, or No-Hub inlet and decorative face of wall flange and outlet nozzle.

OPTIONS (Check/specify appropriate options)

PIPE SIZE

2, 3, 4, 5, 6, 8, 10, 12 [51,76,102,127,152, 203, 254,305]
 2, 3, 4, 5, 6, 8, 10, 12 [51,76,102,127,152, 203, 254,305]
 2, 3, 4, 5, 6, 8, 10, 12 [51,76,102,127,152, 203, 254,305]

(Specify size/type) OUTLET

___ IP Threaded
 ___ NH No-Hub
 ___ PVC PVC Connection

PREFIXES

___ ZANB All Nickel Bronze Body*
 ___ ZAB All Polished Bronze Body
 ___ ZARB All Plain Bronze Body

SUFFIXES

___ -SS Removable Stainless Screen

* Regularly furnished unless otherwise specified.

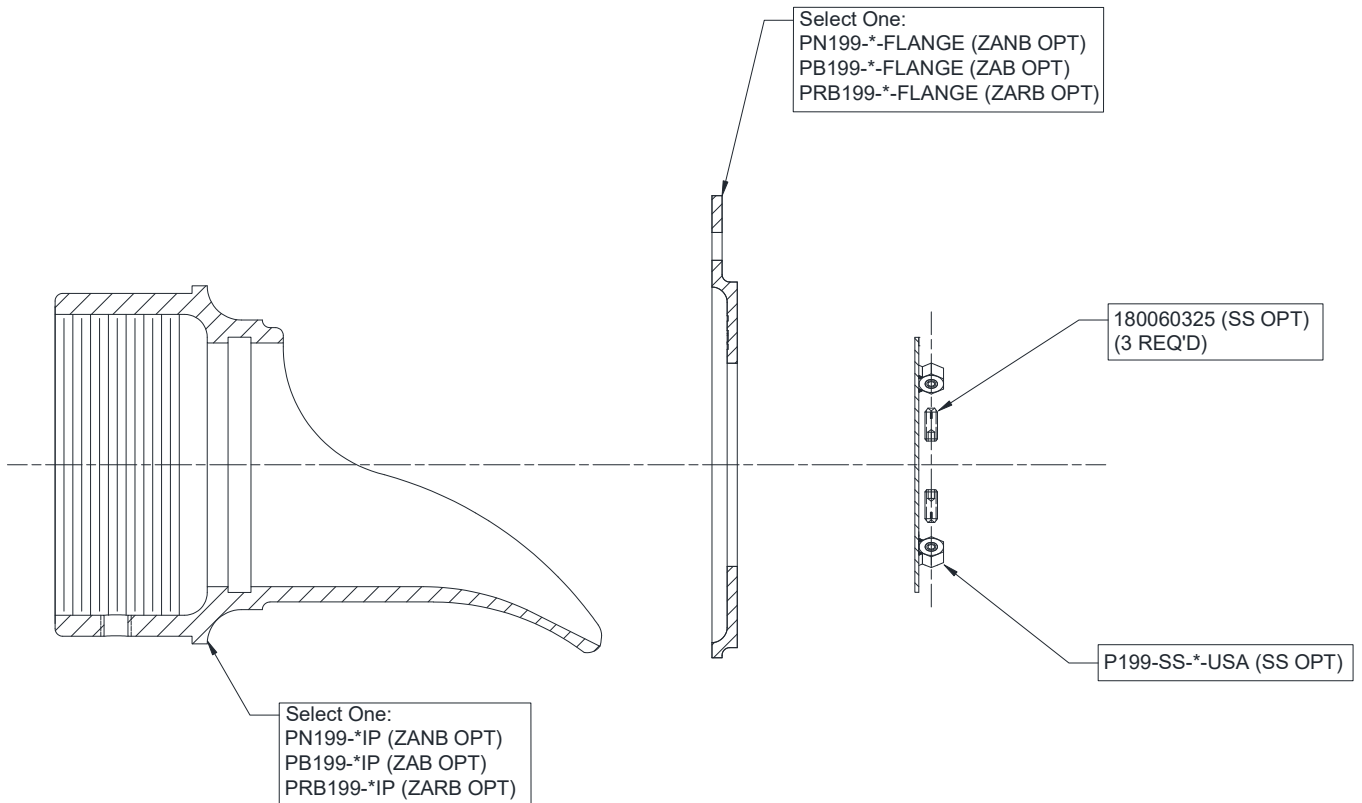


COMMON COMPONENTS

Z199-ZANB/ZAB/ZARB_IP

DOWNSPOUT NOZZLE W/ ALL NICKEL BRONZE BODY, ALL POLISHED BRONZE BODY, OR ALL PLAIN BRONZE BODY, WITH THREADED CONNECTION AND REMOVABLE STAINLESS STEEL SCREEN

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



* Customer to Specify Size

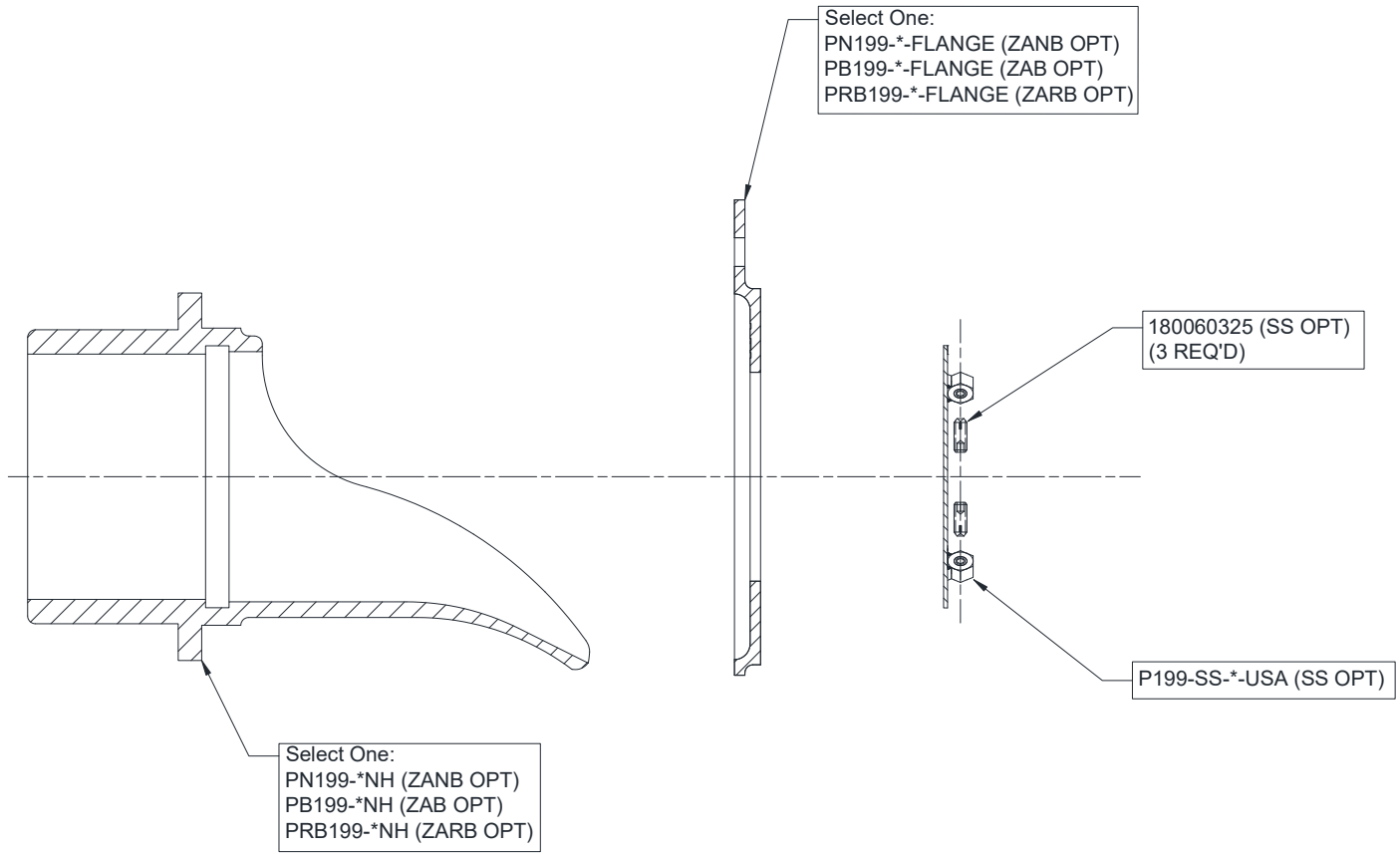
COMMON COMPONENTS



Z199-ZANB/ZAB/ZARB_NH-SS

DOWNSPOUT NOZZLE W/ ALL NICKEL BRONZE BODY, ALL POLISHED BRONZE BODY, OR ALL PLAIN BRONZE BODY WITH NO-HUB CONNECTION AND REMOVABLE STAINLESS STEEL SCREEN

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



* Customer to Specify Size

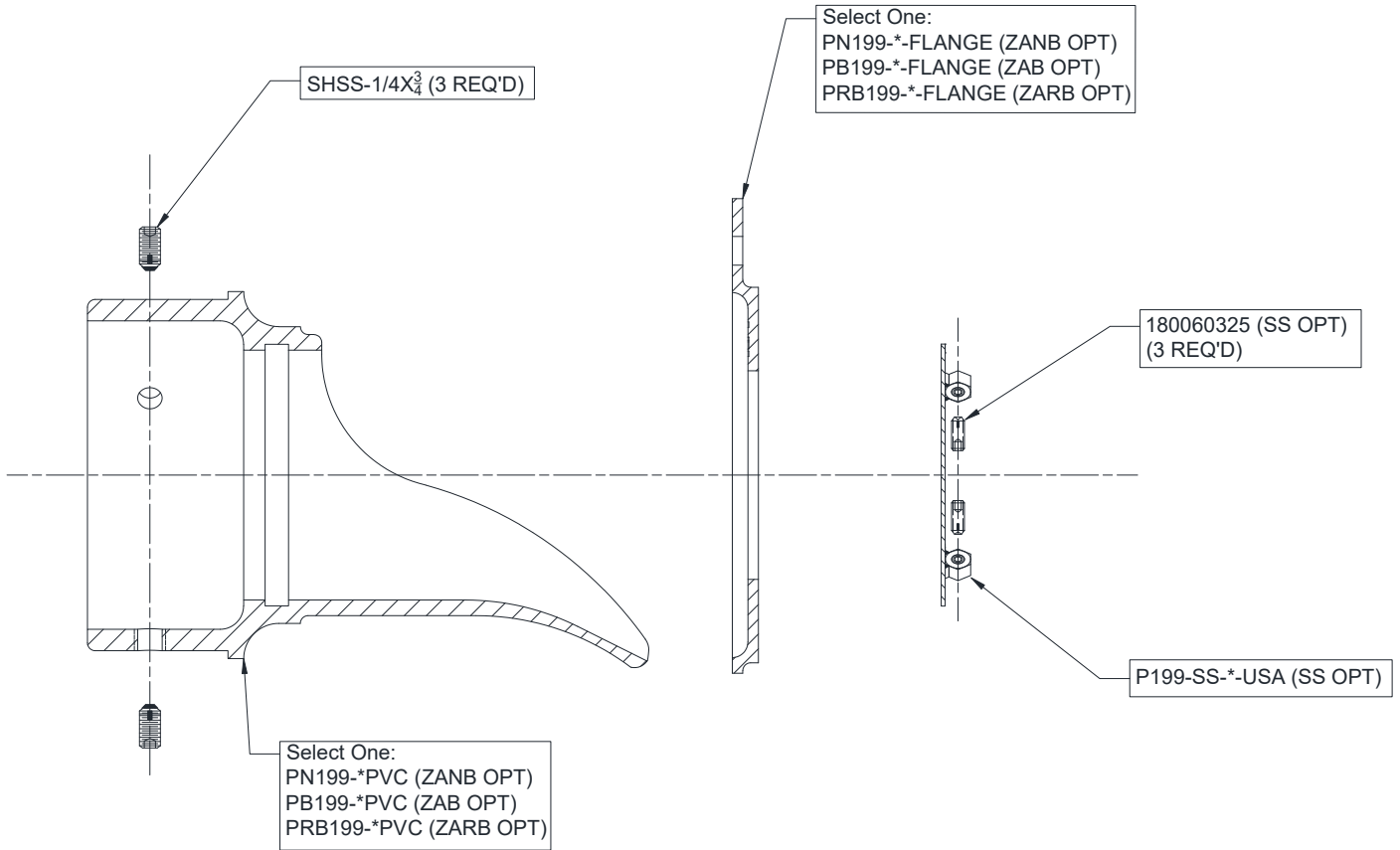
COMMON COMPONENTS



Z199-ZANB/ZAB/ZARB_PVC

DOWNSPOUT NOZZLE W/ ALL NICKEL BRONZE BODY, ALL POLISHED BRONZE BODY OR ALL PLAIN BRONZE BODY WITH PVC CONNECTION AND REMOVABLE STAINLESS STEEL SCREEN

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice

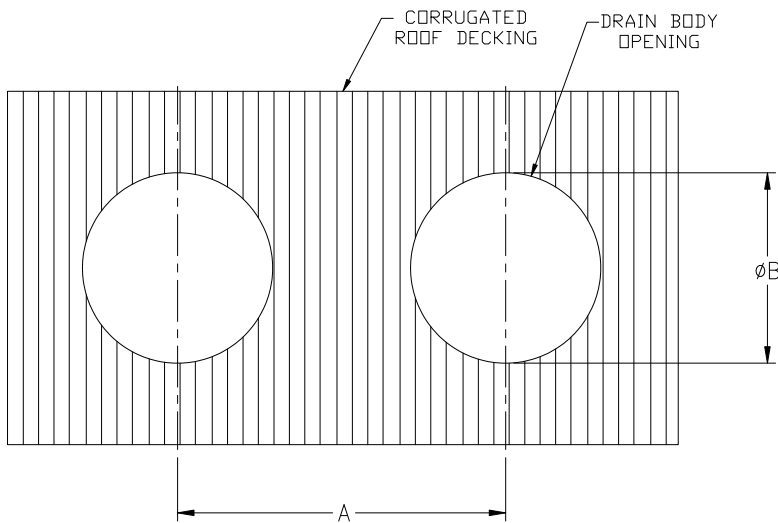
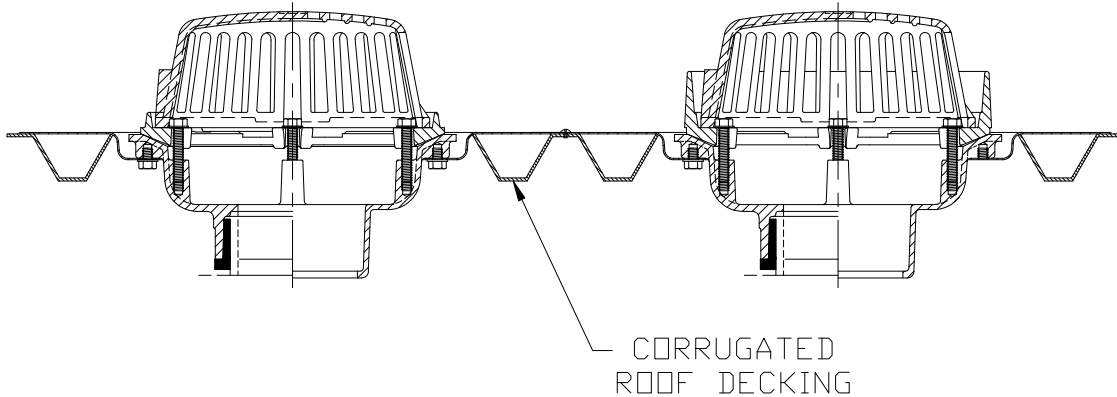


* Customer to Specify Size



TYPICAL INSTALLATION FOR Z163, Z164, Z165 COMBINATION MAIN ROOF AND OVERFLOW DRAIN

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



	A	ØB
Z163	24 [610]	16-1/2 [419]
Z164	20 [508]	13-1/2 [343]
Z165	16 [406]	10 [254]

Z163, Z164, Z165

COMBINATION MAIN ROOF AND OVERFLOW DRAINS

Drain installed in a typical corrugated roof decking application. All four sides and middle of deck plate must be supported adequately, subject to the approval of the project's structural engineer.

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

⚠ ADVERTENCIA: Cáncer y daño reproductivo - www.P65Warnings.ca.gov

⚠ AVERTISSEMENT: Cancer et effets néfastes sur la reproduction - www.P65Warnings.ca.gov



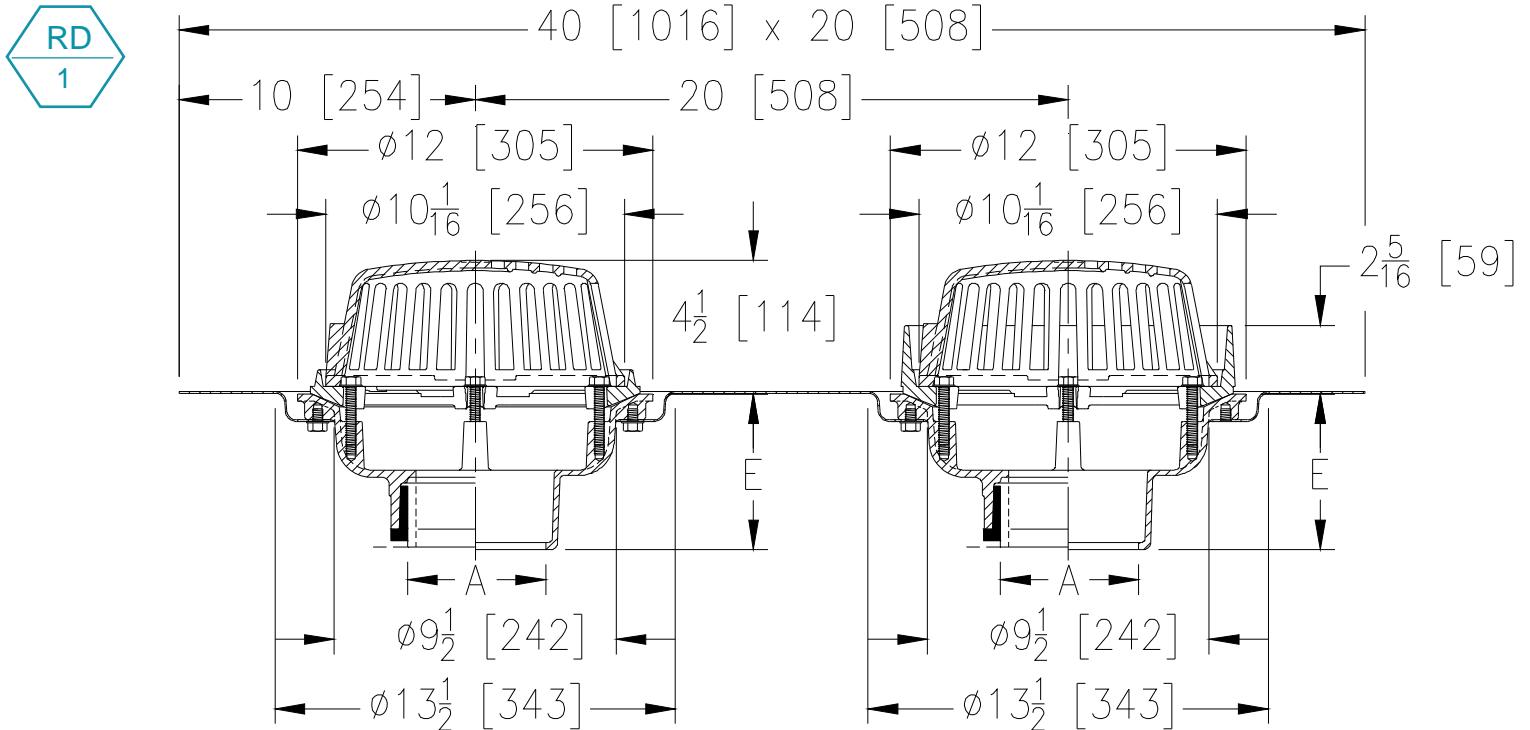
Z164

12 [305] DIAMETER COMBINATION MAIN ROOF
AND OVERFLOW DRAIN WITH LOW SILHOUETTE DOMES
AND DOUBLE TOP-SET® DECK PLATE

SPECIFICATION SHEET

TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



A Pipe Size In. [mm]	Approx. Wt. Lbs. [kg]	Dome Open Area Sq. In. [cm ²]
2, 3, 4, 6 [51, 76, 102, 152]	66 [30]	78 [503]

ENGINEERING SPECIFICATION: ZURN Z164

12" [305mm] Diameter roof drain and overflow drain, Dura-Coated cast iron bodies with combination membrane flashing clamp/gravel guards, double Top-Set® deck plate, and low silhouette cast iron domes.

OPTIONS (Check/specify appropriate options)

PIPE SIZE

- 2, 3, 4, 6 [51, 76, 102, 152]
- 2, 3, 4, 6 [51, 76, 102, 152]
- 2, 3, 4, 6 [51, 76, 102, 152]
- 2, 3, 4 [51, 76, 102]

(Specify size/type) OUTLET

- _____ IC Inside Caulk
- _____ IP Threaded
- _____ NH No-Hub
- _____ NL Neo-Loc

E BODY HT. DIM.

- 5-1/4 [133]
- 3-3/4 [95]
- 5-1/4 [133]
- 4-5/8 [117]

PREFIXES

- _____ Z D.C.C.I. Body with Dome (4-1/4 [108] Dome Height)*
- _____ ZA D.C.C.I. Body with Aluminum Dome (6-9/16 [167] Dome Height)

SUFFIXES

- _____ -AR Acid Resistant Epoxy Coated Finish
- _____ -E Static Extension 1 thru 4 [25 thru 102] (Specify Ht.)
- _____ -G Galvanized Cast Iron
- _____ -SC Secondary Clamping Collar
- _____ -SS Stainless Steel Mesh Screen Over Dome
- _____ -TC Neo-Loc Test Cap Gasket (2, 3, 4 [51, 76, 102] NL Bottom Outlet Only)
- _____ -VP Vandal-Proof Secured Top
- _____ -XJ Vertical Expansion Joint
- _____ -84 Stainless Steel Perforated Gravel Guard
- _____ -85 Stainless Steel Perforated Extension

* Regularly furnished unless otherwise specified.

Tankless Electric Water Heater

Available up to 54 KW in Single or Three Phase Voltages

Features

■ Heavy Duty Construction

- ✓ Constructed with high grade materials to ensure long operating life
- ✓ Simple to specify and easy to install and operate
- ✓ Factory packaged heater provides trouble-free installation and operation

■ Reliability

- ✓ Engineered for your specific application to ensure reliable operation
- ✓ Wide selection of sizes to meet the needs of even the most demanding application

■ High Efficiency

- ✓ On demand heating eliminates costly and cumbersome storage tanks
- ✓ Instantaneous design reduces stand-by heat loss and significantly lowers operating costs compared to traditional storage systems

Applications

- Process Systems
- Wash Downs
- Heat Pump Back-Up
- Boiler Systems
- Emergency Safety Wash Systems
- Freeze Protection
- Heat Transfer Systems
- Supplemental Heat
- Point-of-Use Hot Water



Model HX/TX Tankless



ANSI/NSF 5 LISTED

The Model HX/TX Tankless is a compact wall mounted electric tankless water heater that is 98% + efficient and is easily installed and operated.



Products marked with the Lead-Free logo comply with the Safe Drinking Water Act (SDWA) requirements of a weighted average of less than 0.25% lead content on wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures.

Tankless Water Heater For Commercial and Industrial Use

The Hubbell model HX/TX Tankless electric water heater is a highly reliable and easily maintained heater designed for operation in a commercial or industrial application. The Hubbell HX/TX Tankless heater is compact, extremely efficient, takes up minimal space, and reduces operating costs. Hubbell's vast experience, meticulous engineering, and advanced technology ensure that you can rely on the

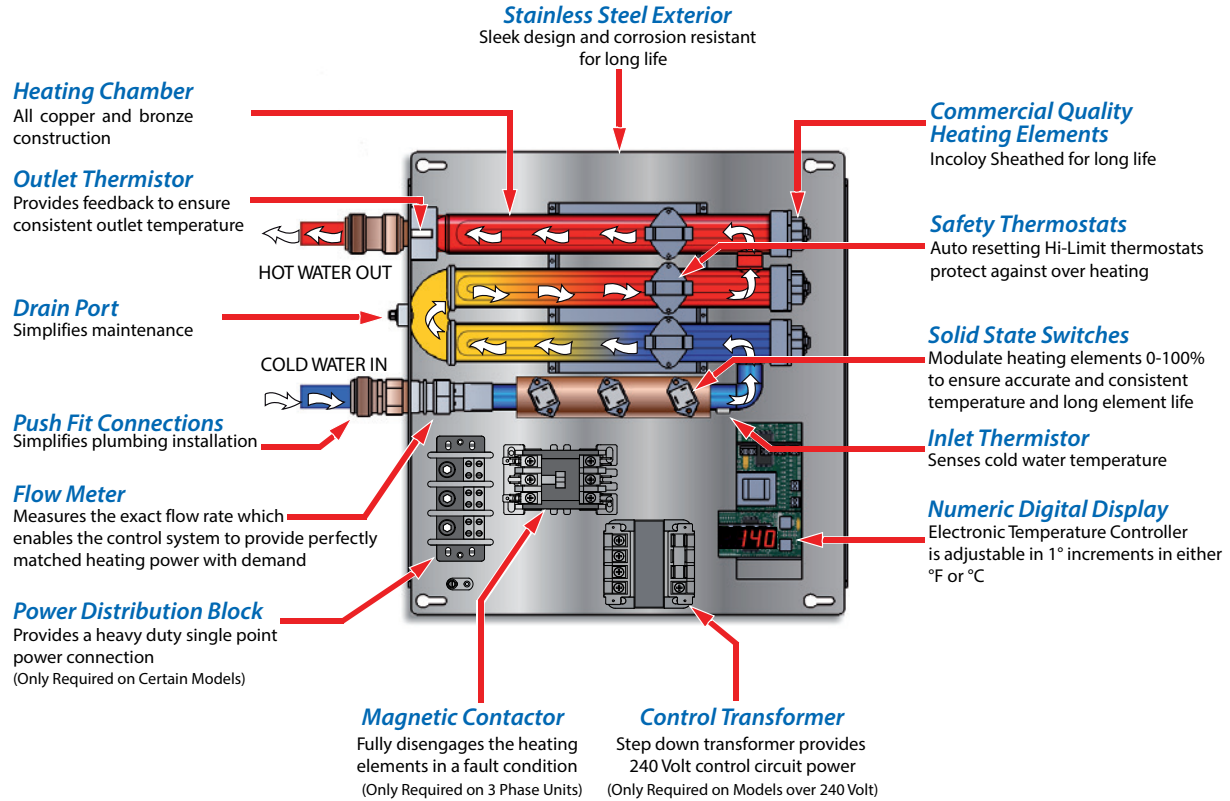
model HX/TX for your water heating needs in even the most demanding and critical applications. The Hubbell Tankless is the right choice for your water heating requirements, as you will be providing your customer with a quality product that is long lasting, trouble-free, and energy efficient.

Hubbell Tankless Features

How It Works

The Hubbell Model HX/TX electric tankless water heater contains high powered heating elements that heat water only when there is demand for hot water. When hot water is needed, a built in flow sensor measures the exact flow rate, and that data combined with temperature readings at the heater's inlet and outlet are processed by the electronic temperature controller. This data is continuously transmitted to the temperature controller, which constantly calculates the precise amount of power (kW) needed to achieve the desired temperature. A zero cross over fring signal is sent to the fast acting triacs in order to modulate the heating elements to the precise level needed to meet demand. The Hubbell tankless heater uses only as much power as is needed, while delivering accurate and consistent hot water temperature.

Heater Overview - 3 Element Model Shown



Tankless Model HX/TX Standard Specifications

Heating Chamber:	Copper and Bronze	Thermostat Range:	32 -194°F / 0-90°C
Capacities:	8 thru 54 kW	Hi-Limit:	200°F (Fixed Temperature)
Orientation:	Wall Mounted	Design WP:	150 psi
Voltages:	208 thru 600 Volt 50/60 Hz	Design TP:	300 psi
Phase:	1 Φ and 3 Φ (balanced)	Elements:	Incoloy 800
Power Factor:	0.999	Standby Power:	< 3 Watts
Thermal Efficiency:	98% +	Heating Chamber Warranty:	5 Year
Inlet/Outlet Size:		Electrical Warranty:	1 Year
TX:	3/4" Push Fit		
HX:	1" Push Fit		
Min/Max Flow:		Enclosure:	Stainless Steel Brushed Finish
TX:	0.2 GPM Min, 8.0 GPM Max		
HX:	0.5 GPM Min, 40 GPM Max	Approvals:	cULus, UL, EPH, ANSI/NSF 5
Max Inlet Temp.:	150°F		

Technical Features

Temperature Controller

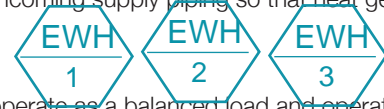
A sophisticated electronic temperature controller with LED digital display provides the user interface. The temperature controller processes all flow and temperature data and calculates the precise amount of power needed to meet demand.

Operator Control Capabilities

✓	Power Limiting:	Allows the operator to reduce the power consumption by any percentage to provide installation and operational flexibility and savings.
✓	Diagnostics:	Display inlet and outlet temperatures, flow rate and error codes to assist in troubleshooting.
✓	Cost Calculator:	Determine the exact cost of operating the heater. Input your cost per KW·Hr and the controller displays total KW·HRs consumed, total cost of operation, and total hot water usage (shown in gallons or liters).
✓	Temperature Control:	Set the digital display to the desired water temperature in °F or °C. Fully adjustable in 1° increments from 32-194°F (0-90°C). A user adjustable +/- 3° calibration feature provides additional control for superior accuracy.

Full Heater Modulation

Each heating element is switched on/off using a fast acting solid state triac with zero cross over fring control. This switching schema provides full modulation of each heating element, ensuring that the precise amount of heat is added to meet demand. To improve operating efficiency and component longevity, each triac is mounted to a heat sink located on the incoming supply piping so that heat generated by the triac during the switching process is dissipated into the water.



Proper Power Integrity

All Hubbell tankless water heaters, including all 3 phase models, are engineered to operate as a balanced load and operate at 0.999 Power Factor. All Hubbell 3 phase models are designed for 3 wire (3 live, 1 ground) and 4 wire power systems and draw equal current across all conductors to maintain the power integrity of the users electrical system. Hubbell does not recommend the use of heaters that operate as an unbalanced load, as is common with staged heaters designed for star systems (3 live, 1 neutral, 1 ground) that require use of the neutral leg. All load switching in Hubbell tankless models is performed as zero cross over, eliminating phase angle fring interference and associated EMI issues.

Full Resource Staging

The Hubbell tankless control schema ensures that usage is equalized across all heating circuits. To achieve this, once the controller has calculated the precise amount of kW required, all circuits are energized in a staggered fashion such that each circuit is proportionally and independently energized and then time staggered between circuits. This Full Resource Staging Schema reduces EMI output, increases component longevity, and provides highly accurate and consistent hot water temperatures. For three phase models, all circuits are fully modulated and synchronized to operate as a balanced load.

Building Management Integration

Remote Control: Ability to remotely enable or inhibit the heating operation of the unit using one of the following two methods:

1. Customer supplied 24VDC signal is user configured for either Inhibit Mode or Normal Operation Mode.
2. Customer supplied volt free contact is user configured for either Inhibit Mode or Normal Operation Mode.

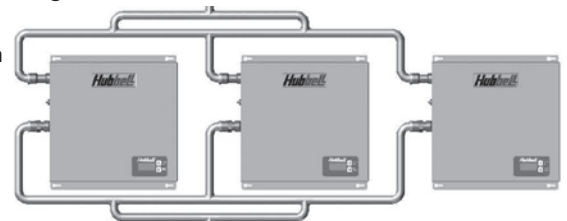
Priority Control: An integrated SPDT potential free dry contact (NO/NC 10A @ 240VAC) energizes when the unit is heating and de-energizes when not heating. This feature is useful when it is desirable to give the water heater priority over another electrical load to ensure that both are not operational at the same time.

Options

- A. High flow construction specify model HX for up to 40 GPM flow (min 0.5 GPM actuation).
- B. Type 316L stainless steel heating chamber for added corrosion resistance.
- C. Special construction features. Please consult factory.
- D. Inlet and Outlet Valve assembly simplifies installation~and includes unions, shut offs, check valve, drain~ports and pressure relief valve.
- E. Heating chamber built to ASME Section VIII and "UM" stamped.
- F. Remote Control Display allows the heater to be installed in a remote location. The 3" x 5" NEMA 4 display enclosure can be located up to 250' from the heater and gives the operator full remote control and monitoring capabilities.
- G. NEMA 4x construction when heater is located in a wet environment. Overall dimensions 24" x 20" x 6"
- H. Additional heater control features to meet UL834 Electric Boiler requirements. Please specify base model CR.
- I. Factory supplied manifold single point connection for redundancy and high demand applications.
- J. An ASSE 1070 code compliant Thermostatic mixing valve to increase the amount of hot water available. Valve is 1/2" (-UT) size and adjustable from 80-120°F. Typically used when supplying hot water to multiple lavs from a single water heater.

Manifold Assembly Option

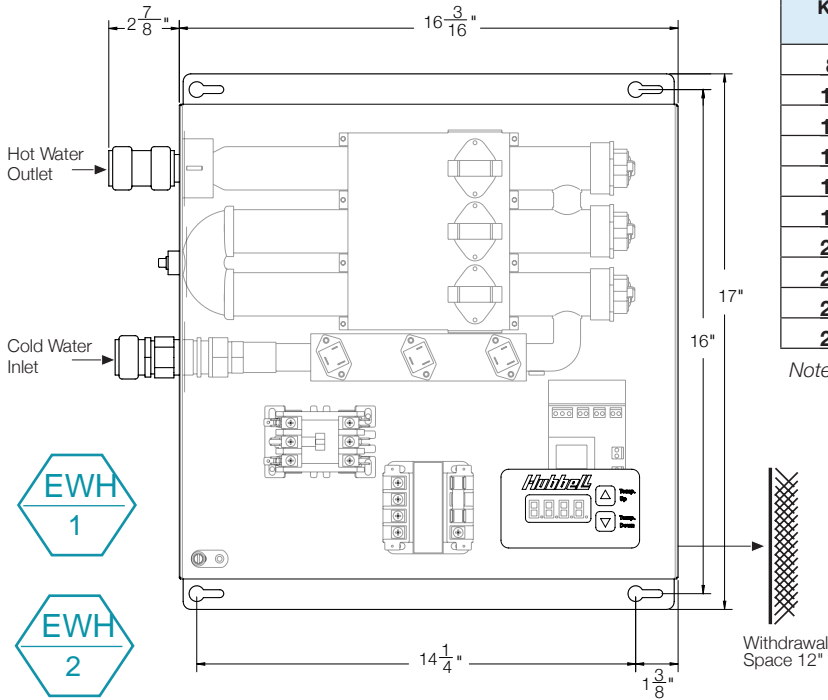
Single point connection for redundancy and high demand applications.



Please note: optional equipment may impact overall dimensions and weight. Please request submittal drawing from factory.

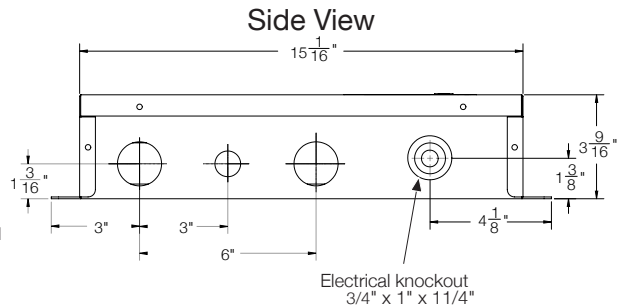
Outline Dimensions and Model Selection

8-27 KW Models (2 and 3 Element)



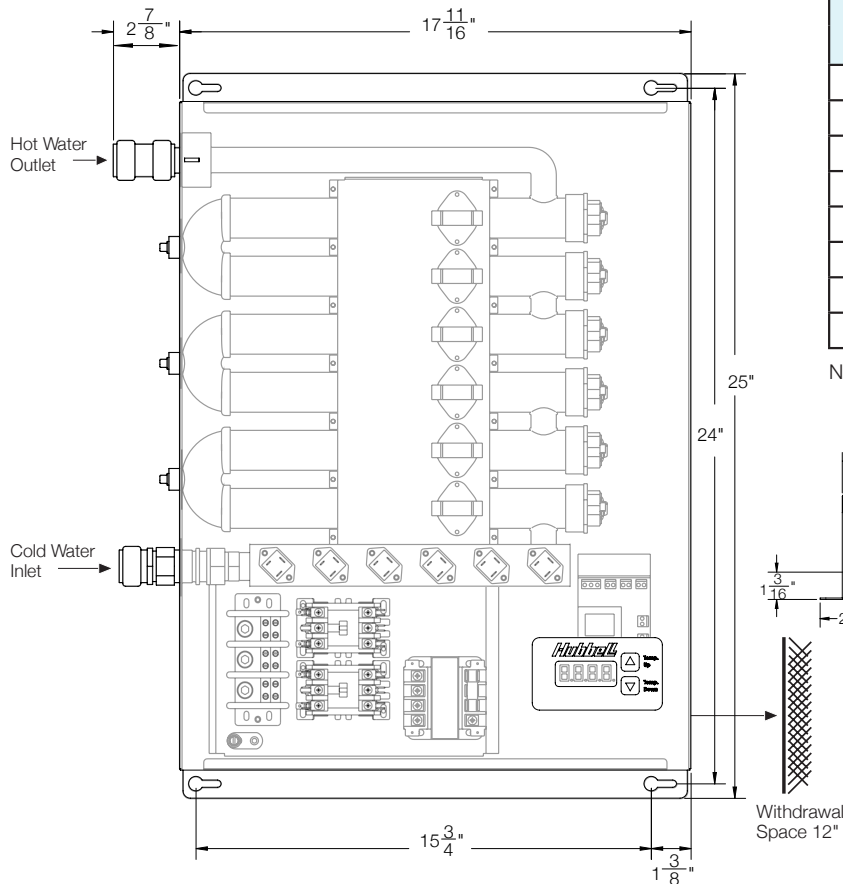
KW	3 Phase Voltages				1 Phase Voltages	
	208V	240V	480V	600V	208V	240V
8					√ (2)	
11	√ (3)					√ (2)
12	√ (3)				√ (2)	
14		√ (3)			√ (2)	√ (2)
16	√ (3)	√ (3)			√ (3)	√ (2)
18	√ (3)		√ (3)		√ (3)	√ (2)
20	√ (3)				√ (3)	
21		√ (3)	√ (3)	√ (3)		√ (3)
24		√ (3)	√ (3)	√ (3)		√ (3)
27		√ (3)	√ (3)	√ (3)		√ (3)

Note: Chart indicates three element (3) and two element (2) model types



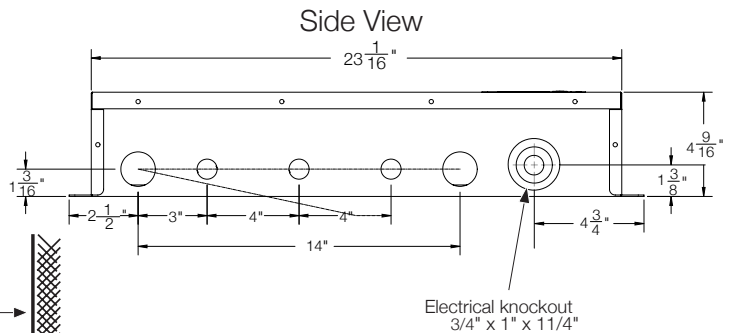
Pressure Drop: 14 psi @ 8 GPM Dry Weight: 21 Lbs Wet Weight: 21.5 Lbs Shipping Weight: 24 Lbs

24-54 KW Models (6 Element)



KW	3 Phase Voltages				1 Phase Voltages	
	208V	240V	480V	600V	208V	240V
24	√ (6)				√ (6)	
31	√ (6)				√ (6)	
33		√ (6)				√ (6)
36	√ (6)		√ (6)		√ (6)	
40	√ (6)				√ (6)	
42		√ (6)	√ (6)	√ (6)		√ (6)
48	√ (6)	√ (6)	√ (6)	√ (6)	√ (6)	√ (6)
54		√ (6)	√ (6)	√ (6)		√ (6)

Note: All models shown in this chart are six element (6) model types



Pressure Drop: 16 psi @ 8 GPM Dry Weight: 38 Lbs Wet Weight: 39 Lbs Shipping Weight: 42 Lbs

Heating Capacity and Amperage Chart

KW Rating	Heating Capability in GPM at F° Temperature Rise (°FΔT)										MAX Amps (at 100% heater output)					
	20° ΔT	30° ΔT	40° ΔT	60° ΔT	70° ΔT	80° ΔT	100° ΔT	110° ΔT	120° ΔT	140° ΔT	3 Phase Voltages				1 Phase Voltages	
											208V	240V	480V	600V	208V	240V
8	2.73	1.82	1.36	0.91	0.78	0.68	0.55	0.50	0.45	0.39	-	-	-	-	38	-
11	3.75	2.50	1.88	1.25	1.07	0.94	0.75	0.68	0.63	0.54	31	-	-	-	-	46
12	4.09	2.73	2.05	1.36	1.17	1.02	0.82	0.74	0.68	0.58	33	-	-	-	58	-
14	4.78	3.18	2.39	1.59	1.36	1.19	0.96	0.87	0.80	0.68	-	34	-	-	67	58
16	5.46	3.64	2.73	1.82	1.56	1.36	1.09	0.99	0.91	0.78	44	39	-	-	77	67
18	6.14	4.09	3.07	2.05	1.75	1.54	1.23	1.12	1.02	0.88	50	-	22	-	87	75
20	6.82	4.55	3.41	2.27	1.95	1.71	1.36	1.24	1.14	0.97	56	-	-	-	96	-
21	7.17	4.78	3.58	2.39	2.05	1.79	1.43	1.30	1.19	1.02	-	51	25	20	-	88
24	8.19	5.46	4.09	2.73	2.34	2.05	1.64	1.49	1.36	1.17	67	58	29	23	115	100
27	9.21	6.14	4.61	3.07	2.63	2.30	1.84	1.67	1.54	1.32	-	65	33	26	-	113
31	10.58	7.05	5.29	3.53	3.02	2.64	2.12	1.92	1.76	1.51	86	-	-	-	149	-
33	11.26	7.51	5.63	3.75	3.22	2.81	2.25	2.05	1.88	1.61	-	79	-	-	-	138
36	12.28	8.19	6.14	4.09	3.51	3.07	2.46	2.23	2.05	1.75	100	-	43	-	173	-
40	13.65	9.10	6.82	4.55	3.90	3.41	2.73	2.48	2.27	1.95	111	-	-	-	192	-
42	14.33	9.55	7.17	4.78	4.09	3.58	2.87	2.61	2.39	2.05	-	101	51	41	-	175
48	16.38	10.92	8.19	5.46	4.68	4.09	3.28	2.98	2.73	2.34	133	116	58	46	230	200
54	18.42	12.28	9.21	6.14	5.26	4.61	3.68	3.35	3.07	2.63	-	130	65	52	-	225

Note: • Unshaded flows specify Base Model TX, shaded flows must specify Base Model HX due to high flow rate.
• Alternate voltages including 277, 380, 415, 440 and 575 volt available. Please consult factory for exact KW availability in these voltages.

Sizing Formulas

Step 1 Solve for the unknown using formulas below.

Variables To Solve For:

KW Requirement:

$$\text{_____ GPM} \times \text{_____ } ^\circ\text{F}\Delta\text{T} \times 0.1465 = \text{_____ KW}$$

Temperature Rise:

$$\text{_____ KW} \times 6.824 \div \text{_____ GPM} = \text{_____ } ^\circ\text{F}\Delta\text{T}$$

Flow Rate:

$$\text{KW} \times 6.824 \div \text{_____ } ^\circ\text{F}\Delta\text{T} = \text{_____ GPM}$$

Step 2

Choose the Tankless model with the KW rating which meets the peak demand (GPM) and required temperature rise (°FΔT) for your application.

Step 3

Choose the voltage and phase power supply available. Note the total amperage draw of the unit and verify availability.

Voltage De-Rating Factors

Rated Voltage	Applied Voltage	De-Rating Factor
600 V	575 V	92%
600 V	550 V	84%
480 V	460 V	92%
480 V	440 V	84%
240 V	230 V	92%
240 V	220 V	84%
240 V	208 V	75%

When the actual supply voltage (applied voltage) is different than the design voltage (rated voltage) the resulting KW output will be affected. Please see the chart for typical voltage de-rating factors, or use the following formula.

$$\frac{\text{Applied Voltage}^2}{\text{Rated Voltage}^2} \times \text{Rated KW} = \text{KW output at applied voltage}$$

MODEL NUMBER DESIGNATION



■ Step 1

Base Model No.

TX = 8 GPM Max

HX = 40 GPM Max

■ Step 2

KW Rating:

8 thru 54KW

(008 - 054)

■ Step 3

Number of Heating Elements:

2

3

6

■ Step 4

Voltage / Phase / Hz:

RS = 208-1-60

R = 208-3-60

S = 240-1-60

T = 240-3-60

T3 = 380-3-50/60

T7 = 415-3-50/60

T5 = 440-3-60

T4 = 480-3-60

T6 = 600-3-60

Example: TX024-3T4

A Hubbell tankless electric water heater rated at 24 KW with 3 heating elements and powered with 480 volt, three phase, 60 Hz.

Option Note

Any and all optional equipment for a tankless model heater must be called out in the written specifications. A model number in and of itself does not reflect any optional equipment selected.



Master Specification: Model HX/TX Tankless

JOB NAME _____

ENGINEER _____

REPRESENTATIVE _____

CONTRACTOR _____



GENERAL

Provide a quantity of _____ packaged type instantaneous electric tankless water heater(s) Model No. **TX** _____ as manufactured by Hubbell Heaters Stratford, CT. The entire unit is packaged ready for plumbing and electrical service connections and shall bear the cULus listing mark certifying the entire unit to UL499, UL EPH Sanitation listed to ANSI/NSF Standard 5 and CSA C22.2 No. 64-M91 (single phase units) and CSA C22.2 No. 88 (three phase units).

HEATING CHAMBER

The heating chamber shall be all Sil-brazed copper and bronze construction. (**Optional Specification:** Type 316L Stainless Steel). A plastic heating chamber shall not be acceptable. Water heater heating chamber shall be rated for a maximum allowable working pressure of 150psi. The heating chamber and all electrical controls shall be completely enclosed in a heavy gauge stainless steel case.

HEATING CAPACITY

The tankless heater shall be rated at _____KW which will heat _____ GPM of water at _____°F rise (_____ ° to _____°F). Heaters that restrict hot water flow in any way shall not be acceptable.

ELECTRICAL

The tankless heater shall be designed to operate at _____ volts, _____ phase, 50/60Hz balanced power and shall draw equal amperage across all phases at all times. For 3 phase heaters, power shall be a 3 wire (3 live, 1 ground) or a 4 wire (3 live, 1 neutral, 1 ground) system that does not require a neutral leg. The heater will draw _____ amps only when operating at full power. The immersion heating elements shall be high quality incoloy sheathed and sized to obtain the rated capacity. Each element is to be operated using zero cross over solid state controls. The heating elements shall be fully modulated from 0-100% to provide precise temperature control through the full range of flows. A Hi-Limit thermostat with automatic reset shall be factory installed to disconnect each heating element in the event of an over-temperature condition. An electronic digital display temperature controller shall be user adjustable in 1° increments in either °F or °C and shall display flow rate, outlet temperature, inlet temperature and provide error indication. A turbine-type flow meter shall be factory installed to provide precise temperature control for water flows as low as 0.2 GPM up to a maximum flow of 8 GPM. Heaters that require greater than 0.2 GPM flow for actuation or restrict flow shall not be acceptable. (**Optional Specification:** High Flow Model HX, provides up to 40 GPM flow with minimum actuation at 0.5 GPM).

WARRANTY

Hubbell shall warranty all electrical components against defects in workmanship and material for a period of one (1) year from date of start-up, and the heating chamber for a full five (5) years from date of start-up, provided that the unit is started within three (3) months of date of shipment and installed and operated within the scope of the heater's design and operating capability. Labor is not covered under warranty. Each heater shall be shipped with a complete set of installation and operating instructions including spare parts list and approved drawings. All fabrication and assembly shall be performed in the U.S.A.

OPTIONS

In addition, the tankless electric water heater shall be supplied with the following options:

Option _____

Option _____

Option _____



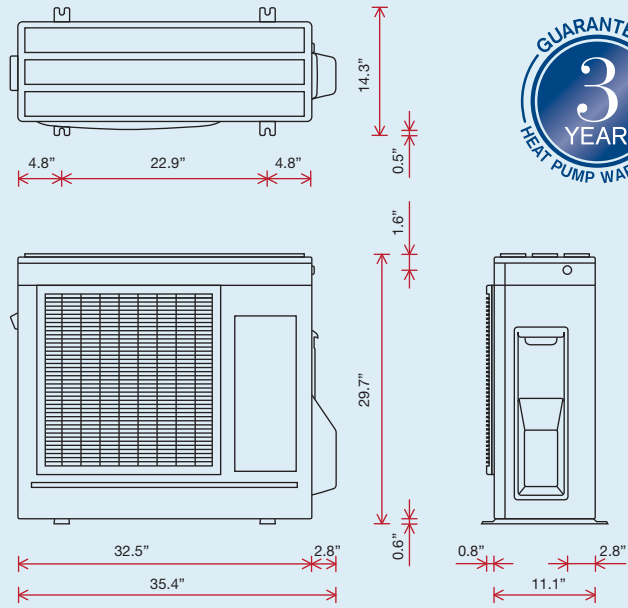
Committed to continuous improvement...

Continuing research results in product improvement; therefore specifications are subject to change without notice. For the most updated information, consult the factory directly.



SanCO₂ Specifications

Heat Pump



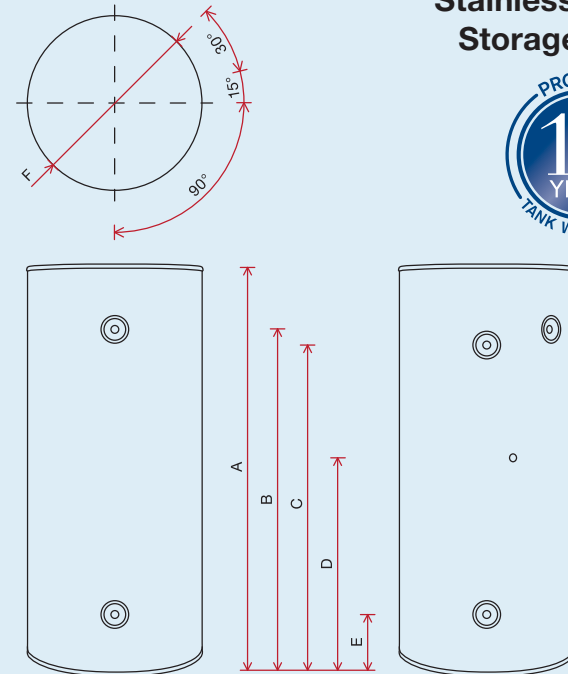
All dimensions displayed in inches.

Dimensions	
Weight	123lbs
Technical	
Power Input	1.0kW
COP	4.5 ^
Energy Factor	3.35
Refrigerant	R744 (CO ₂)
Water Temperature Setting	149°F
Compressor Type	Inverter
Power Supply	220-240V / 60Hz / 1Ph-
Breaker Size	15 Amps
Operating Noise Level	38dB
Ambient Air Operating Temperature	-14°F to +109°F
Water Connections & Settings	
Inlet	½" BSP
Outlet	½" BSP

Note: Materials and specifications are subject to change without notice.



Stainless Steel Storage Tank



Model No:	GAUS-250EQT/A/B	GAUS-315EQT/D/G
A Height	70.9"	58.7"
B Hot Water Outlet & PTR Valve	61"	49.6"
C Heat Pump Return	61"	49.6"
D Sensor Port	32.5"	37.0"
E Cold Water Inlet / Heat Pump Flow	8.25"	7.9"
F Diameter	22.5"	26.6"
Weight	132 lbs	154 lbs.
Storage Capacity	66 gallons	83 gallons
Water Connections & Settings		
Tank Relief Valve Setting	101.5 PSI	101.5 PSI
Maximum Mains Pressure Settings		
With or Without PRV	72.5 PSI	72.5 PSI
Max Inlet Water Pressure	72.5 PSI	72.5 PSI



SANDEN

Delivering Excellence

SanCO₂ Heat Pump Water Heater



Sanden International (U.S.A.) Inc.
47772 Halyard Drive
Plymouth, MI 48170

Phone: 734-459-1900
Email: info@sandenwaterheater.com
Website: www.sandenwaterheater.com

Sanden Dealer

For more information, please call (734) 459-1900 or email info@sandenwaterheater.com.

SANDEN. Hot water, *naturally.*

Superior Features

The Sanden Heat Pump Water Heater is a highly energy efficient alternative to the traditional electric or gas water heater. It absorbs heat from the air to heat water, saving energy and money and reducing greenhouse gas emissions. This system requires much less energy to heat water compared to conventional hot water heaters. No cold showers and plenty of hot water for the washing machine and dishwasher too!

Heat Pump Unit

- **Energy efficient:** 4x more efficient than traditional electric water heater.
- **Cost efficient:** uses over 70% less electricity to make hot water vs. traditional electric water heater.
- **Faster hot water:** up to 50% faster heat recovery than typical heat pumps.
- **Hot water when you need it:** with a first hour rating of over 97 gallons, you can easily fill that large soaking tub.
- **Environmentally friendly:**
 - Significantly reduced energy use and greenhouse gas emissions.
 - Uses unique ozone-friendly CO₂ refrigerant.
 - Heating cycle allows use of off-peak power rather than peak demand power.
- **Low temperature performance:** unlike a typical heat pump, the CO₂ refrigerant operates at temperatures below freezing (32°F), allowing the unit to run without a backup heater.
- **Flexible & simple installation:** unlike other Heat Pump Water Heater systems, the Sanden CO₂ heat pump allows flexibility of the storage tank location (typically installed indoors), which can be up to 50 feet away from the heat pump unit (outdoors).
- **Suitable for most climates:** includes built-in freeze protection (-15 °F to +110 °F operating range).
- **Long lasting:** high quality, weather resistant construction for outdoor location.



Stainless Steel Tank

- High quality, extra-long life stainless steel tank.
- Fully insulated for minimal heat loss.
- Safety pressure and temperature relief valve supplied.



SanCO₂
SANDEN. Hot water, naturally.

Enjoy the Benefits

Whisper Quiet Hot Water

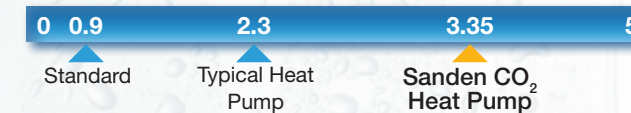
When purchasing a Heat Pump Water Heater system, noise levels are an important consideration. Sanden's extensive research has delivered a "whisper quiet" operating noise level (38dB) that ensures both you and your neighbors won't be disturbed by operating noise.



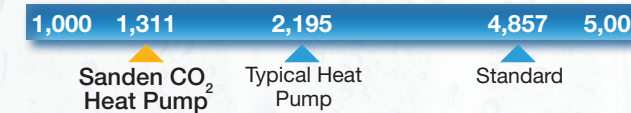
Ultra High Efficiency

The closed-loop system uses less energy and allows for faster heat recovery, resulting in significantly lower operating costs than traditional electric tank heaters or typical heat pumps.

Energy Factor



Annual Energy Consumption (kWh)



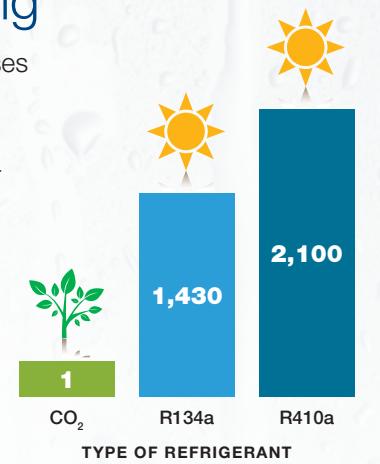
Annual Operating Cost



Energy consumption formula based on DOE procedure (12.03/EF) x 365.
Annual operating cost = KWH at 10.68 cents/KWH
Source: Energy Star; Water_Heater_Market_Profile_2010

Minimal Impact on Global Warming

Our Carbon Dioxide refrigerant poses far less of an environmental impact (i.e. no ozone layer depletion and minimal global warming) than other commonly used refrigerants.



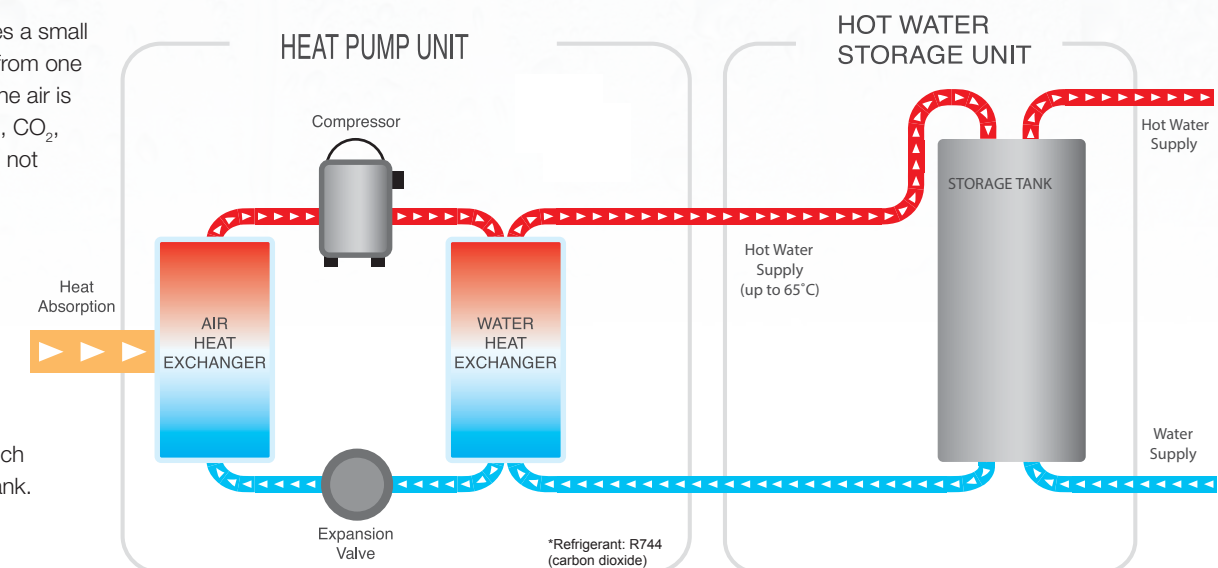
*Global Warming Potential (GWP) is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale which compares the gas in question to that of the same mass of carbon dioxide (whose GWP is equal to 1).

Global Warming Potential* by refrigerant type per 100 years.

How the Sanden SanCO₂ System Works

A heat pump is a device that uses a small amount of energy to move heat from one location to another. The heat in the air is absorbed by a natural refrigerant, CO₂, which is ozone friendly and does not contribute to global warming.

The warm gaseous refrigerant is circulated in the system via a compressor. As it passes through the compressor, its pressure rises, as does its temperature. This hot refrigerant then passes through a heat exchanger to heat the water, which is then pumped to the storage tank.





THERMXTROL®

Water Heater Expansion Tanks



WE CAN TAKE THE PRESSURE™



7

Years



Antimicrobial™



Turbulator™



InSight™



THERMXTROL®

Amtrol invented the thermal expansion tank to control pressure build-up in closed, potable water systems. This prevents the water heater pressure relief valve from opening, saves energy and eliminates a potential safety hazard. All Therm-X-Trol expansion tanks are made in the USA in our ISO 9001:2015 certified facility.



7-Year Warranty

- The industry's longest.



Antimicrobial



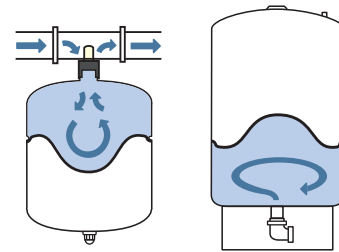
Turbulator



InSight

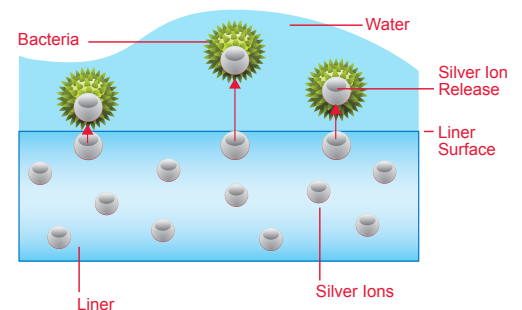
Fresh Water Turbulator™

- Patented diffuser agitates incoming water to keep it tasting fresh and clean.
- Water-jet scrubbing action prevents sediment from collecting inside the tank.



Antimicrobial Liner Protection

- Safe, Silver-Ion technology targets active microorganisms; neutralizes bacteria on contact.
- Proprietary compound is molded into the water reservoir lining; lasts for the life of the tank.



ST-1 for Tankless and POU Water Heaters

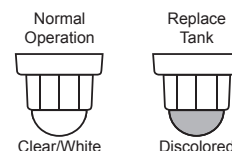


- Absorbs thermal expansion and water hammer to protect the heat exchanger.
- Patented air cell technology requires no precharge adjustment or maintenance.
- 304L SS waterway.
- Big protection in a compact size.



InSight™ Indicator Cap

- Patented sight glass changes color if tank needs replacing.
- Alerts homeowner or plumber to a problem before damage can occur.



Thermal Expansion Tanks



Therm-X-Trol® for Tankless and POU

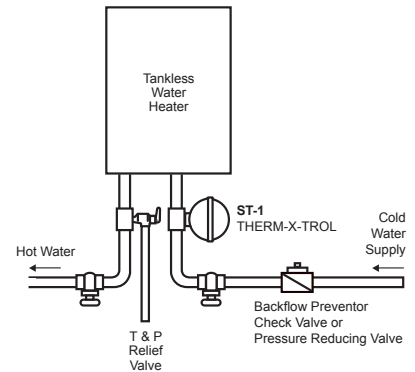
- Accepts expanded water as system temperature rises and returns hot water to system when demand occurs.
- Patented air cell eliminates water hammer to protect heat exchanger.
- Required by most building codes and all water heater warranties.
- 7-Year limited warranty: The industry's longest.

Specifications

Model Number	Diameter (Inches)	Height (Inches)	System Connection (NPTM)	Shipping Weight (lbs.)
ST-1	3.2	3.9	1/2	1

Stainless Steel Waterway.

Maximum Intermittent Temperature: 180°F. Maximum Working Pressure: 150 psig.



Therm-X-Trol In-Line Models

- 7-Year limited warranty: The industry's longest.
- Maintains safe expansion pressure in hot water systems as required by most building codes and warranties.
- 50 PSI factory precharge; The industry's highest.
- InSight® Indicator Cap, Antimicrobial Liner™ and Turbulator™.

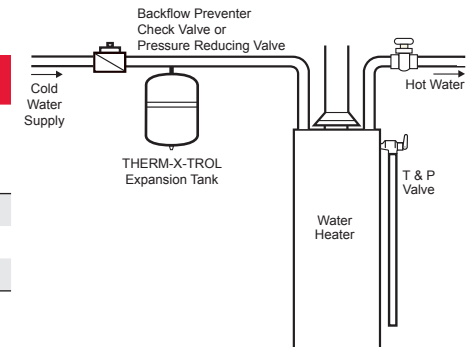
Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	Diameter (Inches)	Height (Inches)	System Connection (NPTM)	Shipping Weight (lbs.)
ST-5	2.0	0.9	8	13	3/4	5
ST-8	3.2	1.9	9	15	3/4	7
ST-12	4.4	3.2	11	15	3/4	9

Stainless Steel System Connection.

Maximum Operating Temperature: 200°F. Maximum Working Pressure: 150 psig.

Factory Precharge: 50 psig.



Therm-X-Trol Vertical Models

- Designed for large residential and light commercial (non-ASME) applications.
- Visit amtrol.com for sizing information.
- 1-Year limited warranty.

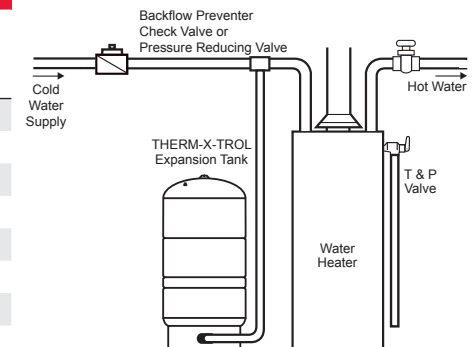
Specifications

Model Number	Tank Volume (Gallons)	Max. Accept. Volume (Gallons)	Diameter (Inches)	Height (Inches)	System Connection (NPTF)	Shipping Weight (lbs.)
ST-25V	10.3	10.3	15	19	3/4	23
ST-30V	14.0	11.3	15	24	3/4	25
ST-42V	20.0	11.3	15	32	3/4	33
ST-60V	34.0	34.0	22	30	1 1/4	61
ST-80V	44.0	34.0	22	36	1 1/4	69
ST-180V	62.0	34.0	22	47	1 1/4	92
ST-200V	81.0	34.0	22	56	1 1/4	103
ST-210V	86.0	46.0	26	47	1 1/4	123

Stainless Steel System Connection.

Maximum Operating Temperature: 200°F. Maximum Working Pressure: 150 psig.

Factory Precharge: 40 psig.





Selection & Selling Tools



AMTROL THERMXTROL
Expansion Tanks
Made in the USA

AMTROL invented the thermal expansion tank to control pressure build-up in closed, potable hot water systems. This prevents the water heater safety relief valve from opening, saving energy and eliminating a potential safety hazard. Therm-X-Trol expansion tanks are all made in the USA in our ISO 9001:2008 registered facilities.



Helps Prevent

- Dripping faucets and wasted energy.
- Puddles of water at base of water heater from pressure relief valve discharge.
- Water heater damage from frequent water pressure build-up.
- Dishwasher and washing machine solenoid damage.
- Toilet valve running intermittently.
- Noisy water hammer.



Ask for Quality ▲ Ask for AMTROL®

Clean Water Technology™
Antimicrobial Liner and Turbulator work together to keep tank surfaces clean.

Antimicrobial.

Turbulator.

Antimicrobial Liner Protection

- Safe, Silver-Ion technology targets active microorganisms; neutralize bacteria on contact.
- Compound is molded into the water reservoir lining; lasts the life of the tank.



Fresh Water Turbulator™

- Patented diffuser agitates incoming water to keep it tasting fresh and clean.
- Water-jet scrubbing action prevents sediment from collecting inside the tank.



Homeowner Brochure (MC10230) explains how Therm-X-Trol controls thermal expansion to provide a better, safer system.

Therm-X-Trol® Quick Sizing Charts											
Water Heater Size (gals.)	Maximum Temperature Setting 140°F			Water Heater Size (gals.)	Maximum Temperature Setting 160°F			Water Heater Size (gals.)	Maximum Temperature Setting 180°F		
	Static Supply Pressure (psig)				Static Supply Pressure (psig)				Static Supply Pressure (psig)		
	40	60	80		40	60	80		40	60	80
Tankless & P.O.U. up to 2 gal.	ST-1	ST-1	ST-1	40	ST-5	ST-5	ST-8	40	ST-8	ST-8	ST-8
40	ST-5	ST-5	ST-5	50	ST-5	ST-8	ST-8	50	ST-8	ST-8	ST-12
50	ST-5	ST-5	ST-5	60	ST-8	ST-8	ST-12	60	ST-8	ST-12	ST-25V
60	ST-8	ST-8	ST-8	80	ST-8	ST-12	ST-25V	80	ST-12	ST-25V	ST-25V
80	ST-8	ST-8	ST-12	120	ST-12	ST-25V	ST-25V	120	ST-25V	ST-25V	ST-25V

Sizing based on: 40°F incoming water temperature; 150 psi T&P safety relief valve; Precharge equal to static supply pressure (ST-5 and above). ST-1 for Tankless and Point-Of-Use (POU) Heaters up to 2 gallons. For larger applications: Visit amtrol.com, download the AMTROL App or contact Technical Support at 401.535.1216.

Quick Sizing Card (MC8520) makes selecting the right tank fast and easy.



The Amtrol App is your mobile toolkit. Also, visit amtrol.com for selection, installation and service tips.



1400 Division Road, West Warwick, RI USA 02893
T: 800.426.8765 www.amtrol.com





GONZALES COMMUNITY CENTER
Plumbing Cut Sheets

END OF PLUMBING CUT SHEETS

AC Level 2 30A

SINGLE or DUAL PORT CHARGING STATION (PEDESTAL)

MODEL	SINGLE PORT		DUAL PORT	
	MODEL Number	EVP-2001-30-P-0001	MODEL Number	EVP-2002-30-P-0001
	PRODUCT Number	L2P-30-240-16-001	PRODUCT Number	L2P-30-240-15-001
Power per Port	7.2 kW (240VAC @ 30A)			
ELECTRICAL SERVICE				
Power	240/208 VAC, 30A Load with 40A Branch Circuit Per Port			
Service Panel	40A Breakers per Port (No GFCI)			
Service Wiring	3-Wire (L1, L2, Earth Ground)		5-wire (L1, L1, L2, L2, Earth Ground)	
FUNCTIONAL INTERFACES				
Connector Type	SAE J1772			
Charging Protocol	SAE J1772			
Standard Cable Length	25 ft			
Cable Retractor	Optional (Cable 18 ft w/ Cable Management)			
LCD Display	500 Nits, 7" Color, 800 x 480, UV Protected			
Card Reader	ISO 14443 Type A & B, ISO 18092 NFC			
SAFETY AND CONNECTIVITY				
Ground Fault Detection	20 mA			
Plug-Out Detection	SAE J1772			
Power Measurement (opt)	Accuracy: 1% - 5%			
Power Report Interval	Every 15 minute on the hour			
Wireless	2.4 GHz Wi-Fi (802.11 b/g/n)			
Wide Area Network	4G Modem			
Communication Protocols	OCPP 1.5 and 1.6 Compliant			
SAFETY AND OPERATION				
Enclosure Rating	NEMA 3R			
Regulatory Compliance	ETL Certified for USA and cUL Certified for Canada; Complies with UL 2594, UL 2231-1, UL 2231-2, and NEC Article 625, EMC: FCC Part 15 Class A			
Operating Temperature	-30°C to +60°C (-22°F to 140°F)			
Storage Temperature	-50°C to +80°C (-58°F to 176°F)			
Humidity	95% Non-Condensing			



- ▶ SINGLE or DUAL PORT, 30A, LEVEL 2
- ▶ CHARGING PROTOCOL: SAE J1772
- ▶ 7.2 KW PER PORT
- ▶ 25 FT or 18 FT with CABLE RETRACTOR
- ▶ NEMA 3R HOUSING
- ▶ RFID READER
- ▶ OCPP COMPLIANT – STANDARD
- ▶ 7" COLOR SCREEN – STANDARD
- ▶ UL COMPLIANT – ETL CERTIFIED
- ▶ OPTIONS:
 - CABLE RETRACTOR
 - CREDIT CARD READER
 - CREDIT CARD SCANNER

BTC POWER

1719 S Grand Ave, Santa Ana, CA 92705

www.btcpower.com

sales@btcpower.com

50 kW Slim Line DC Fast Charger

PARAMETERS	MODEL	
	L3S-50-480-01-003	L3S-50-208-01-003
Power Rating	50 kW	50 kW
Connector/Protocol	CHAdEMO, SAE J1772 Combo CCS1	
Network Compatibility	OCPP 1.5/1.6, BTCP Network	
Access Control - Communication	RFID, Credit Card - 4G, Cat-5 Ethernet	
Input Power VAC 3 Phase	480 VAC	208 VAC
Input Power AC Current (FLA)	72 A	166 A
Efficiency Rating	> 90%	
Max Output DC Current	125 A	
Max Output DC Voltage	50 - 500 V	
Surge Protection	6000 VAC	
Ambient Condition	-30 °C to +50 °C, 95% Humidity Non-condensing, 6000 ft Altitude	
Dimension & Weight	34" W x 86" H x 22" D, 850 lbs	
Safety Compliance	ETL Listed for USA and Canada: Complies with UL 2202, UL 2231 UL50E, NEC Article 625, CSA STD C22.2 No. 107.1, FCC Part 15 Class A	



▶ STANDARD

- Integrated Cord Retractors
- 15" Outdoor Color Display
- Connector Configuration:
 - SAE J1772 Combo CCS1 and CHAdEMO
- Payment types: (OCPP Network Enabled)
 - Credit Card Reader
 - RFID

▶ OPTIONAL

- ISO 15118:2014
- 4G Modem
- Connector Configuration:
 - Dual SAE J1772 Combo CCS1
 - Single CHAdEMO
 - Single SAE J1772 Combo CCS1

BTC POWER

1719 S Grand Ave, Santa Ana, CA 92705

www.btcpower.com

sales@btcpower.com



Outdoor Ground Box, part of the Outdoor Power offering from Legrand

Ground Breaking Innovation

As the popularity of outdoor activities grows, so does the demand for connected outdoor spaces that include power, communications and A/V.

The Outdoor Ground Box from Legrand is the first product designed with power and safety in mind. It's the first in-ground product on the market that will deliver permanent power and uses a UL50E Type 6P rated wiring enclosure and has been tested and evaluated by Underwriters Laboratories, Inc. for safe operation year round.

The Outdoor Ground Box is designed to handle the requirements of the outdoor space while blending into the landscape. It's perfect for spaces such as: outdoor retail shopping centers, corporate campuses, amusement parks, sports fields, hospitality, or any outdoor space where power is required.


Features & Benefits

- **Air Pocket Design** - This innovative design traps and maintains an air pocket protecting the devices, plugs and connections from water, snow, and ice. Allows for safer operation year round.
- **Outdoor-Rated Construction** – UV and chemical-resistant F1 rated nonmetallic material, allow the box to hold up for years to come.
- **Three Durable, Premium Finishes** – Outdoor-rated finishes to complement your space design. Choose from black, brown, or gray.
- **Holds up to 5000 lbs** - Has an ANSI/SCTE 77 Tier 5 rating and can hold up to 5,000 lbs of load allowing for the occasional tractor or non-deliberate vehicular traffic.
- **Anti-Float Clips** – Prevents the cover from floating up when flooded. This preserves the air pocket and ensures safe operation.
- **Smart egress door** – Egress door auto adjusts to the size of cable, as well as locking in the closed position when not in use. Prevents cable damage and maintains a safer user experience.
- **Secure** – Includes tamper-resistant lock to prevent unauthorized access.
- **Service feed flexibility** – Each box comes with two (2) locations that will accept up to 1 1/4" trade size nonmetallic conduit, allowing for services to feed the box as well as to daisy chain to other boxes.
- **Modular design** - Boxes are designed to interlock allowing an endless number of boxes in the same location. Provides service separation, everything in one location, and easier installation.
- **Flush to the finished ground** - The buried box can be made flush with any surface, grass, walkways (brick, pavers, concrete, etc). Reduces trip hazards and allows it to blend in with its surroundings.
- **ADA compliant** – Meets all specifications for ADA guidelines.
- **cULus listed to UL50E Type 6P and IP68 requirements while in use** - Tested and listed by Underwriters Laboratories, Inc. to UL2996 and ULC/ORD-C2996:2017 for use in the ground in all weather conditions.

Vertical Markets

- Commercial
- Education
- Entertainment
- Retail
- Hospitality
- Parks
- Healthcare
- Transit

Compliance

-  cULus Listed, File Number E486738. Guide QCNL/QCNL7.
Outdoor Ground Boxes (Power Applications) are UL Listed to meet UL50E Type 6P and IP68 requirements.
Outdoor Ground Boxes (Low Voltage Applications) are UL Listed to meet UL50E Type 4X and IP65 requirements.

Installation Considerations

Determine location to install the Ground Box:

- The location must be in a well drained area, away from inlets and outfalls.
- Do not install Box at low points or in areas prone to accumulate standing water.
- Do not install Box in locations where it will be subject to deliberate vehicular traffic.
 - Box is rated for occasional non-deliberate vehicular traffic with a maximum 5,000 lb (22.2 kN) design load (ANSI/SCTE 77 Tier 5).
- Box should only be installed in locations where the grade is within 1% of level.
- Box should be installed in sidewalks only where the grade is less than 2% in all directions.
- Box installation in locations where the seasonally high water table is less than 3 feet (600mm) below finished grade is not recommended.
- Consultation of a licensed professional engineer knowledgeable of local soils is recommended to determine if unsuitable or poor soils may be encountered at the intended Box location.
- Do not install Box on unsuitable soils.
 - Unsuitable soils are those with unsatisfactory drainage characteristics and high volume change potential. Unsuitable soils are defined herein as USCS soil groups OL, OH, and PT (organic silts, organic clays, and peat).
- Installation of Box on poor soils is not recommended without additional drainage improvements. A method for improving drainage and minimizing the potential for heave in frost-susceptible and other poor soils is presented in the product installation instructions.
 - Poor soils are those with poor drainage characteristics.
 - For warm and cold climates, poor soils are defined herein as USCS soil groups ML, MH, CL, and CH (inorganic silts and inorganic clays). Additionally, for cold climates poor soils include USCS soil groups GC and SC (clayey gravels and clayey sands).
 - Poor soils are not a concern for un-irrigated locations where the average annual precipitation is less than 30 inches (762mm).
- Do not install Box in permafrost areas.
- Box should not be installed in locations where bedrock is less than 3 feet (600mm) below finished grade.

Environmental Code Ratings

Type 6P Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts to provide a degree of protection against ingress of solid foreign objects (falling dirt); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, hose directed water, and the entry of water during prolonged submersion at a limited depth); that provides an increased level of protection against corrosion; and that will be undamaged by the external formation of ice on the enclosure.

Type 4X Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose-directed water); that provides an increased level of protection against corrosion; and that will be undamaged by the external formation of ice on the enclosure.

The IP Code is an International Protection Marking per IEC standard 60529.

IP 68 Enclosure is dust tight. No ingress of dust; complete protection against contact. Enclosure is protected in immersion beyond 1 meter. The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer. Normally, this will mean that the equipment is hermetically sealed. However, with certain types of equipment, it can mean that water can enter but only in such a manner that it produces no harmful effects.

IP 65 Enclosure is dust tight. No ingress of dust; complete protection against contact. Enclosure is protected from water jets. Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects.

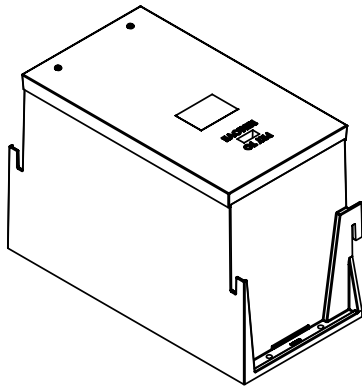
Glossary of Terms:

USCS Unified Soil Classification System	MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
OL Organic silts and organic silty clays of low plasticity	CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
OH Organic clays of medium to high plasticity, organic silts	CH Inorganic clays of high plasticity, fat clays
PT Peat and other highly organic silts	GC Clayey gravels, gravel-sand-clay mixtures
ML Inorganic silts and very fine sands, rock flour, clayey silts or fine sands with slight plasticity	SC Clayey sands, sand-clay mixtures

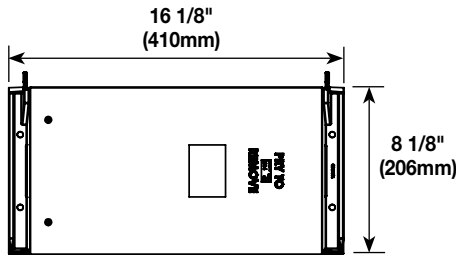
XB814

Exterior Ground Box – Single service 2-gang nonmetallic ground box. The box is made from F1 rated nonmetallic material and has been designed to withstand harsh outdoor environments. The box can accept up to (2) 1 1/4" trade size PVC conduit feeds. Boxes are designed to be installed separately or ganged together, for greater capacity and flexibility. Works with XB814 cover assembly (sold separately). These boxes are perfect for grass, sidewalks, patio, or any other location where permanent power is needed.

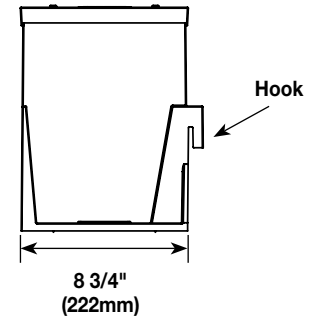
Country of Origin: China



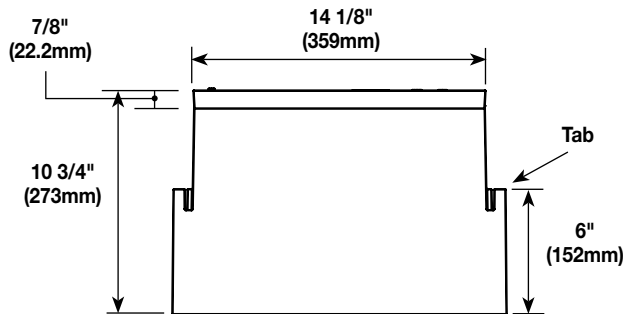
TOP



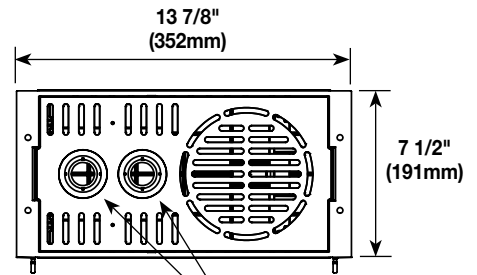
SIDE



FRONT



BOTTOM



3/4" - 1 1/4" Trade Size Feed Locations



Outdoor Ground Box, exterior view, view installed with bricks, and a cross-sectional view of a Ground Box installation.

XB814C520BN
XB814C520BK
XB814C520GY

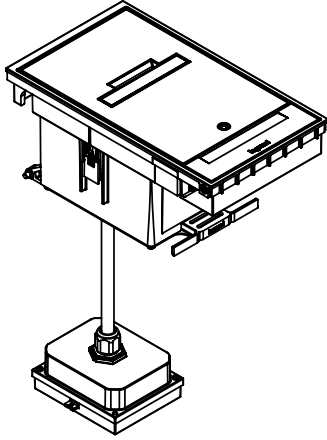
Exterior Box Cover Assembly 5-20R – Exterior box cover assembly prewired with (2) 20A weather resistant duplex receptacles. Both duplex receptacles are wired together on a single circuit. Available in brown (XB814C520BN), black (XB814C520BK), or gray (XB814C520GY). When used in conjunction with the ground box body (XB814) the entire unit has a UL50E Type 6P & IP68 rating in outdoor locations.

Country of Origin: China

CAUTION: All ground box electrical circuits must be protected by a Ground Fault Circuit Interrupter upstream from the ground box.

NOTE: Cover must be closed while in use. Use only molded plug and cord assemblies that are rated for outdoor use.

NOTE: Maximum length of plug allowed at end of cord is 3" (76mm).

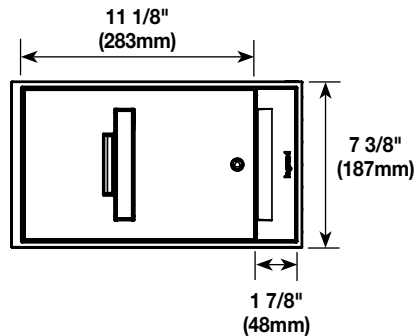


Components Included:

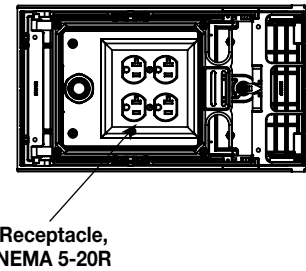
- Cover Flange
- Cover Body
- Textured Surface Plate
- Egress Door
- Handle
- 500W Cord
- NEMA 6P Rated Wiring Enclosure
- 2 20A Duplex Weather Resistant Receptacles
- Tamper-Resistant Key & Lock

NOTE: Lock Nut Tool (XBLNT) sold separately.

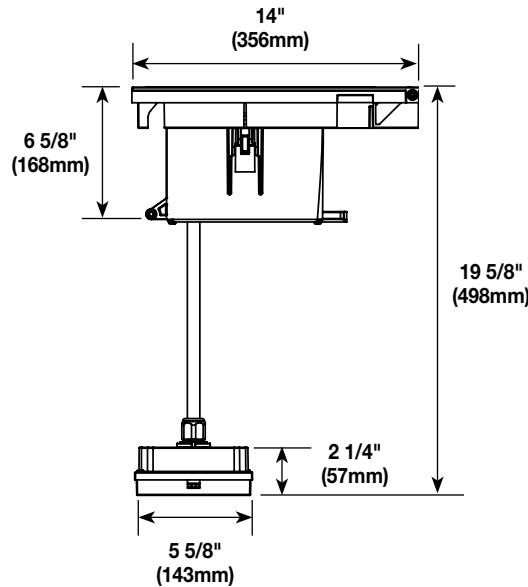
TOP



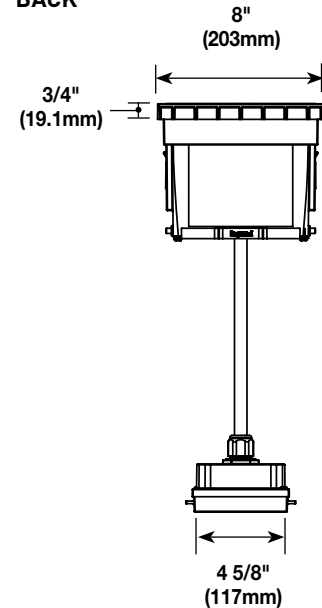
INSIDE VIEW



FRONT



BACK



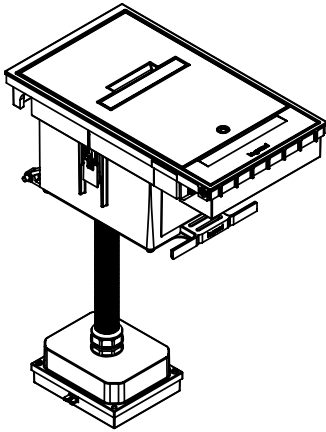
XB814CLVBN
XB814CLVBK
XB814CLVGY

Exterior Box Cover Assembly Low Voltage – Exterior box low voltage cover assembly, designed to accept up to 12 communication ports or 8 Legrand AVIP devices. Available in brown (XB814CLVBN), black (XB814CLVBK), or gray (XB814CLVGY). When used in conjunction with the ground box body (XB814) the entire unit has a UL50E Type 4X & IP65 rating in outdoor locations.

Country of Origin: China

NOTE: Cover must be closed while in use. Use only cables that are rated for outdoor use.

NOTE: Maximum length of connector allowed at end of cable is 2" (51mm).

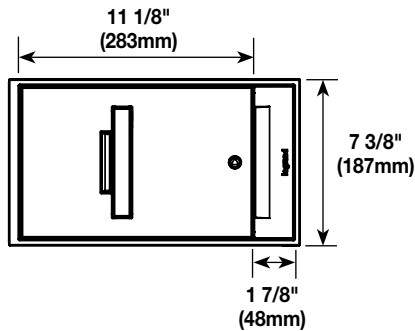


Components Included:

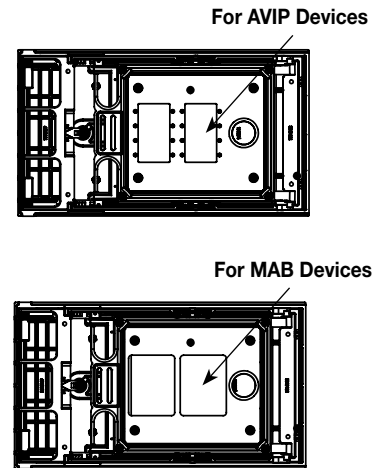
- Cover Flange
- Cover Body
- Textured Surface Plate
- Egress Door
- Handle
- 1" Trade Size Cable Chase
- NEMA 4X Rated Wiring Enclosure
- 8-Port AVIP Device Mounting Plate
- 12-Port Communications Device Plate
- Tamper-Resistant Key & Lock

NOTE: Lock Nut Tool (XBLNT) sold separately.

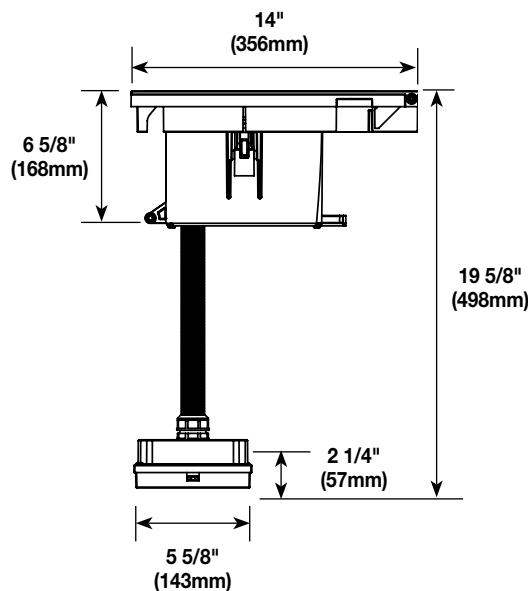
TOP



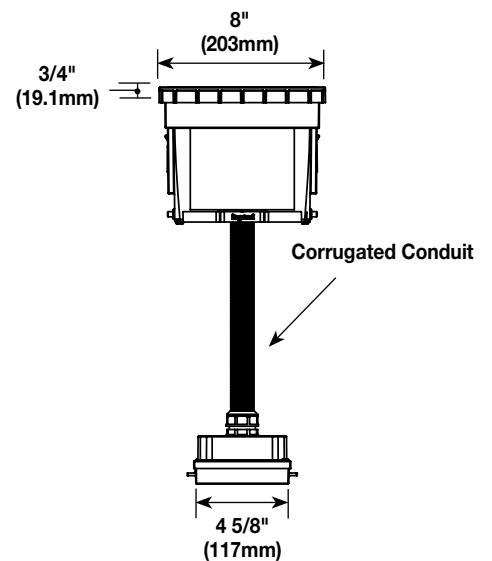
INSIDE VIEWS



SIDE



FRONT

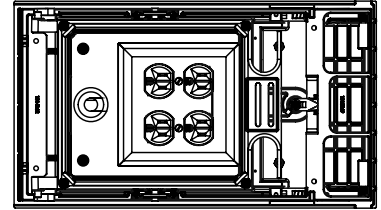


Made-To-Order Cover Assembly Options

These cover assemblies are made-to-order with a 10-day lead time. Please refer to the listings below to select the correct configuration to meet your receptacle requirements.

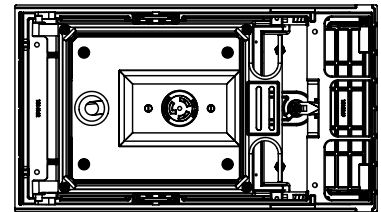
Part Number	Description	NEMA Configuration	Colors Available
XB814C515BK XB814C515BN XB814C515GY	Exterior Box Cover Assembly with 2 NEMA 5-15R Duplex Receptacles	5-15R	Black, Brown, Gray

Country of Origin: China



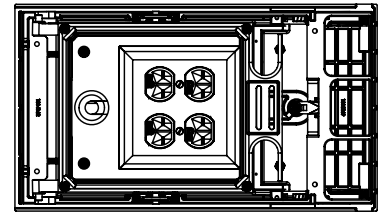
XB814CL515BK XB814CL515BN XB814CL515GY	Exterior Box Cover Assembly with a Single NEMA L5-15R Locking Receptacle	L5-15R	Black, Brown, Gray
---	--	--------	--------------------

Country of Origin: China



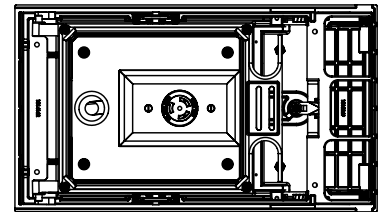
XB814C615BK XB814C615BN XB814C615GY	Exterior Box Cover Assembly with 2 NEMA 6-15R Duplex Receptacles	6-15R	Black, Brown, Gray
--	--	-------	--------------------

Country of Origin: China



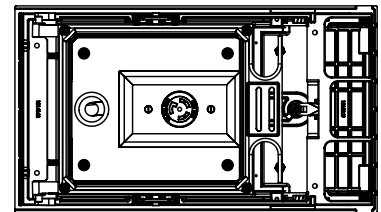
XB814CL615BK XB814CL615BN XB814CL615GY	Exterior Box Cover Assembly with a Single NEMA L6-15R Locking Receptacle	L6-15R	Black, Brown, Gray
---	--	--------	--------------------

Country of Origin: China



XB814CL715BK XB814CL715BN XB814CL715GY	Exterior Box Cover Assembly with a Single NEMA L7-15R Locking Receptacle	L7-15R	Black, Brown, Gray
---	--	--------	--------------------

Country of Origin: China



CAUTION: All ground box electrical circuits must be protected by a Ground Fault Circuit Interrupter upstream from the ground box.

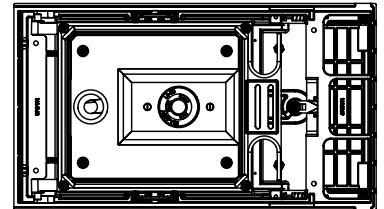
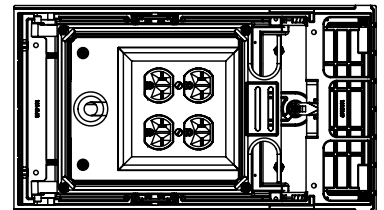
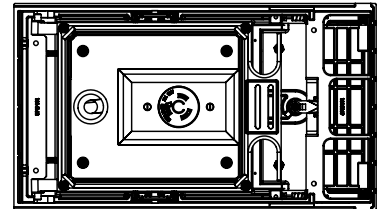
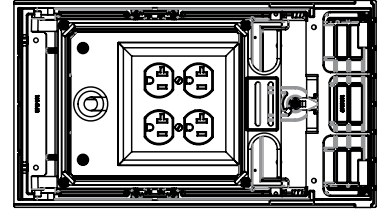
NOTE: Cover must be closed while in use. Use only molded plug and cord assemblies that are rated for outdoor use.

NOTE: Maximum length of plug allowed at end of cord is 3" (76mm).

Made-To-Order Cover Assembly Options

These cover assemblies are made-to-order with a 10-day lead time. Please refer to the listings below to select the correct configuration to meet your receptacle requirements.

Part Number	Description	NEMA Configuration	Colors Available
XB814C520C2BK XB814C520C2BN XB814C520C2GY	Exterior Box Cover Assembly with 2 NEMA 5-20R Duplex Receptacles on 2 Circuits Country of Origin: China	5-20R	Black, Brown, Gray
XB814CL520BK XB814CL520BN XB814CL520GY	Exterior Box Cover Assembly with a Single NEMA L5-20R Locking Receptacle Country of Origin: China	L5-20R	Black, Brown, Gray
XB814C620BK XB814C620BN XB814C620GY	Exterior Box Cover Assembly with 2 NEMA 6-20R Duplex Receptacles Country of Origin: China	6-20R	Black, Brown, Gray
XB814CL620BK XB814CL620BN XB814CL620GY	Exterior Box Cover Assembly with a Single NEMA L6-20R Locking Receptacle Country of Origin: China	L6-20R	Black, Brown, Gray



CAUTION: All ground box electrical circuits must be protected by a Ground Fault Circuit Interrupter upstream from the ground box.

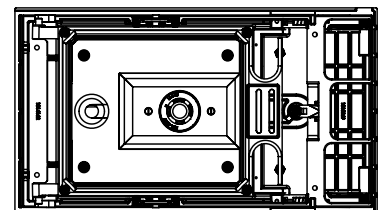
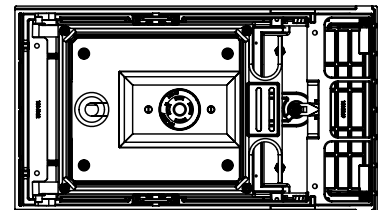
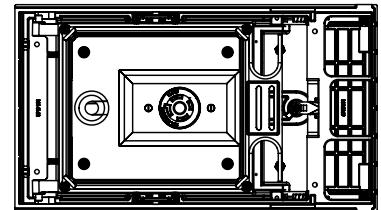
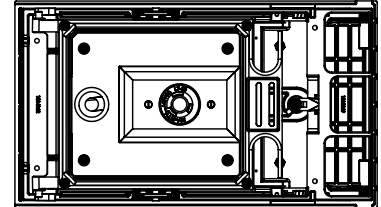
NOTE: Cover must be closed while in use. Use only molded plug and cord assemblies that are rated for outdoor use.

NOTE: Maximum length of plug allowed at end of cord is 3" (76mm).

Made-To-Order Cover Assembly Options

These cover assemblies are made-to-order with a 10-day lead time. Please refer to the listings below to select the correct configuration to meet your receptacle requirements.

Part Number	Description	NEMA Configuration	Colors Available
XB814CL720BK XB814CL720BN XB814CL720GY	Exterior Box Cover Assembly with a Single NEMA L7-20R Locking Receptacle Country of Origin: China	L7-20R	Black, Brown, Gray
XB814CL1420BK XB814CL1420BN XB814CL1420GY	Exterior Box Cover Assembly with a Single NEMA L14-20R Locking Receptacle Country of Origin: China	L14-20R	Black, Brown, Gray
XB814CL1520BK XB814CL1520BN XB814CL1520BGY	Exterior Box Cover Assembly with a Single NEMA L15-20R Locking Receptacle Country of Origin: China	L15-20R	Black, Brown, Gray
XB814CL1620BK XB814CL1620BN XB814CL1620GY	Exterior Box Cover Assembly with a Single NEMA L16-20R Locking Receptacle Country of Origin: China	L16-20R	Black, Brown, Gray



CAUTION: All ground box electrical circuits must be protected by a Ground Fault Circuit Interrupter upstream from the ground box.

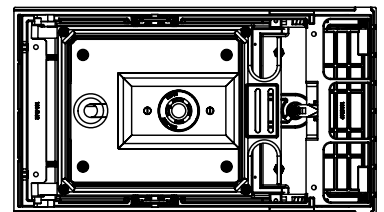
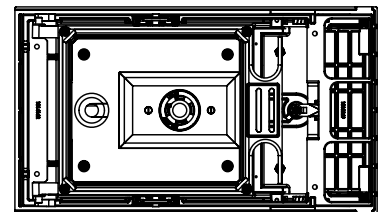
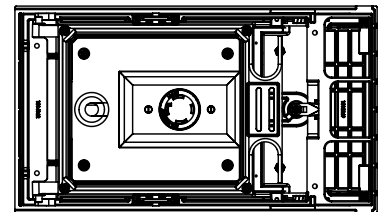
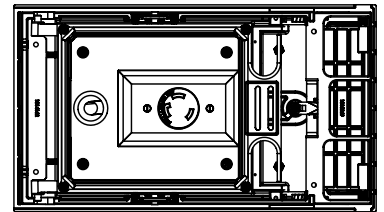
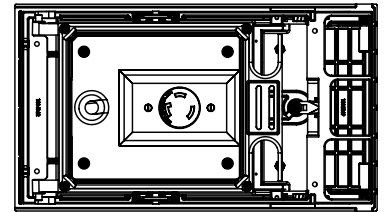
NOTE: Cover must be closed while in use. Use only molded plug and cord assemblies that are rated for outdoor use.

NOTE: Maximum length of plug allowed at end of cord is 3" (76mm).

Made-To-Order Cover Assembly Options

These cover assemblies are made-to-order with a 10-day lead time. Please refer to the listings below to select the correct configuration to meet your receptacle requirements.

Part Number	Description	NEMA Configuration	Colors Available
XB814CL530BK XB814CL530BN XB814CL530GY	Exterior Box Cover Assembly with a Single NEMA L5-30R Locking Receptacle Country of Origin: China	L5-30R	Black, Brown, Gray
XB814CL630BK XB814CL630BN XB814CL630GY	Exterior Box Cover Assembly with a Single NEMA L6-30R Locking Receptacle Country of Origin: China	L6-30R	Black, Brown, Gray
XB814CL1430BK XB814CL1430BN XB814CL1430GY	Exterior Box Cover Assembly with a Single NEMA L14-30R Locking Receptacle Country of Origin: China	L14-30R	Black, Brown, Gray
XB814CL1530BK XB814CL1530BN XB814CL1530GY	Exterior Box Cover Assembly with a Single NEMA L15-30R Locking Receptacle Country of Origin: China	L15-30R	Black, Brown, Gray
XB814CL1630BK XB814CL1630BN XB814CL1630GY	Exterior Box Cover Assembly with a Single NEMA L16-30R Locking Receptacle Country of Origin: China	L16-30R	Black, Brown, Gray



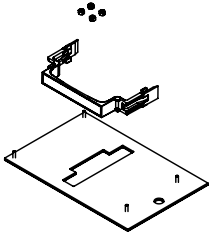
CAUTION: All ground box electrical circuits must be protected by a Ground Fault Circuit Interrupter upstream from the ground box.

NOTE: Cover must be closed while in use. Use only molded plug and cord assemblies that are rated for outdoor use.

NOTE: Maximum length of plug allowed at end of cord is 3" (76mm).

Outdoor Ground Box Accessories Ordering Information

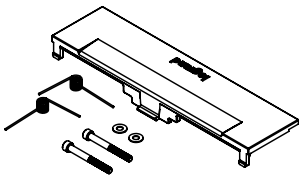
XB814CPBN
XB814CPBK
XB814CPGY



Exterior Box Cover Plate Kit
- Replacement cover plate.
Comes complete with a new handle and all of the mounting hardware required. Available in brown (XB814CPBN), black (XB814CPBK), or gray (XB814CPGY).

Country of Origin: China

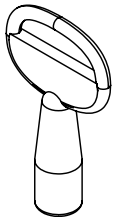
XB814ED



Replacement Egress Door Kit -
Replacement door can be changed out if the door ever wears out or becomes damaged.

Country of Origin: China

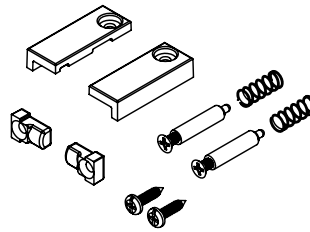
CRFB-KEY



Key Set - Replacement Key Set for Outdoor Ground Box.

Country of Origin: US

XB814SP



Replacement Egress Door Spring Pin Set -
Locks the egress door in the closed position when cover is closed.

Country of Origin: China


XBLNT



Exterior Box Locknut Tool -
Exterior Box locknut wrench. Used to tighten the locknut on the junction box. Sold Separately.

Country of Origin: China

NOTE: All brand and product names referenced in this document are registered trademarks or trademarks of their respective holders.

 **NOTE:** The paper used to print this document is an environmentally responsible paper with 10% post consumer waste, with FSC and SFI Chain of Custody certifications, Lacey Act compliant. 100% of the electricity used to manufacture Flo sheets is generated with Green-e certified renewable energy.



Legrand, North America
60 Woodlawn Street
West Hartford, CT 06110
1.877.BY.LEGRAND (295.3472)
www.legrand.us

Canada
905.738.9195
www.legrand.ca

FOLLOW US





Outdoor Charging Station with Area Light.

Satisfy the Power Hungry

Outdoor spaces are becoming hubs for social activity and productivity. From corporate campuses with outdoor meeting spaces to colleges offering outdoor courses, the need for convenient and safe access to power outdoors continues to grow.

The Outdoor Charging Stations from Legrand provide an ideal solution for employees, students, and guests to charge their mobile devices in outdoor spaces. Each station includes a combination of standard GFCI power outlets and USB outlets. In addition, some stations incorporate LED lighting to enable easy usage at night. They can also support A/V or communication connectivity.

All stations are ADA compliant and NEMA 3R listed for use in outdoor locations. Shelves are available for device storage while charging. Available in three standard finishes, these elegant pedestals are designed to enhance your facility while blending into existing landscaping.

Products



Charging Station with Accent Light

Select a charging station with an LED accent light to enable device charging during the day and after dark. Accent light ensures the station stands out from standard bollards and clearly indicates "charging."

Charging Station with Area Light

Combine outdoor device charging with an LED light to eliminate the need for a stand-alone bollard. Perfect for use as pathway lighting in educational, corporate and recreational applications.

Power Pedestal

Ideal for areas that are already illuminated, such as outdoor dining areas. Shorter height enables use beside tables or as a lower-profile solution in landscaping.

Lighting Station

Add lighting-only stations to complement the charging stations in your space. Enable a consistent look and provide pathway lighting to campuses.

Compliance



cULus Listed, File Number E479489, Guide PUPR

Outdoor Charging Stations are UL Listed to meet NEMA 3R requirements for use in outdoor locations.

Outdoor Charging Stations comply with ADA guidelines.

Features & Benefits

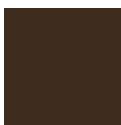
- **Charging and Illumination** – Combine charging with accent or area lighting in one pedestal to maximize functionality of outdoor spaces.
- **2- or 3-Gang Options** – Customize the station with two or three gangs of devices to meet your facility’s unique needs. Prewired versions include weather-resistant GFCI outlets and 4-port USB outlets. Also available unwired for complete customization.
- **Outdoor-Rated Construction** – Rugged aluminum form designed for durability in outdoor locations. UL listed to NEMA 3R requirements to ensure optimal performance. Door closes automatically to meet while-in-use requirements.
- **Durable, Premium Finishes** – Available in three outdoor-rated finishes to complement your space design. Choose from black, bronze, and silver to perfectly match your project.
- **A/V & Communication Compatible** – Add an A/V-Communication Kit to 3-gang versions to accommodate Wiremold AVIP plates, as well as decorator A/V or communication devices. Enables pedestal to support outdoor presentation areas and classrooms, eliminating the need to bring cables from inside a building.
- **Device Shelves** – Add up to two pairs of shelves to hold mobile devices while charging.
- **Door Options** – Interior illuminates when door is opened. Replace standard color-matched door with a transparent version to make devices inside more visible. Or, select a lockable door for added security or to ensure use is limited to facility personnel.
- **ADA compliant** – Meets all specifications for ADA guidelines, including unobstructed reach requirements.



COLOR OPTIONS:



Black



Bronze

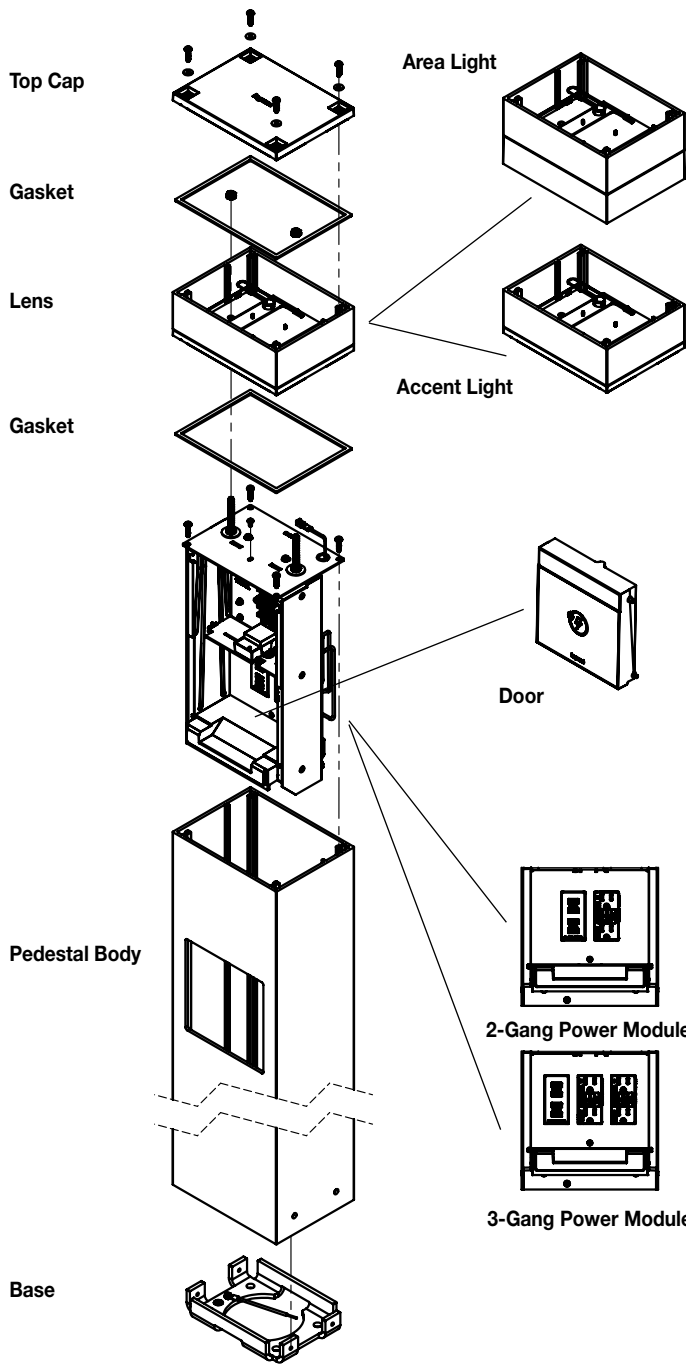


Silver

Vertical Markets

- Commercial
- Education
- Entertainment
- Healthcare
- Hospitality
- Parks
- Retail
- Transit

Charging Station Components



Lens Options:

- Charging Station or Lighting Station with Area Light
- Charging Station with Accent Light
- No Lens – Power Pedestal

Door Options:

- Color-Matched Door – shipped with pedestal
- Transparent Door – available accessory
- Locking Door – available accessory
- No Door – Lighting Station

Device Options:

- 2-Gang Power Module – Prewired with GFCI, USB devices or unwired with no devices
- 3-Gang Power Module – Prewired with GFCI, USB devices or unwired with no devices
- 3-Gang Power Module – Select unwired version and add A/V-Communications Kit (AVKIT) to combine power and low voltage
- No Devices – Lighting Station

Technical Information

Components & Material	
Lenses	Polycarbonate. UL F1 rating to ensure UV resistance.
Paint	Outdoor-rated powder coat
Pedestal Base & Hardware	Steel base (4 1/4" (108mm) diameter opening) with four (4) 3/8" (9.5mm) L bolts (8" length (203mm))
Pedestal Body	0.188" thick aluminum extrusion
Shelves	0.25" thick aluminum coated with outdoor-rated plasticcoat coating
Transparent Door	Polycarbonate. UL F1 rating to ensure UV resistance.
Idle Power Draw	
4-Port USB Outlet	0.775W
Lighting	
Accent Light	7W, 4000k
Area Light	25W, 4000k
LED Driver	Accepts 120V and 277V
Temperature Ratings	
Charging Station with Accent Light	-22° F (-30° C) to 140° F (60° C)
Charging Station with Area Light	-22° F (-30° C) to 140° F (60° C)
Power Pedestal	-31° F (-35° C) to 140° F (60° C)

CHARGING STATION INSTALLATION:

Pedestal installs via four L bolts sunk into concrete. Conduit should be stubbed up to a height of 8" for standard power installations. If using AVKIT, conduit should be run up to bottom of power module/door.

To wire, remove four screws from top of pedestal, then remove gasketing and lens (if applicable). Loosen screw inside door area. Power module lifts out of pedestal body, allowing wiring to be pulled up through pedestal. Make all wiring connections, then lower power module back into pedestal body, tighten door area screw, and reassemble top.

LIGHTING STATION INSTALLATION:

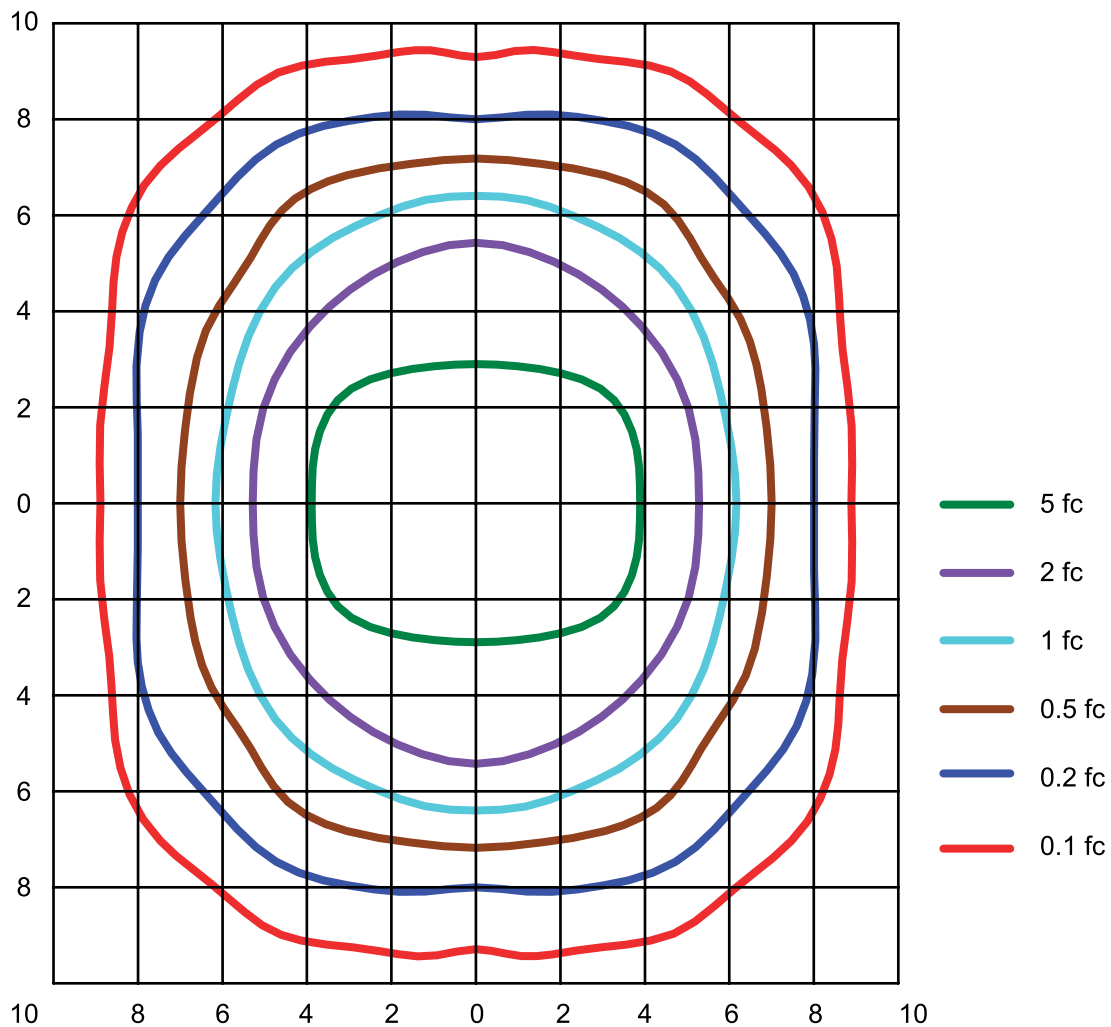
Pedestal installs via four L bolts sunk into concrete. Conduit should be stubbed up to a height of 8". All wiring should be completed at base of pedestal, with incoming power wired to included leads .

Technical Information – Area Light & Lighting Station

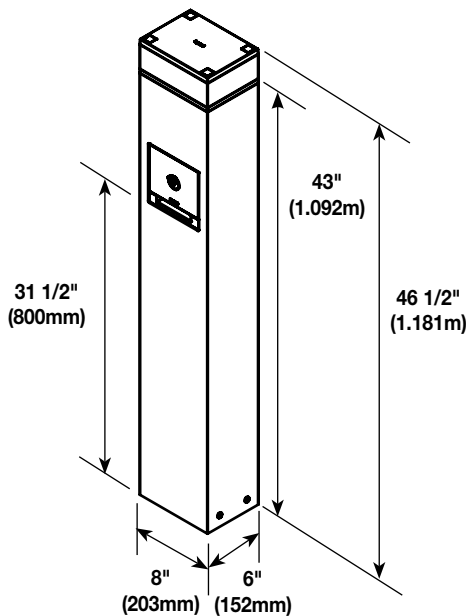
Lighting Data

Light Output (Lumens):	457 Lumens
Watts:	21.8 W
B.U.G. Rating:	B0 U2 G0
Max. Intensity:	230 candela
Correlated Color Temperature (CCT):	4000k
Color Rendering Index (CRI):	84
Rated Life (L70):	> 50,000

Photometrics



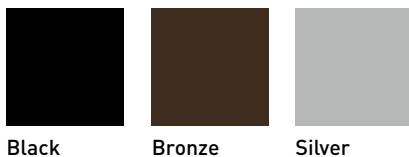
Outdoor Charging Station with Accent Light



Components Included:

- Top Cap and Pedestal Body
- Required Gasketing
- Accent Light Assembly
- Power Module (2- or 3-Gang)
- Color-Matched Door
- Mounting Base
- Four (4) L Bolts

COLOR OPTIONS:



Station features rugged aluminum construction and includes an accent LED light (7W, 4000k) for easy identification at night.

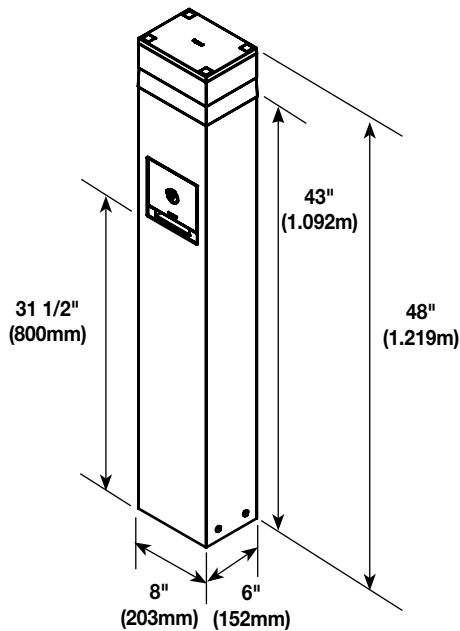
- NEMA 3R listed for use in outdoor locations.
- Aluminum body is 0.188" (4.78mm) thick and powder-coated with durable, outdoor-rated paint. Mounts into concrete with four L bolts.
- Available prewired with two or three devices, per chart below. Devices include weather-resistant 20A GFCIs and 4-port USB outlets. Power and lighting are prewired on separate circuits. Lighting circuit can be controlled by a timer at the panel if desired.
- Also available unwired in two- or three-gang versions. Unwired versions can be populated with any combination of weather-resistant GFCI receptacles and USB outlets.
- Includes color-matched door, which can be easily replaced by a color-matched locking door (XCSLOCK-XX) or a transparent door (XCSCLEAR) (see page 8).
- Interior illuminates when door is open. Door closes automatically to meet while-in-use requirements.
- A/V and communication devices can be added to unwired three-gang versions with addition of A/V-Communication Kit (AVKIT – see page 8). Kit includes two replacement device plates to accommodate:
 - > two decorator-style power devices and one decorator style A/V or communication device,
 - > two decorator-style power devices and four Wiremold AVIP device plates.
- Use unwired two- or three-gang pedestal versions for dedicated low voltage applications where power is not required – no A/V-Communication kit needed.

Outdoor Charging Station with Accent Light Ordering Information

Part Number	Gangs	20A WR GFCI	4-Port 4.2A USB	Finish
XCSAL2GRU-BK	2	1	1	Black
XCSAL2GRU-BZ	2	1	1	Bronze
XCSAL2GRU-SV	2	1	1	Silver
XCSAL2GUU-BK	2	0	2	Black
XCSAL2GUU-BZ	2	0	2	Bronze
XCSAL2GUU-SV	2	0	2	Silver
XCSAL2GRR-BK	2	2	0	Black
XCSAL2GRR-BZ	2	2	0	Bronze
XCSAL2GRR-SV	2	2	0	Silver
XCSAL2G-BK*	2	0	0	Black
XCSAL2G-BZ*	2	0	0	Bronze
XCSAL2G-SV*	2	0	0	Silver
XCSAL3GRUU-BK	3	1	2	Black
XCSAL3GRUU-BZ	3	1	2	Bronze
XCSAL3GRUU-SV	3	1	2	Silver
XCSAL3GRRU-BK	3	2	1	Black
XCSAL3GRRU-BZ	3	2	1	Bronze
XCSAL3GRRU-SV	3	2	1	Silver
XCSAL3G-BK*	3	0	0	Black
XCSAL3G-BZ*	3	0	0	Bronze
XCSAL3G-SV*	3	0	0	Silver

* Stations with no devices are provided unwired for addition of customized selections. Lighting element is prewired.

Outdoor Charging Station with Area Light



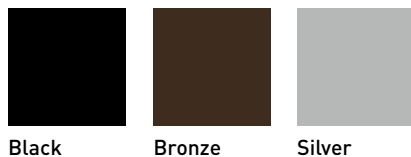
Station features rugged aluminum construction and includes an LED light for area illumination (25W, 4000k).

- NEMA 3R listed for use in outdoor locations.
- Aluminum body is 0.188" (4.78mm) thick and powder-coated with durable, outdoor-rated paint. Mounts into concrete with four L bolts.
- Available prewired with two or three devices, per chart below. Devices include weather-resistant 20A GFCIs and 4-port USB outlets. Power and lighting are prewired on separate circuits. Lighting circuit can be controlled by a timer at the panel if desired.
- Also available unwired in two- or three-gang versions. Unwired versions can be populated with any combination of weather-resistant GFCI receptacles and USB outlets.
- Includes color-matched door, which can be easily replaced by a color-matched locking door (XCSLOCK-XX) or a transparent door (XCSCLEAR) (see page 8).
- Interior illuminates when door is open. Door closes automatically to meet while-in-use requirements.
- A/V and communication devices can be added to unwired three-gang versions with addition of A/V-Communication Kit (AVKIT – see page 8). Kit includes two replacement device plates to accommodate:
 - > two decorator-style power devices and one decorator style A/V or communication device,
 - > two decorator-style power devices and four Wiremold AVIP device plates.
- Use unwired two- or three-gang pedestal versions for dedicated low voltage applications where power is not required – no A/V-Communication kit needed.

Components Included:

- Top Cap and Pedestal Body
- Required Gasketing
- Area Light Assembly
- Power Module (2- or 3-Gang)
- Color-Matched Door
- Mounting Base
- Four (4) L Bolts

COLOR OPTIONS:

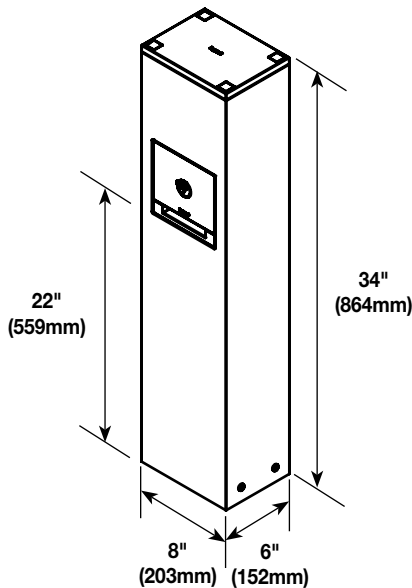


Outdoor Charging Station with Area Light Ordering Information

Part Number	Gangs	20A WR GFCI	4-Port 4.2A USB	Finish
XCSLF2GRU-BK	2	1	1	Black
XCSLF2GRU-BZ	2	1	1	Bronze
XCSLF2GRU-SV	2	1	1	Silver
XCSLF2GUU-BK	2	0	2	Black
XCSLF2GUU-BZ	2	0	2	Bronze
XCSLF2GUU-SV	2	0	2	Silver
XCSLF2GRR-BK	2	2	0	Black
XCSLF2GRR-BZ	2	2	0	Bronze
XCSLF2GRR-SV	2	2	0	Silver
XCSLF2G-BK*	2	0	0	Black
XCSLF2G-BZ*	2	0	0	Bronze
XCSLF2G-SV*	2	0	0	Silver
XCSLF3GRUU-BK	3	1	2	Black
XCSLF3GRUU-BZ	3	1	2	Bronze
XCSLF3GRUU-SV	3	1	2	Silver
XCSLF3GRRU-BK	3	2	1	Black
XCSLF3GRRU-BZ	3	2	1	Bronze
XCSLF3GRRU-SV	3	2	1	Silver
XCSLF3G-BK*	3	0	0	Black
XCSLF3G-BZ*	3	0	0	Bronze
XCSLF3G-SV*	3	0	0	Silver

* Stations with no devices are provided unwired for addition of customized selections. Lighting element is prewired.

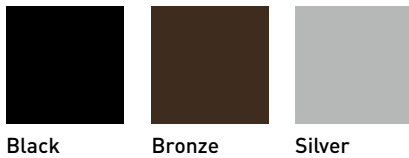
Power Pedestal



Components Included:

- Top Cap and Pedestal Body
- Required Gasketing
- Power Module (2- or 3-Gang)
- Color-Matched Door
- Mounting Base
- Four (4) L Bolts

COLOR OPTIONS:



Station features rugged aluminum construction.

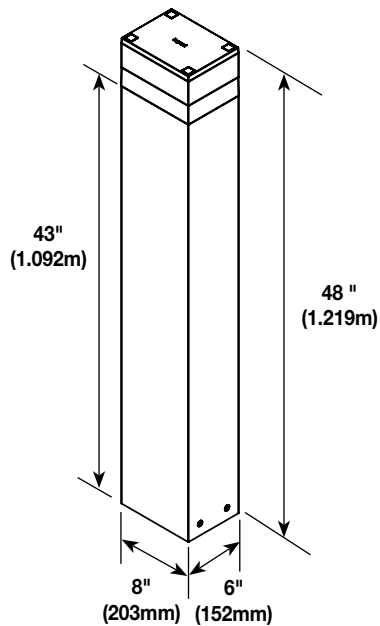
- NEMA 3R listed for use in outdoor locations.
- Aluminum body is 0.188" (4.78mm) thick and powder-coated with durable, outdoor-rated paint. Mounts into concrete with four L bolts.
- Available prewired with two or three devices, per chart below. Devices include weather-resistant 20A GFCIs and 4-port USB outlets.
- Also available unwired in two- or three-gang versions. Unwired versions can be populated with any combination of weather-resistant GFCI receptacles and USB outlets.
- Includes color-matched door, which can be easily replaced by a color-matched locking door (XCSLOCK-XX) or a transparent door (XCSCLEAR) (see page 8).
- Interior illuminates when door is open. Door closes automatically to meet while-in-use requirements.
- A/V and communication devices can be added to unwired three-gang versions with addition of A/V-Communication Kit (see page 8). Kit includes two replacement device plates to accommodate:
 - > two decorator-style power devices and one decorator style A/V or communication device,
 - > two decorator-style power devices and four Wiremold AVIP device plates.
- Use unwired two- or three-gang pedestal versions for dedicated low voltage applications where power is not required – no A/V-Communication kit needed.

Power Pedestal Ordering Information

Part Number	Gangs	20A WR GFCI	4-Port 4.2A USB	Finish
XCSP2GRU-BK	2	1	1	Black
XCSP2GRU-BZ	2	1	1	Bronze
XCSP2GRU-SV	2	1	1	Silver
XCSP2GUU-BK	2	0	2	Black
XCSP2GUU-BZ	2	0	2	Bronze
XCSP2GUU-SV	2	0	2	Silver
XCSP2GRR-BK	2	2	0	Black
XCSP2GRR-BZ	2	2	0	Bronze
XCSP2GRR-SV	2	2	0	Silver
XCSP2G-BK*	2	0	0	Black
XCSP2G-BZ*	2	0	0	Bronze
XCSP2G-SV*	2	0	0	Silver
XCSP3GRUU-BK	3	1	2	Black
XCSP3GRUU-BZ	3	1	2	Bronze
XCSP3GRUU-SV	3	1	2	Silver
XCSP3GRRU-BK	3	2	1	Black
XCSP3GRRU-BZ	3	2	1	Bronze
XCSP3GRRU-SV	3	2	1	Silver
XCSP3G-BK*	3	0	0	Black
XCSP3G-BZ*	3	0	0	Bronze
XCSP3G-SV*	3	0	0	Silver

* Stations with no devices are provided unwired for addition of customized selections.

Lighting Station



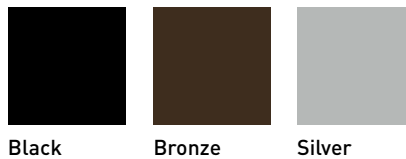
Station features rugged aluminum construction and includes an LED light for area illumination (25W, 4000k).

- NEMA 3R listed for use in outdoor locations.
- Aluminum body is 0.188" (4.78mm) thick and powder-coated with durable, outdoor-rated paint. Mounts into concrete with four L bolts.

Lighting Station Ordering Information

Part Number	Finish
XLF-BK	Black
XLF-BZ	Bronze
XLF-SV	Silver

COLOR OPTIONS:

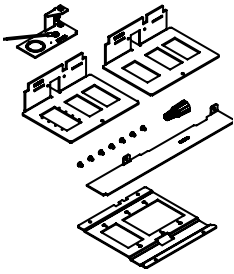


Components Included:

- Top Cap and Pedestal Body
- Required Gasketing
- Area Light Assembly
- Mounting Base
- Four (4) L Bolts

Outdoor Charging Station Accessories

A/V-COMMUNICATION KIT – XCSAV



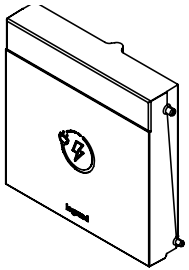
Kit enables combining power and low voltage in one three-gang pedestal. Includes two device plates to accommodate:

- two decorator-style power devices and one decorator style A/V or communication device,
- two decorator-style power devices and four Wiremold AVIP device plates.

Also includes interior divider to separate A/V or communication from high voltage wiring. Compatible with three-gang versions only.

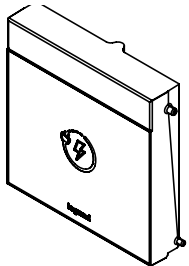
Use unwired two- or three-gang pedestal versions for dedicated low voltage applications where power is not required – no A/V-Communication kit (AVKIT) needed.

TRANSPARENT DOOR – XCSCLEAR



Replaces color-matched door (included).

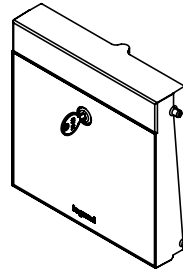
REPLACEMENT DOOR – XCSDOOR



Available Colors:
XCSDOOR-BK Black
XCSDOOR-BZ Bronze
XCSDOOR-SV Silver

Replacement door for all charging stations. Included with initial shipment of all models.

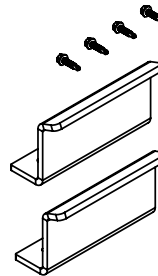
LOCKING DOOR – XCSLOCK



Available Colors:
XCSLOCK-BK Black
XCSLOCK-BZ Bronze
XCSLOCK-SV Silver

Replaces standard color-matched door (included). Includes standard lock and two keys.

DEVICE SHELVES – XCSSHELF




Available Colors:
XCSSHELF-BK Black
XCSSHELF-SV Silver

Pair of shelves to hold mobile device while charging. Shelves are intended to mount to the pedestal sides and have been tested to hold up to 250 lbs. Recommend maximum of two shelves per pedestal.

NOTE: Shelves must be mounted below door opening.



NOTE: All brand and product names referenced in this document are registered trademarks or trademarks of their respective holders.

 **NOTE:** The paper used to print this document is an environmentally responsible paper with 10% post consumer waste, with FSC and SFI Chain of Custody certifications, Lacey Act compliant. 100% of the electricity used to manufacture Flo sheets is generated with Green-e certified renewable energy.



Legrand, North America
60 Woodlawn Street
West Hartford, CT 06110
1.877.BY.LEGRAND (295.3472)
www.legrand.us

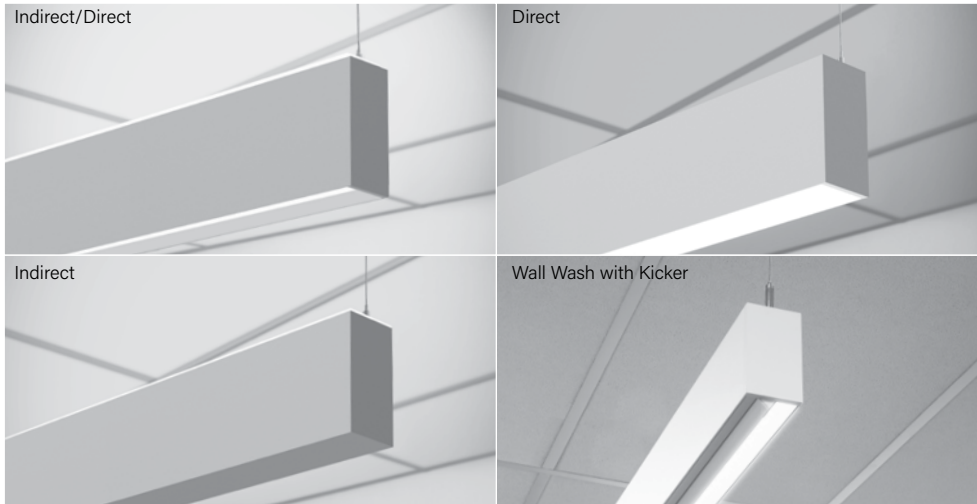
570 Applewood Crescent
Vaughan, Ontario L4K 4B4
905.738.9195
www.legrand.ca

FOLLOW US



Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant



High Performance 2" Aperture is a patented, linear LED luminaire family. HP-2 delivers excellent performance using an advanced optical design and mid-power LEDs. Achieving 90% of initial light output at 100,000+ hours and backed by a 10-year performance-based warranty on all standard components.

This product is enrolled in the International Living Future Institute (ILFI) Declare 2.0 Program and is third-party verified with options achieving **Red List Approved** and **Declared** status.

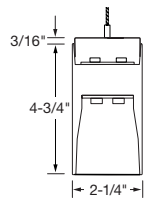
Signal White is standard finish

Note: see page 6 for all aesthetic options

CROSS SECTIONS

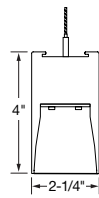
Indirect/Direct

Top Glow Diffuser
(standard)



Flush Downlight Diffuser
(standard)

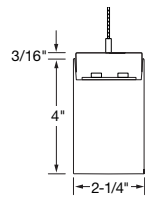
Direct



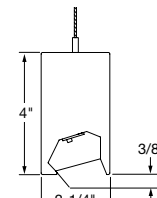
Flush Downlight Diffuser
(standard)

Indirect

Top Glow Diffuser
(standard)



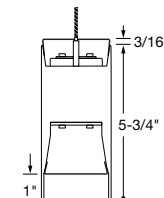
Wall Wash Direct



Kicker
(standard)

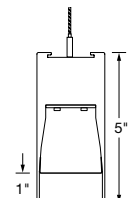
Regressed Indirect/Direct

Top Glow Diffuser
(standard)



Flat Diffuser with 1" Regressed
(standard)

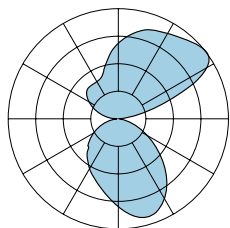
Regressed Direct



Flat Diffuser with 1" Regressed
(standard)

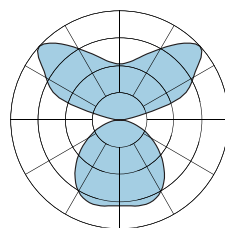
OPTIC OPTIONS

Asymmetric & Asymmetric Top Glow
(ASY / ASY-TG)



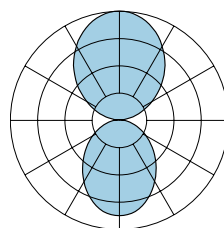
Downlight Asymmetric Optic **(DAO)**

Widespread & Widespread Top Glow
(WSO / WSO-TG)



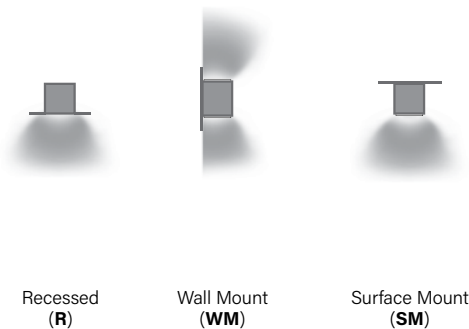
Downlight Spread Optic **(DSO)**

Standard Uplight Flush Optic **(F)**



Standard Downlight Flush Optic **(F)**

ALSO AVAILABLE IN



Also available in Indigo-Clean. See Indigo-Clean Tech Sheet

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

BODY TYPE

OUTPUT and LED TYPE

Platform	Series Name	Luminaire Type	Luminaire Distribution	Total Length of Run	Uplight Output ID & I Only (Flush)	Downlight Output ID & D Only (Flush)
HP - High Performance	2	P - Pendant P RG - Pendant Regressed ¹ (Wall Wash not available)	D - Direct WW-D - Wall Wash Direct ID - Indirect/Direct I - Indirect	Minimum 2' section length. Increments accurate to 1/16" (±1/32"), standard. 12' maximum section length.	S - Standard (393 lm/ft) B - Boosted (494 lm/ft) H - High (747 lm/ft) V - Very High (961 lm/ft) TL - Tailored: _____ lm/ft*	S - Standard (322 lm/ft) B - Boosted (405 lm/ft) H - High (612 lm/ft) V - Very High (786 lm/ft) TL - Tailored: _____ lm/ft*

* Specify lm/ft of outputs between Standard (S) and Very High (V). Consult factory for tailored lumen output outside of this range.

OUTPUT and LED TYPE

MECHANICAL/OPTICAL OPTIONS

ELECTRICAL OPTIONS

LED CRI/CCT	Uplight	Downlight	Reflector System	Voltage
830 - 80 CRI, 3000K 835 - 80 CRI, 3500K 840 - 80 CRI, 4000K 930 - 90 CRI, 3000K 935 - 90 CRI, 3500K 940 - 90 CRI, 4000K 8TW - 80 CRI, Tunable White 9TW - 90 CRI, Tunable White	TG - Top Glow (standard) F - Flush WSO - Widespread Optic WSOTG - Widespread Optic with Top Glow ASY-L - Asymmetric Left Optic ASY-R - Asymmetric Right Optic ASYTG-L - Asymmetric Left Optic with Top Glow ASYTG-R - Asymmetric Right Optic with Top Glow	F - Flush (standard) ² BG - Bottom Glow ² DL - 1" Drop Down Lens ² RG-D - Flat Diffuser with 1" Regress ^{2,3} RG WCB - White Cross Blade Baffle ^{2,3} RG-LHE - Hollowed Ellipse Louver ^{2,3} RG-LHC - Hex Louver ^{2,3} DSO - Downlight Spread Optic ^{2,4} DAO-L - Downlight Asymmetric Optic Left ^{2,4} DAO-R - Downlight Asymmetric Optic Right ^{2,4} K - Kicker for Wall Wash only (standard) FO - Fully Open for Wall Wash only	96LG - 96 Low Gloss White SW - Signal White for Wall Wash only	120 - 120 Voltage 277 - 277 Voltage 347 - 347 Voltage

ELECTRICAL OPTIONS

MOUNTING OPTIONS

Circuiting ⁵	Driver Selection	Mounting Method	
SC - Single Circuit* One single circuit in a run DC - Dual Circuit* ⁶ Independent control of up and down separately in an I/D style fixture MC - Multi-Circuit* More than one switch leg or zone. Factory shop drawings required	0-10V Driver Options FC-10% - 0-10V 10% ⁷ (standard) FC-1% - 0-10V 1% ⁷ OSR-10% - Osram OTi, 0-10V 10% ⁷ OSR-1% - Osram OTi, 0-10V 1% ⁷ ELD-10V-0% - EldoLED SOLOdrive, 0-10V 0.1% OSR-10V-TW - Osram OTi, 0-10V 10% (Tunable White) ⁷ DALI Driver Options FC-DALI-1% - DALI 1% OSR-DALI-1% - Osram Dexal, 1% ELD-DALI-0% - EldoLED SOLOdrive, 0.1% ELD-DALI-TW - EldoLED DUALdrive LightShape, 0.1% (Tunable White)	DMX Driver Options FIN-DMX - Finelite DMX 1% (Tunable White - FineTune Controls Only) ⁸ ELD-DMX - EldoLED POWERdrive, 0.1% ELD-DMX-TW - EldoLED POWERdrive, 0.1% (Tunable White) Lutron Driver Options LUT-ES1 - Lutron, Ecosystem 1% LUT-2W - Lutron, 2-wire (120V only) 1% LUT-TW - Lutron T-Series, EcoSystem 0.1% (Tunable White)	FA50 - Fully Adjustable 50" (standard) FA100 - Fully Adjustable 100" FA150 - Fully Adjustable 50" FA200 - Fully Adjustable 200" FA250 - Fully Adjustable 250" FA300 - Fully Adjustable 300" FM - Flexible Mounting ⁹

* Battery, Night Light, and Emergency to Generator circuits are in addition to the normal luminaire circuit(s)

See Page 3 for additional driver options and details

MOUNTING OPTIONS

OTHER OPTIONS

Ceiling Hardware Type	Endcap Style	Finish	Emergency Style (Optional)	Integrated Sensor (Optional)	Special Options (Optional)
C1 - 1" T-Bar C2 - 9/16" T-Bar C3 - Screw Slot C4 - Hard Ceiling	FE - Flat Endcap (standard) DE - 1" Drop Endcap ¹⁰ OE - Open Endcap ¹¹	SW - Signal White (standard) FB - Finelite Black ¹² SA - Satin Aluminum ¹² #### - RAL Color Code ¹²	FAC CHO - Factory Choice Battery Back-up EM/GEN - Emergency to Generator NL - Night Light BSL310LP - Bodine Battery Back up Low Profile GTD - Generator Transfer Device ALCR - Automatic Load Control Relay	OBO - Occupancy ² OBD - Daylight ² OBE - Enlighted ^{2,13} W601 - Wattstopper ¹⁴ Wireless Sensor REE - Remote Enlighted ¹⁵	CP - Chicago Plenum ¹⁶ RLA - Red List Approved RLD - Declared

¹ Not available with Indirect

⁷ Add DTO to gain "Dim to Off" functionality (FC-10% - DTO)

² Not available with Wall Wash

³ D & ID Regressed only

⁸ B & V outputs only

⁴ Not available with Regressed or Curves

⁹ Direct only

⁵ Contact factory for switching options

¹⁰ 1" Drop Down Lens downlight only

⁶ Indirect/Direct only

¹¹ Available with Hollowed Ellipse Louver (LHE) only

¹² 20 business days lead time for color

¹³ Enlighted components installed by Finelite, provided by others

¹⁴ LMFS-601 w/ 0-10V driver(s) and LMFI-111, up to 6 drivers may be connected. LMFS-601 w/ DALI driver, only 1 driver can be connected.

¹⁵ Enlighted for Wall Wash fixtures. Enlighted Control Unit & Sensor Cable installed for Remote mounting sensor

¹⁶ Only available with C1, C2, and C3 mounting hardware with Finelite Gridbox

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

SUPPLEMENTARY DRIVER PAGE

0-10V Driver Options

FC-10%	Factory Choice, 0-10V 10% Dimming (Linear)
FC-10%-DTO	Factory Choice, 0-10V 10% Dimming, Dim-to-Off (Linear)
FC-1%	Factory Choice, 0-10V 1% Dimming (Linear)
FC-1%-DTO	Factory Choice, 0-10V 1% Dimming, Dim-to-Off (Linear)
ELD-10V-0%	EldoLED SOLOdrive, 0-10V 0.1% Dimming (Linear)
ELD-10V-1%	EldoLED ECOdrive, 0-10V 1% Dimming (Linear)
OSR-10V-TW	Osram OTi, 0-10V 10% Dimming, <i>Tunable White</i> (Linear)
OSR-10V-TW-DTO	Osram OTi, 0-10V 10% Dimming, Dim-to-Off, <i>Tunable White</i> (Linear)
OSR-10%	Osram OTi, 0-10V 10% Dimming (Linear)
OSR-10%-DTO	Osram OTi, 0-10V 10% Dimming, Dim-to-Off (Linear)
OSR-1%	Osram OTi, 0-10V 1% Dimming (Linear)
OSR-1%-DTO	Osram OTi, 0-10V 1% Dimming, Dim-to-Off (Linear)

DALI Driver Options

FC-DALI-1%	Factory Choice, DALI 1% Dimming (Logarithmic)
OSR-DALI-1%	Osram Dexal, DALI 1% Dimming (Logarithmic)
ELD-DALI-0%	EldoLED SOLOdrive, DALI 0.1% Dimming (Logarithmic)
ELD-DALI-1%	EldoLED ECOdrive, DALI 1% Dimming (Logarithmic)
ELD-DALI-TW	EldoLED DUALdrive Light Shape, DALI 0.1% Dimming, <i>Tunable White</i> (Logarithmic Dimming, Linear CCT Control)

DMX Driver Options

FIN-DMX	Finelite, DMX 1% Dimming, <i>Tunable White</i> - FineTUNE Controls Only (Linear)
ELD-DMX	EldoLED POWERdrive, DMX 0.1% Dimming (8 Bit, 1CH) (Linear)
ELD-DMX-16	EldoLED POWERdrive, DMX 0.1% Dimming (16 Bit, 2CH) (Linear)
ELD-DMX-TW	EldoLED POWERdrive, DMX 0.1% Dimming, <i>Tunable White</i> (8 Bit, 2CH - CH1 Warm / CH2 Cool) (Linear)
ELD-DMX-TW16	EldoLED POWERdrive, DMX 0.1% Dimming, <i>Tunable White</i> (16 Bit, 4CH - CH1, 2 Warm / CH3, 4 Cool) (Linear)

Lutron Driver Options

LUT-ES1	Lutron, Ecosystem 1% Dimming
LUT-2W	Lutron, 2-wire (120V only) 1% Dimming
LUT-TW	Lutron T-Series, EcoSystem 0.1% Dimming, <i>Tunable White</i>

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

SPECIFICATIONS

BODY TYPE

CONSTRUCTION: Precision-cut 6061-T6 extruded aluminum body. Internal joiner system and plug-together wiring are standard.

LENGTHS: Any length, 2' minimum, in increments down to 1/16th" (±1/32"). 12' maximum section length. Hollowed Ellipse Louver (**LHE**), Hex Louver (**LHC**), and White Cross Blade Baffle (**WCB**) are available in 1' increments.

MITERED CORNERS¹: Illuminated corners of greater than 60° and less than 180° in a single plane, available with Flush Diffuser, Bottom Glow Diffuser, 1" Drop Down Lens ², Regressed Diffuser, or White Cross Blade Baffle ³. Corners not available with Wall Wash (**WW**), Hollowed Ellipse Louver (**LHE**) or Hex Louver (**LHC**). Contact factory for Double miters using the White Cross Blade Baffle. Consult factory for tailored lighting options.

OUTPUT AND LED TYPE

LIGHT OUTPUT: Four lumen packages available, Standard (**S**), Boosted Standard (**B**), High (**H**), and Very High (**V**). For lengths 3' and greater, the uplight and downlight can be specified with different lumen packages and dual controls. For Tailored Outputs outside of range from Standard (**S**) to Very High (**V**), consult factory. Light engines are replaceable.

MECHANICAL/OPTICAL OPTIONS

UPLIGHT OPTION ⁴: Patented Top Glow frost white diffuser standard. 12' maximum diffuser length. 73% transmissive, 99% diffusion. Internal secondary diffusers at corners ensure visually seamless, uniform, continuous illumination options include: Flush frost white snap-in diffuser, 73% transmissive, 99% diffusion; Widespread Optic (**WSO**) and Widespread Optic with Top Glow (**WSOTG**); WSO enables increased luminaire spacing with improved ceiling uniformity. Asymmetric optic directs light in a specific direction. **ASY-L** distributes light to the left, **ASY-R** distributed light to the right of the luminaire. Consult factory for more tailored lumen outputs.

DOWNLIGHT OPTION ⁵: 12' maximum diffuser length. Flush frost white snap-in diffuser standard, 73% transmissive, 99% diffusion. Internal secondary diffusers at corners ensure visually seamless, uniform, continuous illumination. Available with Flush (**F**), Bottom Glow (**BG**), 1" Drop Down Lens (**DL**), White Cross Blade Baffle (**WCB**)⁷, Hollowed Ellipse Louver (**LHE**)⁷, Hex Louver (**LHC**)⁷, Downlight Spread Optic (**DSO**)⁶, Downlight Asymmetric Optic (**DAO**)⁶, and Regressed downlight diffusers (**RG**)⁷. 1" Drop Down Lens made of highly efficient acrylic. Available with a solid endcap or an endcap with a diffuse filler to continue the luminous aesthetic. Downlight Spread & Downlight Asymmetric Optics are extruded lenses with a subtle ribbed appearance providing a batwing or asymmetric distribution for improved optical performance. Consult factory for more tailored lumen outputs.

¹ Not available with Wall Wash

² Indirect/Direct and Direct only

³ White Cross Blade (WCB) baffles not available with custom angles. Available in 90 degrees only

⁴ Pendant Indirect/Direct, Pendant Regressed Indirect/Direct, and Pendant Indirect only

⁵ Pendant Indirect/Direct, Pendant Regressed Indirect/Direct, Pendant Direct, and Pendant Regressed Direct only

LUMEN MAINTENANCE: 90% of initial light output (L90) at 100,000+ hours; 70% of initial light output (L70) at 200,000+ hours.

REFLECTORS: Die-formed 20-gauge cold-rolled steel reflectors finished in 96LG High Reflectance white powder coat paint. The standard Semi-Specular Aluminum (**SSA**) Kicker (**K**) reflector delivers light high on the vertical surface. The Kicker reflector can be easily removed for open distribution (**FO**).

ELECTRICAL OPTIONS

STATIC WHITE FEED: Standard with one 18-gauge/5-conductor single-circuit feed controlling uplight and downlight together (power and dimming). Specify dual feeds for independent control of uplight and downlight. 14-gauge feed used when luminaire current exceeds 5 amps.

TUNABLE WHITE FEED: Standard with one 18-gauge/5-conductor single-circuit feed. 14-gauge feed used when fixture current exceeds 5 amps. DMX and power feed at same location (standard). DMX feeds cannot be cut or spliced. DMX feeds should be ordered based on fixed lengths.

STATIC WHITE DRIVER: Replaceable 120V, 277V, and 347V constant current reduction dimming driver standard. Can be wired dimming or non-dimming. 0-10V dimming controls with a range of 100%-10% standard. Dimming to 1% available. Separate dimming for uplight and downlight available. Driver is fully accessible from below the ceiling.

- **Power Factor:** ≥ 0.9
- **Total Harmonic Distortion (THD):** <20%
- **Expected driver lifetime:** 100,000 hours

LUTRON STATIC DRIVER OPTIONS:

- **LUT-ES1 (LDE1)** - (Hi-lume 1% EcoSystem with Soft-On, Fade-to-Black dimming (LDE1 series))
- **LUT-2W (LTEA2W)** - (Hi-lume 1% 2-wire, 120V forward phase dimming (LTEA series)),

TUNABLE WHITE DRIVER: Replaceable LED driver. Driver is accessible from below the ceiling. 120V, 277V, and 347V.

- **Power factor:** ≥0.90
- **Total Harmonic Distortion (THD):** <20%
- **Dimming Range:** 100%-10%
- **Expected driver lifetime:** 100,000 hours
- **FineTune DMX:** 1%

LUTRON TUNABLE WHITE DRIVER OPTION: LUT-TW (0.1% T-Series 2-Channel Digital Tunable White (PSQ Series)).

⁶ Not available with Regressed or Curves

⁷ Pendant Regressed Indirect/Direct & Pendant Regressed Direct only

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

SPECIFICATIONS

MOUNTING OPTIONS

HANGING HARDWARE: 50" Fully Adjustable (FA) plated steel aircraft cable with safety stop hardware standard. The Flexible Mounting Bracket (FM) adjusts the suspension points to accommodate existing architecture. Suspension points adjust up to 2' in from the end of 8' or 12' fixture lengths and up to 1' in on shorter lengths. Consult factory for tailored lighting options.

TUNABLE WHITE DMX HANGING HARDWARE: For grid ceiling applications the dual GridBox™ mounting is supplied (standard). For hard ceiling applications the ceiling mounting box is supplied (standard). DMX feeds cannot be cut or spliced. DMX feeds should be ordered based on fixed lengths. Available DMX pendant feed lengths are 5' (standard), 12', and 30'.

TUNABLE WHITE DMX INTERCONNECTION CABLES: Luminaires are pre-wired with plug-and-play interconnection cables to support easy plug-together joining of fixture runs. If a non-FineTune DMX system is specified, a DMX to RJ45 adapter is provided.

OTHER OPTIONS

ENDCAPS: Flat diecast aluminum endcaps (FE) add 1/4" to each end of luminaire. 1" Drop Down Lens Endcap (DE)⁷ includes diffuse element to continue luminance of drop lens. Open Endcap (OE) is for use with the Hollowed Ellipse Louver (LHE); following the curve of the louver.

EMERGENCY STYLE: Optional emergency to generator/inverter wiring, internal generator transfer switch, nightlight wiring, step-dimming driver, backup battery.

Backup Battery

	Factory Choice	Bodine BSL310LP
HP2-P-D		
Min. Housing Length	8*	4'
EM Lumen Output	1608	956
EM Section Illuminated	2'	2' or 4'
HP2-P-WW-D		
Min. Housing Length	8*	4*
EM Lumen Output	1500	891
EM Section Illuminated	4'	4'

* Minimum fixture housing length for battery pack approved without sensor

Backup Battery

	Factory Choice	Bodine BSL310LP
HP2-P-ID		
Min. Housing Length	12'	8'
EM Lumen Output	1854	956
EM Section Illuminated	2'	2' or 4'
HP2-P-I		
Min. Housing Length	8*	4*
EM Lumen Output	1874	956
EM Section Illuminated	2'	2' or 4'

* Minimum fixture housing length for battery pack approved without sensor

TUNABLE WHITE ELECTRICAL OPTIONS⁸:

- **TW Driver Options 0-10V:** EM/GEN, GTD or Battery Back up
- **FineTune DMX:** EM/GEN or Battery Back up
- **DMX:** Battery Back up
- **DALI:** EM/GEN, GTD or Battery Back up
- **LUTRON:** EM/GEN, GTD or Battery Back up

INTEGRATED SENSORS: Integrated PIR (Passive Infrared) occupancy or daylight sensors available with Flush and Bottom Glow downlight diffusers. Refer to Occupancy Sensor and Daylight Sensor tech sheets for more info.

FINISHES: Finelite Signal White (SW) powder coat, Finelite Black (RAL 9005) with semi gloss fine texture (FB)⁹, and Satin Aluminum (SA)⁹ are standard. Optional Adder: 185 RAL colors⁹ are available.

LABELS: Luminaire and electrical components are ETL-listed conforming to UL 1598 in the U.S.A. and CAN/CSA C22.2 No. 250.0 in Canada. In accordance with NEC Code 410.130 (G), this luminaire contains an internal driver disconnect. UL 924 and UL 2108 - PoE options available on request. These fixtures are rated for Damp Location. Chicago Plenum options available for C1, C2, or C3 suspension using our GridBox. HP-2 can be used to comply with 2016 Title 24, Part 6 (JA8); high efficacy LED light source requirements. Finelite products use electronic components that are RoHS compliant, and the mechanical components of the luminaire have been verified to not knowingly contain any restricted substances listed per RoHS Directive 2015/863. Consult factory for tailored lighting options. Finelite makes the specification process easy when putting healthier products on your projects. Simply add - **RLA** (Red List Approved) or - **RLD** (Declared Label) to your part number.

WEIGHT¹⁰: ID - 2.9 lb/ft; D - 2.3 lb/ft; I - 2.3 lb/ft; WW - 2.9 lb/ft

WARRANTY: 10-year performance-based warranty on all standard components. Optional accessories such as emergency battery packs are covered by their individual manufacturer warranties.

⁸ Consult Finelite for Generator Transfer Device and Battery Back up fit

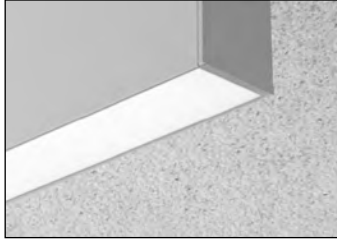
⁹ 20 business days lead time for color

¹⁰ Excludes Battery Back up and Generator Transfer Device weight

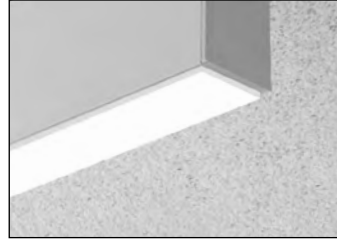
Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

AESTHETIC OPTIONS



Flush Diffuser (**F**)



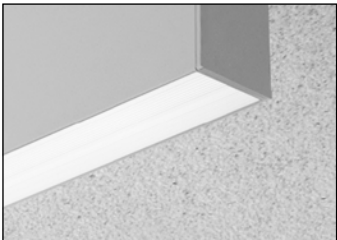
Bottom Glow Diffuser (**BG**)



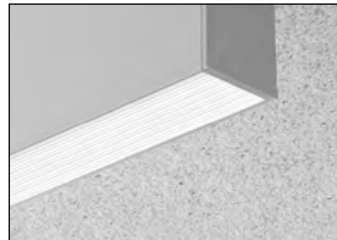
1" Drop Down Lens (**DL**)



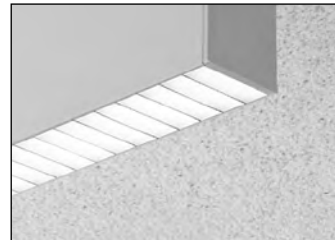
Flat Diffuser with 1" Regressed (**RG-D**)



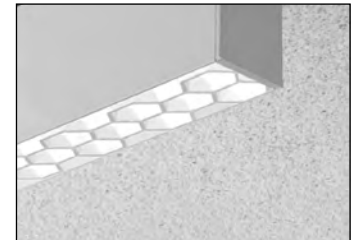
Downlight Asymmetric Optic (**DAO**)¹
Externally flush



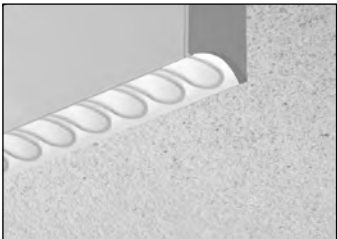
Downlight Spread Optic (**DSO**)¹
Externally flush



White Cross Blade Baffle¹ (**RG-WCB**)



Hex Louver² (**RG-LHC**)



Hollowed Ellipse Louver² (**RG-LHE**)



Kicker (**K**) - Wall Wash only

¹ With a subtle ribbed appearance providing specialized distribution

² Regressed only. Not available with Wall Wash

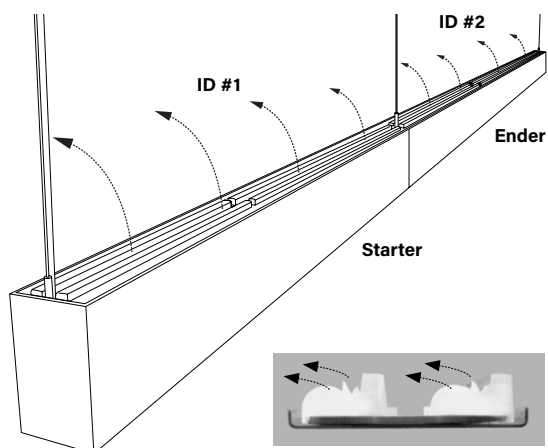
Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

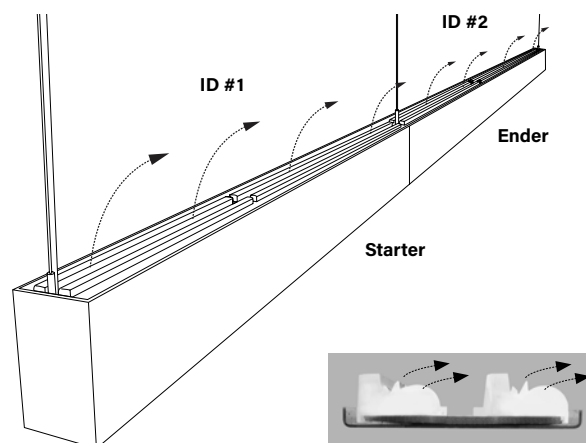
ASYMMETRIC OPTIONS

Use this tool to understand how to specify Asymmetric for your project. The diagrams below show a linear run from power feed to ender. Specify ASY-L distributes light to the left or ASY-R distributes light to the right.

Asymmetric Left Optic (ASY-L)



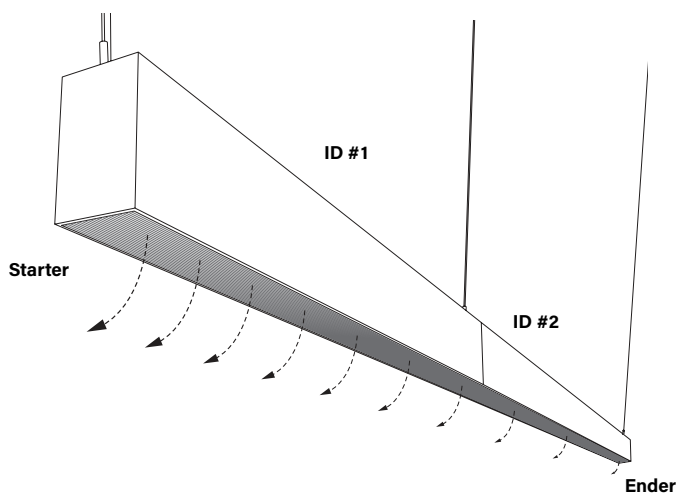
Asymmetric Right Optic (ASY-R)



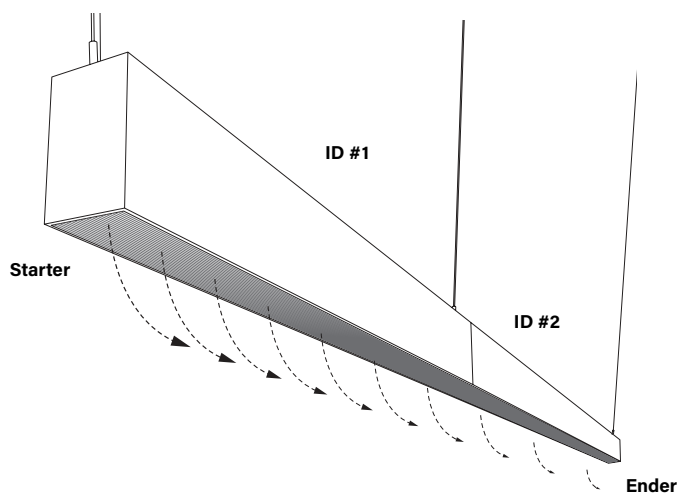
DOWNLIGHT ASYMMETRIC OPTIONS

Use this tool to understand how to specify Downlight Asymmetric for your project. The diagrams below show a linear run from power feed to ender. Specify DAO-L distributes light to the left or DAO-R distributes light to the right.

Downlight Asymmetric Optic Left (DAO-L)



Downlight Asymmetric Optic Right (DAO-R)



PREINSTALLED LABEL



For DAO, Preinstalled label on diffuser shows direction of light. Remove after installation.

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Indirect/Direct Photometry - 4' Luminaire 3500K

HP2-P-ID-4'-V-V-835-ASY-R-DAO-R

Uplight: Asymmetric Right Optic

Downlight: Downlight Asymmetric Optic - Right

Distribution: 53% Up (V) / 47% Down (V)

Efficacy: 112 lm/W

Uplight: 4301 lumens (1075 lumens/foot)

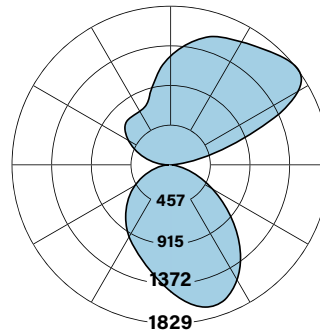
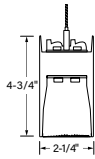
Downlight: 3742 lumens (936 lumens/foot)

Total luminaire output: 8043 lumens (2011 lm/ft)
72 watts (18 W/ft)

Peak Candela Value: 1829 @ 127.5°

CRI: 80 / CCT: 3500K

ITL LM79 Report REP-051921-01



CANDELA DISTRIBUTION

	0.0	20.0	40.0	60.0	80.0	90.0	FLUX
0	1422	1422	1422	1422	1422	1422	135
5	1526	1513	1499	1475	1456	1422	135
15	1670	1650	1594	1515	1426	1350	389
25	1619	1609	1569	1462	1317	1215	585
35	1404	1406	1400	1301	1138	1027	686
45	1082	1105	1131	1090	912	814	678
55	745	771	827	787	672	589	573
65	453	475	521	513	436	384	408
75	232	244	271	270	229	197	225
85	77.80	80	91	90	72	55	67
90	36	34	26	14	4	0	
95	156	156	146	134	101	59	121
105	513	575	620	515	299	209	397
115	1389	1378	1204	804	460	367	685
125	1821	1714	1375	936	622	532	785
135	1760	1662	1392	1057	788	699	738
145	1654	1594	1419	1181	951	868	635
155	1583	1550	1444	1272	1094	1027	498
165	1493	1468	1402	1300	1195	1149	325
175	1318	1309	1291	1263	1230	1214	115
180	1222	1222	1222	1222	1222	1222	

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	3292 [↑53% 47%↓]	3745 [↑59% 41%↓]	4877 [↑69% 31%↓]	5833 [↑74% 26%↓]
↓B ¹	3686 [↑48% 52%↓]	4139 [↑53% 47%↓]	5271 [↑63% 36%↓]	6227 [↑69% 31%↓]
↓H ¹	4671 [↑38% 62%↓]	5124 [↑43% 57%↓]	6256 [↑54% 46%↓]	7211 [↑60% 40%↓]
↓V ²	5503 [↑32% 68%↓]	5955 [↑37% 63%↓]	7087 [↑47% 53%↓]	8043 [↑53% 47%↓]

Light Output, 3500K, 80 CRI (Lumens Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	823	936	1219	1458
↓B ¹	922	1035	1318	1557
↓H ¹	1168	1281	1564	1803
↓V ²	1376	1489	1772	2011

Power, 3500K (Watts Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	7.0	8.0	10.4	12.5
↓B ¹	8.0	9.0	11.4	13.5
↓H ¹	10.4	11.4	13.8	15.9
↓V ²	12.5	13.5	15.9	18.0

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	117	117	117	116
↓B ¹	115	116	116	116
↓H ¹	112	113	113	113
↓V ²	110	111	111	112

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H) / Standard Output (S), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 4877 lm x 0.789 = 3848 lm

Total Light Output per Foot: 1219 lm/ft x 0.789 = 962 lm/ft.

watts/foot: 10.4 W/ft.

$$\text{Efficacy} = \frac{962 \frac{\text{lm}}{\text{ft.}}}{10.4 \frac{\text{W}}{\text{ft.}}} = 92 \text{ lm/W}$$

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL reports: 89456, 94139

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Indirect/Direct Photometry - 4' Luminaire 3500K

HP2-P-ID-4'-V-V-835-WSO-DSO

Uplight: Widespread Optic

Downlight: Downlight Spread Optic

Distribution: 55% Up (V) / 45% Down (V)

Efficacy: 101 lm/W

Uplight: 4018 lumens (1105 lumens/foot)

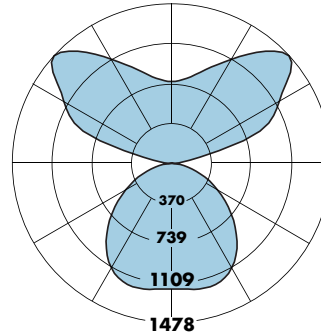
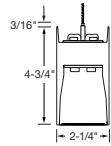
Downlight: 3273 lumens (818 lumens/foot)

Total luminaire output: 7291 lumens (1823 lm/ft)
72 watts (18 W/ft)

Peak Candela Value: 1457 @ 135°

CRI: 80 / CCT: 3500K

ITL LM79 Report 89456 and 94139



CANDELA DISTRIBUTION

		CANDELA DISTRIBUTION					
	0.0	22.5	45.0	67.5	90.0	FLUX	
0.0	1166	1166	1166	1166	1166		
5.0	1158	1159	1164	1169	1171	111	
15.0	1093	1103	1150	1187	1197	324	
25.0	971	972	1074	1135	1149	498	
35.0	814	866	984	1036	1042	596	
45.0	644	703	814	842	836	597	
55.0	475	525	608	616	608	512	
65.0	314	348	398	397	387	370	
75.0	171	185	208	203	197	207	
85.0	50	52	53	50	48	58	
90.0	0	0	0	0	0		
95.0	47	83	83	69	68	92	
105.0	183	258	532	556	458	434	
115.0	324	409	720	993	1048	694	
125.0	460	542	887	1257	1299	793	
135.0	558	634	907	1299	1457	741	
145.0	633	693	885	1127	1236	572	
155.0	694	728	843	963	1012	393	
165.0	736	749	793	837	853	226	
175.0	756	758	763	768	770	73	
180.0	759	759	759	759	759		

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	2985 [↑55% 45%↓]	3408 [↑60% 40%↓]	4465 [↑70% 30%↓]	5358 [↑75% 25%↓]
↓B ¹	3329 [↑49% 51%↓]	3752 [↑55% 45%↓]	4809 [↑65% 35%↓]	5702 [↑70% 30%↓]
↓H ¹	4191 [↑39% 61%↓]	4614 [↑45% 55%↓]	5671 [↑55% 45%↓]	6564 [↑61% 39%↓]
↓V ²	4918 [↑33% 67%↓]	5341 [↑38% 62%↓]	6398 [↑49% 51%↓]	7291 [↑55% 45%↓]

Light Output, 3500K, 80 CRI (Lumens Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	746	852	1116	1340
↓B ¹	832	938	1202	1426
↓H ¹	1048	1154	1418	1641
↓V ²	1230	1335	1600	1823

Power, 3500K (Watts Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	7.1	8.0	10.5	12.6
↓B ¹	8.0	9.0	11.4	13.5
↓H ¹	10.4	11.4	13.8	15.9
↓V ²	12.5	13.4	15.9	18.0

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	106	107	107	107
↓B ¹	104	105	105	105
↓H ¹	101	102	103	103
↓V ²	99	99	101	101

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL reports: 89456, 94139

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H) / Standard Output (S), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 4465 lm x 0.789 = 3523 lm

Total Light Output per Foot: 1116 lm/ft x 0.789 = 881 lm/ft.

watts/foot: 10.5 W/ft.

$$\text{Efficacy} = \frac{881 \frac{\text{lm}}{\text{ft.}}}{10.5 \frac{\text{W}}{\text{ft.}}} = 84 \text{ lm/W}$$

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Indirect/Direct Photometry - 4' Luminaire 3500K

HP2-P-ID-V-V-835-F-F

Uplight: Flush Diffuser / **Downlight:** Flush Diffuser

Distribution: 55% Up (V) / 45% Down (V)

Efficacy: 95 lm/W

Uplight: 3813 lumens (953 lumens/foot)

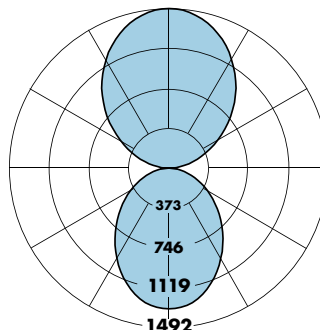
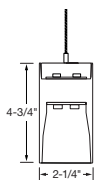
Downlight: 3175 lumens (794 lumens/foot)

Total luminaire output: 6988 lumens (1747 lm/ft)
73.8 watts (18.5 W/ft)

Peak Candela Value: 1492 @ 180°

CRI: 80 / CCT: 3500K

ITL LM79 Report 85132



		CANDELA DISTRIBUTION					
		0.0	22.5	45	67.5	90	FLUX
0	1314	1314	1314	1314	1314		
5	1306	1307	1305	1304	1304		124
15	1241	1233	1231	1225	1220		346
25	1114	1098	1089	1076	1064		501
35	942	925	910	887	877		568
45	749	734	718	693	683		552
55	553	542	526	506	499		470
65	368	360	349	337	332		346
75	203	198	192	187	184		204
85	60	59	58	57	55		64
90	0	0	0	0	0		0
95	71	68	68	69	70		77
105	244	241	236	235	234		252
115	442	439	437	427	425		431
125	661	649	653	643	638		581
135	884	871	875	866	866		673
145	1099	1084	1088	1084	1077		679
155	1283	1268	1275	1269	1263		585
165	1415	1405	1408	1406	1403		396
175	1482	1482	1482	1482	1481		141
180	1492	1492	1492	1492	1492		

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	2861 (155% 45%↓)	3262 (160% 40%↓)	4265 (170% 30%↓)	5113 (175% 25%↓)
↓B ¹	3195 (149% 51%↓)	3596 (155% 45%↓)	4600 (165% 35%↓)	5447 (170% 30%↓)
↓H ¹	4030 (139% 61%↓)	4432 (144% 56%↓)	5435 (155% 45%↓)	6282 (161% 39%↓)
↓V ²	4736 (133% 67%↓)	5137 (138% 62%↓)	6141 (148% 52%↓)	6988 (155% 45%↓)

Light Output, 3500K, 80 CRI (Lumens Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	715	815	1066	1278
↓B ¹	799	899	1150	1362
↓H ¹	1008	1108	1359	1571
↓V ²	1184	1284	1535	1747

Power, 3500K (Watts Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	7.2	8.2	10.7	12.8
↓B ¹	8.2	9.2	11.7	13.8
↓H ¹	10.7	11.7	14.2	16.3
↓V ²	12.8	13.8	16.3	18.5

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	99	99	100	100
↓B ¹	97	98	99	99
↓H ¹	94	95	96	96
↓V ²	92	93	94	95

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H) / Standard Output (S), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 4265 lm x 0.789 = 3365 lm

Total Light Output per Foot: 1066 lm/ft x 0.789 = 841 lm/ft.

watts/foot: 10.7 W/ft.

$$\text{Efficacy} = \frac{841 \frac{\text{lm}}{\text{ft.}}}{10.7 \frac{\text{W}}{\text{ft.}}} = 78.6 \text{ lm/W}$$

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 89132

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Page 10

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Indirect/Direct Photometry - 4' Luminaire 3500K

HP2-P RG-ID-V-V-835-F

Uplight: Flush Diffuser / **Downlight:** Regressed Diffuser

Distribution: 59% Up (V) / 41% Down (V)

Efficacy: 99 lm/W

Uplight: 4304 lumens (1076 lumens/foot)

Downlight: 2928 lumens (732 lumens/foot)

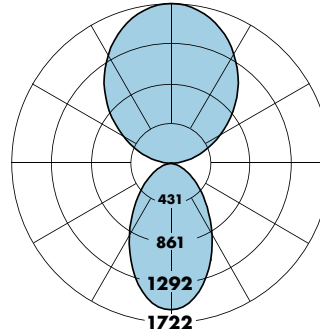
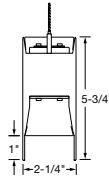
Total luminaire output: 7232 lumens (1808 lm/ft)

73.2 watts (18.3 W/ft)

Peak Candela Value: 1722 @ 180°

CRI: 80 / CCT: 3500K

ITL LM79 Report 90352



CANDELA DISTRIBUTION						
	0.0	22.5	45	67.5	90	FLUX
0	1585	1585	1585	1585	1585	
5	1573	1571	1564	1558	1556	147
15	1492	1459	1411	1364	1342	396
25	1334	1260	1157	1068	1034	536
35	1118	1013	875	770	730	560
45	872	758	613	516	483	495
55	631	517	391	324	303	381
65	403	307	218	178	173	248
75	206	138	103	96	94	130
85	48	30	26	25	24	34
90	0	0	0	0	0	
95	69	69	69	66	64	76
105	251	250	250	249	247	265
115	478	474	476	471	470	470
125	734	726	728	723	721	650
135	1000	990	994	990	982	765
145	1265	1245	1253	1248	1238	781
155	1482	1463	1476	1467	1460	676
165	1635	1623	1630	1626	1621	458
175	1712	1711	1711	1710	1709	162
180	1722	1722	1722	1722	1722	

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K 0.985

3500K 1.000

4000K 1.032

Lumen Adjustment Factors 90 CRI

3000K 0.746

3500K 0.760

4000K 0.789

High Output (H) / Standard Output (S), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 4546 lm x 0.789 = 3587 lm

Total Light Output per Foot: 1137 lm/ft x 0.789 = 897 lm/ft.

watts/foot: 10.6 W/ft.

$$\text{Efficacy} = \frac{897 \frac{\text{lm}}{\text{ft}}}{10.6 \frac{\text{W}}{\text{ft}}} = 85 \text{ lm/W}$$

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	2960 (160% 40%↓)	3414 (165% 35%↓)	4546 (174% 26%↓)	5503 (178% 22%↓)
↓B ¹	3269 (154% 46%↓)	3722 (160% 40%↓)	4854 (169% 31%↓)	5811 (174% 26%↓)
↓H ¹	4039 (144% 56%↓)	4492 (149% 51%↓)	5625 (160% 40%↓)	6581 (165% 35%↓)
↓V ²	4690 (138% 62%↓)	5143 (143% 57%↓)	6276 (153% 47%↓)	7232 (159% 41%↓)

Light Output, 3500K, 80 CRI (Lumens Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	740	853	1137	1376
↓B ¹	817	930	1214	1453
↓H ¹	1123	1406	1645	1645
↓V ²	1172	1286	1569	1808

Power, 3500K (Watts Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	7.2	8.1	10.6	12.7
↓B ¹	8.1	9.1	11.6	13.7
↓H ¹	10.6	11.6	14.0	16.2
↓V ²	12.7	13.7	16.2	18.3

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	103	105	107	108
↓B ¹	100	102	105	106
↓H ¹	95	97	100	102
↓V ²	92	94	97	99

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 90352

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Indirect/Direct Photometry - 4' Luminaire 3500K

HP2-P-ID-V-V-835-WSO-F

Uplight: Widespread Optic / **Downlight:** Fluse Diffuser

Distribution: 55% Up (V) / 45% Down (V)

Efficacy: 101 lm/W

Uplight: 4018 lumens (1005 lumens/foot)

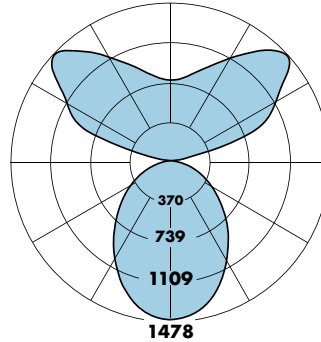
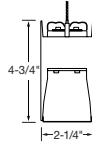
Downlight: 3312 lumens (828 lumens/foot)

Total luminaire output: 7330 lumens (1833 lm/ft)
74.5 watts (18.6 W/ft)

Peak Candela Value: 1461 @ 0°

CRI: 80 / CCT: 3500K

ITL LM79 Report 89456



CANDELA DISTRIBUTION						
	0.0	22.5	45	67.5	90	FLUX
0	1461	1461	1461	1461	1461	
5	1451	1450	1448	1447	1447	137
15	1376	1362	1359	1348	1342	381
25	1224	1204	1187	1165	1153	545
35	1023	998	973	942	929	608
45	793	773	749	717	705	576
55	568	557	535	509	499	478
65	364	356	344	328	322	341
75	187	186	180	174	170	191
85	49	49	48	46	45	54
90	0	0	0	0	0	
95	47	83	83	69	68	92
105	183	258	532	556	458	434
115	324	409	720	993	1048	694
125	460	542	887	1257	1299	793
135	558	634	907	1299	1457	741
145	633	693	885	1127	1236	572
155	694	728	843	963	1012	393
165	736	749	793	837	853	226
175	756	758	763	768	770	73
180	759	759	759	759	759	

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H) / Standard Output (S), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 4481 lm x 0.789 = 3536 lm

Total Light Output per Foot: 1120 lm/ft x 0.789 = 884 lm/ft.

watts/foot: 10.5 W/ft.

$$\text{Efficacy} = \frac{884 \frac{\text{lm}}{\text{ft}}}{10.5 \frac{\text{W}}{\text{ft}}} = 84 \text{ lm/W}$$

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	3001 (155% 45%↓)	3424 (160% 40%↓)	4481 (170% 30%↓)	5374 (175% 25%↓)
↓B ¹	3349 (149% 51%↓)	3772 (155% 45%↓)	4830 (165% 35%↓)	5722 (170% 30%↓)
↓H ¹	4221 (139% 61%↓)	4644 (144% 56%↓)	5701 (155% 45%↓)	6594 (161% 39%↓)
↓V ²	4957 (133% 67%↓)	5380 (138% 62%↓)	6437 (148% 52%↓)	7330 (155% 45%↓)

Light Output, 3500K, 80 CRI (Lumens Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	750	856	1120	1343
↓B ¹	837	943	1207	1431
↓H ¹	1055	1161	1425	1649
↓V ²	1239	1345	1609	1833

Power, 3500K (Watts Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	7.1	8.1	10.5	12.6
↓B ¹	8.1	9.0	11.5	13.6
↓H ¹	10.5	11.5	13.9	16.0
↓V ²	12.6	13.6	16.0	18.1

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	106	106	107	107
↓B ¹	104	105	105	105
↓H ¹	100	101	102	103
↓V ²	98	99	100	101

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 89456

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Direct Photometry - 4' Luminaire 3500K

HP2-P-D-4'-V-835-DSO

Downlight: Downlight Spread Optic

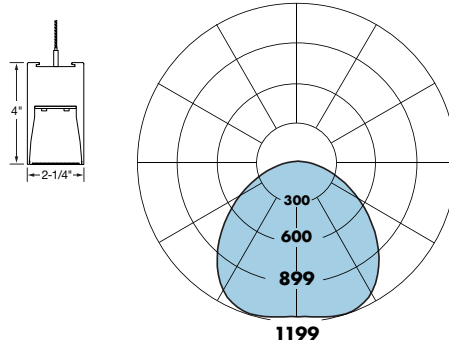
Efficacy: 92 lm/W

Total luminaire output: 3273 lumens (818 lm/ft)
35.7 watts (8.9 W/ft)

Peak Candela Value: 1199 @ 17.5°

CRI: 80 / CCT: 3500K

ITL LM79 Report 94139



CANDELA DISTRIBUTION						
	0.0	22.5	45	67.5	90	FLUX
0	1166	1166	1166	1166	1166	
5	1158	1159	1164	1169	1171	111
15	1093	1103	1150	1187	1197	324
25	971	1002	1096	1156	1170	498
35	814	866	984	1036	1042	596
45	644	703	814	842	836	597
55	475	525	608	616	608	512
65	314	348	398	397	387	370
75	171	185	208	203	197	207
85	50	52	53	50	48	58
90	0	0	0	0	0	

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
1340	1684	2546	3273

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
335	421	636	818

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
3.5	4.4	6.8	8.9

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
96	95	93	92

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 2546 lm x 0.789 = 2009 lm

Total Light Output per Foot: 636 lm/ft x 0.789 = 502 lm/ft.

watts/foot: 6.8 W/ft.

$$\text{Efficacy} = \frac{502 \frac{\text{lm}}{\text{ft.}}}{6.8 \frac{\text{W}}{\text{ft.}}} = 74 \text{ lm/W}$$

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 94139

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Direct Photometry - 4' Luminaire 3500K

HP2-P-D-V-835-F

Downlight: Flush Diffuser

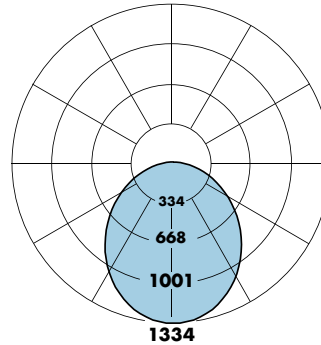
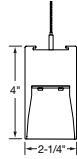
Efficacy: 87 lm/W

Total luminaire output: 3215 lumens (804 lm/ft)
36.9 watts (9.2 W/ft)

Peak Candela Value: 1334 @ 0°

CRI: 80 / CCT: 3500K

ITL LM79 Report 85136



CANDELA DISTRIBUTION						
	0.0	22.5	45.0	67.5	90.0	FLUX
0	1334	1334	1334	1334	1334	
5	1327	1326	1326	1325	1324	126
15	1263	1252	1251	1244	1236	352
25	1133	1117	1109	1088	1075	508
35	958	942	923	896	887	576
45	762	747	725	697	686	558
55	563	551	532	509	500	475
65	374	365	351	337	331	349
75	206	201	195	188	184	207
85	62	61	59	57	57	66
90	0	0	0	0	0	

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
1316	1655	2501	3215

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
329	414	625	804

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
3.6	4.6	7.1	9.2

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
91	90	88	87

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 2501 lm x 0.789 = 1973 lm

Total Light Output per Foot: 625 lm/ft x 0.789 = 493 lm/ft.

watts/foot: 7.1 W/ft.

$$\text{Efficacy} = \frac{493 \frac{\text{lm}}{\text{ft}}}{7.1 \frac{\text{W}}{\text{ft}}} = 69 \text{ lm/W}$$

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 85136

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Page 14

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Direct Photometry - 4' Luminaire 3500K

HP2-P RG-D-V-835-RG

Downlight: Regressed Diffuser

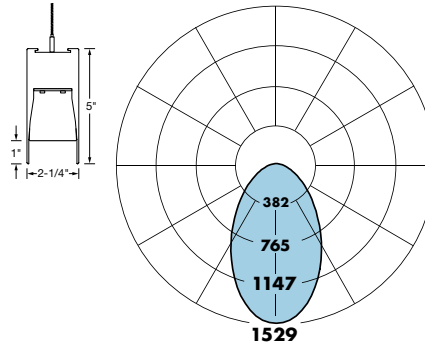
Efficacy: 79 lm/W

Total luminaire output: 2887 lumens (722 lm/ft)
36.7 watts (9.2 W/ft)

Peak Candela Value: 1529 @ 0°

CRI: 80 / CCT: 3500K

ITL LM79 Report 90350



CANDELA DISTRIBUTION						
	0.0	22.5	45.0	67.5	90.0	FLUX
0	1529	1529	1529	1529	1529	
5	1520	1518	1513	1507	1504	143
15	1443	1412	1370	1327	1309	385
25	1293	1224	1131	1049	1017	523
35	1086	993	862	757	722	550
45	855	749	608	511	482	490
55	624	516	392	322	305	380
65	212	141	103	95	94	131
75	212	141	103	95	94	131
85	57	32	28	26	26	36
90	0	0	0	0	0	

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 2245 lm x 0.789 = 1771 lm

Total Light Output per Foot: 561 lm/ft x 0.789 = 443 lm/ft.

watts/foot: 7.0 W/ft.

$$\text{Efficacy} = \frac{443 \frac{\text{lm}}{\text{ft.}}}{7.0 \frac{\text{W}}{\text{ft.}}} = 63 \text{ lm/W}$$

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
1182	1486	2245	2887

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
295	371	561	722

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
3.6	4.6	7.0	9.2

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
82	81	80	79

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 90350

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Indirect Photometry - 4' Luminaire 3500K

HP2-P-I-V-835-F

Uplight: Flush Diffuser

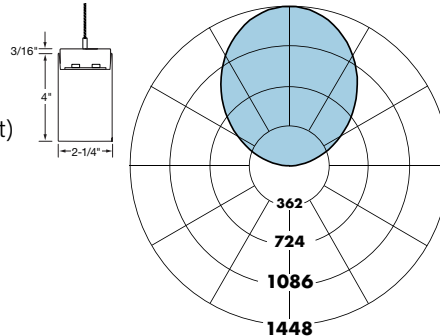
Efficacy: 102 lm/W

Total luminaire output: 3749 lumens (937 lm/ft)
36.7 watts (9.2 W/ft)

Peak Candela Value: 1448 @ 180°

CRI: 80 / CCT: 3500K

ITL LM79 Report 85134



CANDELA DISTRIBUTION						
	0.0	22.5	45.0	67.5	90.0	FLUX
90	0	0	0	0	0	
95	72	73	73	72	72	80
105	245	243	240	236	237	254
115	439	436	433	424	422	427
125	651	644	642	633	632	573
135	868	856	859	849	846	660
145	1074	1061	1062	1056	1051	663
155	1249	1235	1241	1235	1229	570
165	1374	1366	1370	1367	1365	386
175	1439	1439	1439	1439	1439	136
180	1448	1448	1448	1448	1448	

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
1535	1929	2916	3749

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
384	482	729	937

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
3.6	4.6	7.0	9.2

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
107	106	104	102

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 2916 lm x 0.789 = 2301 lm

Total Light Output per Foot: 729 lm/ft x 0.789 = 575 lm/ft.

watts/foot: 7.0 W/ft.

$$\text{Efficacy} = \frac{575 \frac{\text{lm}}{\text{ft.}}}{7.0 \frac{\text{W}}{\text{ft.}}} = 82 \text{ lm/W}$$

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 85134

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

Wall Wash Direct Photometry - 4' Luminaire 3500K

HP2-P-WW-D-K-V-835

Downlight: With Kicker

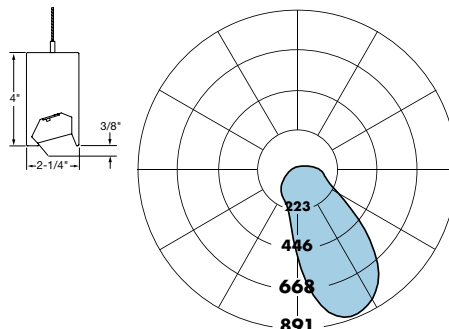
Efficacy: 77 lm/W

Total luminaire output: 1500 lumens (375 lm/ft)
19.6 watts (4.9 W/ft)

Peak Candela Value: 882 @ 25°

CRI: 80 / CCT: 3500K

ITL LM79 Report 85137



FLUX	CANDELA DISTRIBUTION				
	0.0	22.5	45.0	67.5	90.0
0	485	485	485	485	485
5	652	606	483	378	342
15	863	790	470	251	219
25	882	829	442	201	184
35	795	764	397	168	152
45	581	629	333	133	105
55	326	436	251	86	62
65	196	250	167	43	24
75	158	145	88	7	0
85	124	97	24	0	0
90	93	68	0	0	0

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 1167 lm x 0.789 = 921 lm

Total Light Output per Foot: 292 lm/ft x 0.789 = 230 lm/ft.

watts/foot: 3.8 W/ft.

$$\text{Efficacy} = \frac{230 \frac{\text{lm}}{\text{ft}}}{3.8 \frac{\text{W}}{\text{ft}}} = 60.5 \text{ lm/W}$$

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
614	772	1167	1500

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
154	193	292	375

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
2.0	2.5	3.8	4.9

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
76	77	77	77

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 85137

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Page 17

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 2" Aperture (HP-2) Pendant

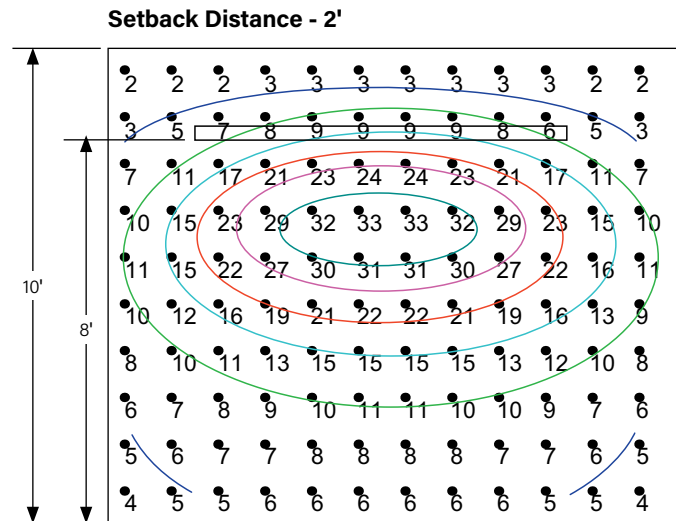
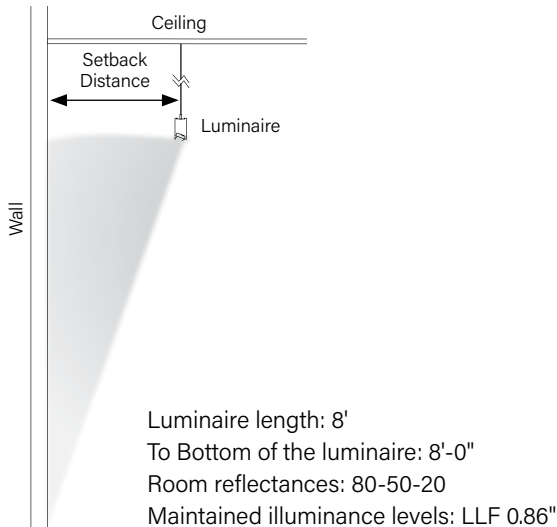
Wall Wash Direct - Setback Info and Application Data

HP2-WW-D-K-4'-V-835

Downlight: With Kicker

Total luminaire output: 1206 lumens (302 lm/ft)
19.6 watts (4.9 W/ft)

CRI: 80 / CCT: 3500K



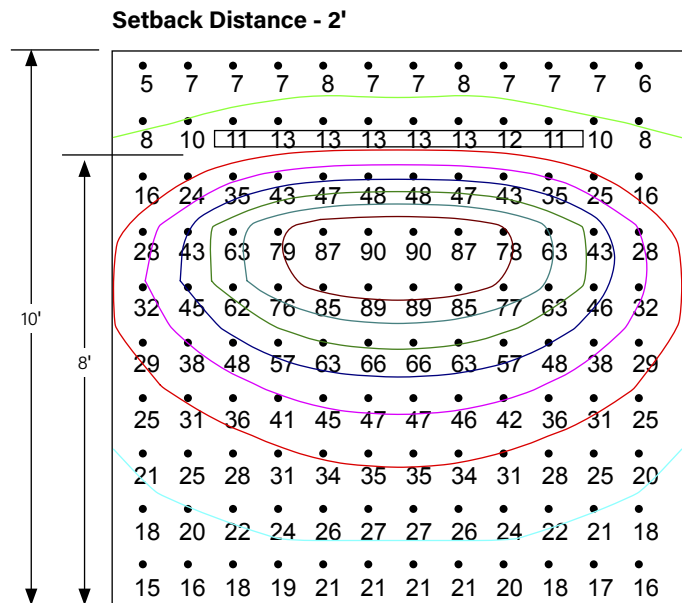
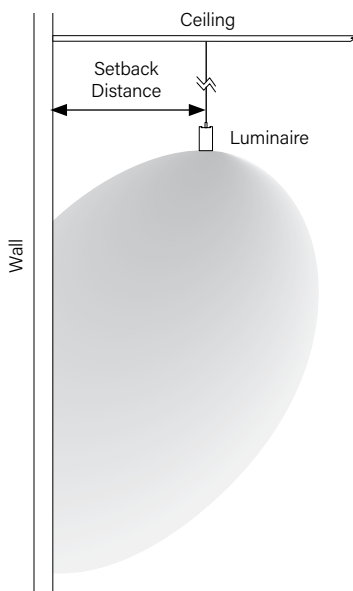
Downlight Asymmetric Optic - Setback Info and Application Data

HP2-P-D-4ft-V-835-DAO

Downlight: DAO

Total luminaire output: 3742 lumens (936 lm/ft)
35.6 watts (8.9 W/ft)

CRI: 80 / CCT: 3500K



Submitted by:		Date:
Type:	Project:	
Ordering Info:		

0-10V Tunable White

Finelite's award-winning, contractor friendly Tunable White luminaires are available at low cost, with powerful and simple 0-10V tuning and intensity controls.

TUNABLE WHITE FEATURES

- CCT range: 2700K - 6500K
- Dimming Range: 100% to 10%
- CRI Options: 80 CRI or 90 CRI

PHOTOMETRY

Apply a power adjustment factor to calculate wattage usage

POWER	CONVERSION FACTOR
	1.1X

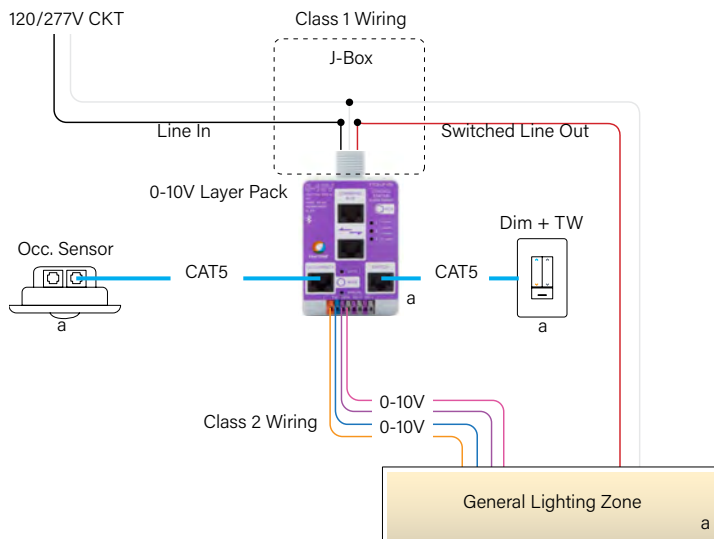
(Example: a 50 watt luminaire in static white would draw 55 watts using 0-10V Tunable White)

LUMINAIRE FAMILY MODIFICATIONS/RESTRICTIONS

Direct	Section Lengths											
	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	
Output S,B,H,V Single Circuit	Rows can be comprised of 2'-12' sections. Tailored lengths available.											
Integral Battery Backup (BSL310LP)							✓		✓		✓	
Indirect/Direct												
Output S,B Single Circuit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Integral Battery Backup (BSL310LP)							✓		✓		✓	✓
Output H,V Single Circuit			✓				✓				✓	✓
Integral Battery Not Available	Remote Battery backup solution available. Consult factory for tailored lighting options.											
Output S,B,H,V Dual Circuit			✓				✓				✓	✓
Integral Battery Not Available	Remote Battery backup solution available. Consult factory for tailored lighting options.											

EN/GEN sections available for all body lengths

WIRING DIAGRAM - DIMMABLE TO 10%



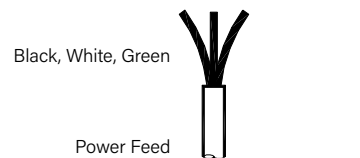
Luminaire Wiring

- **Purple (+) / Pink (-)** control wires are for intensity control
- **Orange (+) / Blue (-)** control wires are for Tunable White control

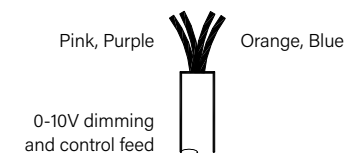
Note:

Load or Dim to Off options available.

DUAL FEED DETAIL



WIRING LEGEND		
Black	Hot	Line Voltage
White	Neutral	Line Voltage
Green	Ground	



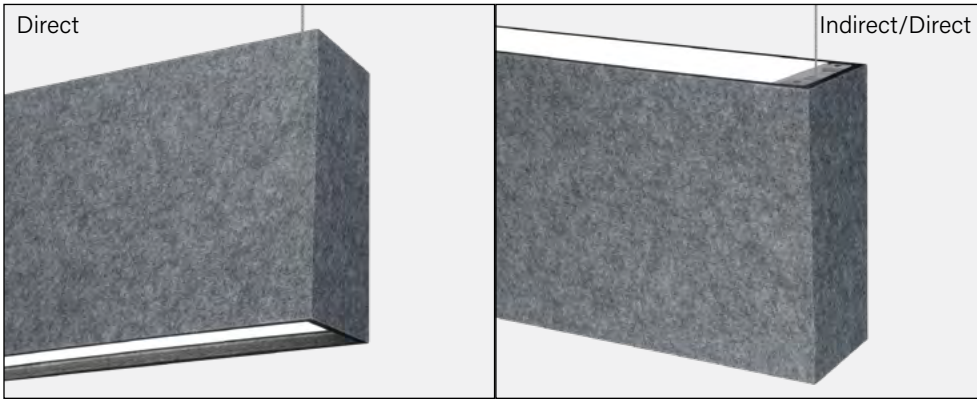
WIRING LEGEND		
Pink	Dimming	0-10V DC
Purple	Dimming	0-10V DC
Orange	TW	0-10V DC
Blue	TW	0-10V DC



Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit



HP-2 Acoustic Baffle Lit is a high-performing, sound-absorbing LED pendant luminaire with a 2" aperture. It's available in direct and indirect/direct, flush or regressed options. This luminaire offers a sophisticated and convenient way to achieve desired illumination and reverberation levels in open space environments. HP-2 Acoustic contributes towards WELL Sound Absorption SO4 requirements.

Pewter housing shown

Pewter or Slate are standard housing color options; Signal White luminaire finish is standard.

Great Sound Absorption



Apparent noise reduction coefficient (NRC) up to 1.20.

10 Day Shipping



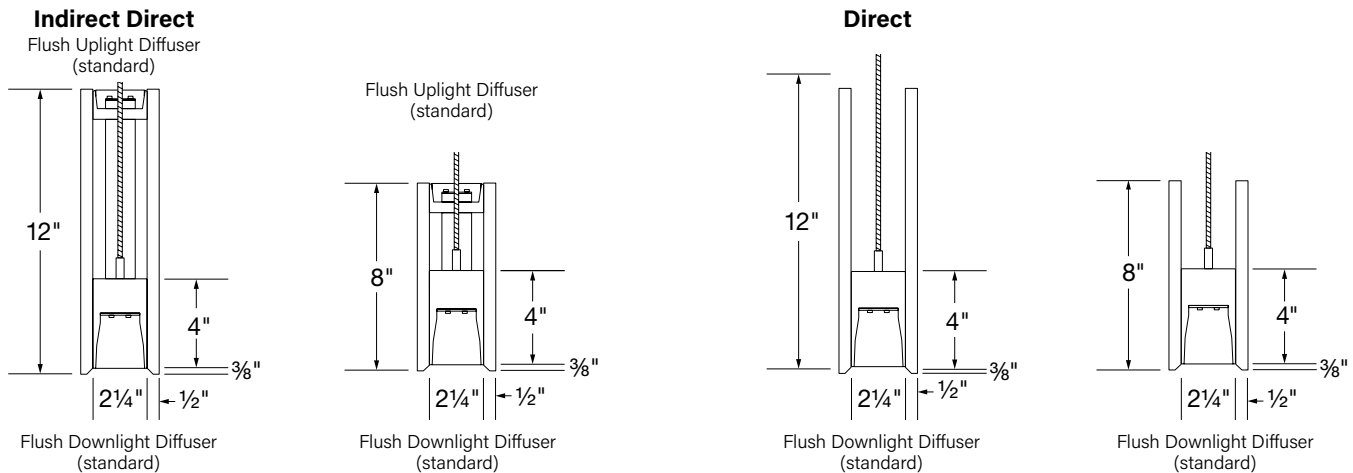
10-Working day shipping on standard orders. Consult factory for extended acoustic housing color options.

Quality Material



Class A fire resistant material (ASTM E-84); Moisture resistant.

CROSS SECTIONS Standard body shown. D, I/D, 8", and 12" options also available with regressed body.



RUNS



Now available in continuous runs and independent section lengths. See page 6 for configurations

COMPLEMENTARY PRODUCT



HP-2 Acoustic Baffle Unlit

Pair with this sound-absorbing and eco-friendly unlit pendant baffle to achieve desired reverberation levels with a consistent aesthetic.

[Refer to complementary tech sheet](#)



Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

BODY TYPE				OUTPUT and LED TYPE		
Platform	Series Name	Luminaire Type	Luminaire Distribution	Total Length of Run	Uplight Output ID only	Downlight Output
HP - High Performance	2	P - Pendant P RG - Pendant Regressed	D - Direct ID - Indirect Direct	Multiples of 4' and 8' sections, standard	S - Standard B - Boosted Standard H - High V - Very High TL - Tailored: _____lm/ft *	S - Standard (329 lm/ft) B - Boosted Standard (414 lm/ft) H - High (625 lm/ft) V - Very High (804 lm/ft) TL - Tailored: _____lm/ft *

* Specify lm/ft of outputs between Standard (S) and Very High (V). Consult factory for tailored lumen output outside of this range.

OUTPUT and LED TYPE		MECHANICAL/OPTICAL OPTIONS	
LED CRI/CCT	Uplight Option ID only	Downlight Option	Reflector System
830 - 80 CRI min, 3000K 835 - 80 CRI min, 3500K 840 - 80 CRI min, 4000K 930 - 90 CRI min, 3000K 935 - 90 CRI min, 3500K 940 - 90 CRI min, 4000K 8TW - 80 CRI min, Tunable White 9TW - 90 CRI min, Tunable White	F - Flush (standard) WSO - Widespread Optic ASY-L - Asymmetric Left ASY-R - Asymmetric Right	F - Flush (standard) BG - Bottom Glow DL - 1" Drop Down Lens RG-D - Flat Diffuser with 1" Regress ¹ RG-WCB - White Cross Blade Baffle ¹ RG-LHE - Hollowed Ellipse Louver ¹ RG-LHC - Hex Louver ¹ DAO-L - Downlight Asymmetric Optic Left ² DAO-R - Downlight Asymmetric Optic Right ² DSO - Downlight Spread Optic ²	96 - 96 Low Gloss White

ELECTRICAL OPTIONS

Voltage	Circuiting	Driver Selection	
120 - 120 Voltage 277 - 277 Voltage 347 - 347 Voltage	SC - Single Circuit* One single circuit in a run DC - Dual Circuit* Independent control of up and down separately in an I/D style fixture MC - Multi Circuit* More than one switch leg or zone (not "DC" independent control of up and down separately for an I/D style fixture) Factory shop drawings required Battery, Night Light, and Emergency to Generator circuits are in addition to the normal luminaire circuit(s)	0-10V Driver Options FC-10% - 0-10V 10% (standard) ³ FC-1% - 0-10V 1% ³ OSR-10% - Osram OTi, 0-10V 10% ³ OSR-1% - Osram OTi, 0-10V 1% ³ ELD-10V - EldoLED SOLOdrive, 0-10V 0.1% 10V-TW - Osram OTi, 0-10V 10% (Tunable White) ³	DMX Driver Options FIN-DMX - Finelite DMX 1% (Tunable White - FineTUNE Controls Only) ⁴ DMX - EldoLED POWERdrive, 0.1% DMX-TW - EldoLED POWERdrive, 0.1% (Tunable White) Lutron Driver Options LUT-ES1 - Lutron, Ecosystem 1% LUT-2W - Lutron, 2-wire (120v only) 1% LUT-TW - Lutron T-Series, EcoSystem 1% (Tunable White)

See Page 3 for additional driver options and details

MOUNTING OPTIONS

Mounting Method	Ceiling Hardware Type	Endcap Style	Luminaire Finish
FA50 - Fully Adjustable 50" FA100 - Fully Adjustable 100" FA150 - Fully Adjustable 150" FA200 - Fully Adjustable 200" FA250 - Fully Adjustable 250" FA300 - Fully Adjustable 300" FM - Flexible Mounting ⁵	C1 - 1" T-Bar C2 - 9/16" T-Bar C3 - Screw Slot C4 - Hard Ceiling	FE - Flat Endcap (standard) DE - 1" Drop Down Lens ⁶	SW - Signal White FB - Finelite Black ⁷ SA - Satin Aluminum ⁷ #### - RAL Color Code ⁷ _____

OTHER OPTIONS

OTHER OPTIONS

Emergency Style (Optional)	Integrated Sensor (Optional)	Special Options (Optional)	Acoustic	Height	Acoustic Housing Color
FAC CHO - Factory Choice Battery Back-up EM/GEN - Emergency to Generator NL - Night Light BSL310LP - Bodine Battery Back up Low Profile GTD - Generator Transfer Device ALCR - Automatic Load Control Relay	OBO - Occupancy OBD - Daylight OBE - Enlighted ⁸ W601 - Wattstopper ⁹ Wireless Sensor	CP - Chicago Plenum ¹⁰	ABL - Acoustic Baffle Lit	8H 12H	PEW - Pewter (standard) SLA - Slate (standard) ### - Letter Code ¹¹ : _____ See Page 6 for extended acoustic housing color options. Consult factory.

ACOUSTIC

¹ Pendant Regressed only

² Not available with Pendant Regressed

³ Add DTO to gain "Dim to Off" functionality (FC-10% - DTO)

⁴ B & V outputs only

⁵ Not available with ID

⁶ 1" Drop Down Lens (DL) downlight only

⁷ 20 Business day lead time for color

⁸ Enlighted components installed by Finelite, provided by others

⁹ LMFS-601 w/ 0-10V driver(s) and LMFI-111, up to 6 drivers may be connected.

LMFS-601 w/ Dali driver, only 1 driver can be connected.

¹⁰ Only available with C1, C2, and C3 mounting hardware with Finelite Gridbox

¹¹ Consult factory for extended acoustic housing color options

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

SUPPLEMENTARY DRIVER PAGE

0-10V Driver Options

FC-10%	Factory Choice, 0-10V 10% Dimming (Linear)
FC-10%-DTO	Factory Choice, 0-10V 10% Dimming, Dim-to-Off (Linear)
FC-1%	Factory Choice, 0-10V 1% Dimming (Linear)
FC-1%-DTO	Factory Choice, 0-10V 1% Dimming, Dim-to-Off (Linear)
ELD-10V-0%	EldoLED SOLOdrive, 0-10V 0.1% Dimming (Linear)
ELD-10V-1%	EldoLED ECOdrive, 0-10V 1% Dimming (Linear)
OSR-10V-TW	Osram OTi, 0-10V 10% Dimming, Tunable White (Linear)
OSR-10V-TWDTO	Osram OTi, 0-10V 10% Dimming, Dim-to-Off, Tunable White (Linear)
OSR-10%	Osram OTi, 0-10V 10% Dimming (Linear)
OSR-10%-DTO	Osram OTi, 0-10V 10% Dimming, Dim-to-Off (Linear)
OSR-1%	Osram OTi, 0-10V 1% Dimming (Linear)
OSR-1%-DTO	Osram OTi, 0-10V 1% Dimming, Dim-to-Off (Linear)

DALI Driver Options

FC-DALI-1%	Factory Choice, DALI 1% Dimming (Logarithmic)
OSR-DALI-1%	Osram Dexal, DALI 1% Dimming (Logarithmic)
ELD-DALI-0%	EldoLED SOLOdrive, DALI 0.1% Dimming (Logarithmic)
ELD-DALI-1%	EldoLED ECOdrive, DALI 1% Dimming (Logarithmic)
ELD-DALI-TW	EldoLED DUALdrive Light Shape, DALI 1% Dimming, Tunable White (Logarithmic Dimming, Linear CCT Control)

DMX Driver Options

FIN-DMX	Finelite, DMX 1% Dimming, Tunable White - FineTUNE Controls Only (Linear)
ELD-DMX	EldoLED POWERdrive, DMX 0.1% Dimming (8 Bit, 1CH) (Linear)
ELD-DMX-16	EldoLED POWERdrive, DMX 0.1% Dimming (16 Bit, 2CH) (Linear)
ELD-DMX-TW	EldoLED POWERdrive, DMX 0.1% Dimming, Tunable White (8 Bit, 2CH - CH1 Warm / CH2 Cool) (Linear)
ELD-DMX-TW16	EldoLED POWERdrive, DMX 0.1% Dimming, Tunable White (16 Bit, 4CH - CH1, 2 Warm / CH3, 4 Cool) (Linear)

Lutron Driver Options

LUT-ES1	Lutron, Ecosystem 1% Dimming
LUT-2W	Lutron, 2-wire (120v only) 1% Dimming
LUT-TW	Lutron T-Series, EcoSystem 1% Dimming, Tunable White

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

SPECIFICATIONS

BODY TYPE

CONSTRUCTION: Lighting luminaire body is precision-cut 6061-T6 extruded aluminum. Internal joiner system, plug-together wiring are standard. Acoustic housing is 100% Polyester fiber, joined with double-coated tape and adhesive.

LENGTHS: Standard section lengths of 4' and 8'. Combined runs available in multiples of 4' and 8'. For Indirect/Direct, select a minimum body length of 3' or greater when requiring dual circuiting or when uplight and downlight outputs differs. Acoustic housing walls are 1/2" thick and add 1" to total length.

OUTPUT AND LED TYPE

LIGHT OUTPUT: Four lumen packages available, Standard (**S**), Boosted Standard (**B**), High (**H**), and Very High (**V**). A separate chart summarizes lumen distribution and wattage. For Tailored Outputs outside of range from Standard (**S**) to Very High (**V**), consult factory. Light engines are replaceable.

MECHANICAL/OPTICAL OPTIONS

UPLIGHT OPTION: Flush frost white snap-in diffuser, 73% transmissive, 99% diffusion; Widespread Optic (**WSO**) enables increased luminaire spacing with improved ceiling uniformity. Asymmetric optic directs light in a specific direction. ASY-L distributes light to the left, ASY-R distributes light to the right of the luminaire. Consult factory for more tailored lumen outputs.

DOWNLIGHT OPTION: 8' maximum diffuser length. Flush (**F**) frost white snap-in diffuser, standard; 73% transmissive, 99% diffusion. Internal secondary diffusers at corners ensure visually seamless, uniform, continuous illumination. Available with Flush (**F**), Bottom Glow (**BG**), 1" Drop Down Lens (**DL**), White Cross Blade Baffle (**WCB**)¹, Hollowed Ellipse Louver (**LHE**)¹, Hex Louver (**LHC**)¹, Downlight Asymmetric Optic (**DAO**)², Downlight Spread Optic (**DSO**)², and Regressed downlight diffusers (**RG**)¹. 1" Drop Down Lens made of highly efficient acrylic. Available with a solid endcap or an endcap with a diffuse filler to continue the luminous aesthetic. Downlight Spread Optic and Downlight Asymmetric Optic are extruded lenses with a subtle ribbed appearance providing a batwing or asymmetric distribution for improved optical performance.

LUMEN MAINTENANCE: 90% of initial light output (L90) at 100,000+ hours; 70% of initial light output (L70) at 200,000+ hours.

REFLECTORS: Die-formed 20-gauge cold-rolled steel reflectors finished in 96LG High Reflectance white powder coat paint.

ELECTRICAL OPTIONS

STATIC WHITE FEED: 18-gauge/5-conductor single-circuit feed, standard. 14-gauge feed used when luminaire current exceeds 5 amps.

TUNABLE WHITE FEED: Standard with one 18-gauge/5-conductor single-circuit feed. 14-gauge feed used when luminaire current exceeds 5 amps. DMX and power feed at same location (standard). DMX feeds cannot be cut or spliced. DMX feeds should be ordered based on fixed lengths.

STATIC WHITE DRIVER: Replaceable 120V, 277V, and 347V constant current reduction dimming driver standard. Can be wired dimming or non-dimming. 0-10V dimming controls with a range of 100% - 10%. Dimming to 1% available; Consult factory. Driver is fully accessible from below the ceiling.

- **Power Factor:** ≥ 0.9
- **Total Harmonic Distortion (THD):** <20%
- **Expected driver lifetime:** 100,000 hours

LUTRON STATIC DRIVER OPTIONS:

- **LUTES1 (LDE1)** (Hi-lume 1% EcoSystem with Soft-On, Fade-to-Black dimming (LDE1 series))
- **LUT2W (LTEA2w)** (Hi-lume 1% 2-wire, 120V forward phase dimming (LTEA series)).

TUNABLE WHITE DRIVER: Replaceable LED driver. Driver is accessible from below the ceiling. 120V, 277V, and 347V.

- **Power factor** ≥0.9
- **Total Harmonic Distortion (THD):** <20%
- **Dimming Range:** 100% - 10%
- **Expected driver lifetime:** 100,000 hours
- FineTune DMX is 1%

LUTRON TUNABLE WHITE DRIVER OPTION: LUT-TW (1% T-Series 2-Channel Digital Tunable White (PSQ Series)).

MOUNTING OPTIONS

HANGING HARDWARE: 50" Fully Adjustable (**FA**) steel-plated aircraft cable with safety stop hardware standard. Contact factory for additional lengths up to 300". The Flexible Mounting Bracket (**FM**) adjusts the suspension points to accommodate existing architecture. Suspension points adjust up to 2' in from the end of 8' luminaire and up to 1' in on a 4' luminaire.

TUNABLE WHITE DMX HANGING HARDWARE: For grid ceiling applications the dual GridBox™ mounting is supplied (standard). For hard ceiling applications the ceiling mounting box is supplied (standard). DMX feeds cannot be cut or spliced. DMX feeds should be ordered based on fixed lengths. Available DMX pendant feed lengths are 5' (standard), 12', and 30'.

¹ Pendant Regressed Direct only
² Not available with Regressed

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

SPECIFICATIONS

TUNABLE WHITE DMX INTERCONNECTION CABLES: Luminaires are pre-wired with plug-and-play interconnection cables to support easy plug-together joining of luminaire runs. If a non-FineTune DMX system is specified, a DMX to RJ45 adapter is provided.

OTHER OPTIONS

ENDCAPS: Flat diecast aluminum endcaps add 1/4" to each end of luminaire. 1" Drop Down Lens Endcap (**DE**) includes diffuse element to continue luminance of drop lens.

EMERGENCY STYLE: Optional emergency to generator/inverter wiring, internal generator transfer switch, nightlight wiring, step-dimming driver, backup battery.

Backup Battery		
	Factory Choice	Bodine BSL310LP
HP2-P-D		
Min. Housing Length	8*	4'
EM Lumen Output	1608	956
EM Section Illuminated	2'	2' or 4'
HP2-P-ID		
Min. Housing Length	12'	8'
EM Lumen Output	1854	956
EM Section Illuminated	2'	2' or 4'

TUNABLE WHITE ELECTRICAL OPTIONS ³:

- **TW Driver Options 0-10V:** EM/GEN, GTD, or Battery Back-up
- **FineTune DMX:** EM/GEN or Battery Back-up
- **DMX:** Battery Back-up
- **DALI:** EM/GEN, GTD, or Battery Back-up
- **LUTRON:** EM/GEN, GTD, or Battery Back-up

INTEGRATED SENSORS: Integrated PIR (Passive Infrared) occupancy or daylight sensors available with Flush and Bottom Glow downlight diffusers. Refer to Occupancy Sensor and Daylight Sensor tech sheets for more info.

FINISHES: Finelite Signal White (**SW**) powder coat, standard. Finelite Black (RAL 9005) with semi gloss fine texture (**FB**) ⁴, Satin Aluminum (**SA**) ⁴, and 185 RAL colors ⁴ are available.

LABELS: Luminaire and electrical components are ETL-listed conforming to UL 1598 in the U.S.A. and CAN/CSA C22.2 No. 250.0 in Canada. In accordance with NEC Code 410.130 (G), this luminaire contains an internal driver disconnect. UL 924 and UL 2108 - PoE options available on request, contact factory for more details. These luminaires are rated for Damp Location. Finelite products use electronic components that are RoHS compliant, and the mechanical components of the luminaire have been verified to not knowingly contain any restricted substances listed per RoHS Directive 2015/863. Consult factory for tailored lighting options.

ACOUSTIC

NRC: Noise Reduction Coefficient (NRC) is measured at six frequencies: 125Hz, 250Hz, 500Hz, 1,000Hz, 2,000Hz, and 4,000 Hz expressed to the nearest integral multiple of 0.05. Apparent NRC up to 1.20.

HEIGHTS: Housing Heights of 8" and 12" available. All heights are compatible with both Direct and Direct Regressed Luminaire Type.

COLORS: Pewter (**PEW**) and Slate (**SLA**), standard. 18 Extended color options available ⁵.

WEIGHT ⁶:

- Indirect Direct**
- **8"H** 3.86 lbs/ft.
 - **12"H** 4.31 lbs/ft.

Direct

- **8"H** 2.975 lbs/ft.
- **12"H** 3.35 lbs/ft.

WARRANTY: 10-year performance-based warranty on all standard direct components and indirect/direct components up to High Output (**H**). 5-year performance-based warranty for indirect/direct Very High Output (**V**). Optional accessories such as emergency battery packs are covered by their individual manufacturer warranties.

WARRANTY: 10-year performance-based warranty on all standard components. Optional accessories such as emergency battery packs are covered by their individual manufacturer warranties.

³ Consult Finelite for Generator Transfer Device and Battery Back-up fit

⁴ 20 Business day lead time for color

⁵ Consult factory for extended acoustic housing color options

⁶ Excludes Battery Back-up and Generator Transfer Device weight

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

COLOR OPTIONS

Standard

Extended Consult factory for extended acoustic housing color options



Pewter (**PEW**)



Slate (**SLA**)



Sky (**SKY**)



Cobalt (**COB**)



Bark (**BAR**)



Tar (**TAR**)



Fossil (**FOS**)



Greige (**GRE**)



Cadet (**CAD**)



Malachite (**MAL**)



Ocher (**OCH**)



Mandarine (**MAN**)



Grass (**GRA**)



Sunshine (**SUN**)



Ecru (**ECR**)



Linen (**LIN**)



Chambray (**CHA**)



Ivory (**IVO**)



Frost (**FRO**)

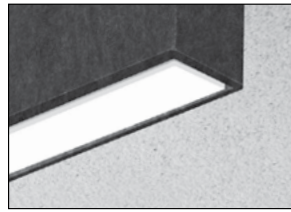


Smoke (**SMO**)

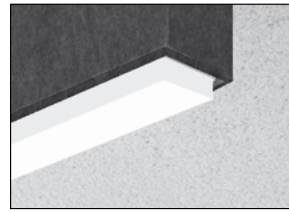
AESTHETIC OPTIONS



Flush Diffuser (**F**)



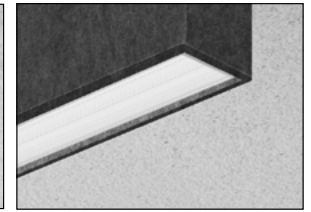
Bottom Glow Diffuser (**BG**)



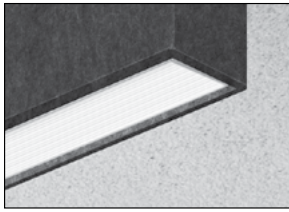
1" Drop Down Lens (**DL**)



Flat Diffuser with 1" Regressed (**RG-D**)



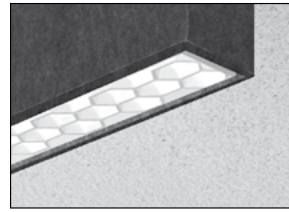
Downlight Asymmetric Optic (**DAO**)¹
Externally flush



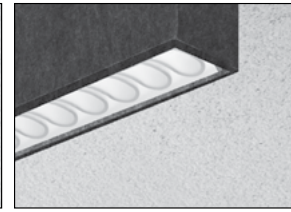
Downlight Spread Optic (**DSO**)¹
Externally flush



White Cross Blade Baffle² (**RG-WCB**)



Hex Louver² (**RG-LHC**)



Hollowed Ellipse Louver² (**RG-LHE**)

¹ With a subtle ribbed appearance providing an asymmetric or batwing distribution

² Regressed only.

STANDARD RUN CONFIGURATIONS

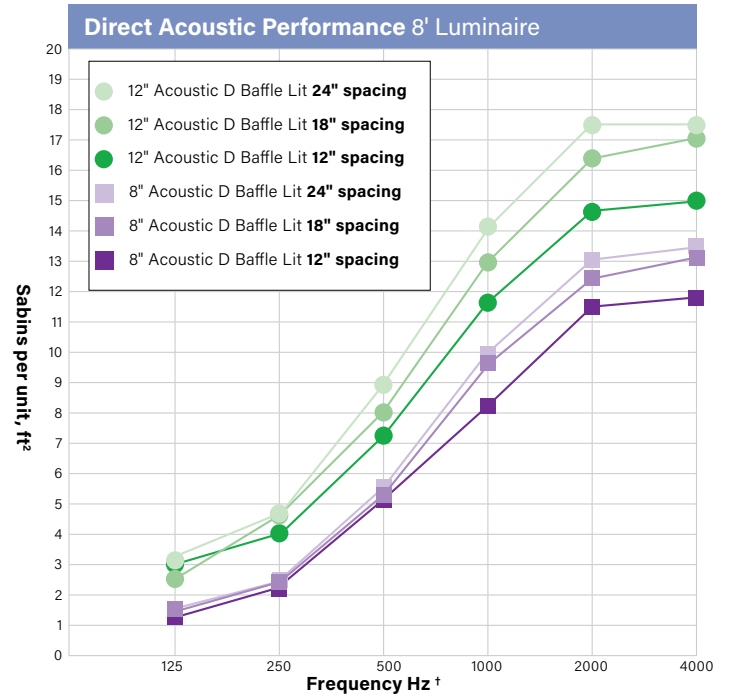
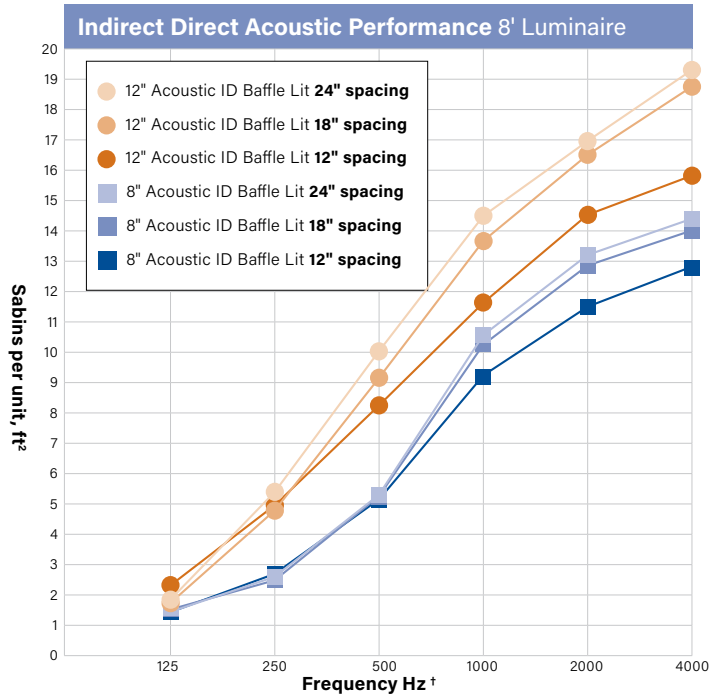
Run Length (ft)	Configuration	Hanging Points
12	8 + 4	3
16	8 + 8	3
20	8 + 8 + 4	4
24	8 + 8 + 8	4
28	8 + 8 + 8 + 4	5
32	8 + 8 + 8 + 8	5
36	8 + 8 + 8 + 8 + 4	6
40	8 + 8 + 8 + 8 + 8	6
44	8 + 8 + 8 + 8 + 8 + 4	7
48	8 + 8 + 8 + 8 + 8 + 8	7
52	8 + 8 + 8 + 8 + 8 + 8 + 4	8
56	8 + 8 + 8 + 8 + 8 + 8 + 8	8
60	8 + 8 + 8 + 8 + 8 + 8 + 8 + 4	9

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

Acoustic Performance Graph Sabins by Frequency



Acoustic Product Properties Per-Unit Sabins, Apparent NRC & SAA

Product	Spacing	Sabins (ft ² of sound absorption area) per Unit						Equivalent ceiling treatment †	
		125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	Apparent NRC	Apparent SAA
HP-2 Acoustic ID Baffle Lit 12"	Spaced 24"	1.90	5.30	10.05	14.52	17.29	19.39	0.75	0.72
	Spaced 18"	1.69	4.84	9.02	13.62	16.54	18.71	0.90	0.91
	Spaced 12"	2.28	4.95	8.22	11.64	14.52	15.73	1.20	1.21
HP-2 Acoustic ID Baffle Lit 8"	Spaced 24"	1.44	2.68	5.36	10.53	13.10	14.36	0.50	0.49
	Spaced 18"	1.62	2.62	4.93	10.21	12.76	14.03	0.65	0.63
	Spaced 12"	1.54	2.66	5.22	9.27	11.59	12.85	0.90	0.87
HP-2 Acoustic D Baffle Lit 12"	Spaced 24"	3.13	4.77	8.91	14.16	17.41	17.41	0.70	0.69
	Spaced 18"	2.54	4.65	8.04	13.09	16.37	17.07	0.85	0.87
	Spaced 12"	3.06	4.07	7.25	11.67	14.67	15.00	1.15	1.16
HP-2 Acoustic D Baffle Lit 8"	Spaced 24"	1.50	2.49	5.57	9.91	13.07	13.55	0.50	0.48
	Spaced 18"	1.47	2.38	5.35	9.68	12.40	13.15	0.60	0.61
	Spaced 12"	1.33	2.24	5.23	8.29	11.46	11.85	0.85	0.84

† 1/3 octave band test results presented and 1/1 octave band center frequencies

‡ Apparent NRC & SAA ratings were calculated from the measured total absorption in Sabins divided by the area of a projected horizontal plane that encompasses the set of objects. This provides an accurate comparison to 2-dimensional ceiling surface treatment options.

NOTE: Acoustic Performance Testing conducted by Riverbank Acoustical Laboratories.

Reference reports RAL-A19-505, RAL-A21-079, RAL-A21-080, RAL-A21-081, RAL-A21-086, RAL-A21-087, RAL-A21-088

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

Indirect/Direct Photometry - 4' Luminaire 3500K

HP2-P-ID-4'-V-V-835-ASY-R-DAO-R

Uplight: Asymmetric Right Optic

Downlight: Downlight Asymmetric Optic - Right

Distribution: 53% Up (V) / 47% Down (V)

Efficacy: 112 lm/W

Uplight: 4301 lumens (1075 lumens/foot)

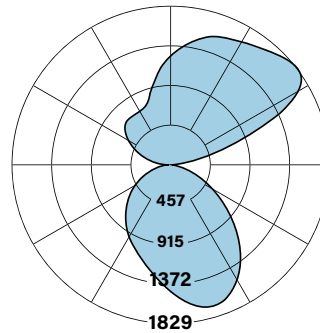
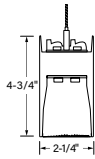
Downlight: 3742 lumens (936 lumens/foot)

Total luminaire output: 8043 lumens (2011 lm/ft)
72 watts (18 W/ft)

Peak Candela Value: 1829 @ 127.5°

CRI: 80 / CCT: 3500K

ITL LM79 Report REP-051921-01



CANDELA DISTRIBUTION

	0.0	20.0	40.0	60.0	80.0	90.0	FLUX
0	1422	1422	1422	1422	1422	1422	135
5	1526	1513	1499	1475	1456	1422	135
15	1670	1650	1594	1515	1426	1350	389
25	1619	1609	1569	1462	1317	1215	585
35	1404	1406	1400	1301	1138	1027	686
45	1082	1105	1131	1090	912	814	678
55	745	771	827	787	672	589	573
65	453	475	521	513	436	384	408
75	232	244	271	270	229	197	225
85	77.80	80	91	90	72	55	67
90	36	34	26	14	4	0	
95	156	156	146	134	101	59	121
105	513	575	620	515	299	209	397
115	1389	1378	1204	804	460	367	685
125	1821	1714	1375	936	622	532	785
135	1760	1662	1392	1057	788	699	738
145	1654	1594	1419	1181	951	868	635
155	1583	1550	1444	1272	1094	1027	498
165	1493	1468	1402	1300	1195	1149	325
175	1318	1309	1291	1263	1230	1214	115
180	1222	1222	1222	1222	1222	1222	

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	3292 [↑53% 47%↓]	3745 [↑59% 41%↓]	4877 [↑69% 31%↓]	5833 [↑74% 26%↓]
↓B ¹	3686 [↑48% 52%↓]	4139 [↑53% 47%↓]	5271 [↑63% 36%↓]	6227 [↑69% 31%↓]
↓H ¹	4671 [↑38% 62%↓]	5124 [↑43% 57%↓]	6256 [↑54% 46%↓]	7211 [↑60% 40%↓]
↓V ²	5503 [↑32% 68%↓]	5955 [↑37% 63%↓]	7087 [↑47% 53%↓]	8043 [↑53% 47%↓]

Light Output, 3500K, 80 CRI (Lumens Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	823	936	1219	1458
↓B ¹	922	1035	1318	1557
↓H ¹	1168	1281	1564	1803
↓V ²	1376	1489	1772	2011

Power, 3500K (Watts Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	7.0	8.0	10.4	12.5
↓B ¹	8.0	9.0	11.4	13.5
↓H ¹	10.4	11.4	13.8	15.9
↓V ²	12.5	13.5	15.9	18.0

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	117	117	117	116
↓B ¹	115	116	116	116
↓H ¹	112	113	113	113
↓V ²	110	111	111	112

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL reports: 89456, 94139

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H) / Standard Output (S), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 4877 lm x 0.789 = 3848 lm

Total Light Output per Foot: 1219 lm/ft x 0.789 = 962 lm/ft.

watts/foot: 10.4 W/ft.

$$\text{Efficacy} = \frac{962 \frac{\text{lm}}{\text{ft.}}}{10.4 \frac{\text{W}}{\text{ft.}}} = 92 \text{ lm/W}$$

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

Indirect Direct Photometry 4' Luminaire 3500k

HP2-P-ID-V-V-835-WSO-F

Uplight: Widespread Optic / **Downlight:** Flush Diffuser

Distribution: 57% Up (V) / 43% Down (V)

Efficacy: 102 lm/W

Uplight: 4133 lumens (1033 lumens/foot)

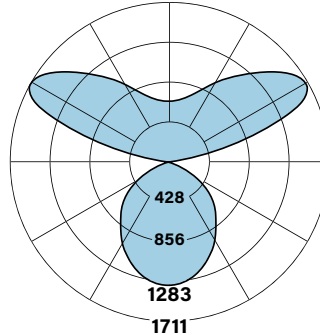
Downlight: 3069 lumens (767 lumens/foot)

Total luminaire output: 7202 lumens (1801 lm/ft)
54.3 watts (13.6 W/ft)

Peak Candela Value: 1711 @ 180°

CRI: 80 / CCT: 3500K

ITL LM79 Report 94474



CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	FLUX
0	1308	1308	1308	1308	1308	
5	1300	1299	1298	1298	1297	123
15	1238	1226	1230	1226	1221	346
25	1113	1098	1098	1086	1079	504
35	948	935	928	909	898	578
45	764	752	737	707	693	564
55	572	562	534	489	470	471
65	381	370	322	277	261	320
75	199	176	128	94	81	144
85	51	18	4	4	3	20
90	0	0	0	0	0	
95	44	83	157	91	74	120
105	156	242	711	760	574	549
115	276	359	802	1507	1632	881
125	383	457	816	1417	1662	829
135	462	522	805	1195	1372	667
145	529	574	766	1000	1103	497
155	586	612	719	831	882	336
165	632	641	677	712	728	193
175	649	650	654	657	659	63
180	651	651	651	651	651	

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H) / Standard Output (S), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 4471 lm x 0.789 = 3528 lm

Total Light Output per Foot: 1118 lm/ft x 0.789 = 882 lm/ft.

watts/foot: 10.3 W/ft.

$$\text{Efficacy} = \frac{882 \frac{\text{lm}}{\text{ft.}}}{10.3 \frac{\text{W}}{\text{ft.}}} = 85.6 \text{ lm/W}$$

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	2948 (157% 43%↓)	3383 (163% 37%↓)	4471 (172% 28%↓)	5389 (177% 23%↓)
↓B ¹	3271 (152% 48%↓)	3706 (157% 43%↓)	1198 (167% 23%↓)	5712 (172% 28%↓)
↓H ¹	4079 (142% 58%↓)	4514 (147% 53%↓)	5602 (157% 43%↓)	6520 (163% 37%↓)
↓V ²	4761 (133% 67%↓)	5196 (138% 62%↓)	6284 (151% 49%↓)	7202 (157% 43%↓)

Light Output, 3500K, 80 CRI (Lumens Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	737	846	1118	1347
↓B ¹	818	927	1198	1428
↓H ¹	1020	1128	1400	1630
↓V ²	1190	1299	1571	1801

Power, 3500K (Watts Per Foot)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	6.9	7.9	10.3	12.3
↓B ¹	7.9	8.8	11.2	13.3
↓H ¹	10.3	11.2	13.6	15.6
↓V ²	12.3	13.3	15.6	17.7

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

	↑S ¹	↑B ¹	↑H ¹	↑V ²
↓S ¹	106	108	109	109
↓B ¹	104	105	107	108
↓H ¹	99	101	103	104
↓V ²	97	98	100	102

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 94474

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

Direct Photometry 4' Luminaire 3500k

HP2-P-D-V-835-F

Downlight: Flush Diffuser

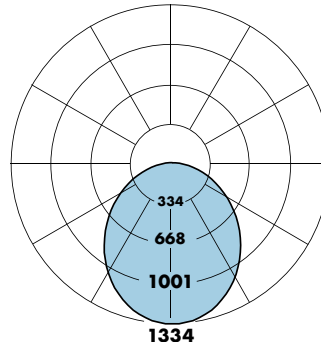
Efficacy: 87 lm/W

Total luminaire output: 3215 lumens (804 lm/ft)
36.9 watts (9.2 W/ft)

Peak Candela Value: 1334 @ 0°

CRI: 80 / CCT: 3500K

ITL LM79 Report 85136



CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	FLUX
0	1334	1334	1334	1334	1334	
5	1327	1326	1326	1325	1324	126
15	1263	1252	1251	1244	1236	352
25	1133	1117	1109	1088	1075	508
35	958	942	923	896	887	576
45	762	747	725	697	686	558
55	563	551	532	509	500	475
65	374	365	351	337	331	349
75	206	201	195	188	184	207
85	62	61	59	57	57	66
90	0	0	0	0	0	

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 2501 lm x 0.789 = 1973 lm

Total Light Output per Foot: 625 lm/ft x 0.789 = 493 lm/ft.

watts/foot: 7.1 W/ft.

$$\text{Efficacy} = \frac{493 \frac{\text{lm}}{\text{ft}}}{7.1 \frac{\text{W}}{\text{ft}}} = 69 \text{ lm/W}$$

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
1316	1655	2501	3215

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
329	414	625	804

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
3.6	4.6	7.1	9.2

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
91	90	88	87

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 85136

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

Acoustic

HP-2 Acoustic Baffle Lit

Direct Photometry

4' Luminaire 3500k

HP2-P RG-D-V-835-F

Downlight: Regressed Diffuser

Efficacy: 79 lm/W

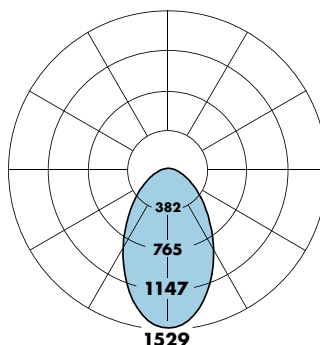
Total luminaire output: 2887 lumens (722 lm/ft)

36.7 watts (9.2 W/ft)

Peak Candela Value: 1529 @ 0°

CRI: 80 / CCT: 3500K

ITL LM79 Report 90350



	0.0	22.5	45.0	67.5	90.0	FLUX
0	1529	1529	1529	1529	1529	
5	1520	1518	1513	1507	1504	143
15	1443	1412	1370	1327	1309	385
25	1293	1224	1131	1049	1017	523
35	1086	993	862	757	722	550
45	855	749	608	511	482	490
55	624	516	392	322	305	380
65	212	141	103	95	94	131
75	212	141	103	95	94	131
85	57	32	28	26	26	36
90	0	0	0	0	0	

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 2245 lm x 0.789 = 1771 lm

Total Light Output per Foot: 561 lm/ft x 0.789 = 443 lm/ft.

watts/foot: 7.0 W/ft.

$$\text{Efficacy} = \frac{443 \frac{\text{lm}}{\text{ft}}}{7.0 \frac{\text{W}}{\text{ft}}} = 63 \text{ lm/W}$$

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
1182	1486	2245	2887

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
295	371	561	722

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
3.6	4.6	7.0	9.2

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
82	81	80	79

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 90350

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

0-10V Tunable White

Finelite's award-winning, contractor friendly Tunable White luminaires are available at low cost, with powerful and simple 0-10V tuning and intensity controls.

TUNABLE WHITE FEATURES

- CCT range: 2700K - 6500K
- Dimming Range: 100% to 10%
- CRI Options: 80 CRI or 90 CRI

PHOTOMETRY

Apply a power adjustment factor to calculate wattage usage

POWER	CONVERSION FACTOR
	1.1X

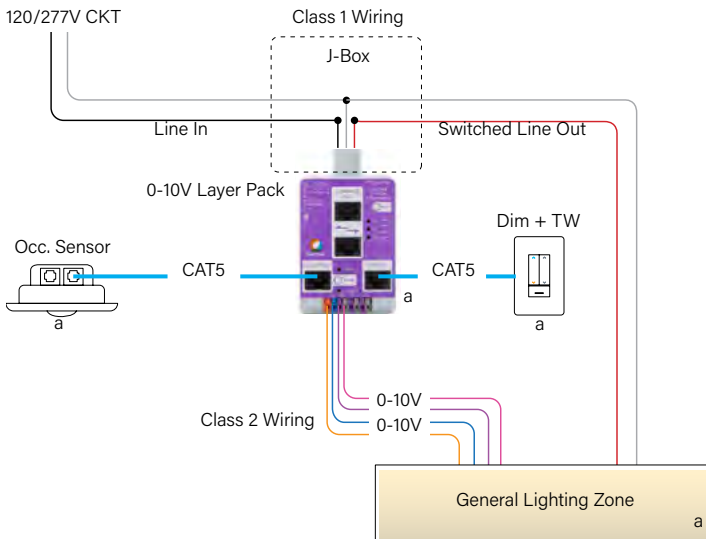
(Example: a 50 watt luminaire in static white would draw 55 watts using 0-10V Tunable White)

LUMINAIRE FAMILY MODIFICATIONS/RESTRICTIONS

Direct	Section Lengths						
	2'	3'	4'	5'	6'	7'	8'
Output S,B,H,V Single Circuit	Rows can be comprised of 4' or 8' sections.						
Integral Battery Backup (BSL310LP)	✓						

EN/GEN sections available for all body lengths

WIRING DIAGRAM - DIMMABLE TO 10%



Luminaire Wiring

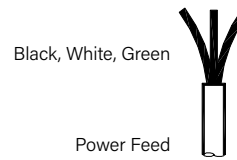
- **Purple (+) / Pink (-)** control wires are for intensity control
- **Orange (+) / Blue (-)** control wires are for Tunable White control

Note:

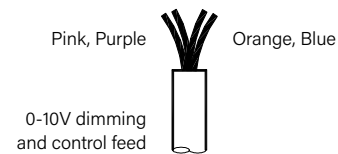
Load or Dim to Off options available.



DUAL FEED DETAIL



WIRING LEGEND		
Black	Hot	Line Voltage
White	Neutral	Line Voltage
Green	Ground	



WIRING LEGEND		
Pink	Dimming	0-10V DC
Purple	Dimming	0-10V DC
Orange	TW	0-10V DC
Blue	TW	0-10V DC

Skydome® Edge™

LED PENDANT



canopy detail

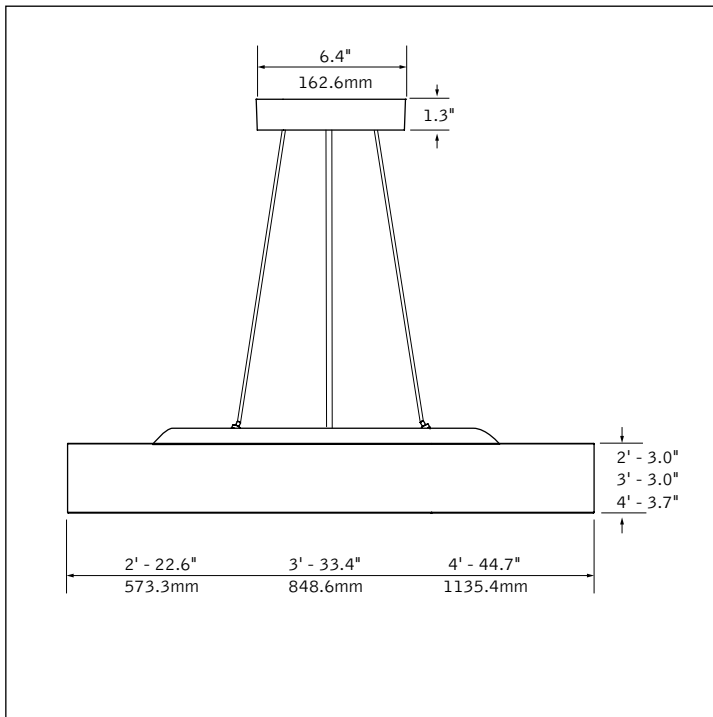


surface mount companion

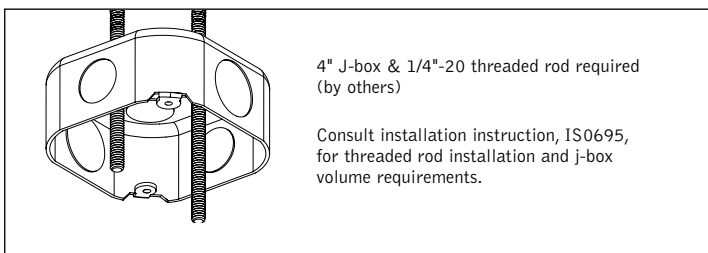


unlit acoustic companion

DIMENSIONAL DATA



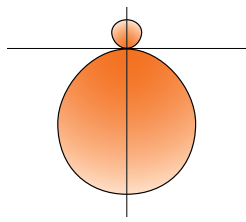
MOUNTING INFORMATION



FEATURES

- Shallow housing.
- Edge lighting technology ensures even illumination of the lens.
- Slot canopy provides no visibility to mechanical elements.
- Knife edge design provides a modern aesthetic.
- Available in nominal 2', 3' and 4' diameters.
- Choice of direct and indirect output levels to meet a wide variety of application needs, specified and controlled independently.
- PoE compatible: Integrates with Power over Ethernet lighting systems via standard, low-voltage wires.

PERFORMANCE



PRODUCT OVERVIEW

Lumen Output: 2000-16500lm

Wattage: 17 - 162W

LPW: 104 - 118

SDCM: 2

3' Diameter
 2000 Lumens indirect /
 9000 Lumens direct
Delivered Lumens: 11000lm
Total System Watts: 106W

Photometric performance is measured in accordance with IESNA LM-79.
 Visit focalpointlights.com for complete photometric data.

fixture:

project:

SPECIFICATIONS

LED System

LED module incorporates premium LEDs on a robust platform to achieve excellent thermal management. LEDs are placed to promote a uniform appearance. Available in 2700K, 3000K, 3500K or 4000K with 80 or 90 CRI. 3500K and 4000K with CRI>90 have a cyanosis observation index (COI) of 3.3 or less. Drivers are replaceable.

Construction

Extruded aluminum housing. One-piece ABS plastic top cover. Luminaire weights: 2' unit: 24lbs, 3' unit: 48lbs, 4' unit: 82lbs.

Mounting

White canopy provided for below ceiling access. Minimum mounting heights: 2' unit: 15", 3' unit: 30", 4' unit: 45".

Optic

18 Ga. steel reflector finished in High Reflectance white powder coat. Regressed lens of 0.118" thick acrylic.

Electrical

Standard 120-277V driver includes 0-10V analog dimming. Power factor > .9. PoE compatible: Integrates with Power over Ethernet lighting systems via standard, low-voltage wires.

Nominal Size	Direct Distribution	Driver Quantity	
		Direct Only	Direct/Indirect
2'	2000DN - 5000DN	1	2
	4000DN - 7000DN	1	2
3'	9000DN	2	3
	7000DN	1	2
4'	9000DN - 1400DN	2	3

Emergency Battery

Bodine BSL6LST. Emergency output - 6 watts for 90 minutes. Maximum mounting height: 14.25ft.

Labels

UL and cUL Listed. Suitable for Dry or Damp Locations, indoor use only.

Finish

Polyester powder coat applied over a multi-stage pre-treatment.

Lumen Maintenance

Reported: L70 at >61,000 hours Calculated: L70 at 221,000 hours
 L90 at 57,000hrs L90 at 57,000hrs

Derived from EPA TM-21 calculator. Based on typical conditions, consult factory for additional data.

Reliability

At Focal Point, our products are designed to stand the test of time. Each luminaire is engineered using superior components, manufactured with the utmost care and rigorously tested. Contact us for reliability data.

Warranty

LED system rated for operation in ambient environments up to 25°C. 5 year limited warranty.

PERFORMANCE CHART (Direct only) See page 3 for additional performance.

Nominal Size	Delivered Lumens	Tested System Watts	LPW
2'	2000	17	116
	3000	26	118
	4000	35	118
	5000	44	114
3'	4000	35	118
	5000	43	117
	7000	63	113
	9000	82	109
4'	7000	62	112
	9000	85	110
	11000	105	107
	14000	135	104

Based on 3500K, 80CRI. Lumen multiplier for 90CRI = 0.85. Lumen output may vary +/- 5%. Actual wattage may vary +/- 5%.

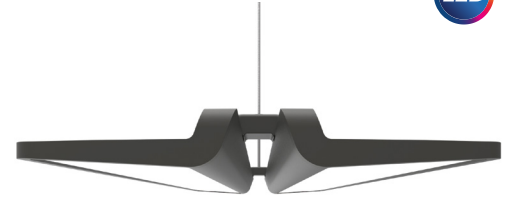
ORDERING

Luminaire Series	FSDEP
Skydome Edge	FSDEP
Nominal Size	
2' Diameter	2
3' Diameter	3
4' Diameter	4
Shielding	FL
Frosted Lens	FL
Direct Distribution	
2' Diameter	
2000 Lumen	2000DN
3000 Lumen	3000DN
4000 Lumen	4000DN
5000 Lumen	5000DN
3' Diameter	
4000 Lumen	4000DN
5000 Lumen	5000DN
7000 Lumen	7000DN
9000 Lumen	9000DN
4' Diameter	
7000 Lumen	7000DN
9000 Lumen	9000DN
11,000 Lumen	11000DN
14,000 Lumen	14000DN
Indirect Distribution	
No Uplight	0UP
500 Lumen (L11 & LD1 only)	500UP
1000 Lumen	1000UP
1500 Lumen	1500UP
2000 Lumen (3' & 4' Diameters only)	2000UP
2500 Lumen (4' Diameter only)	2500UP
Color Temperature	
2700K, 80+ CRI or 90+ CRI	27K or 927K
3000K, 80+ CRI or 90+ CRI	30K or 930K
3500K, 80+ CRI or 90+ CRI	35K or 935K
4000K, 80+ CRI or 90+ CRI	40K or 940K
Circuit	
Single Circuit	1C
Dual Circuit	2C
Voltage	
120/277 UNV Volt	UNV
347 Volt (L11 & LD1 only. Not available with uplight, 0UP only. Not available with EM battery.)	347
Low Voltage	LV
Control System & Dimming Level	
0-10V - 1% Dimming	L11
0-10V - 10% Dimming	LD1
Low Voltage, PoE compatible (No driver. Not available with EM or EC. LV Voltage only.)	LVN
Lutron Hi-Lume EcoSystem (LDE1) - 1% Dimming (9000, 11000 & 14000 lumens not available)	LH1
DALI 1% Dimming (7000, 9000, 11000 & 14000 lumens not available)	D11
Mounting	
24" Aircraft Cable (2' diameter only)	C24
48" Aircraft Cable	C48
96" Aircraft Cable (Consult factory for other lengths)	C96
Factory Options	
Emergency Battery (120/277 Volt only)	EM
Housing Finish	
Matte Satin White	WH
Titanium Silver	TS
Matte Black	BK
Custom Color (Specify your RAL color value. Extended lead time, consult factory.)	RAL_____

PERFORMANCE CHART WITH UPLIGHT

Nominal Size	Direct Distribution	Indirect Distribution	Distribution % (Direct/Indirect)	Total Delivered Lumens	Tested System Watts	LPW
2'	2000DN	500UP	80/20	2500	24	104
		1000UP	65/35	3000	29	105
		1500UP	60/40	3500	35	101
	3000DN	500UP	85/15	3500	32	108
		1000UP	75/25	4000	37	109
		1500UP	65/35	4500	43	105
	4000DN	500UP	90/10	4500	42	109
		1000UP	80/20	5000	46	110
		1500UP	70/30	5500	52	106
	5000DN	500UP	90/10	5500	51	109
		1000UP	85/15	6000	55	109
		1500UP	75/25	6500	62	106
3'	4000DN	500UP	90/10	4500	42	109
		1000UP	80/20	5000	47	108
		1500UP	75/25	5500	52	107
		2000UP	65/35	6000	58	104
	5000DN	500UP	90/10	5500	51	109
		1000UP	85/15	6000	55	109
		1500UP	75/25	6500	61	108
		2000UP	70/30	7000	67	105
	7000DN	500UP	95/5	7500	71	108
		1000UP	90/30	8000	75	108
		1500UP	80/20	8500	80	107
		2000UP	80/20	9000	87	105
9000DN	500UP	95/5	9500	90	106	
	1000UP	90/10	10000	95	106	
	1500UP	85/15	10500	100	105	
	2000UP	80/20	11000	106	104	
4'	7000DN	500UP	95/5	7500	69	108
		1000UP	90/10	8000	74	109
		1500UP	80/20	8500	78	109
		2000UP	80/20	9000	83	108
		2500UP	75/25	9500	89	106
	9000DN	500UP	95/5	9500	92	107
		1000UP	90/10	10000	96	108
		1500UP	85/15	10500	100	108
		2000UP	80/20	11000	106	107
		2500UP	80/20	11500	112	106
	11000DN	500UP	95/5	11500	112	105
		1000UP	90/10	12000	117	106
1500UP		90/10	12500	121	106	
2000UP		85/15	13000	127	105	
2500UP		80/20	13500	132	104	
14000DN	500UP	95/5	14500	142	102	
	1000UP	95/5	15000	147	103	
	1500UP	90/10	15500	151	103	
	2000UP	90/10	16000	157	102	
	2500UP	85/15	16500	162	102	

Based on 3500K, 80CRI. Lumen multiplier for 90CRI = 0.85. Lumen output may vary +/- 5%. Actual wattage may vary +/- 5%.



Stylishly sophisticated, boldly dramatic... **Ledalite EyeLine suspended** is sure to make a statement in any architectural space. Its horizontally ultra-thin line of light makes EyeLine virtually weightless, and so utterly organic that it becomes a natural element of design of the built environment. Providing gentle, glare free illumination, EyeLine performs like no other with maximized row spacing, and keeping energy densities to a minimum in large open plan areas. Make your room the view with EyeLine.

Project: _____
 Location: _____
 Cat.No: _____
 Type: _____
 Line ID: _____ Qty: _____
 Notes: _____

EyeLine now includes AccuRender technology for the highest color quality at the highest efficacy

Ordering guide

example: ELGSL93548QN04DERNNNWW04, R5

Family	Ceiling Type	Mount Type	Source	CRI / CCT ¹	Lumens ¹	Optics	Distribution ¹	Run Length
EL		S	L			Q		
EL EyeLine	G T-Grid C Chicago T-Grid D Drywall ⁴ S Open Structure	S Suspended	L LED	950 CRI 90, 5000K 940 CRI 90, 4000K 935 CRI 90, 3500K 930 CRI 90, 3000K 927 CRI 90, 2700K 850 CRI 80, 5000K 840 CRI 80, 4000K 835 CRI 80, 3500K 830 CRI 80, 3000K 827 CRI 80, 2700K	68 6800lm/4ft 48 4800lm/4ft 34 3400lm/4ft	Q Symmetric MesoOptics Lens	N 65% Up / 35% Dn G 20% Up / 80% Dn J 100% Dn	04 4ft XX Continuous Run (4ft increments)
Voltage	Driver	Circuit ²	Wiring Option ²	System / Controls ⁵	Finish ⁶	Power Cord Color	Suspension	Ceiling Mount
D UNV 120-277V 3 347V ³	E Advance Xitanium 0-10V (1% Dim) D Advance Xitanium DALI (5% Dim) ³ H Lutron EcoSystem LDE1 (<1% Dim, Fade-to-Black) ³ S Advance Xitanium Sensor Ready (5% Dim) ³	R Single Circuit, Remote Driver	N None E Auxiliary Wiring ⁷ B Battery Pack ^{3,4}	NN None SZ SpaceWise DT Daylight & Occupancy	W Signal White B Midnight Black R Racing Red G Graphite Grey C Custom	W White B Black	04 4ft 08 8ft 12 12ft 20 20ft	R1 Drywall R3 Surface/ Structure/ Hard Ceiling R5 T-Grid 24" Span Mount R6-1 On-Grid 15/16" non-regular R6-2 On-Grid 9/16" non-regular R6-3 On-Grid 9/16" & 5/16" regular

1. Nominal values within a range. Consult photometry data for CRI, CCT, lumens & distribution of chosen configuration.
2. Not all wiring types are available with all configurations. Consult Ledalite for a complete list of available options.
3. 347V not available with Battery Pack, DALI, Lutron EcoSystem or Sensor Ready drivers or SpaceWise DT options.
4. Battery Pack not available with Drywall Ceiling.
5. Sensors are mounted remote from the luminaire.
6. Luminaires painted in finishes other than standard white result in up to 8% drop in luminous flux and efficacy.
7. Auxiliary Wiring not available with SpaceWise DT luminaires.



EyeLine linear suspended

Options and Details

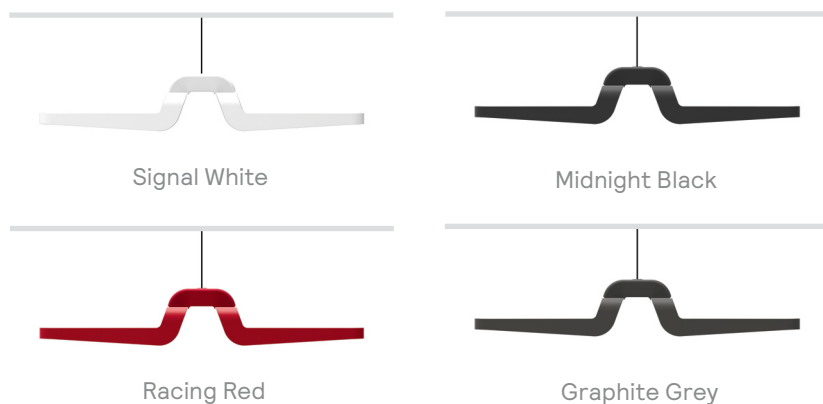
Performance Summary – Suspended*

LED Output (lm/4ft)	3400lm		4800lm		6800lm	
CCT	3500K	4000K	3500K	4000K	3500K	4000K
Energy (W/4ft)	25	25	35.9	35.9	53.1	53.3
Efficacy (lm/W)	118.3	122	116.5	120.2	116	119.2

* Values based on CRI 90, 3500K CCT and standard 65% up / 35% down optics

Standard Finish Options

The finish options shown below are standard options for EyeLine. No additional set up fees apply.



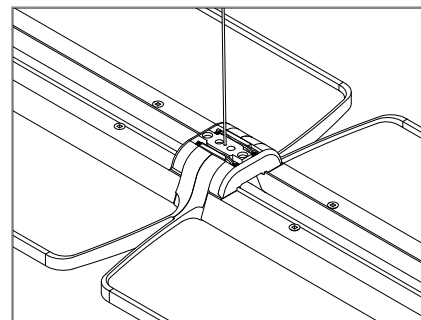
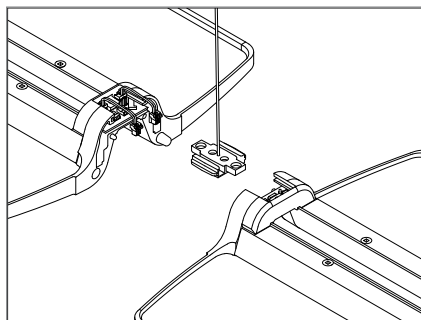
Modular Continuous Rows

EyeLine has been designed to use as few Driver Pods and power drops as possible for continuous rows. A 4-letter suffix will be added by the factory to the EyeLine part number as chosen by customers. This 4-letter suffix will be noted on factory drawings and orders and can be referenced below.

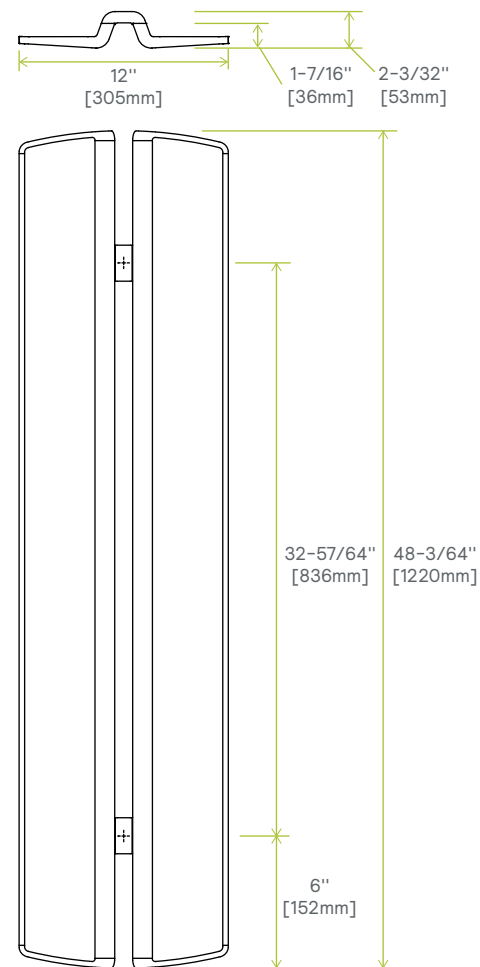
Version	Driver Count	Wiring Pass-Thru
Reference only - specified by factory based on row requirements		
S Standalone	A Single Driver	PT Power/Terminate
M Mid-run	B Dual Driver	PJ Power/Jumper
E End-Run		JJ Jumper/Jumper
		JT Jumper/Terminate

EyeLine can be specified in any row length, in 4ft increments. The luminaire has been uniquely engineered so continuous row mounting is an easy plug and play installation with 4ft modules.

All individual modules are joined together onsite using the simple joining connections outlined in the installation instructions.



Dimensions



EyeLine linear suspended

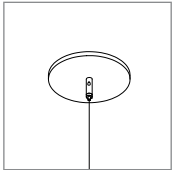
Mounting

EyeLine can be mounted to a T-Grid, drywall, or exposed ceiling.
The canopies used for each ceiling type are shown below.

R1 and R3 canopies can be customized to any paint finish upon request.

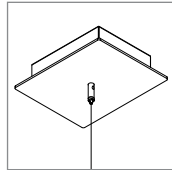
Non-Power

Drywall (R1)



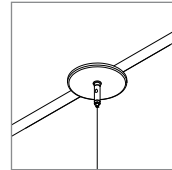
Canopy diameter: 5"

Open Structure (R3)



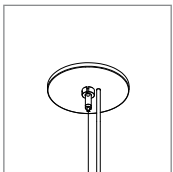
Cover: 6"x6"x0.13"
Base: 4.5"x4.5"x1.75"

T-Grid (R5 & R6)

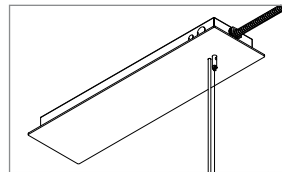


Canopy diameter: 3.75"
(R6-1 shown)

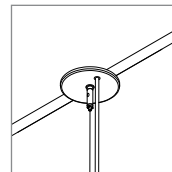
Power



Canopy diameter: 5"



Cover: 22"x6"x0.13"
Base: 20.4"x4.5"x1.75"

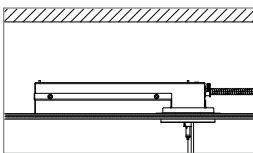
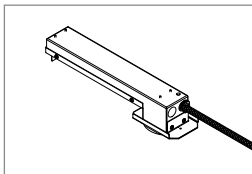


Canopy diameter: 3.75"
(R6-1 shown)

Driver Pod Details

The EyeLine Driver Pod is a remote-mounted, metal enclosure housing the driver(s) and the optional battery pack. In a T-Grid installation, the Driver Pod either attaches directly to the grid with enclosed mounting hardware or to grid with a 24" span mount bracket. In a drywall installation, the Driver Pod is smaller to enable the pod to be installed through a 4.5" round opening. In an exposed or open structure ceiling installation, the Driver Pod is attached directly to the ceiling, along with a decorative covering to minimize the appearance of the Driver Pod.

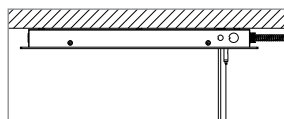
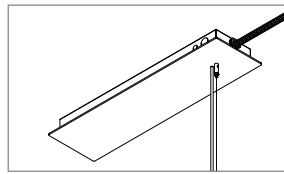
Drywall (R1)



Max dimensions of box:
16"x3"x3"

Plenum height in drywall ceilings must have a minimum of 8.5" of clearance in order to install the Driver Pod

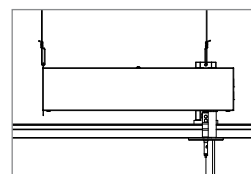
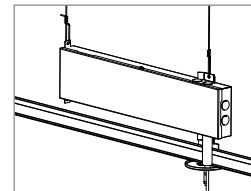
Open Structure (R3)



Max dimensions of box
(including decorative cover plate):
22"x6"x1.88"

R3 Open Structure Driver Pods can be painted to match luminaire or any other color on request

T-Grid (R5 & R6)



Max dimensions of box:
20.5"x4.5"x1.75"
R6-1 mount shown

Note: Due to EyeLine's design where the mount points on the modules ends are inset 6", a mix of R5 (off-grid) and R6 (on-grid) mounts may be required when mounting EyeLine perpendicular to the grid system.

EyeLine linear suspended

Specifications

Optical System

The optical system contains arrays of LEDs edge-lighting a low-profile light-guide panel, using total internal reflection to homogenize the sources. The microstructure surface of the light-guide optimizes light extraction to create an efficacious direct/indirect distribution. Light is purified and controlled by MesoOptics as it is extracted from the light-guide to give a wide and low glare distribution. Standard distribution is 65% up / 35% down for both suspended and wall versions. Factory or field installable variable optics kits are available to modify the distribution to 80% down or close to 100% down light.

Construction

Housing:

Architectural grade extruded aluminum rails.

Endcaps:

Die-cast aluminum pre-installed endcaps

Luminaire Weight:

Maximum 9.6lbs/4ft

Finish Options

Standard powder coat finish options: white, black, gray. Standard high gloss finish option: red. Luminaires painted in finishes other than standard white result in up to 8% drop in light flux and efficacy.

Standard Drivers

- Advance Xitanium 0-10V, 1-100%.
- Advance Xitanium SR, 5-100% (SpaceWise DT, Interact Pro or Interact Office Wireless)
- Advance Xitanium DALI, 5-100%.
- Lutron EcoSystem LDE1, 1-100% with Soft-on, Fade-to-Black
- Constant Current Class 2 rated output. Consult Ledalite for other available drivers.
- Power Factor: >0.90
- Total Harmonic Distortion: <20%

Standard Battery Pack

Bodine, 90 min, 10W, Class 2 rated output, located in the remotely mounted Driver Pod (T-Grid and Open Structure ceilings only)
Emergency lumen output = 10W x luminaire efficacy x 1.1. Typical output: 1300lm

Lumen Maintenance

LEDs have been tested by the manufacturer in accordance with IESNA LM-80-15. At an ambient temperature of 25°C, the LED lumen maintenance expectation according to IES TM-21-11 is:
 L_{80} (10K) > 60,000 hours (reported methodology).

Source Color

LEDs rated for color rendering of:

- CRI \geq 80, $R_g \geq 0$
- CRI \geq 90, $R_g \geq 50$
IES TM-30-18 : $R_f \geq 90$, $R_g \geq 99$, $R_{cs,ht} \geq -6\%$
- SPD and TM-30-18 reports available upon request
- Fixture to fixture color accuracy within: 2 SDCM for Static White luminaires

Electrical

LED boards are field replaceable. Fixtures are factory pre-wired to section ends and joints with low voltage class 2 wiring. Designed to be used with remotely mounted Driver Pods, provided by Ledalite. Driver Pods are connected to building mains in the ceiling and low voltage wires provide power between luminaires and Driver Pods per factory provided drawings. Due to the nature of low voltage wiring, EyeLine can lose up to 4% efficacy with a 20ft power cable which connects the EyeLine fixture to the Driver Pod.

Joint

Self-aligning joining system with easy plug and play installation with 4ft modules. All individual 4ft modules are joined together onsite using the simple joining connections outlined in installation instructions.

Mounting

Aircraft cable: pre-installed at power cord locations, provided separate for non-power locations. Easy cable cinch & cut at ceiling level

Power and non-power canopies standard finish is white, R1 (Drywall) & R3 (Open Structure) canopies available in custom finish.

Approvals

Certified to UL, CSA and IES standards
Available with CCEA Chicago Plenum approved Driver Pods. DesignLights Consortium®.

Environment

Luminaires and Driver Pods suitable for dry or damp locations in operating ambient temperatures 0-40°C (32-104°F). T-Grid and Drywall mounted recessed Driver Pods not suitable for contact with insulation (NON-IC rated) Certain luminaire components may be adversely affected by contaminants. Damage caused by sulfur, chlorine, petroleum based solutions or other contaminants are not covered under warranty. Not suitable for natatorium environments.

Warranty

Five-year luminaire limited warranty including LED boards and driver pods.
www.signify.com/warranties

Standalone Controls

SpaceWise DT:

Available with SpaceWise DT Daylight & Occupancy sensing with advanced grouping & dwell time.

Dimming with compatible Zigbee wireless wall switches.

www.usa.lighting.philips.com/systems/lighting-systems/spacewise

EyeLine linear suspended

Photometrics

65% Up / 35% Down Nominal Distribution (QN Optics)

(Click "PDF", "IES", or "RFA" text to Download)

Lumen Package (per 4ft)	Nominal CRI & CCT	Flux ¹ (lm)	Watts ¹ (W)	Efficacy ¹ (lm/W)	CIE 013.3-1995 ²		IES TM-30-18 ³			MDER ⁴	UGR ⁵	WELL ⁶	DLC (120/227) ⁷	Photometry Report	IES File	Revit/BIM
					CRI R _a	R _g	R _r	R _g	R _{ca,ht}							
6800lm	CRI 90, 5000K	6498	53.1	122.4	93	67	90	100	-5%	0.88	13.4	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	6351	53.3	119.2	93	64	91	99	-5%	0.71	13.4			PDF	IES	
	CRI 90, 3500K	6157	53.1	116.0	93	60	91	100	-6%	0.63	13.3			PDF	IES	
	CRI 90, 3000K	5881	53.3	110.3	94	58	91	100	-5%	0.55	13.1			PDF	IES	
	CRI 90, 2700K	5792	53.1	109.1	94	54	92	100	-6%	0.48	13.0			PDF	IES	
4800lm	CRI 90, 5000K	4414	35.9	123.0	93	67	90	100	-5%	0.88	12.1	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	4314	35.9	120.2	93	64	91	99	-5%	0.71	12.0			PDF	IES	
	CRI 90, 3500K	4182	35.9	116.5	93	60	91	100	-6%	0.63	11.9			PDF	IES	
	CRI 90, 3000K	3994	35.9	111.3	94	58	91	100	-5%	0.55	11.8			PDF	IES	
	CRI 90, 2700K	3934	35.9	109.6	94	54	92	100	-6%	0.48	11.7			PDF	IES	
3400lm	CRI 90, 5000K	3122	25.0	124.9	93	67	90	100	-5%	0.88	10.9	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	3051	25.0	122.0	93	64	91	99	-5%	0.71	10.8			PDF	IES	
	CRI 90, 3500K	2958	25.0	118.3	93	60	91	100	-6%	0.63	10.7			PDF	IES	
	CRI 90, 3000K	2825	25.0	113.0	94	58	91	100	-5%	0.55	10.5			PDF	IES	
	CRI 90, 2700K	2782	25.0	111.3	94	54	92	100	-6%	0.48	10.5			PDF	IES	

¹ 4ft Luminaire photometry has been conducted in accordance with IES LM-79-08. IES files can be downloaded by clicking the links in the table above, or online at ledalite.com. Luminaires painted in finishes other than standard white result in an up to 8% drop in light flux and efficacy.

² Color Rendering Index (CRI R_a) and Strong Red (R_g) are calculated in accordance with CIE 013.3-1995.

³ Fidelity Index (R_r), Gamut Index (R_g), and Red Local Chroma Shift (R_{ca,ht}) are calculated in accordance with IES TM-30-18.

⁴ Melanopic Daylight Efficacy Ratio (MDER) is the measure for "spectral melanopic efficiency" as defined in CIE S 026-2018.

⁵ Unified Glare Ratio (UGR) is calculated in accordance with CIE 117-1995. Reference conditions of 4Hx8Hx1H and reflectances of 70/50/20% have been applied using the procedure described in CIE 190-2010.

⁶ The WELL Building Standard® is the first standard to integrate human health and wellness into the design, construction, maintenance and operations of buildings. Select EyeLine configurations contribute toward satisfying features L03, L04, L06, L07 and L08 under the WELL v2 Building Standard®.

⁷ DLC is only available for configurations with a standard white finish. For 347V DLC listings, please visit the DLC QPL website. Battery Packs are not available for DLC listed versions.

	CANDELA DISTRIBUTION					Flux Lumens
	0	22.5	45	67.5	90	
0	268	268	268	268	268	
5	275	277	279	288	285	28
15	302	317	342	381	383	99
25	318	340	404	475	503	185
35	248	258	332	383	435	204
45	175	177	208	229	256	163
55	142	141	152	155	166	136
65	118	112	114	111	118	113
75	79	73	74	67	71	76
85	27	20	25	24	28	32
90	13	18	31	51	60	
95	97	94	174	258	346	196
105	216	245	394	545	651	418
115	257	299	427	603	672	439
125	235	269	348	473	506	328
135	206	225	267	326	339	214
145	198	206	226	251	257	145
155	206	209	219	229	232	102
165	217	218	222	224	226	63
175	223	223	224	224	224	21
180	224	224	224	224	224	

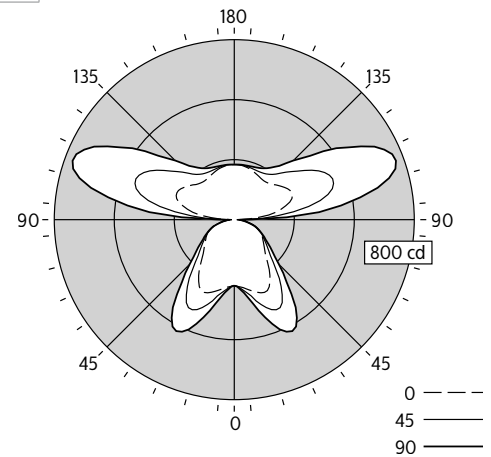
*Photometric data shown is for 3400lm/4ft, CRI 90, 3500K configuration.

Pc---	COEFFICIENTS OF UTILIZATION (%)											
	80				70				50			
Pw---	70	50	30	10	70	50	30	50	30	10	0	0
RCR	0	104	104	104	104	94	94	94	75	75	75	35
	1	94	90	86	83	85	81	78	65	63	61	29
	2	86	78	72	67	77	71	66	57	54	50	24
	3	78	69	62	56	70	63	56	50	46	42	21
	4	72	61	53	47	64	55	49	45	40	36	18
	5	66	54	46	41	59	49	42	40	35	31	15
	6	60	49	41	35	54	44	37	36	31	27	14
	7	56	44	36	31	50	40	33	33	28	24	12
	8	52	40	32	27	47	36	30	30	25	21	11
	9	48	36	29	24	43	33	27	27	22	19	10
	10	45	33	26	21	40	30	24	25	20	17	9

ZONAL LUMEN SUMMARY			
Zone	Lumens	%Fixture	%Lamp
0-30	312	10.5%	10.5%
0-40	515	17.4%	17.4%
0-60	814	27.5%	27.5%
0-90	1034	35.0%	35.0%
90-130	1380	46.7%	46.7%
90-150	1738	58.8%	58.8%
90-180	1924	65.0%	65.0%
0-180	2958	100.0%	100.0%

ELECTRICAL					
120V: P(W), I(A), THD(%), PF	25.0	0.210	9.0	0.993	
277V: P(W), I(A), THD(%), PF	25.0	0.096	14.5	0.944	
347V: P(W), I(A), THD(%), PF	24.8	0.075	13.0	0.957	

	AVG LUMINANCE (cd/m ²)		
	0	45	90
0	779	779	779
5	800	814	830
15	906	1024	1145
25	1018	1284	1595
35	875	1162	1520
45	715	839	1030
55	712	751	817
65	802	752	774
75	870	774	741
85	854	684	762



65% Up / 35% Down

EyeLine linear suspended

Photometrics

20% Up / 80% Down Nominal Distribution (QG Optics)

(Click "PDF", "IES", or "RFA" text to Download)

Lumen Package (per 4ft)	Nominal CRI & CCT	Flux ¹ (lm)	Watts ¹ (W)	Efficacy ¹ (lm/W)	CIE 013.3-1995 ²		IES TM-30-18 ³			MDER ⁴	UGR ⁵	WELL ⁶	DLC (120/227) ⁷	Photometry Report	IES File	Revit/BIM
					CRI R _a	R _g	R _r	R _g	R _{ca,ht}							
6800lm	CRI 90, 5000K	6035	53.1	113.7	93	67	90	100	-5%	0.88	19.9	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	5920	53.4	110.9	93	62	91	99	-5%	0.70	19.9		Standard	PDF	IES	
	CRI 90, 3500K	5698	53.2	107.1	93	59	91	100	-6%	0.62	19.7		N/A	PDF	IES	
	CRI 90, 3000K	5470	53.4	102.4	94	57	91	100	-5%	0.55	19.6		N/A	PDF	IES	
	CRI 90, 2700K	5398	53.1	101.7	93	54	92	99	-6%	0.48	19.6		N/A	PDF	IES	
4800lm	CRI 90, 5000K	4099	35.9	114.2	93	67	90	100	-5%	0.88	18.6	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	4021	35.9	112.0	93	62	91	99	-5%	0.70	18.5		Standard	PDF	IES	
	CRI 90, 3500K	3870	35.9	107.8	93	59	91	100	-6%	0.62	18.4		N/A	PDF	IES	
	CRI 90, 3000K	3715	35.9	103.5	94	57	91	100	-5%	0.55	18.3		N/A	PDF	IES	
	CRI 90, 2700K	3666	35.9	102.1	93	54	92	99	-6%	0.48	18.2		N/A	PDF	IES	
3400lm	CRI 90, 5000K	2899	25.0	116.0	93	67	90	100	-5%	0.88	17.4	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	2844	25.0	113.8	93	62	91	99	-5%	0.70	17.3		Standard	PDF	IES	
	CRI 90, 3500K	2737	25.0	109.5	93	59	91	100	-6%	0.62	17.2		N/A	PDF	IES	
	CRI 90, 3000K	2628	25.0	105.1	94	57	91	100	-5%	0.55	17.1		N/A	PDF	IES	
	CRI 90, 2700K	2593	25.0	103.7	93	54	92	99	-6%	0.48	17.0		N/A	PDF	IES	

¹ 4ft Luminaire photometry has been conducted in accordance with IES LM-79-08. IES files can be downloaded by clicking the links in the table above, or online at ledalite.com. Luminaires painted in finishes other than standard white result in an up to 8% drop in light flux and efficacy.

² Color Rendering Index (CRI R_a) and Strong Red (R_g) are calculated in accordance with CIE 013.3-1995.

³ Fidelity Index (R_r), Gamut Index (R_g), and Red Local Chroma Shift (R_{ca,ht}) are calculated in accordance with IES TM-30-18.

⁴ Melanopic Daylight Efficacy Ratio (MDER) is the measure for "spectral melanopic efficiency" as defined in CIE S 026-2018.

⁵ Unified Glare Ratio (UGR) is calculated in accordance with CIE 117-1995. Reference conditions of 4Hx8Hx1H and reflectances of 70/50/20% have been applied using the procedure described in CIE 190-2010.

⁶ The WELL Building Standard® is the first standard to integrate human health and wellness into the design, construction, maintenance and operations of buildings. Select EyeLine configurations contribute toward satisfying features L03, L04, L06, L07 and L08 under the WELL v2 Building Standard®.

⁷ DLC is only available for configurations with a standard white finish. For 347V DLC listings, please visit the DLC QPL website. Battery Packs are not available for DLC listed versions.

	CANDELA DISTRIBUTION					Flux Lumens
	0	22.5	45	67.5	90	
0	700	700	700	700	700	
5	707	712	717	730	719	70
15	738	761	797	855	863	229
25	726	748	850	944	991	386
35	542	543	664	728	803	405
45	372	378	427	449	485	328
55	303	298	313	314	334	279
65	244	237	240	230	246	235
75	161	148	152	141	149	157
85	51	39	46	42	50	53
90	7	7	13	16	18	
95	23	14	17	15	17	21
105	78	67	75	74	85	77
115	108	111	127	146	158	126
125	108	116	131	152	160	119
135	102	107	118	132	135	92
145	100	102	109	118	120	69
155	104	104	108	113	114	50
165	108	108	110	111	112	31
175	110	110	111	111	111	11
180	111	111	111	111	111	

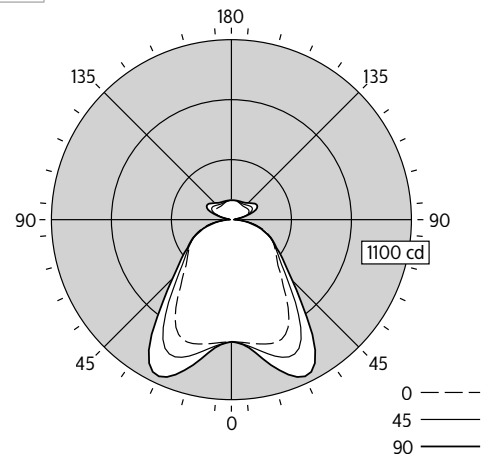
*Photometric data shown is for 3400lm/4ft, CRI 90, 3500K configuration.

Pc---	COEFFICIENTS OF UTILIZATION (%)											
	80				70				50			
Pw---	70	50	30	10	70	50	30	50	30	10	0	0
RCR	0	114	114	114	114	109	109	109	99	99	99	78
	1	104	99	95	91	99	95	91	87	84	81	66
	2	95	87	80	75	90	83	77	76	72	68	55
	3	87	77	69	63	82	74	67	67	62	57	47
	4	80	68	60	54	76	65	58	60	54	49	41
	5	73	61	53	46	70	59	51	54	48	43	35
	6	68	55	47	41	65	53	45	49	43	38	31
	7	63	50	42	36	60	48	41	45	38	33	28
	8	59	46	38	32	56	44	37	41	35	30	25
	9	55	42	34	29	52	41	33	38	32	27	23
	10	51	39	31	26	49	37	30	35	29	25	21

ZONAL LUMEN SUMMARY			
Zone	Lumens	%Fixture	%Lamp
0-30	684	25.0%	25.0%
0-40	1090	39.8%	39.8%
0-60	1697	62.0%	62.0%
0-90	2141	78.2%	78.2%
90-130	342	12.5%	12.5%
90-150	504	18.4%	18.4%
90-180	596	21.8%	21.8%
0-180	2737	100.0%	100.0%

Electrical				
120V: P(W), I(A), THD(%), PF	25.0	0.210	9.0	0.993
277V: P(W), I(A), THD(%), PF	25.0	0.096	14.5	0.944
347V: P(W), I(A), THD(%), PF	24.8	0.075	13.0	0.957

	AVG LUMINANCE (cd/m ²)		
	0	45	90
0	2034	2034	2034
5	2060	2086	2093
15	2217	2384	2582
25	2320	2702	3147
35	1914	2324	2807
45	1522	1723	1952
55	1524	1542	1642
65	1657	1584	1617
75	1768	1598	1547
85	1610	1264	1338



22% Up / 78% Down

EyeLine linear suspended

Photometrics

100% Down Nominal Distribution (QJ Optics)

(Click "PDF", "IES", or "RFA" text to Download)

Lumen Package (per 4ft)	Nominal CRI & CCT	Flux ¹ (lm)	Watts ¹ (W)	Efficacy ¹ (lm/W)	CIE 013.3-1995 ²		IES TM-30-18 ³			MDER ⁴	UGR ⁵	WELL ⁶	DLC (120/227) ⁷	Photometry Report	IES File	Revit/BIM
					CRI R _a	R _g	R _r	R _g	R _{ca,ht}							
6800lm	CRI 90, 5000K	6082	53.2	114.3	93	64	90	99	-5%	0.86	22.3	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	5887	53.4	110.2	93	62	91	99	-5%	0.70	22.2		Standard	PDF	IES	
	CRI 90, 3500K	5698	53.2	107.1	93	58	91	99	-6%	0.62	22.1		N/A	PDF	IES	
	CRI 90, 3000K	5465	53.4	102.3	94	57	91	100	-5%	0.54	21.9		N/A	PDF	IES	
	CRI 90, 2700K	5380	53.1	101.3	93	53	92	99	-6%	0.48	21.9		N/A	PDF	IES	
4800lm	CRI 90, 5000K	4131	35.9	115.1	93	64	90	99	-5%	0.86	21.0	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	3998	35.9	111.4	93	62	91	99	-5%	0.70	20.8		Standard	PDF	IES	
	CRI 90, 3500K	3870	35.9	107.8	93	58	91	99	-6%	0.62	20.7		N/A	PDF	IES	
	CRI 90, 3000K	3712	35.9	103.4	94	57	91	100	-5%	0.54	20.6		N/A	PDF	IES	
	CRI 90, 2700K	3654	35.9	101.8	93	53	92	99	-6%	0.48	20.5		N/A	PDF	IES	
3400lm	CRI 90, 5000K	2927	24.9	117.6	93	64	90	99	-5%	0.86	19.8	Yes	Standard	PDF	IES	RFA
	CRI 90, 4000K	2833	24.9	113.8	93	62	91	99	-5%	0.70	19.6		Standard	PDF	IES	
	CRI 90, 3500K	2742	24.9	110.1	93	58	91	99	-6%	0.62	19.5		N/A	PDF	IES	
	CRI 90, 3000K	2630	24.9	105.6	94	57	91	100	-5%	0.54	19.4		N/A	PDF	IES	
	CRI 90, 2700K	2589	24.9	104.0	93	53	92	99	-6%	0.48	19.3		N/A	PDF	IES	

¹ 4ft Luminaire photometry has been conducted in accordance with IES LM-79-08. IES files can be downloaded by clicking the links in the table above, or online at ledalite.com. Luminaires painted in finishes other than standard white result in an up to 8% drop in light flux and efficacy.

² Color Rendering Index (CRI R_a) and Strong Red (R_g) are calculated in accordance with CIE 013.3-1995.

³ Fidelity Index (R_r), Gamut Index (R_g), and Red Local Chroma Shift (R_{ca,ht}) are calculated in accordance with IES TM-30-18.

⁴ Melanopic Daylight Efficacy Ratio (MDER) is the measure for "spectral melanopic efficiency" as defined in CIE S 026-2018.

⁵ Unified Glare Ratio (UGR) is calculated in accordance with CIE 117-1995. Reference conditions of 4Hx8Hx1H and reflectances of 70/50/20% have been applied using the procedure described in CIE 190-2010.

⁶ The WELL Building Standard® is the first standard to integrate human health and wellness into the design, construction, maintenance and operations of buildings. Select EyeLine configurations contribute toward satisfying features L03, L04, L06, L07 and L08 under the WELL v2 Building Standard®.

⁷ DLC is only available for configurations with a standard white finish. For 347V DLC listings, please visit the DLC QPL website. Battery Packs are not available for DLC listed versions.

CANDELA DISTRIBUTION					Flux Lumens
	0	22.5	45	67.5	
0	932	932	932	932	932
5	939	944	949	962	959
15	970	993	1036	1101	1114
25	937	958	1082	1185	1237
35	677	672	823	901	984
45	476	470	531	543	603
55	383	380	394	395	414
65	309	301	303	293	303
75	211	189	195	177	185
85	68	52	62	50	62
90	2	6	11	13	14
95	3	3	3	4	4
105	3	5	7	9	9
115	3	5	7	9	10
125	3	5	7	9	10
135	3	4	7	9	10
145	4	5	6	9	10
155	5	5	7	8	9
165	6	6	7	8	8
175	7	7	7	7	7
180	7	7	7	7	7

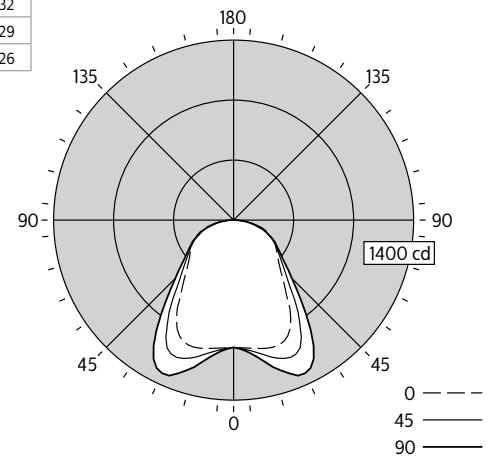
*Photometric data shown is for 3400lm/4ft, CRI 90, 3500K configuration.

COEFFICIENTS OF UTILIZATION (%)													
Pc---	80				70				50				0
Pw---	70	50	30	10	70	50	30	50	30	10	0	0	
RCR													
0	119	119	119	119	116	116	116	110	110	110	99		
1	108	104	99	96	106	101	97	97	94	91	83		
2	99	91	84	79	96	89	83	85	80	75	69		
3	91	80	72	66	88	79	71	75	69	64	59		
4	83	72	63	57	81	70	62	68	61	55	51		
5	77	64	56	49	75	63	55	61	54	48	45		
6	71	58	50	43	69	57	49	55	48	43	40		
7	66	53	45	39	65	52	44	51	43	38	35		
8	62	49	40	35	60	48	40	47	39	34	32		
9	58	45	37	31	56	44	37	43	36	31	29		
10	54	42	34	29	53	41	34	40	33	28	26		

ZONAL LUMEN SUMMARY			
Zone	Lumens	%Fixture	%Lamp
0-30	877	32.0%	32.0%
0-40	1380	50.3%	50.3%
0-60	2141	78.1%	78.1%
0-90	2702	98.5%	98.5%
90-130	25	0.9%	0.9%
90-150	35	1.3%	1.3%
90-180	40	1.5%	1.5%
0-180	2742	100.0%	100.0%

Electrical				
120V: P(W), I(A), THD(%), PF	24.9	0.209	9.0	0.993
277V: P(W), I(A), THD(%), PF	25.0	0.096	14.5	0.944
347V: P(W), I(A), THD(%), PF	24.8	0.075	13.0	0.957

AVG LUMINANCE (cd/m ²)			
	0	45	90
0	2708	2708	2708
5	2738	2763	2793
15	2914	3101	3331
25	2996	3437	3927
35	2394	2880	3439
45	1946	2143	2426
55	1928	1946	2036
65	2101	2005	1992
75	2328	2047	1920
85	2149	1712	1654



1% Up / 99% Down

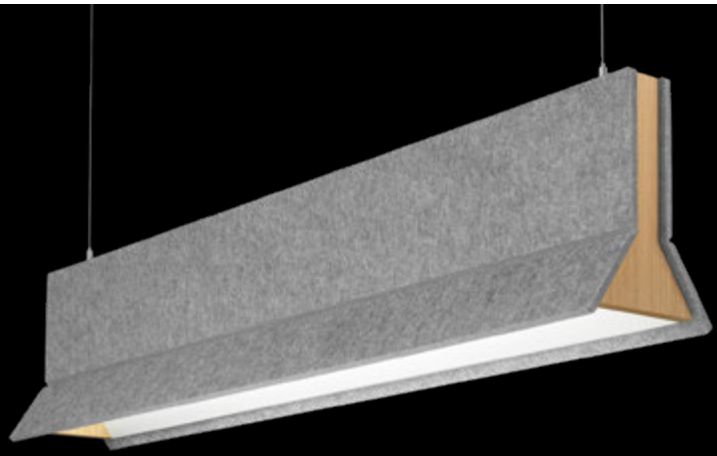


Eave™

ACOUSTIC PENDANT



FOCAL POINT®



White Oak Canopy



White Oak End Cap



Amber Oak Canopy



Amber Oak End Cap

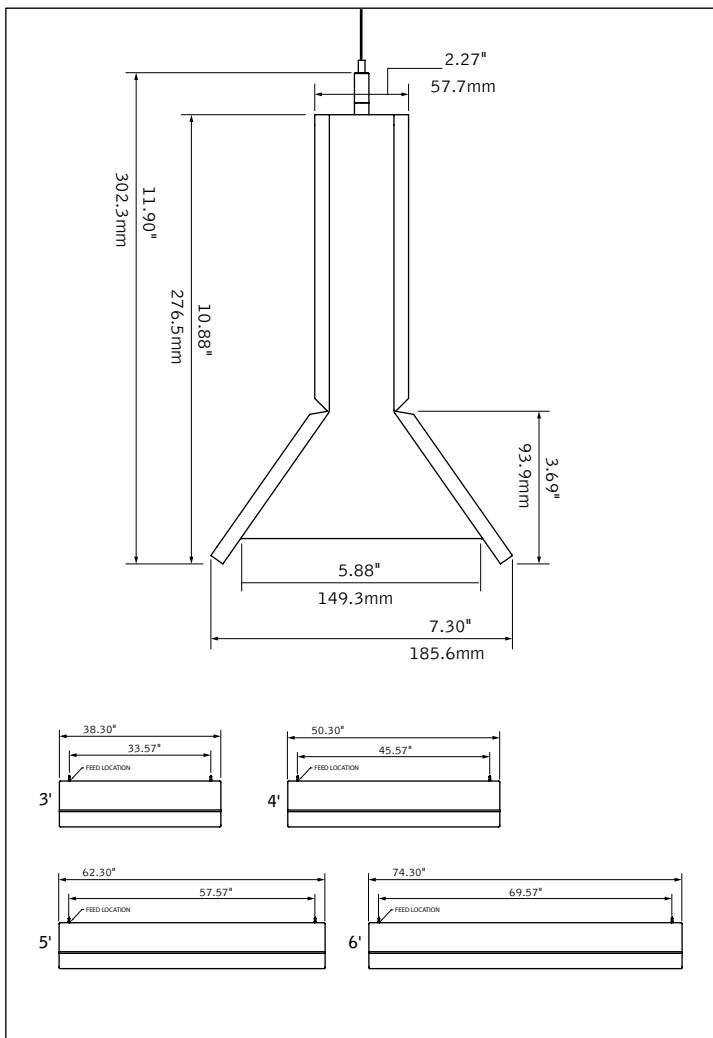


Espresso Oak Canopy



Espresso Oak End Cap

DIMENSIONAL DATA



FEATURES

Nominal 11" height decorative PET felt pendant with wood end caps.

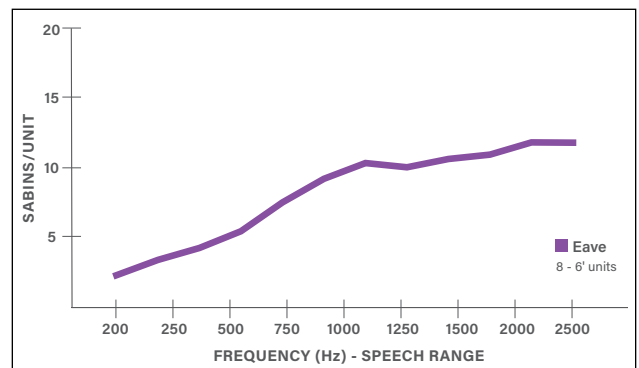
Available in 3', 4', 5' and 6' lengths.

Direct only or independently controlled Indirect/Direct distributions (3' direct only).

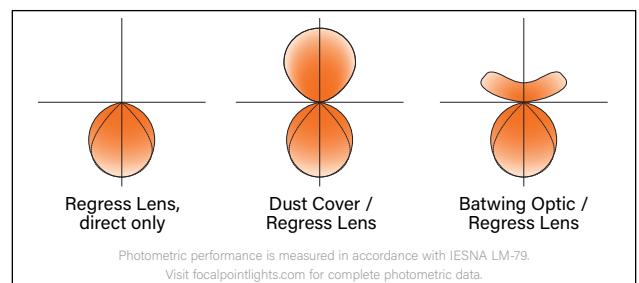
AirCore™ Technology: patent pending, eco-friendly technology that maximizes sound absorption and reduces ecological impact.

Excellent companion to Seem 1 Acoustic and Seem 1 Acoustic Trio with matching baffle width.

ACOUSTIC PERFORMANCE

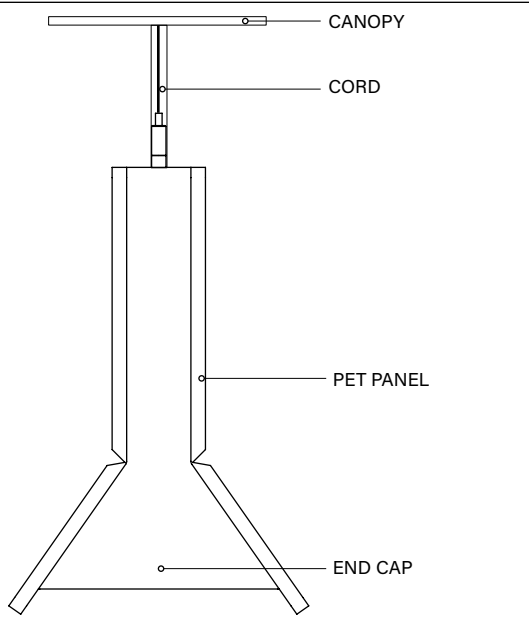


DISTRIBUTIONS



Decorative Finishes

Finish Diagram



End Cap & Canopy Finishes†



Canopy only Finishes



Cord Material



PET Material*

STANDARD COLORS



PREMIUM COLORS**



Declare.

9mm PET Felt Focal Point, LLC

Final Assembly: Chicago, Illinois, USA
Life Expectancy: 30 Years
End of Life Options: Salvageable/Reusable in its Entirety, Recyclable (100%)

Ingredients:

PET; Octadecanamide, N,N'-1,2-ethanediybis; Stearic Acid; Benzenamine, 4-(1-methyl-1-phenylethyl)-N-[4-(1-methyl-1-phenylethyl)phenyl]-; Benzenepranoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, octadecyl ester; Titanium dioxide

Living Building Challenge Criteria: Compliant

I-13 Red List:

LBC Red List Free % Disclosed: 100% at 100ppm
 LBC Red List Approved VOC Content: Not Applicable
 Declared

I-10 Interior Performance: CDPH Standard Method v1.1-2010
I-14 Responsible Sourcing: Not Applicable

FPL-0001
EXP: 01 FEB 2022
Original Issue Date: 2020

MANUFACTURER RESPONSIBLE FOR LABEL ACCURACY
INTERNATIONAL LIVING FUTURE INSTITUTE™ living-future.org/declare

†Slight variations in color and grain are inherent to the nature of real wood products and should be expected.

*Slight variations in the color of the PET felt should be expected as a result of the manufacturing process. **Contact factory for lead time and pricing.

4' DIRECT/INDIRECT PERFORMANCE CHART



**Dust Cover
Regress Lens**



**Batwing Optic
Regress Lens**

Direct Distribution	Indirect Distribution	Distribution % (Direct/Indirect)	Total Delivered Lumens	Tested System Watts	LPW	Total Delivered Lumens	Tested System Watts	LPW
200DN	125UP	62/38	1388	18	75	1376	18	74
	250UP	44/56	1728	20	87	1728	20	87
	375UP	35/65	2257	23	97	2224	23	96
	500UP	29/71	2750	27	104	2706	27	102
	625UP	24/76	3240	30	108	3184	30	106
	800UP	20/80	3912	35	110	3841	35	108
300DN	125UP	71/29	1789	23	77	1776	23	77
	250UP	55/45	2128	25	87	2128	25	87
	375UP	44/56	2657	28	95	2624	28	94
	500UP	38/62	3151	31	101	3106	31	99
	625UP	32/68	3640	35	105	3584	35	104
	800UP	27/73	4312	40	107	4241	40	106
400DN	125UP	76/24	2196	28	78	2183	28	78
	250UP	62/38	2535	29	86	2535	29	86
	375UP	52/48	3064	33	94	3031	33	93
	500UP	44/56	3557	36	99	3513	36	97
	625UP	39/61	4047	39	103	3991	39	101
	800UP	33/67	4719	45	105	4648	45	103
500DN	125UP	80/20	2652	34	79	2639	34	79
	250UP	67/33	2992	35	86	2992	35	86
	375UP	57/43	3520	38	92	3487	38	91
	500UP	50/50	4014	42	96	3970	42	95
	625UP	44/56	4503	45	100	4448	45	99
	800UP	38/62	5175	51	102	5104	51	101
600DN	125UP	80/20	2988	39	76	2976	39	76
	250UP	67/33	3328	41	82	3328	41	82
	375UP	57/43	3857	44	88	3824	44	87
	500UP	50/50	4350	47	92	4306	47	91
	625UP	44/56	4840	51	96	4784	51	95
	800UP	38/62	5512	56	98	5441	56	97
700DN	125UP	80/20	3388	44	76	3376	44	76
	250UP	67/33	3728	46	81	3728	46	81
	375UP	57/43	4257	49	87	4223	49	86
	500UP	50/50	4750	52	91	4706	52	90
	625UP	44/56	5239	56	94	5184	56	93
	800UP	38/62	5912	61	96	5841	61	95

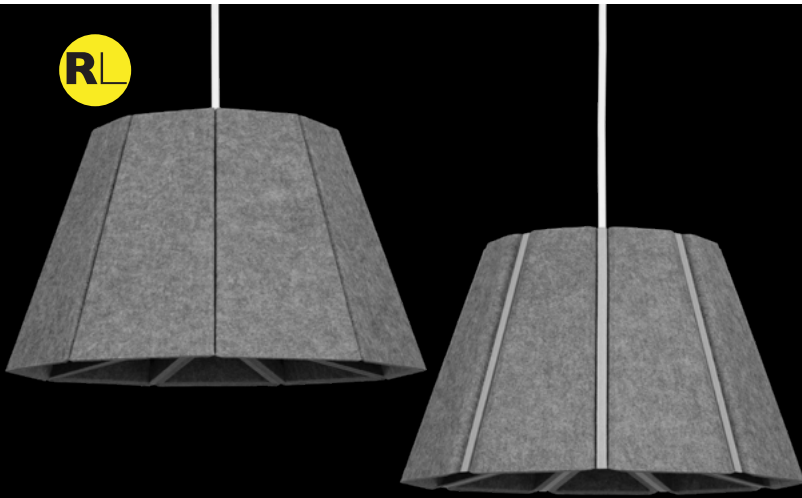
*Based on 3500k, 80CRI, 4' lengths. Lumen multipliers: Dust Cover Top = 1.23, 90 CRI = 0.87. Lumen output may vary +/- 5%. Actual wattage may vary +/- 5%.

Blume™ 4

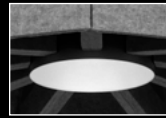
DECORATIVE LED PENDANT



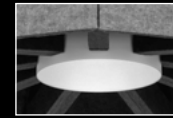
FOCAL POINT®



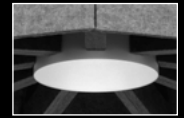
100's of customizable color combinations



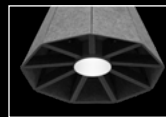
Black trim detail



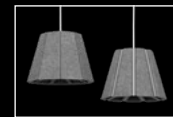
White trim detail



Palladium Silver trim detail



Solid shade detail from below



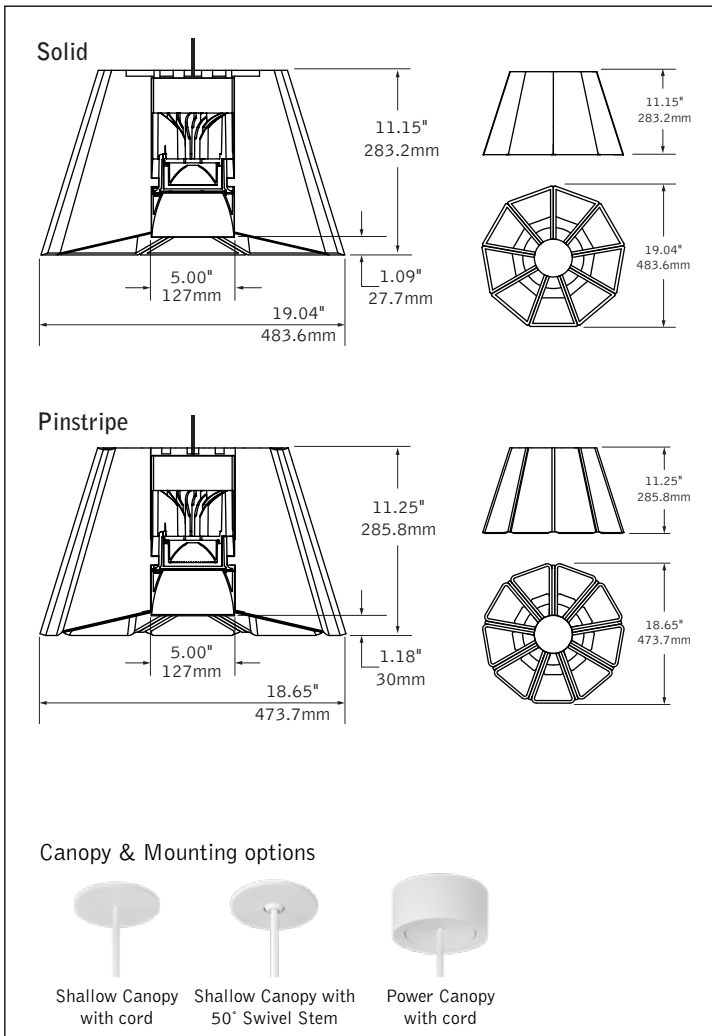
Blume 3 companions



Cylinder companions



DIMENSIONAL DATA (continued on page 4)



FEATURES

Nominal 19" diameter decorative PET felt shaded pendant.

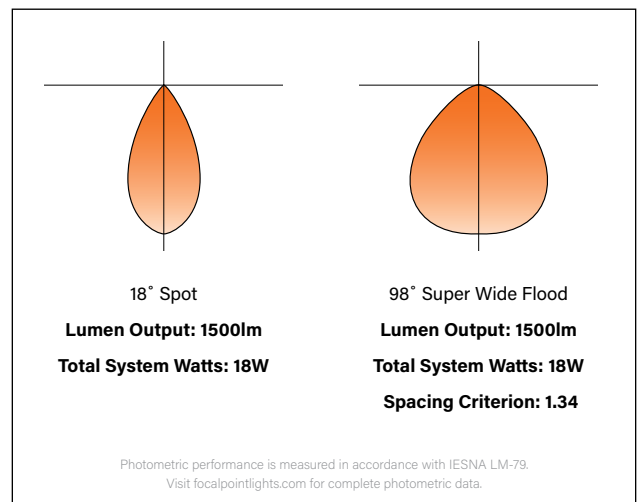
Wide range of color options provides design flexibility and personalization for any project.

Optional Pinstripe detail may be specified in any of the available colors.

50° cut-off available with Solite lens for brightness control and visual comfort.

50° and 80° cut-off available for optimal visual comfort.

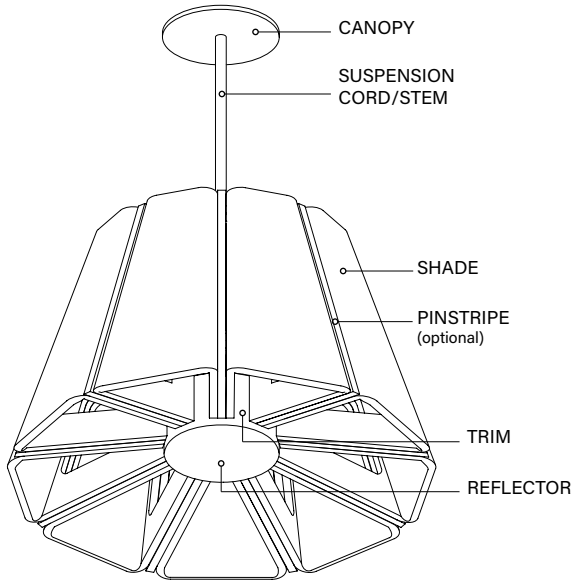
PERFORMANCE



Decorative Finishes



Finish Diagram



Canopy/Stem/Trim Paint Finishes



Cord Colors



PET Material

STANDARD COLORS



PREMIUM COLORS*



Declare.

9mm PET Felt
Focal Point, LLC

Final Assembly: Chicago, Illinois, USA
Life Expectancy: 30 Years
End of Life Options: Salvageable/Reusable in its Entirety, Recyclable (100%)

Ingredients:

PET; Octadecanamide, N,N'-1,2-ethanediybis; Stearic Acid; Benzenamine, 4-(1-methyl-1-phenylethyl)-N-[4-(1-methyl-1-phenylethyl)phenyl]; Benzenepranoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, octadecyl ester; Titanium dioxide

Living Building Challenge Criteria: Compliant

I-13 Red List:

- LBC Red List Free
- LBC Red List Approved
- Declared

% Disclosed: 100% at 100ppm
VOC Content: Not Applicable

I-10 Interior Performance: CDPH Standard Method v1.1-2010

I-14 Responsible Sourcing: Not Applicable

FPL-0001
EXP: 01 FEB 2022
Original Issue Date: 2020

MANUFACTURED RESPONSIBLY FOR LABEL ACCURACY
INTERNATIONAL LIVING FUTURE INSTITUTE™ living-future.org/declare

*Contact factory for lead time and pricing.

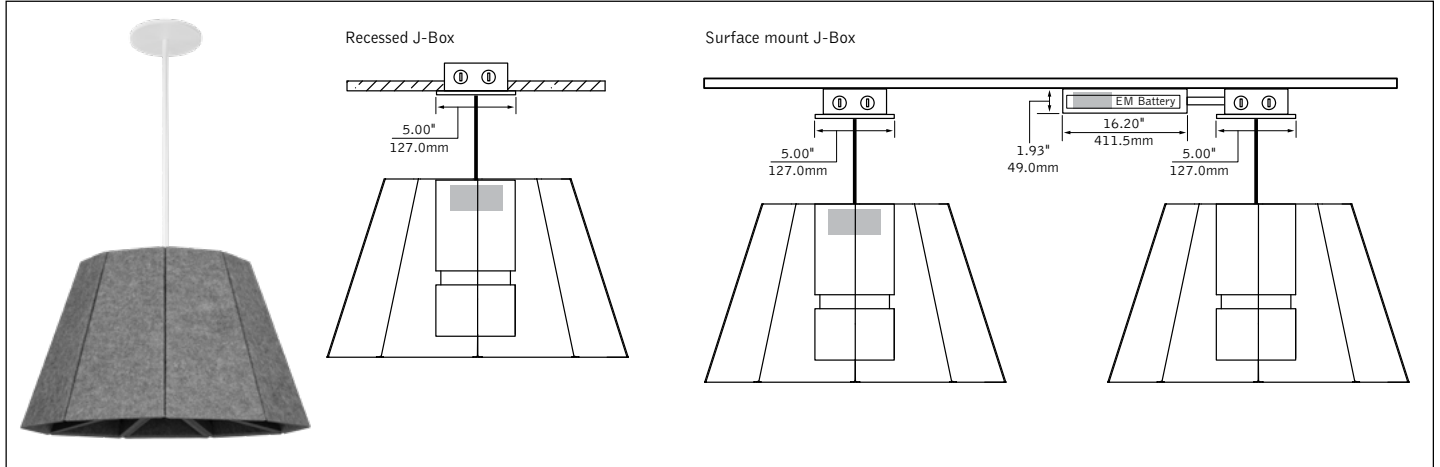
Blume™ 4

DECORATIVE LED PENDANT

DIMENSIONAL DATA CONTINUED

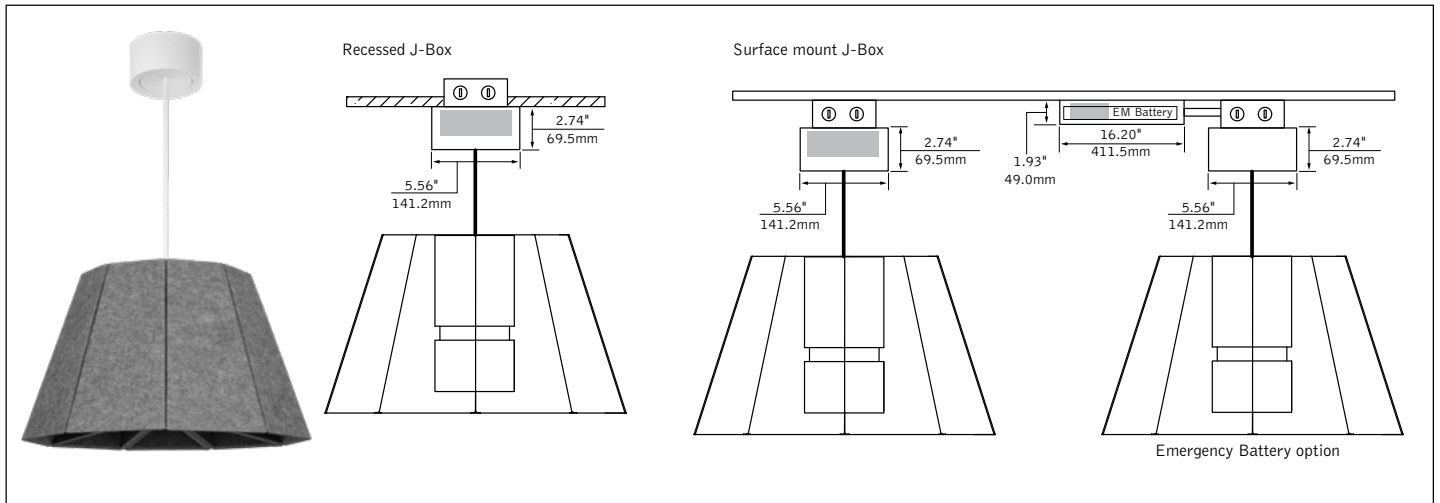
SC - Shallow Canopy (Integral driver)

 Indicates Driver Location

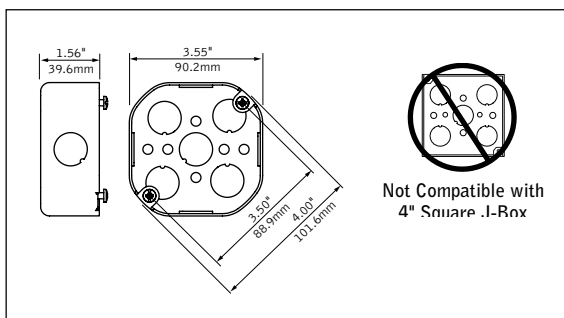


PC - Power Canopy

 Indicates Driver Location



4" Octagonal J-box required (By others)



Blume™ 4

DECORATIVE LED PENDANT

LUMEN MULTIPLIER TABLE

Color Temperature & CRI

Trim Type	Optic	Color Temperature	Multiplier
Round [RD]	ALL	2700K, 80+ CRI [27K]	0.93
		2700K, 90+ CRI [927K]	0.78
		3000K, 80+ CRI [30K]	0.97
		3000K, 90+ CRI [930K]	0.81
		3500K, 80+ CRI [35K]	1.00
		3500K, 90+ CRI [935K]	0.83
		4000K, 80+ CRI [40K]	1.01
		4000K, 90+ CRI [940K]	0.86

Optic & Distribution (1000L - 1500L)

Trim Type	Optic	Distribution	Multiplier
Round [RD]	Tall Cone, 50° cut-off [DNT]	Spot (18°) [SPL]	1.00
		Narrow Flood (27°) [NFL]	0.97
		Flood (35°) [FL]	0.93
		Wide Flood (54°) [WFL]	1.00
		Very Wide Flood (69°) [VWFL]	0.93
	Tall Cone, 50° cut-off with Solite Lens [DNLS]	Narrow Flood (27°) [NFL]	1.00
	Super Short Cone, 80° cut-off [DSS]	Super Wide Flood (98°) [SWFL]	0.85

Optic & Distribution (2000L - 3000L)

Trim Type	Optic	Distribution	Multiplier
Round [RD]	Tall Cone, 50° cut-off [DNT]	Narrow Flood (26°) [NFL]	0.98
		Flood (41°) [FL]	0.92
		Wide Flood (56°) [WFL]	1.00
		Very Wide Flood (69°) [VWFL]	0.89
	Tall Cone, 50° cut-off with Solite Lens [DNLS]	Narrow Flood (26°) [NFL]	1.11
	Super Short Cone, 80° cut-off [DSS]	Super Wide Flood (98°) [SWFL]	0.83

Multiplier tables are provided to aid with estimation of lumen levels across options. Apply multipliers against ordered Lumen Output to estimate Delivered Lumens. Refer to IES files for most accurate photometric information.

How To Use Lumen Multipliers

Formula: (Lumen Output Value) x (Color Temperature & CRI) x (Optic & Distribution)

Example: DBL4-11-XX-XX-XX-XX-XX-XX-CD-XX-1000L-935K-1C-UNV-XX-DNT-FL
 (1000) x (0.83) x (0.93) ≈ 726 lm (estimated delivered lumens)

SIMPLESEAL™

CSEDO SERIES – LED – OVERLAPPING DOOR

PRODUCT FEATURES:

- » High-output, high-CRI LED lamp sources for accurate color rendition and lighting performance
- » Diffused high-efficiency lens for reduced glare
- » Recessed ceiling mount; grid or flange - 1'x4', 2'x2', 2'x4'
- » Suitable for universal installation into 1.0" and 1.5" grid or flange (drywall) ceilings
- » One piece overlapping door provides air-tight integrity of luminaire
- » Optional Food Zone/Non-Contact listing, ideal for food processing applications
- » Optional NSF P442 Protocol assures a sealed cleanroom environment

SPECIFICATIONS

HOUSING: Standard 24-gauge (optional 20-gauge) cold rolled steel, hole-free, one-piece, seam-welded construction. 18-gauge housing flange with mitered and welded corners. White TGIC polyester powder coat finish with 5-step pre-treatment. Salt spray test: 1,000 hours; Reflectance: 92%.

DOORFRAME: 20-gauge type 304 stainless steel (#4 finish-post fabrication). One-piece 60° beveled perimeter construction. Continuous angle lens retention system. Mechanical guide for doorframe fastener alignment. Doorframe secured to housing with stainless steel aircraft cables and captive flush mounted Phillips head stainless steel fasteners (8) for 2x2, (12) for 2x4; thumb screws optional.

OPTICS: Symmetric optic includes diffused, impact-resistant acrylic lens. FN option includes FDA approved Food Zone clear polycarbonate lens outer lens; diffused acrylic inner lens.

DOORFRAME GASKET: One-piece closed cell extruded Nitrile gasket seals Doorframe to housing and ceiling structure.

ELECTRICAL: Available 3000K, 3500K, 4000K and 5000K color temperatures with maximum 3-step MacAdam variation allowance. 120-277VAC, 50/60Hz electrical input with serviceable high power factor electronic, constant-current driver (<20% THD, >0.95 PF). Standard 0-10V dimming with 1-100% range and dim-to-dark capabilities (non dim-to-dark with 347V; 660µA maximum source current per circuit). Optional 0-10V dimming with 0.1-100% range and dim-to-dark capabilities via eLoLED SOLdrive series driver (n/a 347V input; ≤0.5V required from dimming control for dim-to-dark operation; 800µA max. source current).

INSTALLATION: Non-IC recessed ceiling mounting into grid and flange application types. Flange installation utilizes included adjustable swing-out mounting brackets. Grid installation suitable for 1" and 1.5" T-bar ceilings. Housing is field-convertible between grid and flange-style mounting types. See Options for continuous row mounting and install frames.

PHOTOMETRICS: Photometry tested to the IESNA LM-79-08 standard. For additional photometric data, please go to www.kenall.com.

WARRANTY: Limited five (5) year LED warranty.

LISTINGS: Luminaire is certified to UL standards by Intertek Testing Laboratories for Wet Location. Certified IP66 per IEC 60598. NSF2 Splash/Non-Food Zone. CCEA Approved. Suitable for biosafety labs rated BSL 3 and 4. Optional NSF Protocol P442 certified. FED-STD-209E/Class 1 (ISO 3) Cleanrooms. Optional NSF2 Food Zone/Non-Contact. DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC listed. Please check the DLC Qualified Products List [here](#) for listed configuration details. Suitable for EU GMP Grade A cleanrooms. Suitable for installation into -30°C to 40°C ambient environments, unless otherwise noted.



PROJECT INFORMATION

Job Name _____

Fixture Type _____

Catalog Number _____

Approved by _____



ORDERING INFORMATION (Ex: CSEDO-24-67L-40K8-DIM1-DV-2F-4H-SYM)

Model	Size	Lamp Power	Lamp Color	Driver	Voltage	Doorframe	Housing	Optics	Options	Accessories	
CSEDO								SYM			
Size		Lamp Power		Driver Type				Options			
14	1'x4'	1'x4'		DIM1	0-10V Dimming to 1%			LEL†	8.4W Emergency Battery Pack		
22	2'x2'	45L	45 Watt LED	DIM01	0-10V Dimming to 0.1% (n/a with 347 Voltage)			20KV	20KV/KA Surge Protection per IEEE/ANSI C62.41.2 Cat. A		
24	2'x4'	67L	67 Watt LED					AMF▲	Antimicrobial Finish		
		90L	90 Watt LED					FN**	Food Zone/Non-Contact		
		2'x2'		Voltage				TS	Stainless Steel Doorframe Thumb Screws		
		45LD	45 Watt Dual-Row LED	DV	120-277VAC, 50/60Hz			FS	Fuse & Holder		
		67L	67 Watt LED	120	120VAC			HJ	Sealed Wireway		
		90L	90 Watt LED	277	277VAC			MS	Motion Sensor (n/a with 347 Voltage Option)		
		2'x4'		347	347VAC			RF•	Radio Frequency Filter		
		45LD	45 Watt Dual-Row LED	Doorframe Options				RM♦	Continuous Row Mounting		
		67L	67 Watt LED	5F	20-Ga Type 304 SS (STD)			2C	Two Circuit Wiring (1'x4'-45L single circuit operation will yield uneven lens luminance)		
		90L	90 Watt LED	2F	20-Ga CRS			P442‡	Optional NSF Protocol P442 Certified		
		135L	135 Watt LED	XF	20-Ga Type 316 SS			Accessories			
		180L	180 Watt LED	PAF	.063" Painted Fabricated Aluminum			IF**	Install Frame		
		Lamp Color		Housing Options							
		30K8	3000K / 82 CRI min.	4H	24-Ga CRS (STD)					* Add .375" to ceiling cut out dimensions	
		35K8	3500K / 82 CRI min.	2H	20-Ga CRS					• Voltage specific selection required	
		40K8	4000K / 82 CRI min.	5H	20-Ga Type 304 SS					** Lensing consists of FDA approved Food Zone clear polycarbonate outer lens and diffused acrylic inner lens	
		50K8	5000K / 82 CRI min.	XH	20-Ga Type 316 SS					† n/a with 180L lamp option or 347V input; voltage-specific selection required and height of fixture is 5.875" when specified with 135L lamp option; 0°C/32°F min. operating environment.	
				PAH	.050" Painted Aluminum					▲ Applied only to exposed painted surfaces of luminaire (not available on stainless steel doorframes)	
				Optics						‡ P442 only available on CSEDO24	
				SYM	Symmetric, Diffused DR Acrylic					♦ Only available when installed in drywall ceilings (flange mount)	

Click [HERE](#) for CSEDO 'Fast Track' Ordering Options
Ships in 5 days



www.kenall.com | P: 800-4-Kenall | F: 262-891-9701 | 10200 55th Street Kenosha, Wisconsin 53144, USA

A brand of **legrand**

This product complies with the Buy American Act: manufactured in the United States with more than 50% of the component cost of US origin. It may be covered by patents found at www.kenall.com/patents. Content of specification sheets is subject to change; please consult www.kenall.com for current product details. ©2019 Kenall Mfg. Co.

SIMPLESEAL™

CSEDO SERIES – LED – OVERLAPPING DOOR

PERFORMANCE		Initial Delivered Lumens		Input Power (W)	Drive Current (mA)	Estd. L70 LED Life (Hrs)
Model	Lamp Type	@ 25°C	Efficacy (lm/W)			
CSEDO14	45L-30K8	4,906	100	49	100	80,000
	45L-35K8	5,057	103			
	45L-40K8	5,230	107			
	45L-50K8	5,439	111			
	67L-30K8	7,514	104	72	75	80,000
	67L-35K8	7,747	108			
	67L-40K8	8,011	111			
	67L-50K8	8,332	116			
	90L-30K8	9,587	99	97	100	60,000
	90L-35K8	9,884	102			
	90L-40K8	10,221	105			
	90L-50K8	10,630	110			
CSEDO22	45LD-30K8	5,212	106	49	100	80,000
	45LD-35K8	5,373	110			
	45LD-40K8	5,556	113			
	45LD-50K8	5,779	118			
	67L-30K8	7,984	111	72	75	80,000
	67L-35K8	8,231	114			
	67L-40K8	8,511	118			
	67L-50K8	8,852	123			
	90L-30K8	10,259	106	97	100	60,000
	90L-35K8	10,576	109			
	90L-40K8	10,937	113			
	90L-50K8	11,374	117			
CSEDO24	45LD-30K8	6,293	137	46	50	100,000
	45LD-35K8	6,593	143			
	45LD-40K8	6,709	146			
	45LD-50K8	6,977	152			
	67L-35K8	8,753	122	72	75	80,000
	67L-35K8	9,171	127			
	67L-40K8	9,331	130			
	67L-50K8	9,704	135			
	90L-30K8	11,247	116	97	100	60,000
	90L-35K8	11,594	120			
	90L-40K8	11,990	124			
	90L-50K8	12,470	129			
	135L-30K8	15,943	108	147	100	60,000
	135L-35K8	16,436	112			
	135L-40K8	16,997	116			
	135L-50K8	17,677	120			
	180L-30K8	21,739	111	196	100	60,000
	180L-35K8	22,411	114			
180L-40K8	23,176	118				
180L-50K8	24,103	123				

Displayed information is for described luminaires only. Subject to change without notice. Visit www.kenall.com for IES files additional information.



www.kenall.com | P: 800-4-Kenall | F: 262-891-9701 | 10200 55th Street Kenosha, Wisconsin 53144, USA

A brand of Legrand

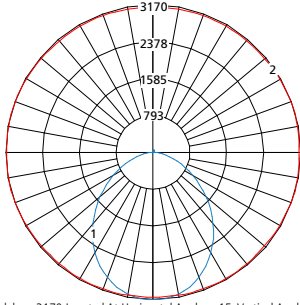
This product complies with the Buy American Act: manufactured in the United States with more than 50% of the component cost of US origin. It may be covered by patents found at www.kenall.com/patents. Content of specification sheets is subject to change; please consult www.kenall.com for current product details. ©2019 Kenall Mfg. Co.

SIMPLESEAL™

CSEDO SERIES – TECHNICAL DATA

PERFORMANCE

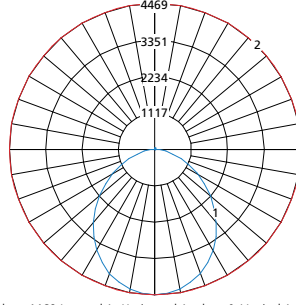
Model: CSEDO14-67L-40K8-DIM1-1-DV-5F-2H-SYM



Maximum Candela = 3170 Located At Horizontal Angle = 15, Vertical Angle = 2.5

1 - Vertical Plane Through Horizontal Angles (15-195) (Through Max. Cd.)
 2 - Horizontal Cone Through Vertical Angle (2.5) (Through Max. Cd.)

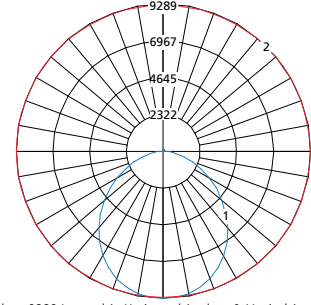
Model: CSEDO22-90L-40K8-DIM1-1-DV-5F-2H-SYM



Max Candela = 4469 Located At Horizontal Angle = 0, Vertical Angle = 0

1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
 2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)

Model: CSEDO24-180L-40K8-DIM1-1-DV-5F-2H-SYM

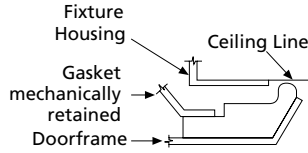


Max Candela = 9289 Located At Horizontal Angle = 0, Vertical Angle = 5

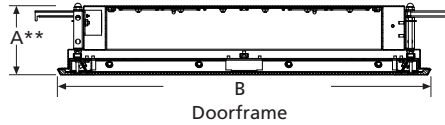
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
 2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

DIMENSIONAL DATA

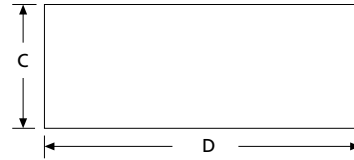
GASKET PROFILE



CROSS SECTION



CEILING CUTOUT



DIMENSIONAL DATA (IN INCHES)

	A	B	C	D
1x4	4.43	11.94 x 47.94	10.85	46.85
2x2	4.43	23.94 x 23.94	22.85	22.85
2x4	4.43	23.94 x 47.94	22.85	46.85

* Add .375" to ceiling cut out dimensions when IF Option is specified

** Height is 5.875" with 135L lamp option when ordered in conjunction with LEL option.



www.kenall.com | P: 800-4-Kenall | F: 262-891-9701 | 10200 55th Street Kenosha, Wisconsin 53144, USA

This product complies with the Buy American Act: manufactured in the United States with more than 50% of the component cost of US origin. It may be covered by patents found at www.kenall.com/patents. Content of specification sheets is subject to change; please consult www.kenall.com for current product details. ©2019 Kenall Mfg. Co.

A brand of **legrand**

FINELITE

High Performance Recessed (HPR LED) 2x4

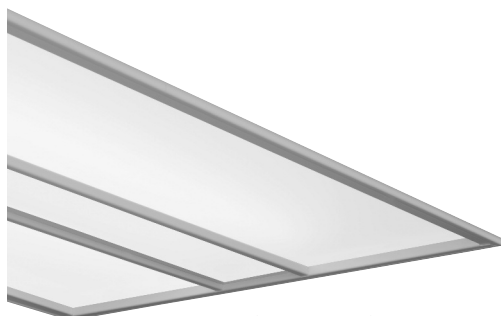


Date

Project

Type

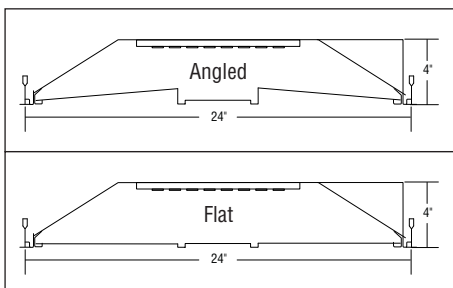
Comments



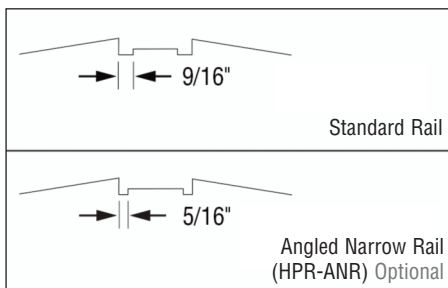
Refer to page 2 for all door styles

DESCRIPTION

HPR LED is a highly efficient recessed luminaire delivering excellent visual comfort and outstanding performance. Advanced optical design makes HPR LED a powerful solution for low-ceiling applications and eliminates the shadows common to other LED recessed products. This Product is enrolled in the International Living Future Institute (ILFI) Declare 2.0 Program and is third-party verified with options achieving Red List Approved and Declared status.

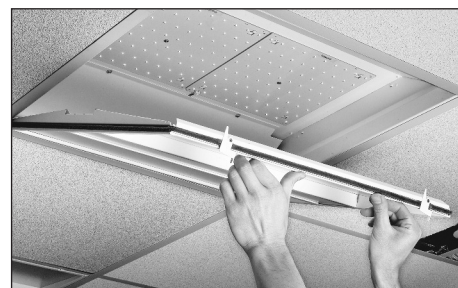


DIMENSIONS



NARROW RAIL OPTION

Available in angled door style with the same center optic choices. The optional narrow rails are approximately 5/16" wide. The standard rails are approximately 9/16" wide.

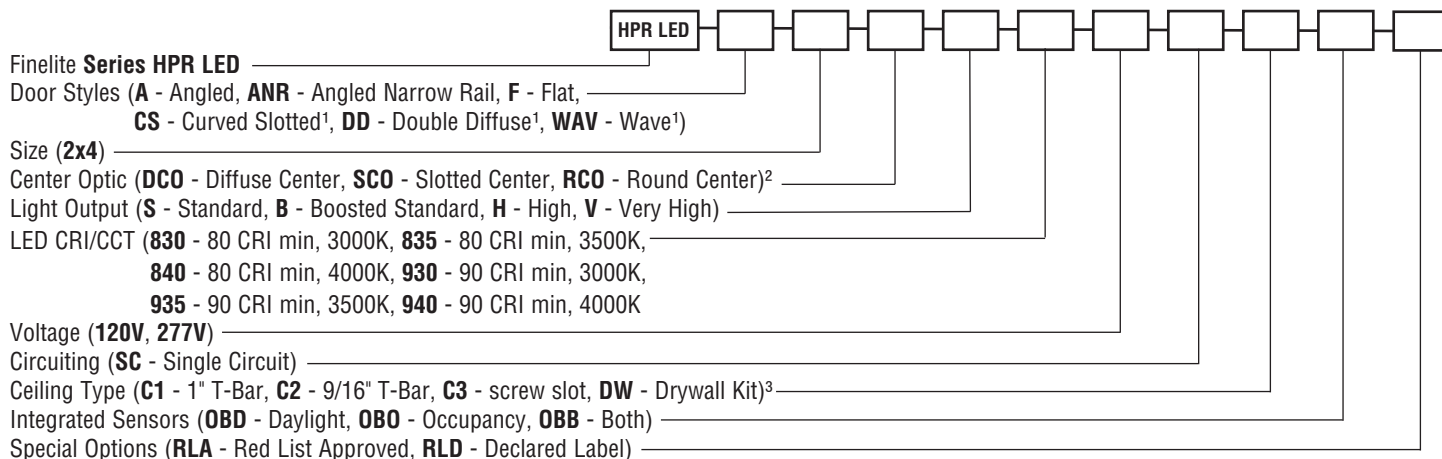


100% SERVICEABLE FROM BELOW

The replaceable light engine and driver are easy to access from below the ceiling.

ORDERING GUIDE

Sample Number: HPR LED - A - 2x4 - DCO - S - 835 - 277V - SC - C1 - OBO - RLA



¹ Curved Slotted, Double Diffuse and Wave door not available with Center Optic options

² Only available with Angled (A), Angled Narrow Rail (ANR) and Flat (F) door options

³ Surface Mount available

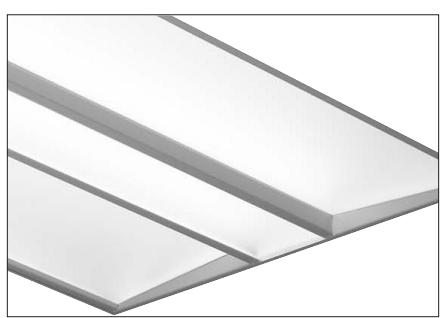
A brand of Legrand

Finelite, Inc. • 30500 Whipple Road • Union City, CA 94587-1530 • (510) 441-1100 • Fax: (510) 441-1510 • www.finelite.com

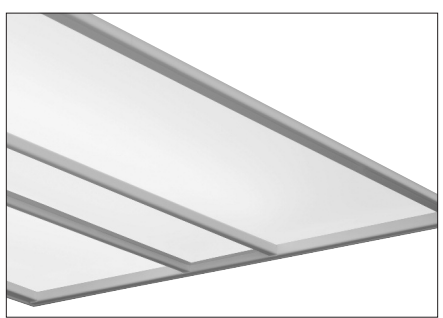
FINELITE

High Performance Recessed (HPR LED) 2x4

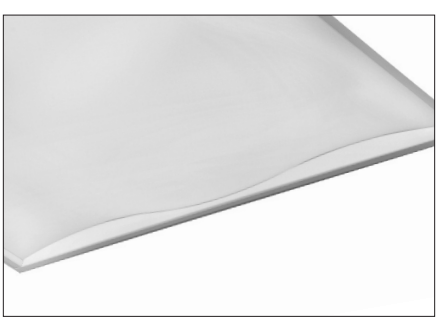
DOOR STYLES



A - Angled
ANR - Angled Narrow Rail

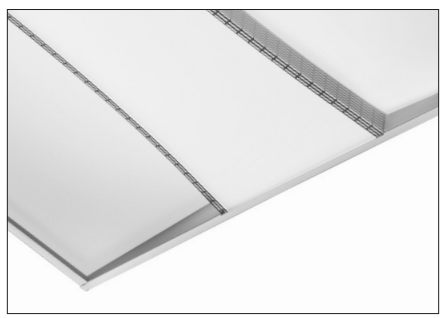


F - Flat

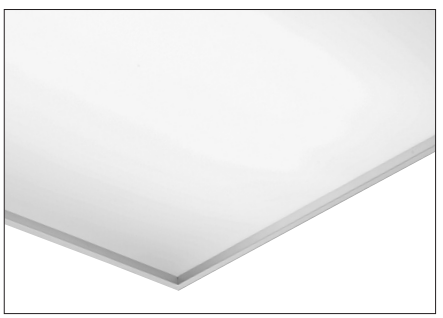


WAV - Wave

DOOR STYLES

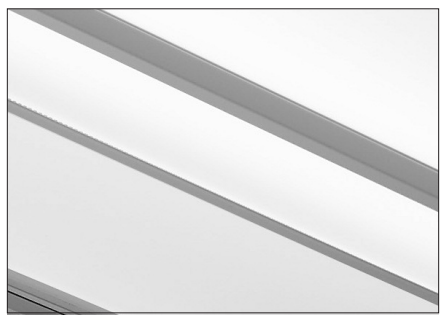


CS - Curved Slotted

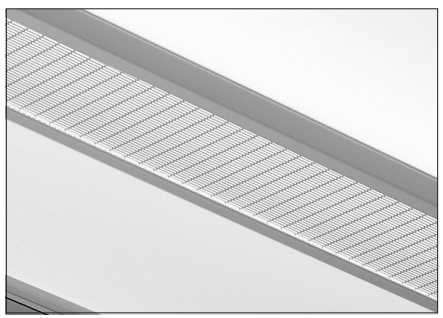


DD - Double Diffuse

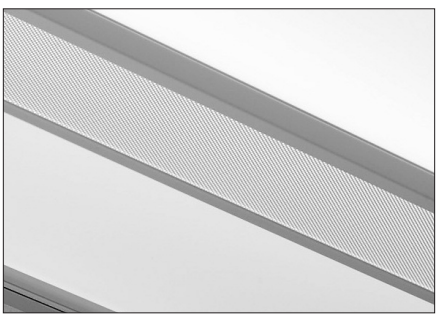
CENTER OPTICS



DCO - Diffuse Center



SCO - Slotted Center



RCO - Round Center

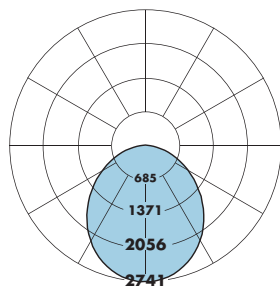
DCO, SCO, and RCO are only available on Angled (A), Angled Narrow Rail (ANR), and Flat (F) doors.

FINELITE

High Performance Recessed (HPR LED) 2x4

PHOTOMETRY

HPR LED-A-2x4-DCO-V
 Very High Output - Angled Rail
 Efficacy: 127 lumens per watt
 Total luminaire output: 6979 Lumens
 55.1 Watts
 Peak Candela Value: 2741 @ 0°
 CCT: 3500K
 ITL LM79 Report 85145



CANDLEPOWER SUMMARY						
	0.0	22.5	45	67.5	ACROSS	Flux
0	2741	2741	2741	2741	2741	
5	2730	2728	2728	2727	2727	259
10	2685	2684	2683	2682	2678	
15	2613	2607	2609	2605	2602	735
20	2511	2506	2502	2498	2498	
25	2380	2374	2371	2366	2367	1091
30	2223	2216	2213	2209	2211	
35	2043	2036	2033	2030	2033	1271
40	1845	1838	1836	1834	1837	
45	1635	1628	1627	1626	1630	1256
50	1417	1412	1412	1410	1413	
55	1200	1195	1196	1195	1187	1069
60	986	984	984	978	974	
65	780	778	774	766	761	766
70	582	583	576	569	565	
75	401	400	393	388	389	420
80	239	236	232	229	229	
85	103	100	97	91	89	111
90	0	0	0	0	0	

Angled (A) and Flat (F) Total Light Output, 3500K, 80 CRI (Lumens)			
S*	B*	H*	V**
3772	4742	5416	6979
Power, 3500K, 80 CRI (Watts)			
S*	B*	H*	V**
27.0	35.2	40.6	55.1
Efficacy, 3500K, 80 CRI (Lumens Per Watt)			
S*	B*	H*	V**
140	135	135	127

Lumen Adjustment Factors - 80 CRI	
3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors - 90 CRI	
3000K	0.746
3500K	0.760
4000K	0.789

Apply a lumen adjustment factor to calculate lumens for the desired CCT and CRI.

* Family Correlation based on 3500K Very High Output (V) test - 120V.
 ** Based on source ITL report: 85145

Angled Narrow Rail (ANR) Total Light Output, 3500K, 80 CRI (Lumens)			
S*	B*	H*	V ^x
3680	4626	5283	6808
Power (Watts)			
S*	B*	H*	V ^x
26.9	35.1	40.5	55.0
Efficacy, 3500K, 80 CRI (Lumens Per Watt)			
S*	B*	H*	V ^x
137	132	130	124

* Family Correlation based on 3500K Very High Output (V) test - 120V.
 ** Based on source ITL report: 85151

S - Standard Output, B - Boosted Standard Output,
 H - High Output, V - Very High Output

SAMPLE LUMEN ADJUSTMENT CALCULATION

High Output (H) Angled (A) & Flat (F)
 4000K, 90 CRI

Lumen Adjustment Factor = 0.789

Total Light Output =
 5416 lm x 0.789 = 4273 lm

$$\text{Efficacy} = \frac{4273 \text{ lm}}{40.6 \text{ W}} = 105 \text{ lm/W}$$

** Correlation based on ITL report: 85145

A brand of Legrand

Finelite, Inc. • 30500 Whipple Road • Union City, CA 94587-1530 • (510) 441-1100 • Fax: (510) 441-1510 • www.finelite.com

Due to continuing product improvements, Finelite reserves the right to change specifications without notice. Please visit www.finelite.com for most current data.



FINELITE

High Performance Recessed (HPR LED) 2x4

Wave (WAV) Total Light Output, 3500K, 80 CRI (Lumens)			
S*	B*	H*	V†
3821	4804	5486	7069
Power, 3500K, 80 CRI (Watts)			
S*	B*	H*	V†
27.0	35.2	40.6	55.1
Efficacy, 3500K, 80 CRI (Lumens Per Watt)			
S*	B*	H*	V†
142	136	135	128

* Family Correlation based on 3500K Very High Output (V) test - 120V.

† Based on source ITL report: 85837

Curve Slotted (CS) Total Light Output, 3500K, 80 CRI (Lumens)			
S*	B*	H*	V‡
3569	4486	5124	6602
Power, 3500K, 80 CRI (Watts)			
S*	B*	H*	V‡
27.0	35.2	40.6	55.1
Efficacy, 3500K, 80 CRI (Lumens Per Watt)			
S*	B*	H*	V‡
132	127	126	120

* Family Correlation based on 3500K Very High Output (V) test - 120V.

‡ Based on source ITL report: 86020

Double Diffuse (DD) Total Light Output, 3500K, 80 CRI (Lumens)			
S*	B*	H*	V‡
3076	3867	4417	5691
Power, 3500K, 80 CRI (Watts)			
S*	B*	H*	V‡
27.0	35.2	40.6	55.1
Efficacy, 3500K, 80 CRI (Lumens Per Watt)			
S*	B*	H*	V‡
114	110	109	103

* Family Correlation based on 3500K Very High Output (V) test - 120V.

‡ Based on source ITL report: 85156

Lumen Adjustment Factors - 80 CRI	
3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors - 90 CRI	
3000K	0.746
3500K	0.760
4000K	0.789

Apply a lumen adjustment factor to calculate lumens for the desired CCT and CRI.

S - Standard Output, B - Boosted Standard Output,
H - High Output, V - Very High Output



FINELITE

High Performance Recessed (HPR LED) 2x4

SPECIFICATIONS

CONSTRUCTION: Die-formed 20-gauge cold-rolled steel housing. All components are hard-tooled to tolerances of +/- 0.010". UV stabilized weather-strip pile gasket with polypropylene backing. Hinged door frame assembly provides easy access to light arrays and driver compartment for servicing from below. Seismic brackets are integrated into the luminaire assembly. Additional wire entrances are positioned on the ends of the housing to allow easy wiring access for the installer.

REFLECTORS: Die-formed 20-gauge cold-rolled steel reflectors are finished in 96LG high reflectance matte white powder coat paint.

AIR RETURN: Refer to 2x4 Air Return Tech Sheet for more information.

OPTICAL SYSTEM: Components include diffuser panels and a central optic element held in place with a frame constructed from die-formed cold-rolled steel. The diffusers are UV-stabilized and impact-resistant frosted virgin acrylic, 0.120" thick. They are either angled toward the central optic or parallel to the ceiling plane. The standard center rails are approximately 9/16" wide. Optional narrow rails are approximately 5/16" wide. Optional wave door includes frosted acrylic panel that undulates from side to side.

DOUBLE DIFFUSE: Visible diffuser: UV-stabilized and impact-resistant frosted virgin acrylic, 0.120" thick. Inner diffuser: 0.120" thick with 60% round perforations white/white.

DOOR STYLE: *Curved Slotted (CS) includes perforated rails that slope inward and a diffuse frosted acrylic center optic.*

CENTER OPTIC OPTIONS: *Only available with Angled (A), Angled Narrow Rail (ANR), and Flat (F) door styles.*

Diffuse Center Optic (DCO): UV-stabilized and impact-resistant frosted virgin acrylic.

Slotted Center Optic (SCO): Die-formed cold-rolled steel panel with a 1/16" x 1/2" rectangular hole pattern. Virgin acrylic overlay.

Round Center Optic (RCO): Die-formed cold-rolled steel panel with precision-punched 3/32" round hole pattern arranged in staggered formation. Virgin acrylic overlay.

LIGHT OUTPUT: Four lumen packages available, Standard (S), Boosted Standard (B), High (H), and Very High (V). A separate chart summarizes lumen distribution and wattage. Light engines are replaceable.

LUMEN MAINTENANCE: 90% of initial light output (L90) at 100,000+ hours; 70% of initial light output (L70) at 200,000+ hours.

DRIVER: Replaceable 120V/277V Constant Current Reduction dimming driver standard. Can be wired dimming or non-dimming. 0-10V dimming controls with a range of 10%- 100%. Dimming to 1% available, consult factory. Driver is fully accessible from below the ceiling. Power Factor: ≥0.9. Total Harmonic Distortion (THD): <20%. Expected driver lifetime: 100,000 hours.

LUTRON DRIVER OPTIONS: LUTES1 (Hi-lume 1% EcoSystem with Soft-On, Fade to Black dimming (LDE1 series)); LUTES5 (5-Series 5% EcoSystem (LDE5 Series)), LUT2W (Hi-lume 1% 2-wire, 120V forward phase dimming (LTEA series)); Contact factory for availability of discontinued Lutron drivers, L3DA-3-wire and L3DA EcoSystem.

ELECTRICAL: Optional emergency to generator/inverter wiring, internal generator transfer switch, nightlight wiring, step-dimming driver, backup battery. Chicago Plenum option. Factory-choice low-profile backup battery available. Bodine BSL722 battery pack also available. Backup batteries deliver 2305 lumens. One quarter of the 2x4 will be illuminated in emergency mode.

INTEGRATED SENSORS: Integrated PIR (Passive Infrared) occupancy and/or daylight sensors available. Refer to Occupancy Sensor and Daylight Sensor tech sheets for more info.

MOUNTING: Standard flange design works with most lay-in ceiling types. Integral pry-out tabs secure the luminaire to the ceiling grid from above. Tie-in locations for tie-wire on all corners. Consult local code for appropriate tie-wire recommendations. Drywall Kit available. Surface mount and air return versions available; refer to separate tech sheets.

FINISH: Housing and door assembly painted with 96 LG high reflectance matte white powder coat paint. Optional adder: Anti-microbial paint. Contact factory.

FEED: Optional whips (with flex connectors) supplied in a maximum of 11' lengths. Lead Wires

LABELS: Luminaire and electrical components are ETL-listed conforming to UL 916, 1598, 8750, 924 in the U.S.A. and CAN/CSA C22.2 No. 205, 250, and 141 in Canada. In accordance with NEC Code 410.73 (G), this luminaire contains an internal driver disconnect. Damp Location. IC-rated. Finelite products use electronic components that are RoHS compliant, and the mechanical components of the luminaire have been verified to not knowingly contain any restricted substances listed per RoHS Directive 2011/65/EU. Finelite makes the specification process easy when putting healthier products on your projects. Simply add – RLA (Red List Approved) or – RLD (Declared Label) to your part number.

WEIGHT: 33 lbs maximum.

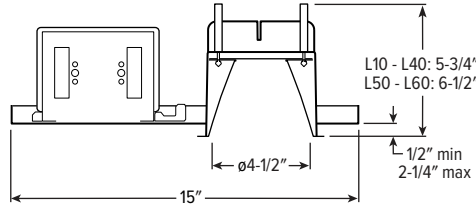
DLC QUALIFIED: Configurations of this product are listed on the DLC Qualified Products List (QPL). www.designlights.org/search

WARRANTY: 10-year performance-based warranty on all standard components. Optional accessories such as emergency battery packs are covered by their individual manufacturer warranties.



* LutVDO & LutVRF can be provided with 1% DALI Sensor Ready Driver (Osram Dexas), 5% DALI Sensor Ready Driver (Philips SR DALI) or any Lutron EcoSystem 1% or 5% LED driver. Customer to specify driver required.

4DR LED 4.5" Downlight – Round



CATALOG #: _____

TYPE: _____

PROJECT: _____

NEW CONSTRUCTION AND REMODEL

FEATURES

TrimLock®

- Innovative TrimLock reflector retention system ensures trim remains flush with ceiling plane
- Industry-leading efficacies as high as 113 lm/W – ENERGY STAR® certified
- Available on QuickShip

SPECIFICATIONS

- HOUSING** – Die-cast aluminum trim housing with forged aluminum heat sink. Galvanized steel splice compartment with driver mounting plate/enclosure. Swing-out mounting arms field adjust for ceiling thickness from 1/2" – 2-1/4".
- TRIMLOCK** – Innovative TrimLock reflector retention system ensures the trim remains flush with the ceiling plane.
- OPEN REFLECTOR** – Low-iridescent anodized aluminum. Clear semi-specular finish standard.
- LENSED TRIM** – Die-cast aluminum frame with micro-prismatic, acrylic lens.
- ELECTRICAL** – High-performance Class 2 C.O.B. LED array. Modular quick-connect plug for easy field-connection of LED light assembly to driver. Reported L70>55,000 hours. Reported L90>55,000 hours. Estimated L70 = 200,000 hours.
- MOUNTING** – Recessed. 20 ga. galvanized steel mounting pan for new construction or IC-rated enclosure. Remodel kit option includes receiver bracket hardware. Minimum 24" O.C. marked spacing required for L50 and L60 lumen packages.
- LISTINGS** –
 - cCSAus conforms to UL STD 1598; Certified to CAN/CSA STD C22.2 No. 250.0 for damp locations. LED light assembly conforms to UL 2108 for remote installation.
 - Suitable for wet location under covered ceiling when specified with WET/CC or TD options.
 - ENERGY STAR® certified in select configurations, see www.energystar.gov
 - IC-rated for direct contact with insulation when specified with I Mounting Type.
 - City of Chicago Environmental Air approved when specified with CP option.
 - Complies with ASTM-E283 when specified with ATH option.
 - RoHS compliant.
 - Title 24 (JA8) compliant in select configurations, see www.cacertappliances.energy.ca.gov.

- WARRANTY** – 5-year limited warranty, see hew.com/warranty.



Available with BIOS® consult factory

ORDERING EXAMPLE: 4DR - TL - L20/835 - OPTIONS - DIM - UNV - OW - OF - CS - TRIM OPTIONS - N - F1

HOUSING

SERIES	LUMENS ^[1]	CRI	CCT	OPTIONS	CONTROL ^[2]	VOLTAGE
4DR - TL	L10 1,000lm ^[3]	8 80	27 2700K	SCA_	DIM	UNV 120-277V
TrimLock	L15 1,500lm	9 90 ^[4]	30 3000K	ATH	DIM1	347 347V ^[6]
	L20 2,000lm		35 3500K	F		
	L30 3,000lm		40 4000K	EM/7W		
	L40 4,000lm		50 5000K	EM/10W		
	L50 5,000lm			EM/10W/RTS		
	L60 6,000lm			CP		
				SDT		

TRIM^[12]

TRIM TYPE	DISTRIBUTION ^[13]	FLANGE TYPE	REFLECTOR FINISH	TRIM OPTIONS
O Open reflector	W Wide	OF 1/2" standard flange	Open trim types	MWT Textured white trim flange ^[20]
L Flush lens	65° Open	SF 1/4" mud-in flange ^[19]	CS Clear semi-specular anodize	IP IP65 rated trim ^[21]
R Regressed lens	50° Flush		SG Satin-glow anodize	AD Diffuse acrylic lens ^[22]
A Angled lens ^[14]	50° Regressed		GD Gold anodize	PD Diffuse 1/8" polycarbonate lens ^[23]
S Non-conductive flush lens for shower applications ^[15]	M Medium ^[16]		CG Champagne gold anodize	TD Diffuse polycarbonate lens media at top of open reflector ^[24]
	45° Open		PW Pewter anodize	WET/CC Wet location, covered ceiling listed ^[25]
	35° Flush		SPC Clear specular anodize	AM Anti-microbial ^[26]
	30° Regressed		RG Rose gold anodize	
	N Narrow ^[17]		WH White texture powder coat	
	10° Open		BL Black texture powder coat	
	25° Flush		MB Black texture splay with white flange ^[27]	
	25° Regressed			
	WW Wall wash ^[18]			

MOUNTING

MOUNTING TYPE^[28]

- N Open pan for new construction
- I IC-rated enclosure for new construction^[30]
- R Remodel kit^[31]

MOUNTING HARDWARE^[29]

- F1 Integral 2-position fixed pan bracket, universal bar hanger included^[32]
- BA1 Adjustable butterfly pan bracket, bar hanger not included^[33]
- CA1 Adjustable caterpillar pan bracket, universal bar hanger included^[34]

NOTES

- Lumen output based on O trim type, W distribution and CS finish, 3500K/80CRI. Actual lumens may vary +/-5%, see page 2 for FIXTURE PERFORMANCE DATA.
- See page 3 for ADDITIONAL CONTROL OPTIONS.
- Not available with EM/10W emergency batteries.
- Extended lead times may apply. Consult factory for availability.
- 9" aperture, specify degrees of slope in 5° increments, 05°-30°. Not available with I Mounting Type, ATH or WET/CC options. Painted white. Other colors available, consult factory. See page 3 for SLOPED CEILING ADAPTOR DETAILS.
- Not available with EM batteries or DMX controls.
- N and R Mounting Types only. Not available with ATH or IP options.
- N and R Mounting Types only. Not available with ATH or IP options.
- Not available with WET/CC, ATH or IP options. N and R Mounting Types only. See page 5 for EM/10W/RTS DETAILS.
- I Mounting Type required.
- May be required for 347V, see product builder at hew.com/product-builder.
- Trim ships separately.
- Beam angle based on CS or WH reflector finish.
- Available with WW Distribution only.
- W Distribution, OF Flange Type, WH Reflector Finish only. Standard with AD diffuse acrylic lens. IP and WET/CC options standard.
- Not available with lumen stops L50 and higher when specified with flush or regressed trim types.
- Not available with lumen stops L50 and higher when specified with flush or regressed trim types.
- O and A Trim Types only.
- For use with mud-in plaster construction only, supplied with mud flange installation kit. See page 4 for FLANGE TYPE DETAILS. Not available with ATH or IP options.
- Not available with WH Reflector Finish, L or S Trim Types.
- L and R Trim Types only.
- Not available with O trim type. W and WW distributions only.
- O Trim Type only. WET/CC standard unless ordered with EM/RTS. L50 lumen package max.
- L50 lumen package max with O Trim Type. Not available with PD trim option.
- WH and BL Reflector Finishes only. Not available with S Trim Type.
- R Trim Type only. Not available with MWT. Mounting hardware required (N and I only), ordered separately, see MOUNTING HARDWARE ordering info. See page 4 for MOUNTING TYPE DETAILS.
- Additional mounting hardware options available. See page 5 for MOUNTING HARDWARE DETAILS.
- L20 lumen package max. L30 available, wide distribution only for lensed trims.
- Also used in new construction sheetrock ceilings.
- N and I Mounting Types only. I Mounting requires external brackets.
- N Mounting Type only.
- N Mounting Type only.

4DR LED 4.5" Downlight – Round

FIXTURE PERFORMANCE DATA

	DISTRIBUTION	WATTAGE	OPEN REFLECTOR TRIM TYPE		FLUSH LENS TRIM TYPE		REGRESSED LENS TRIM TYPE	
			DELIVERED LUMENS	EFFICACY (lm/W)	DELIVERED LUMENS	EFFICACY (lm/W)	DELIVERED LUMENS	EFFICACY (lm/W)
L10	W	9.0	1027	113.6	674	74.6	660	73.0
	M	9.0	999	110.5	895	99.0	895	99.1
	N	9.0	1000	110.6	914	101.2	882	97.7
L15	W	13.9	1466	105.8	994	71.7	972	70.2
	M	13.9	1471	106.2	1319	95.1	1319	95.2
	N	13.9	1473	106.3	1347	97.2	1300	93.8
L20	W	19.8	2005	101.0	1352	68.3	1323	66.2
	M	19.8	2002	101.0	1794	90.6	1795	90.8
	N	19.8	2004	101.1	1833	92.6	1769	88.5
L30	W	27.8	2985	107.3	2022	72.7	1979	71.1
	M	27.8	2900	104.2	2683	96.5	2685	96.5
	N	27.8	2734	98.3	2741	98.6	2646	95.1
L40	W	38.0	3979	104.7	2695	70.9	2638	69.4
	M	38.0	3865	101.7	3577	94.1	3579	94.2
	N	38.0	3644	95.9	3654	96.2	3527	92.8
L50	W	45.2	5124	113.4	3364	74.4	3292	72.8
	M	45.2	4956	109.6	-	-	-	-
	N	45.1	4818	106.8	-	-	-	-
L60	W	47.7	6279	131.6	4234	88.8	4143	86.9
	M	47.7	6073	127.3	-	-	-	-
	N	47.7	5903	123.8	-	-	-	-

MULTIPLIER TABLES

	COLOR TEMPERATURE	
	CCT	CONVERSION FACTOR
80 CRI	2700K	0.92
	3000K	0.98
	3500K	1.00
	4000K	1.01
	5000K	1.02

	COLOR TEMPERATURE	
	CCT	CONVERSION FACTOR
90 CRI	2700K	0.76
	3000K	0.79
	3500K	0.82
	4000K	0.84
	5000K	0.88

TRIM	
CATALOG NUMBER	CONVERSION FACTOR
S	0.85
AD	0.85
PD	0.85
TD	0.75
WET/CC ²	0.85

	REFLECTOR FINISH	
	CATALOG NUMBER	CONVERSION FACTOR
O TRIM	CS	1.00
	SG ¹	0.92
	GD	0.93
	CG	0.96
	PW	0.86
	SPC	1.02
	RG	0.88
R TRIM	WH ¹	0.89
	BL ¹	0.47
	WH	1.00
	CS	0.98
	BL	0.79

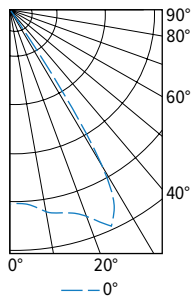
¹ Distribution will also be affected, consult factory.

² Use multiplier when specified with O Trim Type.

- Photometrics tested in accordance with IESNA LM-79. Results shown are based on 25°C ambient temperature.
- Wattage shown is based on 120V input.
- Results based on 3500K, 80 CRI, actual lumens may vary +/-5%
- Use multiplier tables to calculate additional options.

PHOTOMETRY

4DR-TL-L20/835-DIM-UNV-OW-OF-CS Report #: 20685; 12/13/18 | Total Luminaire Output: 2005 lumens; 19.8 Watts | Efficacy: 101.0 lm/W | 83.1 CRI; 3472K CCT

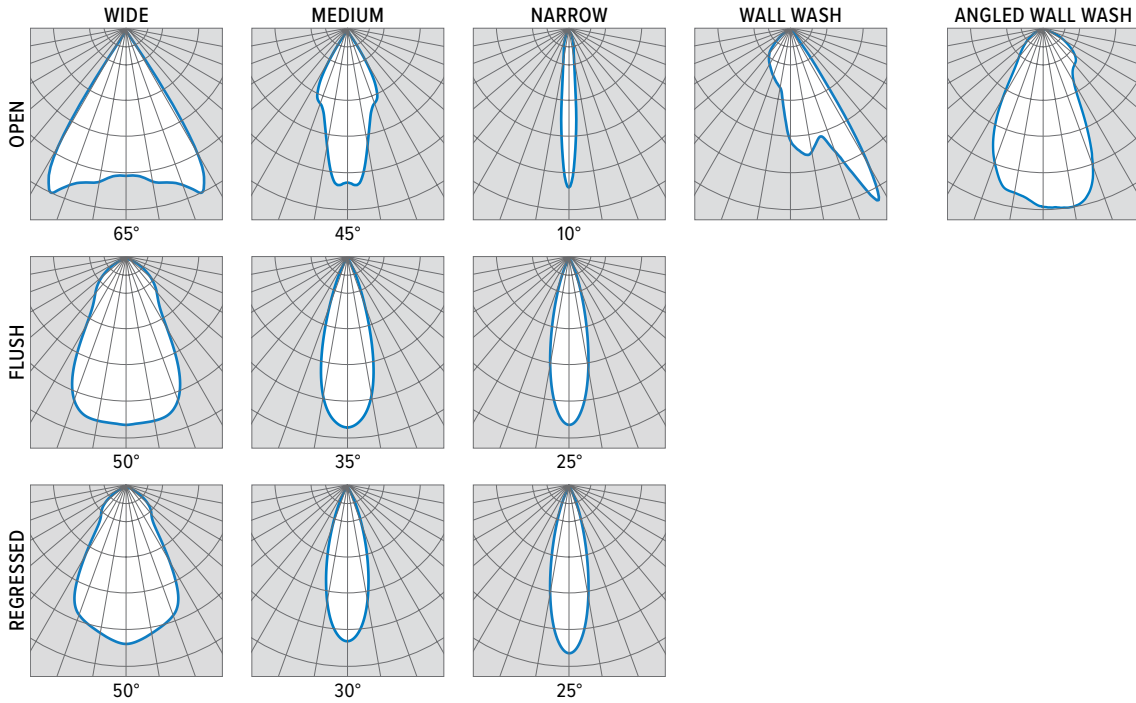


CANDLEPOWER DISTRIBUTION	VERTICAL ANGLE	HORIZONTAL ANGLE	ZONAL LUMENS
		0°	
	0	1810	
	5	1864	178
	15	1960	556
	25	2231	1033
	35	307	193
	45	44	35
	55	11	10
	65	1	1
	75	0	0
	85	0	0
	90	0	0

LUMEN SUMMARY	ZONE	LUMENS	% FIXTURE
	0 - 40	1959	98
	0 - 60	2004	100
	0 - 90	2005	100
	0-180	2005	100



4DR LED 4.5" Downlight – Round



ADDITIONAL CONTROL OPTIONS

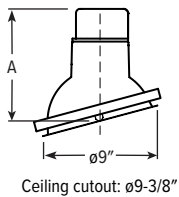
Lumen restrictions apply: L40 max for DMX driver, L40 max for Lutron drivers, L50 max for ELDO drivers, L15 minimum for DIM LINE driver, L60 max for DIM LINE driver. R Mounting Type not available with DMX or FCJS controls. R Mounting Type requires 12" minimum plenum depth when specified with VRF/DBI controls. 347V may require stepdown transformer, see product builder at hew.com/product-builder. I Mounting Type not available with Lutron controls.

CATALOG NUMBER	DESCRIPTION
DIM	Dimming driver prewired for 0-10V low voltage applications
DIM1	1% dimming driver prewired for 0-10V low voltage applications
DIM LINE	Line voltage dimming driver (TRIAC and ELV compatible at 120V only)
DMX	0.1% dimming driver for DMX controls
LTE LINE	Lutron Hi-lume 1% 2-wire dimming driver forward phase line voltage controls (120V only)
LDE1	Lutron Hi-lume 1% EcoSystem dimming LED driver
VRF/DBI/LDE1	Lutron Vive integral fixture control, RF only (DFCSJ-OEM-RF), Lutron Hi-lume 1% EcoSystem dimming LED driver, and digital link interface
FCJS/DIM	Lutron Vive PowPak wireless fixture control with dimming driver
FCJS/DIM1	Lutron Vive PowPak wireless fixture control with 1% dimming driver
ELDO SOLOB	EldoLED Solodrive, 0.1% dimming driver for 0-10V controls
ELDO SOLOB DALI	EldoLED Solodrive, 0.1% dimming driver for DALI controls
ELDO ECO1	EldoLED Ecodrive, 1% dimming driver for 0-10V controls
ELDO ECO1 DALI	EldoLED Ecodrive, 1% dimming driver for DALI controls

TRIMLOCK DETAILS



SLOPED CEILING ADAPTOR DETAILS



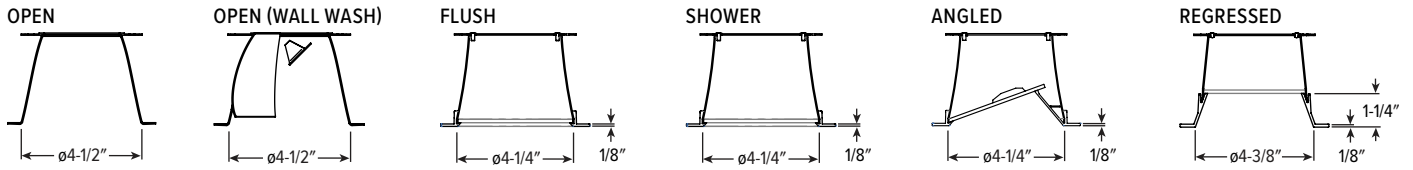
LUMENS	A (HEIGHT)						PLENUM HEIGHT
	5°	10°	15°	20°	25°	30°	
L10 - L30	8-13/16"	8-15/16"	9"	8-15/16"	8-7/8"	8-11/16"	9-1/4"
L40 - L60	9-9/16"	9-11/16"	9-11/16"	9-5/8"	9-1/2"	9-5/16"	10"

15° Shown

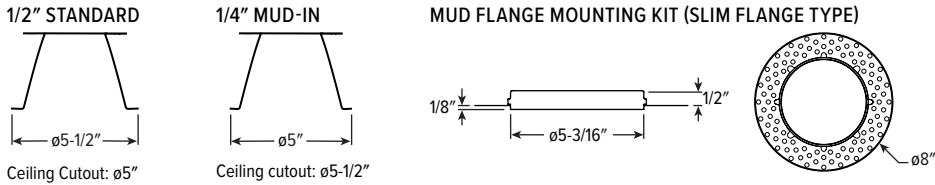


4DR LED 4.5" Downlight – Round

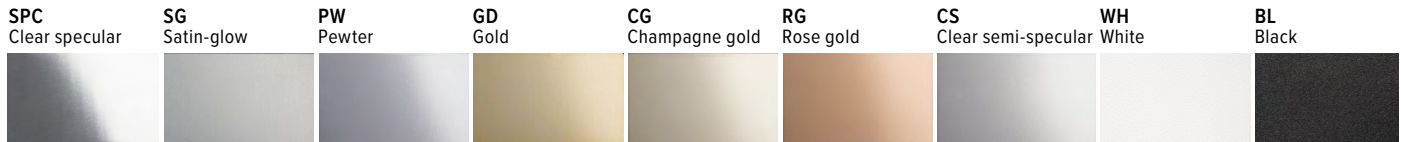
TRIM TYPE DETAILS



FLANGE TYPE DETAILS



REFLECTOR FINISH DETAILS



MOUNTING TYPE DETAILS

NEW CONSTRUCTION

IC-RATED

REMODEL

Cross Section

L10 - L40: 5-3/4"
 L50 - L60: 6-1/2"
 $\phi 4\text{-}1/2\text{'}$

Receiver Bracket

2-3/4"
 3-1/4"
 6-5/8"
 1-1/8" min space
 Ceiling cutout

Driver and Junction Box

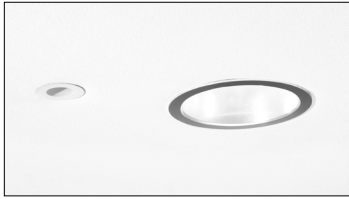
5-1/4"
 4-1/8"
 $\phi 6\text{-}15/16\text{'}$

LUMENS	LENGTH					
	A	B	C	D	E	F
L10 - L20	15-3/16"	16"	6-3/8"	12-1/8"	9-1/2"	6-1/16"
L30	16-5/8"	17-1/2"	7-7/8"	14"	10-1/4"	7"

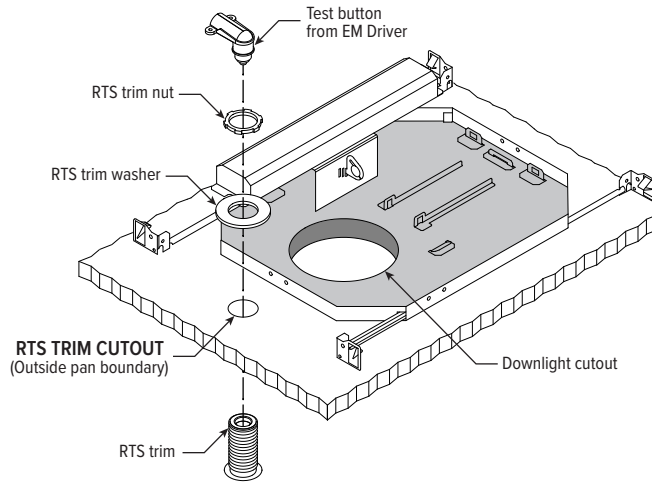


4DR LED 4.5" Downlight – Round

EM/10W/RTS DETAILS

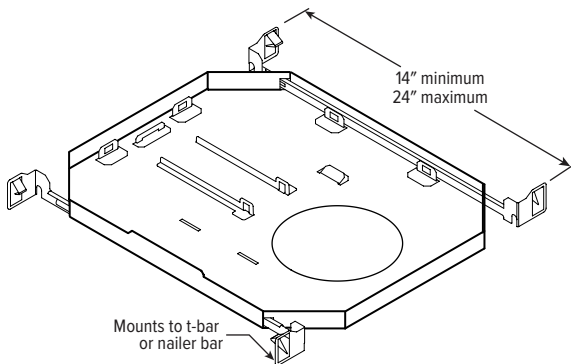


Shown Installed

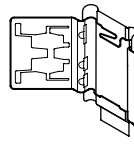


MOUNTING HARDWARE DETAILS

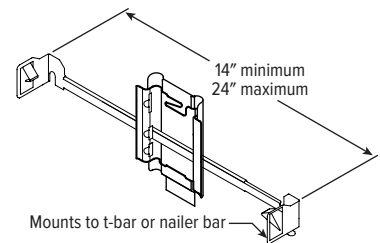
F1 Integral 2-position fixed pan bracket, universal bar hanger included



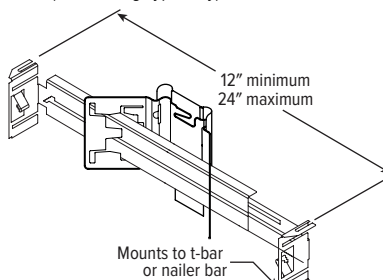
BA1 Adjustable butterfly pan bracket, bar hanger not included (N Mounting Type only)



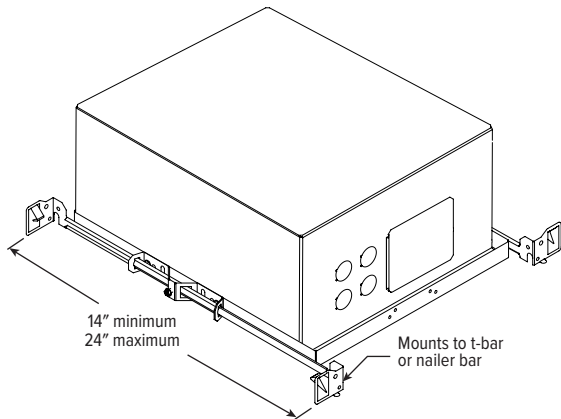
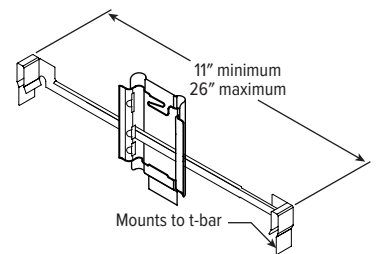
CA1 Adjustable caterpillar pan bracket, universal bar hanger included (N Mounting Type only)



BA2 Adjustable butterfly pan bracket, heavy-duty universal bar hanger included (N Mounting Type only)



CA2 Adjustable caterpillar pan bracket, t-bar hanger included (N Mounting Type only)

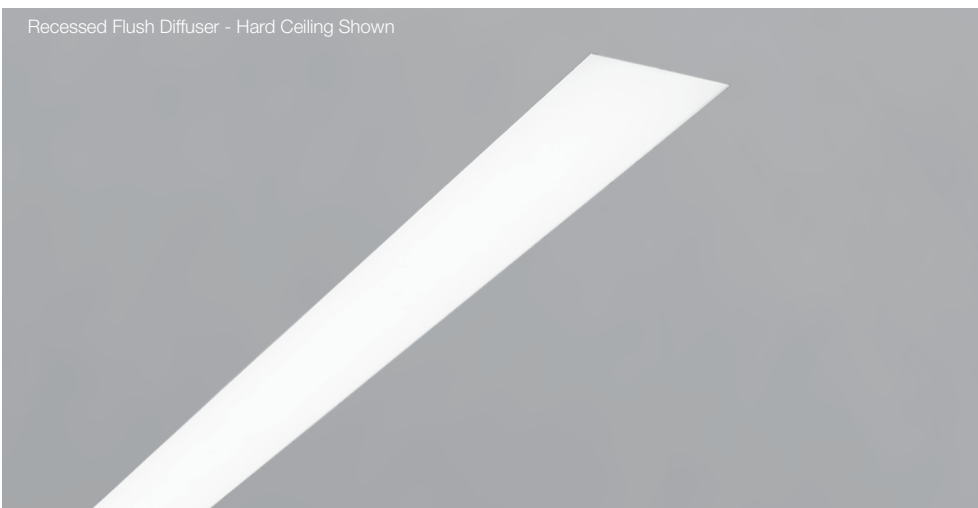


F1 with I Mounting Type



Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

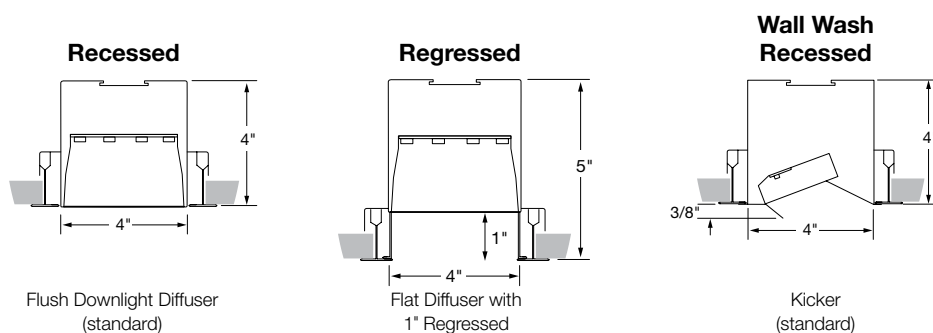


High Performance 4" Aperture is a patented, linear LED luminaire family. HP-4 delivers excellent performance using an advanced optical design and mid-power LEDs. Achieving 90% of initial light output at 100,000+ hours and backed by a 10-year performance-based warranty on all standard components.

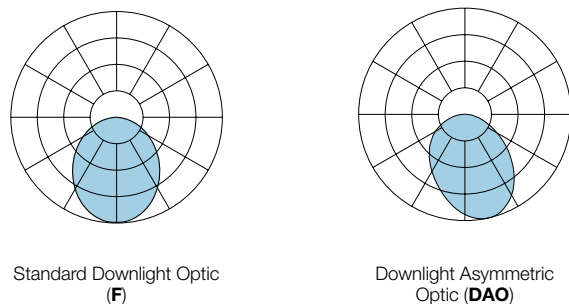
This product is enrolled in the International Living Future Institute (ILFI) Declare 2.0 Program and is third-party verified with options achieving **Red List Approved** and **Declared** status.

Note: see page 6 for all aesthetic options

CROSS SECTIONS



OPTIC OPTIONS



ALSO AVAILABLE IN



Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

BODY TYPE

OUTPUT and LED TYPE

Platform	Series Name	Luminaire Type	Luminaire Distribution	Total Length of Run	Downlight Output (Flush)	LED CRI/CCT
HP - High Performance	4	R - Recessed R RG - Recessed Regressed (Wall Wash not available)	D - Direct WW-D - Wall Wash Direct	Minimum 2' section length. Increments accurate to 1/16" (±1/32"), standard. 12' maximum section length.	S - Standard (381 lm/ft) B - Boosted (479 lm/ft) H - High (725 lm/ft) V - Very High (932 lm/ft) TL - Tailored: _____ lm/ft*	830 - 80 CRI, 3000K 835 - 80 CRI, 3500K 840 - 80 CRI, 4000K 930 - 90 CRI, 3000K 935 - 90 CRI, 3500K 940 - 90 CRI, 4000K 8TW - 80 CRI, Tunable White 9TW - 90 CRI, Tunable White

MECHANICAL/OPTICAL OPTIONS

ELECTRICAL OPTIONS

Downlight	Reflector System	Voltage	Circuiting ³
F - Flush (standard) DL - 1" Drop Down Lens DSO - Downlight Spread Optic ^{2,7} DAO-L - Downlight Asymmetric Optic Left ^{2,7} DAO-R - Downlight Asymmetric Optic Right ^{2,7} FO - Fully Open for Wall Wash only K - Kicker for Wall Wash only RG-D - Flat Diffuser with 1" Regress ¹ RG-WCB - White Cross Blade Baffle ¹ RG-LHE - Hollowed Ellipse Louver ¹ RG-LHC - Hex Louver ¹	96LG - 96 Low Gloss White SSA - Semi-Specular Aluminum for Wall Wash only	120 - 120 Voltage 277 - 277 Voltage 347 - 347 Voltage	SC - Single Circuit* * Battery, Night Light, and Emergency to Generator circuits are in addition to the normal luminaire circuit(s)

ELECTRICAL OPTIONS

MOUNTING OPTIONS

Driver Selection	Ceiling Hardware Type
0-10V Driver Options FC-10% - 0-10V 10% ⁴ (standard) FC-1% - 0-10V 1% ⁴ OSR-10% - Osram OTi, 0-10V 10% ⁴ OSR-1% - Osram OTi, 0-10V 1% ⁴ ELD-10V-0% - EldoLED SOLOdrive, 0-10V 0.1% OSR-10V-TW - Osram OTi, 0-10V 10% (Tunable White) ⁴ DALI Driver Options FC-DALI-1% - DALI 1% OSR-DALI-1% - Osram Dexal, 1% ELD-DALI-0% - EldoLED SOLOdrive, 0.1% ELD-DALI-TW - EldoLED DUALdrive LightShape, 0.1% (Tunable White)	DMX Driver Options FIN-DMX - Finelite DMX 1% (Tunable White - FineTune Controls Only) ⁵ ELD-DMX - EldoLED POWERdrive, 0.1% ELD-DMX-TW - EldoLED POWERdrive, 0.1% (Tunable White) Lutron Driver Options LUT-ES1 - Lutron, Ecosystem 1% LUT-2W - Lutron, 2-wire (120V only) 1% LUT-TW - Lutron T-Series, EcoSystem 0.1% (Tunable White)
See Page 3 for additional driver options and details	C1 - 1" T-Bar C1T - 1" Tegular C2 - 9/16" T-Bar C2T - 9/16" Tegular C3 - Screw Slot C3F - Flush Screw Slot SF - Spackle Flange VF - Visible Flange TZ6 - Tech Zone 6" _____ (C1, C2, C2T, C3, C3F)

OTHER OPTIONS

Endcap Style	Finish	Emergency Style (Optional)	Integrated Sensor (Optional)	Special Options (Optional)
FE - Flat Endcap (standard)	SW - Signal White (standard) FB - Finelite Black ⁶ SA - Satin Aluminum ⁶ #### - RAL Color Code ⁶	FAC CHO - Factory Choice Battery Back-up EM/GEN - Emergency to Generator NL - Night Light BSL722 - Bodine Battery Back up BSL310LP - Bodine Battery Back up Low Profile GTD - Generator Transfer Device	OBO - Occupancy ⁷ OBD - Daylight ⁷ OBE - Enlighted ⁸ REE - Remote Enlighted ⁹	CP - Chicago Plenum FLX - Flex Whip RLA - Red List Approved RLD - Declared

¹ Recessed Regressed only

² Not available with Regressed or Curves

³ Contact factory for switching options

⁴ Add DTO to gain "Dim to Off" functionality (FC-10% - DTO)

⁵ B & V outputs only

⁶ 20 business days lead time for color

⁷ Not available with Wall Wash

⁸ Enlighted components installed by Finelite, provided by others

⁹ Enlighted for Wall Wash fixtures. Enlighted Control Unit &

Sensor Cable installed for Remote mounting sensor.

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

SUPPLEMENTARY DRIVER PAGE

0-10V Driver Options

FC-10%	Factory Choice, 0-10V 10% Dimming (Linear)
FC-10%-DTO	Factory Choice, 0-10V 10% Dimming, Dim-to-Off (Linear)
FC-1%	Factory Choice, 0-10V 1% Dimming (Linear)
FC-1%-DTO	Factory Choice, 0-10V 1% Dimming, Dim-to-Off (Linear)
ELD-10V-0%	EldoLED SOLOdrive, 0-10V 0.1% Dimming (Linear)
ELD-10V-1%	EldoLED ECOdrive, 0-10V 1% Dimming (Linear)
OSR-10V-TW	Osram OTi, 0-10V 10% Dimming, <i>Tunable White</i> (Linear)
OSR-10V-TW-DTO	Osram OTi, 0-10V 10% Dimming, Dim-to-Off, <i>Tunable White</i> (Linear)
OSR-10%	Osram OTi, 0-10V 10% Dimming (Linear)
OSR-10%-DTO	Osram OTi, 0-10V 10% Dimming, Dim-to-Off (Linear)
OSR-1%	Osram OTi, 0-10V 1% Dimming (Linear)
OSR-1%-DTO	Osram OTi, 0-10V 1% Dimming, Dim-to-Off (Linear)

DALI Driver Options

FC-DALI-1%	Factory Choice, DALI 1% Dimming (Logarithmic)
OSR-DALI-1%	Osram Dexal, DALI 1% Dimming (Logarithmic)
ELD-DALI-0%	EldoLED SOLOdrive, DALI 0.1% Dimming (Logarithmic)
ELD-DALI-1%	EldoLED ECOdrive, DALI 1% Dimming (Logarithmic)
ELD-DALI-TW	EldoLED DUALdrive Light Shape, DALI 0.1% Dimming, <i>Tunable White</i> (Logarithmic Dimming , Linear CCT Control)

DMX Driver Options

FIN-DMX	Finelite, DMX 1% Dimming, <i>Tunable White - FineTUNE Controls Only</i> (Linear)
ELD-DMX	EldoLED POWERdrive, DMX 0.1% Dimming (8 Bit, 1CH) (Linear)
ELD-DMX-16	EldoLED POWERdrive, DMX 0.1% Dimming (16 Bit, 2CH) (Linear)
ELD-DMX-TW	EldoLED POWERdrive, DMX 0.1% Dimming, <i>Tunable White</i> (8 Bit, 2CH - CH1 Warm / CH2 Cool) (Linear)
ELD-DMX-TW16	EldoLED POWERdrive, DMX 0.1% Dimming, <i>Tunable White</i> (16 Bit, 4CH - CH1, 2 Warm / CH3, 4 Cool) (Linear)

Lutron Driver Options

LUT-ES1	Lutron, Ecosystem 1% Dimming
LUT-2W	Lutron, 2-wire (120V only) 1% Dimming
LUT-TW	Lutron T-Series, EcoSystem 0.1% Dimming, <i>Tunable White</i>

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

SPECIFICATIONS

BODY TYPE

CONSTRUCTION: Precision-cut 6061-T6 extruded aluminum body. Internal joiner system, plug-together wiring, standard.

LENGTHS: Any length, 2' minimum, in increments down to 1/16" ($\pm 1/32$ "). 12' maximum section length. Hollowed Ellipse Louver (**LHE**), Hex Louver (**LHC**), and White Cross Blade Baffle (**WCB**) are available in 1' increments.

MITERED CORNERS¹: Illuminated corners of greater than 60° and less than 180° in a single plane, available with Flush Diffuser, Bottom Glow Diffuser, 1" Drop Down Lens, Regressed Diffuser, White Cross Blade Baffle² or Wall Wash. Corners not available with Wall Wash (**WW-D**), Hollowed Ellipse Louver (**LHE**) or Hex Louver (**LHC**). Consult factory for tailored lighting options.

OUTPUT AND LED TYPE

LIGHT OUTPUT: Four lumen packages available, Standard (**S**), Boosted Standard (**B**), High (**H**), and Very High (**V**). For lengths 3' and greater, the uplight and downlight can be specified with different lumen packages and dual controls. For Tailored Outputs outside of range from Standard (**S**) to Very High (**V**), consult factory. Light engines are replaceable.

MECHANICAL/OPTICAL OPTIONS

DOWNLIGHT OPTION: 12' maximum diffuser length. Flush frost white snap-in diffuser standard, 73% transmissive, 99% diffusion. Internal secondary diffusers at corners ensure visually seamless, uniform, continuous illumination. Available with Flush (**F**), 1" Drop Down Lens (**DL**), White Cross Blade Baffle (**WCB**)^{3,4}, Ellipse Louver (**LHE**)³, Hex Louver (**LHC**)³, Downlight Spread Optic (**DSO**), Downlight Asymmetric Optic Left and Right (**DAO-L**, **DAO-R**), and Regressed downlight diffusers (**RG**)³. 1" Drop Down Lens made of acrylic. Available with a solid endcap or an endcap with a diffuse filler to continue the luminous aesthetic. Downlight Spread Optic (**DSO**) & Downlight Asymmetric Optic (**DAO**) are an extruded lenses with a subtle ribbed appearance providing desired improved optical performance. Consult factory for more tailored lumen outputs.

LUMEN MAINTENANCE: 90% of initial light output (L90) at 100,000+ hours; 70% of initial light output (L70) at 200,000+ hours.

REFLECTORS: Die-formed 20-gauge cold-rolled steel reflectors finished in 96LG High Reflectance white powder coat paint. The standard Semi-Specular Aluminum (**SSA**) Kicker (**K**) reflector delivers light high on the vertical surface. The Kicker reflector can be easily removed for open distribution (**FO**).

¹ Not available with Wall Wash

² White Cross Blade (WCB) baffles not available with custom angles. Available in 90 degrees only

³ Regressed-Regressed only

⁴ White Cross Blade Baffle (WCB) currently not advisable for drywall

ELECTRICAL OPTIONS

STATIC WHITE FEED: Standard with one 18-gauge/5-conductor single-circuit feed wire controlling uplight and downlight together (power and dimming). Specify dual feed wires for independent control of uplight and downlight. 14-gauge feed wire used when luminaire current exceeds 5 amps.

TUNABLE WHITE FEED: Standard with one 18-gauge/5-conductor single-circuit feed. 14-gauge feed used when luminaire current exceeds 5 amps. DMX and power feed at same location (standard). DMX feeds cannot be cut or spliced. DMX feeds should be ordered based on fixed lengths.

STATIC WHITE DRIVER: Replaceable 120V, 277V, and 347V constant current reduction dimming driver standard. Can be wired dimming or non-dimming. 0-10V dimming controls with a range of 10%- 100% standard. Dimming to 1% available. Separate dimming for uplight and downlight available. Driver is fully accessible from below the ceiling.

- **Power Factor:** ≥ 0.9
- **Total Harmonic Distortion (THD):** <20%
- **Expected driver lifetime:** 100,000 hours

LUTRON DRIVER OPTIONS:

- **LUT-ES1 (LDE1)** - (Hi-lume 1% EcoSystem with Soft-On, Fade-to-Black dimming (LDE1 series))
- **LUT-2W (LTEA2W)** - (Hi-lume 1% 2-wire, 120V forward phase dimming (LTEA series)).

TUNABLE WHITE DRIVER: Replaceable LED driver. Driver is accessible from below the ceiling. 120V, 277V, and 347V.

- **Power factor:** ≥ 0.90
- **Total Harmonic Distortion (THD):** <20%
- **Dimming Range:** 100%-10%
- **Expected driver lifetime:** 100,000 hours
- **FineTune DMX:** 1%

LUTRON TUNABLE WHITE DRIVER OPTION:

LUT-TW (0.1% T-Series 2-Channel Digital Tunable White (PSQ Series)).

MOUNTING OPTIONS

HANGING HARDWARE:

- **Recessed T-Bar:** Standard bracket design works with most lay-in ceiling types. Brackets secure luminaire to the ceiling grid from above. Tie-in T-Bar brackets connect the luminaire to the T-Bar for securing to structure. Consult local codes for tie-wire recommendations.
- **Recessed Spackle Flange:** Drywall surfaces (walls or ceilings):
1/4" - 20 stud and nut (provided by others). Mounted with three equidistant suspension points.

Continued

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

SPECIFICATIONS

TUNABLE WHITE DMX HANGING HARDWARE: For grid ceiling applications the dual GridBox™ mounting is supplied (standard). For hard ceiling applications the ceiling mounting box is supplied (standard). DMX feeds cannot be cut or spliced. DMX feeds should be ordered based on fixed lengths. Available DMX pendant feed lengths are 5' (standard), 12', and 30'.

TUNABLE WHITE DMX INTERCONNECTION CABLES: Luminaires are pre-wired with plug-and-play interconnection cables to support easy plug-together joining of fixture runs. If a non-FineTune DMX system has been specified, a DMX to RJ45 converter is provided.

OTHER OPTIONS

ENDCAPS: Flat endcaps (**FE**) at each end of run add 1/16" to each end of luminaire. Drop Down Lens Illuminated Endcap (**DE**) includes diffuse element to continue luminance of drop lens.

EMERGENCY STYLE: Optional emergency to generator/inverter wiring, internal generator transfer switch, nightlight wiring, step-dimming driver, backup battery.

Backup Battery			
	Factory Choice	Bodine BSL310LP	Bodine BSL722
HP4-R-D			
Min. Housing Length	8'	4'	4**
EM Lumen Output	1854	1102	1854
EM Section Illum.	2'	2' or 4'	2'
HP4-R-WW-D			
Min. Housing Length	8*	4**	4**
EM Lumen Output	2000	1189	2000
EM Section Illum.	4'	4'	4'

* Minimum fixture housing length for battery pack approved without sensor

TUNABLE WHITE ELECTRICAL OPTIONS⁶:

- **TW Driver Options 0-10V:** EM/GEN, GTD or Battery Back up
- **FineTune DMX:** EM/GEN or Battery Back up
- **DMX:** Battery Back up
- **DALI:** EM/GEN, GTD or Battery Back up
- **LUTRON:** EM/GEN, GTD or Battery Back up

INTEGRATED SENSORS: Integrated PIR (Passive Infrared) occupancy or daylight sensors available with Flush and Bottom Glow downlight diffusers. Refer to Occupancy Sensor, Daylight Sensor, and Enlighted Sensor tech sheets for more info.

FINISHES: Finelite Signal White (**SW**) powder coat, Finelite Black (RAL 9005) with semi gloss fine texture (**FB**)⁷, and Satin Aluminum (**SA**)⁷ are standard. Optional Adder: 185 RAL colors⁷ are available.

LABELS: Luminaire and electrical components are ETL-listed conforming to UL 1598 in the U.S.A. and CAN/CSA C22.2 No. 250.0 in Canada. In accordance with NEC Code 410.130 (G), this luminaire contains an internal driver disconnect. UL 924 and UL 2108 - PoE options available on request. These fixtures are rated for Damp Location. IC Rated. Finelite products use electronic components that are RoHS compliant, and the mechanical components of the luminaire have been verified to not knowingly contain any restricted substances listed per RoHS Directive 2015/863. Consult factory for tailored lighting options. Finelite makes the specification process easy when putting healthier products on your projects. Simply add – **RLA** (Red List Approved) or – **RLD** (Declared Label) to your part number.

WEIGHT⁸: R - 2.8 lb/ft; WW-R - 2.9 lb/ft

DLC QUALIFIED: Configurations of this product are listed on the DLC Qualified Products List (QPL). www.designlights.org/search

WARRANTY: 10-year performance-based warranty on all standard components. Optional accessories such as emergency battery packs are covered by their individual manufacturer warranties.

⁶ Consult Finelite for Generator Transfer Device and Battery Backup fit

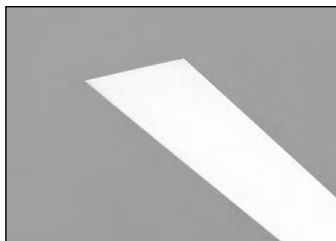
⁷ 20 business days lead time for color

⁸ Excludes Battery Backup and Generator Transfer Device weight

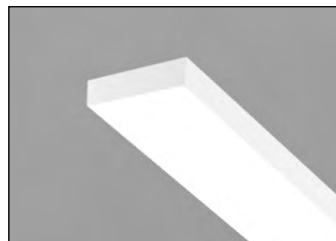
Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

AESTHETIC OPTIONS



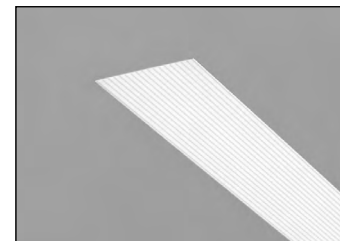
Flush Diffuser (F)



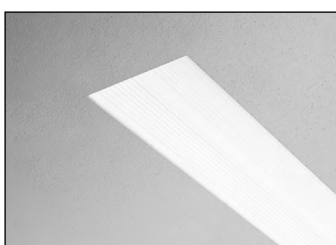
1" Drop Down Lens (DL)



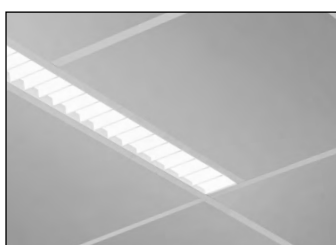
Flat Diffuser with 1" Regressed (RG-D)



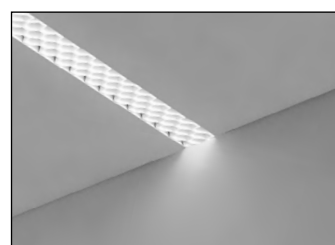
Downlight Spread Optic (DSO)
Externally flush



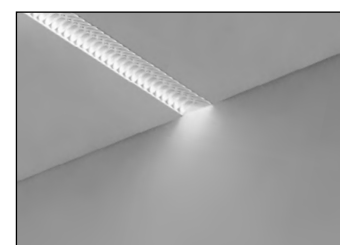
Downlight Asymmetric Optic (DAO)
Externally flush



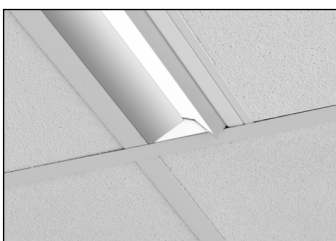
White Cross Blade Baffle¹ (RG-WCB)



Hex Louver¹ (RG-LHC)



Hollowed Ellipse Louver¹ (RG-LHE)

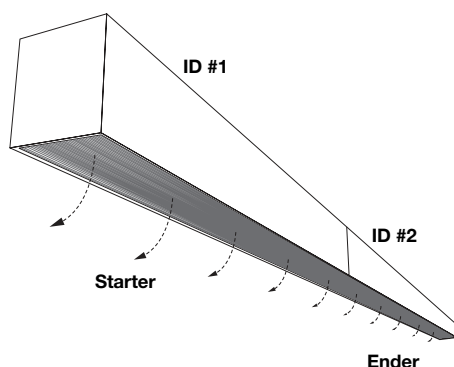


Kicker (K) - Wall Wash only

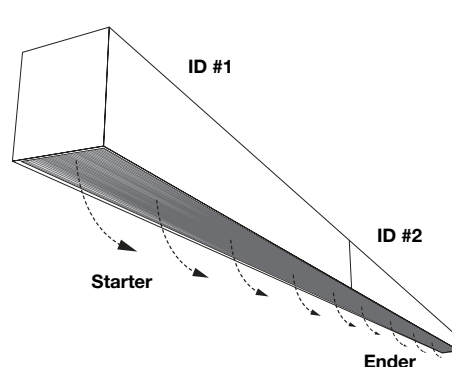
DOWNLIGHT ASYMMETRIC OPTIONS

Use this tool to understand how to specify Downlight Asymmetric for your project. The diagrams below show a linear run from power feed to ender. Specify DAO-L distributes light to the left or DAO-R distributes light to the right.

Downlight Asymmetric Optic Left (DAO-L)



Downlight Asymmetric Optic Right (DAO-R)



PREINSTALLED LABEL

For DAO, Preinstalled label on diffuser shows direction of light. Remove after installation.



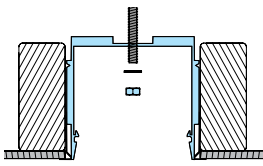
¹ Regressed only

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

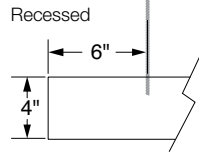
High Performance 4" Aperture (HP-4) Recessed

HARD CEILING MOUNTING OPTIONS

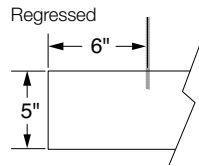
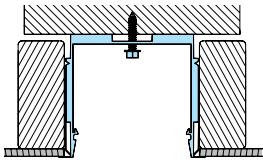
Threaded Rod Option



Mounting Location for Securing to Structure

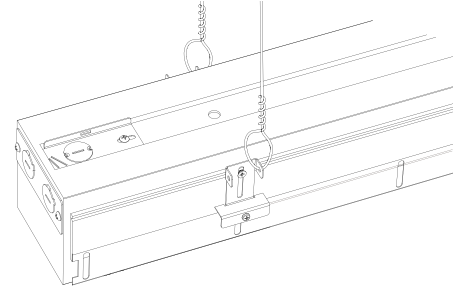


Screw Mount Option



Two mounting options: threaded rod and screw mounting options. Mounting locations are located on each end of the luminaire. Mounting location is 6" away from each end of luminaire.

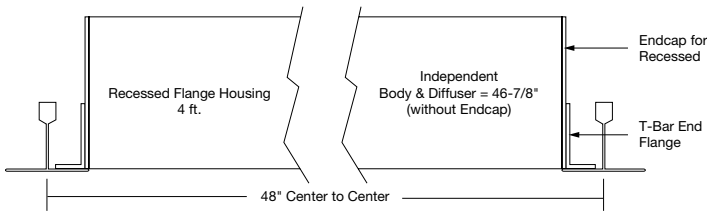
T-BAR INSTALLATION



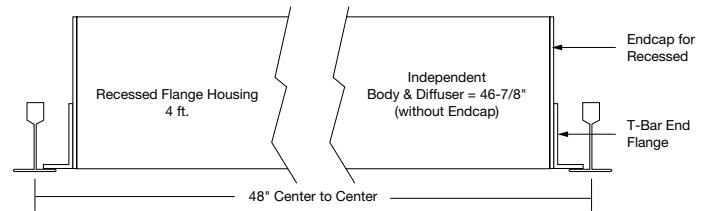
HP-4 R for T-Bar installations comes standard with a splice plate at the end of the luminaire. Mounting brackets (supplied) secure the luminaire to T-Bar and provide support to structure location. All even foot length (2, 4, 6, ...) luminaire runs are reduced in length by an appropriate amount to fit within typical 2x2 and 2x4 T-Bar grid systems. For uncommon T-Bar systems please consult factory.

GRID LENGTH DETAIL - 4' EXAMPLE

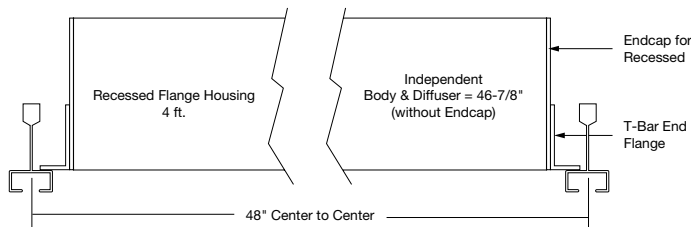
1" T-Bar



9/16" T-Bar

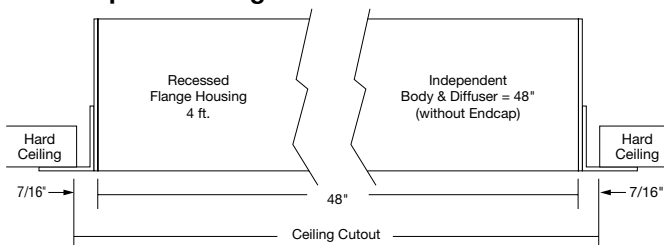


9/16" Screw Slot

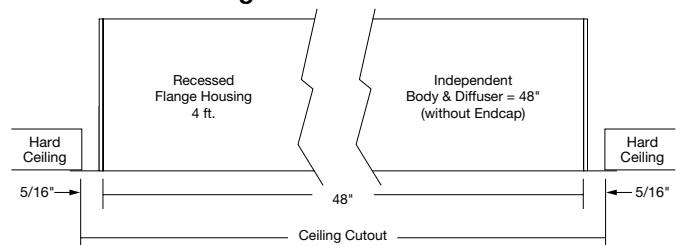


HARD CEILING LENGTH DETAIL - 4' EXAMPLE

Spackle Flange



Visible Flange



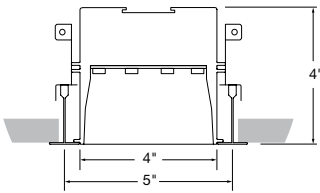
Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

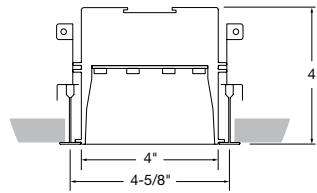
High Performance 4" Aperture (HP-4) Recessed

RECESSED MOUNTING TYPES - T-BAR

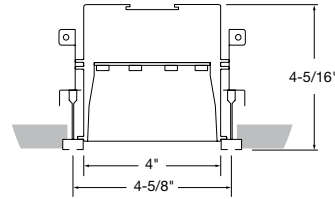
Rough-In Dimensions



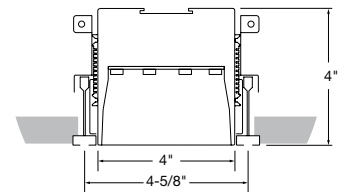
1" T-Bar (C1)



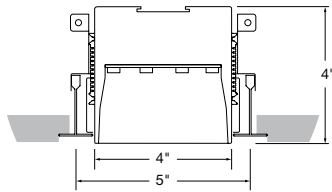
9/16" T-Bar (C2)



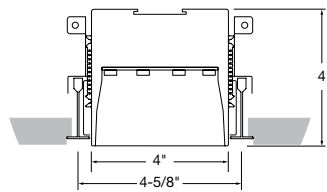
Standard Screw Slot (C3)



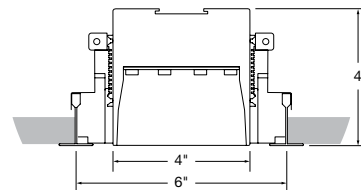
Flush Screw Slot (C3F)



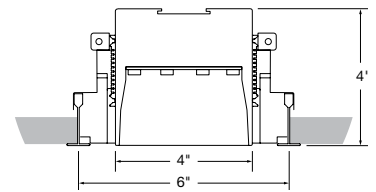
1" Tegular (C1T)



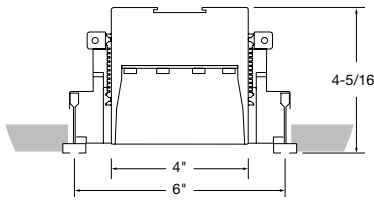
9/16" Tegular (C2T)



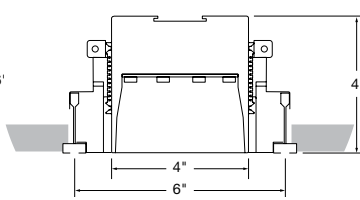
Tech Zone 6" (TZ6)
1" T-Bar (C1)



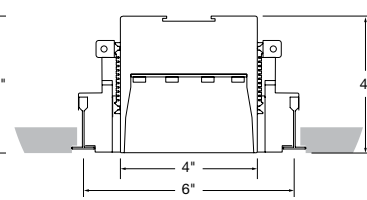
Tech Zone 6" (TZ6)
9/16" T-Bar (C2)



Tech Zone 6" (TZ6)
Standard Screw Slot (C3)

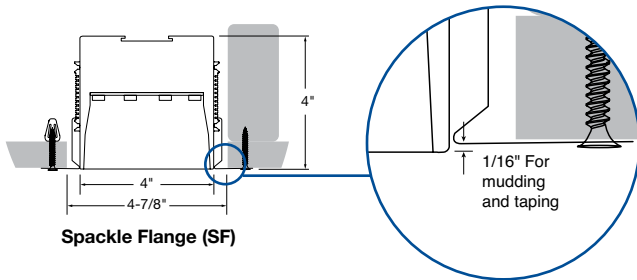


Tech Zone 6" (TZ6)
Flush Screw Slot (C3F)

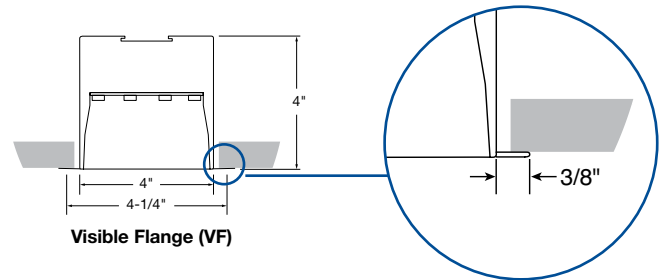


Tech Zone 6" (TZ6)
9/16" Tegular (C2T)

RECESSED MOUNTING TYPES - CUTOUT DIMENSIONS

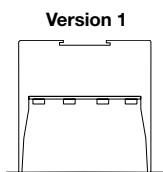


Spackle Flange (SF)

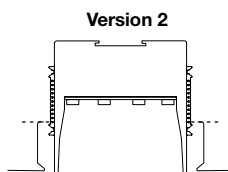


Visible Flange (VF)

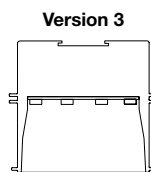
HOUSING



Version 1
Ceiling Option VF



Version 2
Ceiling Options
C1T, C2T, C3F, SF, TZ6



Version 3
Ceiling Options
C1, C2, C3

Note: +/- 1/16"

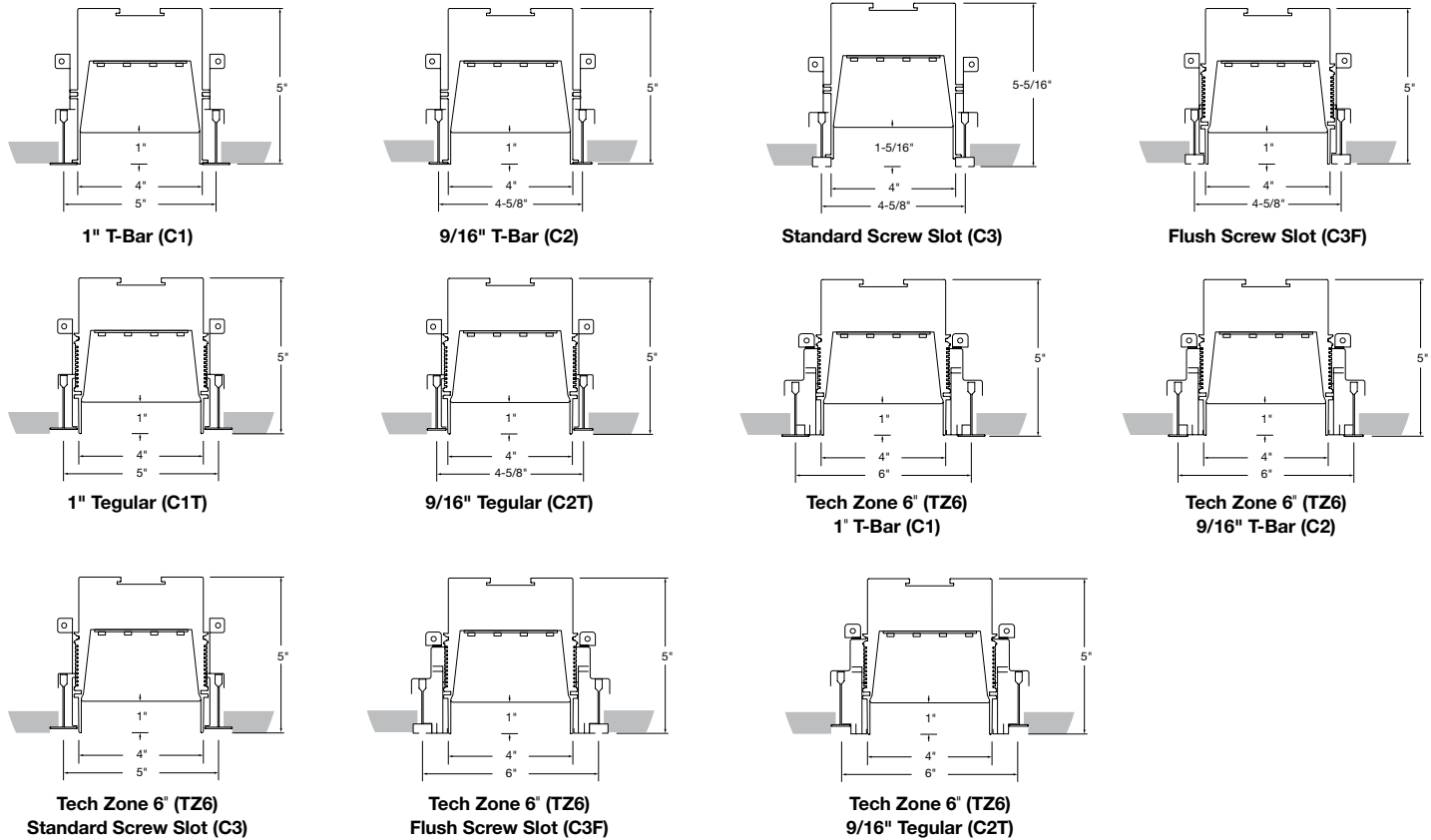
Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

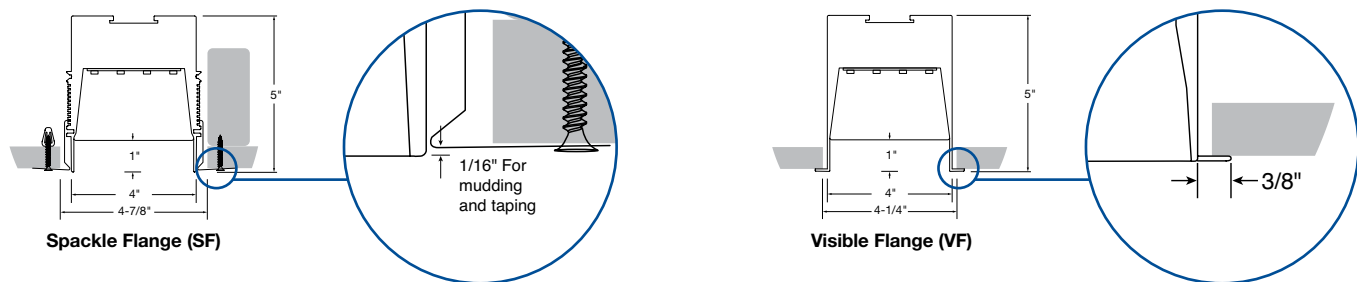
High Performance 4" Aperture (HP-4) Recessed

REGRESSED MOUNTING TYPES - T-BAR

Rough-In Dimensions

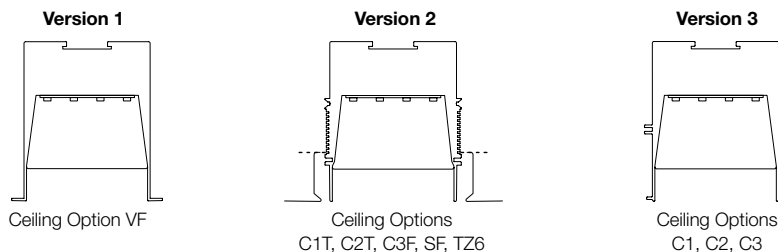


REGRESSED MOUNTING TYPES - CUTOUT DIMENSIONS



Regressed Lens: Regressed lens version is 5" tall with a lens that is regressed 1" from ceiling line.

HOUSING



Note: +/- 1/16"

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

Recessed Photometry - 4' Luminaire 3500K

HP4-R-D-4'-V-835

Downlight: Flush Diffuser

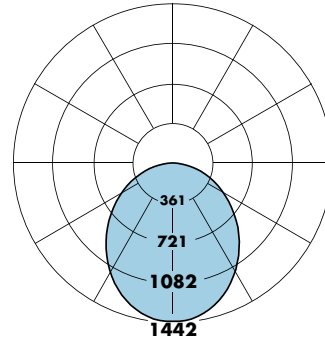
Efficacy: 101 lm/W

Total luminaire output: 3726 lumens (932 lm/ft)
37 watts (9.3 W/ft)

Peak Candela Value: 1442 @ 0°

CRI: 80 / CCT: 3500K

ITL LM79 Report 85128



CANDELA DISTRIBUTION						
	0.0	22.5	45	67.5	90	Flux
0	1442	1442	1442	1442	1442	
5	1434	1434	1433	1433	1434	136
15	1369	1360	1365	1364	1359	384
25	1241	1226	1232	1225	1219	566
35	1064	1053	1055	1043	1037	657
45	864	853	851	840	834	655
55	650	644	640	631	626	571
65	441	436	433	428	425	428
75	238	237	238	237	236	252
85	70	69	70	72	71	78
90	0	0	0	0	0	

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
1525	1917	2898	3726

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
381	479	725	932

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
3.6	4.6	7.1	9.3

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
105	104	102	101

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 2898 lm x 0.789 = 2287 lm

Total Light Output per Foot: 725 lm/ft x 0.789 = 572 lm/ft.

watts/foot: 7.1 W/ft.

$$\text{Efficacy} = \frac{572 \frac{\text{lm}}{\text{ft}}}{7.1 \frac{\text{W}}{\text{ft}}} = 80 \text{ lm/W}$$

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 85128

Protected by one or more US Patents: 8915613; D702,391; D702,390; D700,732

Page 10

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

Recessed Photometry - 4' Luminaire 3500K

HP4-R-D-4'-V-835-DAO

Downlight: Downlight Asymmetric Optic

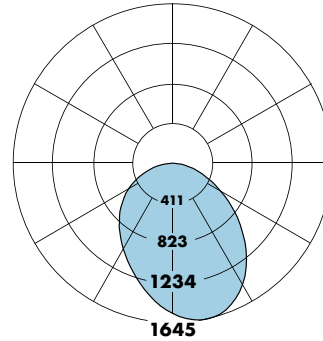
Efficacy: 109 lm/W

Total luminaire output: 3884 lumens (971 lm/ft)
35.6 watts (8.9 W/ft)

Peak Candela Value: 1645 @ 12.5°

CRI: 80 / CCT: 3500K

ITL LM79 Report 94331



CANDELA DISTRIBUTION						
	0.0	22.5	45.0	67.5	90.0	Flux
0	1552	1552	1552	1552	1552	
5	1609	1591	1543	1494	1476	146
15	1641	1599	1468	1341	1292	413
25	1538	1506	1323	1153	1110	609
35	1315	1314	1116	960	939	704
45	1019	1052	872	768	779	691
55	710	759	629	578	616	587
65	438	476	404	391	436	423
75	216	239	214	218	248	239
85	57	62	63	64	70	70
90	0	0	0	0	0	

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
1590	1999	3021	3884

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
397	500	755	971

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
3.5	4.4	6.8	8.9

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
114	113	111	109

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI	
3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI	
3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 3021 lm x 0.789 = 2384 lm

Total Light Output per Foot: 755 lm/ft x 0.789 = 596 lm/ft.

watts/foot: 6.8 W/ft.

$$\text{Efficacy} = \frac{596 \frac{\text{lm}}{\text{ft.}}}{6.8 \frac{\text{W}}{\text{ft.}}} = 88 \text{ lm/W}$$

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 94331

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

Wall Wash Recessed - 4' Luminaire 3500K

HP4-R-WW-D-K-4'-V-835

Downlight: With Kicker

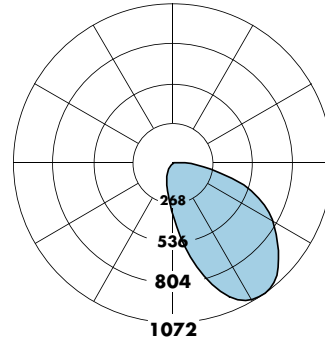
Efficacy: 92 lm/W

Total luminaire output: 1816 lumens (454 lm/ft)
21.5 watts (5.4 W/ft)

Peak Candela Value: 1072 @ 35°

CRI: 80 / CCT: 3500K

ITL LM79 Report 85130



CANDELA DISTRIBUTION						
	0.0	22.5	45.0	67.5	90.0	FLUX
0	373	373	373	373	373	
5	495	456	374	306	281	37
15	791	649	366	209	175	121
25	1018	818	347	147	115	217
35	1072	896	315	101	72	294
45	996	848	271	62	35	328
55	842	708	214	28	6	311
65	673	536	149	5	6	259
75	407	363	84	4	5	173
85	157	137	25	0	0	70
90	75	54	0	0	0	

Sample Lumen Adjustment Calculation

Lumen Adjustment Factors 80 CRI

3000K	0.985
3500K	1.000
4000K	1.032

Lumen Adjustment Factors 90 CRI

3000K	0.746
3500K	0.760
4000K	0.789

High Output (H), 4000K, 90 CRI

Lumen Adjustment Factor: 0.789

Total Light Output: 1412 lm x 0.789 = 1114 lm

Total Light Output per Foot: 353 lm/ft x 0.789 = 279 lm/ft.

watts/foot: 3.8 W/ft.

$$\text{Efficacy} = \frac{279 \frac{\text{lm}}{\text{ft}}}{3.8 \frac{\text{W}}{\text{ft}}} = 73 \text{ lm/W}$$

Total Light Output, 3500K, 80 CRI (Lumens) - 4' Luminaire

S ¹	B ¹	H ¹	V ²
743	935	1412	1816

Light Output, 3500K, 80 CRI (Lumens Per Foot)

S ¹	B ¹	H ¹	V ²
186	234	353	454

Power, 3500K (Watts Per Foot)

S ¹	B ¹	H ¹	V ²
2.0	2.5	3.8	5.0

Efficacy, 3500K, 80 CRI (Lumens Per Watt)

S ¹	B ¹	H ¹	V ²
91	92	92	92

S - Standard Output, B - Boosted Standard Output, H - High Output, V - Very High Output

¹ Family Correlation based on 4' luminaire 3500K Very High Output (V) test - 120V.

² Based on ITL report: 85130

Submitted by:		Date:
Type:	Project:	
Ordering Info:		

High Performance 4" Aperture (HP-4) Recessed

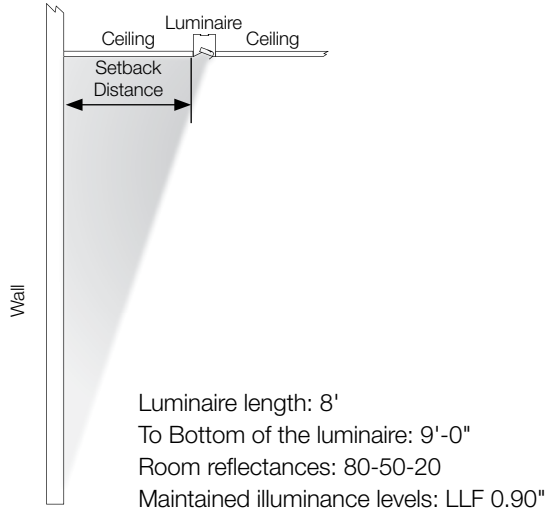
WALL WASH RECESSED - SETBACK INFO AND APPLICATION DATA

HP4-R-WW-D-K-4'-V-835

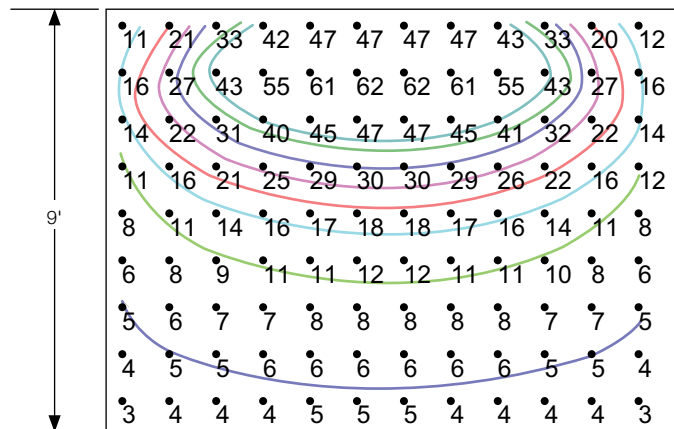
Downlight: With Kicker

Total luminaire output: 1450 lumens (363 lm/ft)
19.1 watts (4.8 W/ft)

CRI: 80 / CCT: 3500K



Setback Distance - 2'



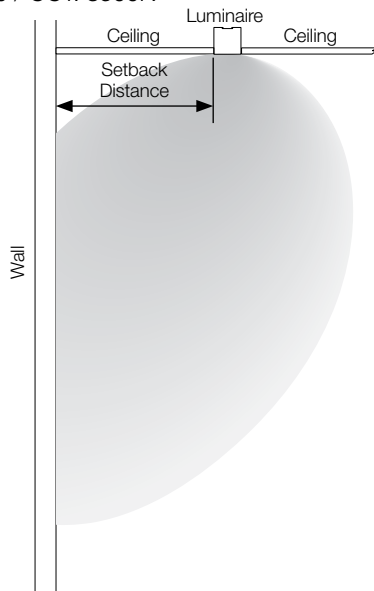
DOWNLIGHT ASYMMETRIC OPTIC - SETBACK INFO AND APPLICATION DATA

HP4-R-D-4ft-V-835-DAO

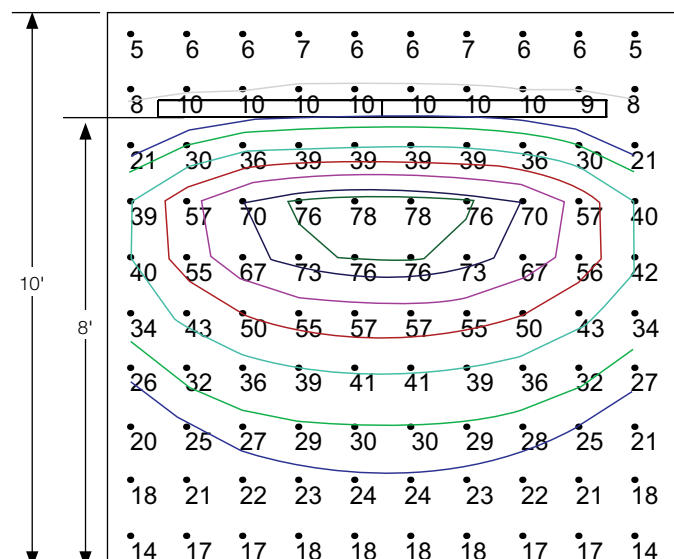
Downlight: DAO

Total luminaire output: 3884 lumens (971 lm/ft)
35.6 watts (8.9 W/ft)

CRI: 80 / CCT: 3500K



Setback Distance - 2'



Submitted by:		Date:
Type:	Project:	
Ordering Info:		

0-10V Tunable White

Finelite's award-winning, contractor friendly Tunable White luminaires are available at low cost, with powerful and simple 0-10V tuning and intensity controls.

TUNABLE WHITE FEATURES

- CCT range: 2700K - 6500K
- Dimming Range: 100% to 10%
- CRI Options: 80 CRI or 90 CRI

LUMINAIRE FAMILY MODIFICATIONS/RESTRICTIONS

Recessed Direct	Section Lengths											
	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	
Output S,B,H,V Single Circuit	Rows can be comprised of 2'-12' sections. Tailored lengths available.											
Integral Battery Backup (BSL310LP)							✓		✓		✓	

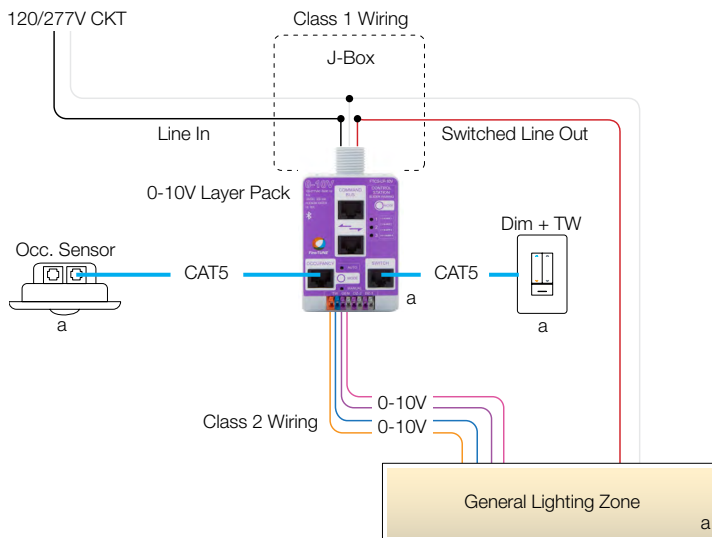
PHOTOMETRY

Apply a power adjustment factor to calculate wattage usage

POWER	CONVERSION FACTOR
	1.1X

(Example: a 50 watt luminaire in static white would draw 55 watts using 0-10V Tunable White)

WIRING DIAGRAM - DIMMABLE TO 10%



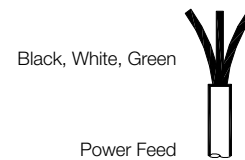
Luminaire Wiring

- **Purple (+) / Pink (-)** control wires are for intensity control
- **Orange (+) / Blue (-)** control wires are for Tunable White control

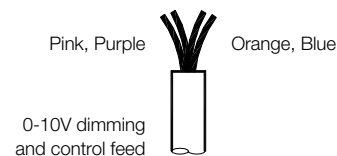
Note:

Load or Dim to Off options available.

DUAL FEED DETAIL

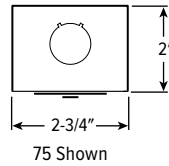


WIRING LEGEND		
Black	Hot	Line Voltage
White	Neutral	Line Voltage
Green	Ground	



WIRING LEGEND		
Pink	Dimming	0-10V DC
Purple	Dimming	0-10V DC
Orange	TW	0-10V DC
Blue	TW	0-10V DC





CATALOG #: _____

TYPE: _____

PROJECT: _____

FEATURES

- Available with Avi-on wireless fixture controls
- Small fixture profile allows inconspicuous placement in coves or confined spaces
- Round and square lensed fixtures provide a clean look for architectural environments
- Row applications produce continuous light with minimal interruption between fixtures
- Diffuse acrylic lens on 75R and 75S enhances uniformity and minimizes glare
- Variety of mounting accessories for surface and suspended applications
- Special reflectors are available to provide precise light distribution (75 only)
- Maximize energy savings with efficacies as high as 164 lm/W
- Made Right Here® in the USA

SPECIFICATIONS

- HOUSING** – 22-gauge die-formed C.R.S.
- FINISH** – 92% minimum average reflective white polyester powder coat bonded to phosphate-free, multi-stage pretreated metal. All parts painted after fabrication to facilitate installation, increase efficiency, and inhibit corrosion.
- ELECTRICAL** – High quality mid-power LED board. See fixture performance data for lumen maintenance. 25°C maximum ambient operating temperature. 40°C maximum ambient operating temperature with HA Option, lumen restrictions apply, consult Fixture Performance Data.
- MOUNTING** – Surface (ceiling or wall) or suspended (hanging hardware required).
- LISTINGS** –
 - cETLus conforms to UL STD 1598. Certified to CAN/CSA STD C22.2 No. 250.0. Suitable for damp locations
 - DesignLights Consortium Premium qualified product. Not all versions of this product may be DLC Premium qualified, see the DLC Qualified Products List at designlights.org/GPL
- WARRANTY** – 5-year limited warranty, see hew.com/warranty.

ORDERING EXAMPLE: 75 - 4 - L85/835 - OPTIONS - CONTROL - DIM - UNV

ORDERING INFO

SERIES	LENGTH ^[1]	LUMENS ^[2]	3'	4'	8'	CRI	CCT
75	2 2'	2'				8 80	27 2700K
75R	3 3'	L15 1,500lm	L40 4,000lm	L30 3,000lm	L60 6,000lm	9 90 ^[7]	30 3000K
75S	4 4'	L25 2,500lm	L64 6,400lm	L50 5,000lm	L100 10,000lm		35 3500K
	8 8' ^[3]	L32 3,200lm	L42 4,200lm	L65 6,500lm	L130 13,000lm		40 4000K
		L60 6,000lm ^[4]		L85 8,500lm	L170 17,000lm		50 5000K
				L100 10,000lm	L200 20,000lm		
				L120 12,000lm ^[5]	L240 24,000lm ^[6]		

OPTIONS ^[8]

EM/7WRM	Remote mount 7-watt emergency battery	45AMB (L_)	(2) 45° adjustable mounting brackets ^[13] Additional lower lumen packages available. ^[14] Example: 7,000 nominal lumens = 75-4-L85/835-(L70)-DIM-UNV
EM/10WLP	Low-profile 10-watt emergency battery ^[9]	HA	High ambient operating temperature, 40°C ^[15]
EM/10WRM	Remote mount 10-watt emergency battery		
C2_	Two-circuit quick-connect wiring harness. ^[10]		
WG-75	11-gauge white powder coat wireguard		
315	1-1/2" ceiling spacer		
VBV	(2) Y-hangers		
VBV-2	(2) Y-hangers and (2) 2' chains		
RA-75	Row aligner ^[11]		
ZLSOR-RA1	Remote controller for Leviton sensor ZLS05 ^[12]		

AIRCRAFT CABLES (EXAMPLE: ACF/D48) ^[16]

Prefix	Type	Length
ACF/	Feeder	D 1" grid & hardpan 24 24"
ACJ/	Joiner	N 9/16" grid 48 48"
	S	Slot grid 96 96"

CONTROL ^[17]

–	None
AVI-LVFA	Avi-on wireless fixture control ^[19]
AVI-LVFA-PIR	Avi-on wireless fixture control with PIR motion and daylight sensor, bottom mount ^[20]
VDO	Lutron Vive integral fixture control, RF with daylight and occupancy sensor (DFCSJ-OEM-OCC) ^[21]
VRF	Lutron Vive integral fixture control, RF only (DFCSJ-OEM-RF) ^[22]
LV-OSFHU-ITW-120-347	Leviton PIR motion sensor, 120-347V
LV-ZLS05-ILW	Leviton PIR motion and daylight sensor ^[23]
WS-FSP-311-L_-120/277	Wattstopper PIR motion and daylight sensor, 120/277V ^[24]

DRIVER ^[18]

DIM	Driver with external dimming wires	120 120V 277 277V
DRV	Driver without external dimming wires	UNV 120-277V 347 347V ^[27]
DA	Driver with 12V auxiliary power, without external dimming wires ^[25]	
DSR	Sensor-ready driver without external dimming wires ^[26]	

QUICKSHIP

4'	75R-4-L50/835-QS-DIM-UNV	75S-4-L50/835-QS-DIM-UNV	75R-8-L100/835-QS-DIM-UNV	75S-8-L100/835-QS-DIM-UNV
8'	75R-4-L50/840-QS-DIM-UNV	75S-4-L50/840-QS-DIM-UNV	75R-8-L100/840-QS-DIM-UNV	75S-8-L100/840-QS-DIM-UNV

NOTES

- For actual length, see page 6 for FIXTURE DETAILS
- Lumen output based on 3500 CCT. Actual lumens may vary +/-5%, see page 2 for FIXTURE PERFORMANCE DATA.
- 75R and 75S ships with (2) 4' lenses.
- 75 only.
- 75 only.
- 75 only.
- Extended lead times may apply. Consult factory for availability.
- See page 7 for FINISH OPTIONS. See page 6 for MOUNTING DETAILS. See page 7 for SPECIAL REFLECTORS.
- 4' and 8' only; Not available with 4' L120 and 8' L240 lumen packages.
- See page 7 for QUICK CONNECT OPTIONS.
- Required when row mounting with aircraft cables.
- Please specify quantity required per project, ordered separately.
- Cord recommended, ships separately. See page 6 for MOUNTING DETAILS. Field-adjustable up and down in 7-1/2" increments.
- Specify in increments of 100 nominal lumens. Option must be specified with next higher lumen package.
- Not available with 2' L60, 4' L120 and 8' L240 lumen packages. Lumen restrictions apply. See page 2 for FIXTURE PERFORMANCE DATA.
- Units specified with aircraft cable require cord. See page 6 for MOUNTING DETAILS. Requires RA-75 row aligner. See page 6 for MOUNTING ACCESSORIES DETAILS.
- See page 4 for CONTROL DETAILS.
- See page 5 for ADDITIONAL DRIVER OPTIONS.
- DA Driver only. SDT required when specified with 347V or 480V.
- DA Driver only. SDT required when specified with 347V or 480V.
- DSR or LDE Drivers only. LDE drivers require driver interface.
- DSR or LDE Drivers only. LDE drivers require driver interface.
- DA Driver only. Adjustable via remote. Optional ZLSOR-RA1 remote controller available, ordered separately, see options.
- Must specify lens: L2 or L3. Factory installed.
- Avi-on and LV-ZLS05 Controls only.
- VDO and VRF Controls only.
- Not available with EM batteries.



FIXTURE PERFORMANCE DATA

	LED PACKAGE	WATTAGE	75 (NO LENS)		75R & 75S		LUMEN MAINTENANCE				AMBIENT TEMPERATURE ¹	
			DELIVERED LUMENS	EFFICACY (lm/W)	DELIVERED LUMENS	EFFICACY (lm/W)	L70	L80	L85	L90	EM	NO EM
2'	L15	10.8	1592	147.5	1511	140.1	>72000	>72000	>72000	50,000	40	40
	L25	18.2	2602	142.7	2470	135.5	>72000	>72000	>72000	50,000	40	40
	L32	21.3	3092	145.5	2936	138.1	>72000	>72000	58,000	36,000	40	40
	L42	31.4	4344	138.5	4124	131.5	>72000	>72000	58,000	36,000	35	40
	L60	43.6	6052	138.9	—	—	>72,000	53,000	38,000	24,000	—	—
3'	L40	28.2	4092	145.2	3885	137.9	>72000	>72000	58,000	36,000	35	40
	L64	48.2	6593	136.9	6259	130.0	>72,000	53,000	38,000	24,000	30	35
	L30	19.7	3071	155.8	2916	147.9	>72000	>72000	>72000	50,000	40	40
4'	L50	33.0	5126	155.5	4867	147.6	>72000	>72000	>72000	50,000	40	40
	L65	42.3	6313	149.3	5994	141.7	>72000	>72000	58,000	36,000	40	40
	L85	56.2	8530	151.7	8098	144.0	>72,000	53,000	38,000	24,000	35	40
	L100	68.3	10154	148.8	9640	141.2	>72000	>72000	58,000	36,000	30	30
	L120	85.9	12105	141.0	—	—	>72,000	53,000	38,000	24,000	—	—
8'	L60	35.3	5814	164.9	5520	156.6	>72000	>72000	>72000	50,000	40	40
	L100	65.9	10078	152.9	9568	145.1	>72000	>72000	>72000	50,000	35	35
	L130	87.9	13011	148.1	12353	140.6	>72000	>72000	58,000	36,000	35	35
	L170	112.4	17060	151.7	16197	144.0	>72,000	53,000	38,000	24,000	35	35
	L200	136.5	20309	148.8	19281	141.2	>72000	>72000	58,000	36,000	30	30
	L240	171.7	24209	141.0	—	—	>72,000	53,000	38,000	24,000	—	—

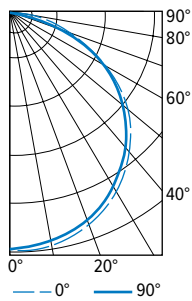
MULTIPLIER TABLE

	COLOR TEMPERATURE	
	CCT	CONVERSION FACTOR
80 CRI	2700K	0.97
	3000K	0.99
	3500K	1.00
	4000K	1.03
	5000K	1.06
90 CRI	2700K	0.80
	3000K	0.82
	3500K	0.83
	4000K	0.86
	5000K	0.89

- Maximum ambient operating temperature (°C) when specified with HA option.
 - Photometrics tested in accordance with IESNA LM-79. Results shown are based on 25°C ambient temperature.
 - Wattage shown is average for 120V through 277V input.
 - Results based on 3500K, 80 CRI, actual lumens may vary +/-5%
 - Predicted lumen maintenance calculated from LED manufacturer IES LM-80 data and In situ temperature measurement.
 - Predicted lumen maintenance calculated in accordance with IES TM-21 per Energy Star (R) TM-21 Calculator rev. 02.08.16.
 - Use multiplier table to calculate additional options.

PHOTOMETRY

75-4-L85/835-DIM Total Luminaire Output: 8530 lumens; 56.2 Watts | Efficacy: 152 lm/W | 80 CRI; 3500K CCT



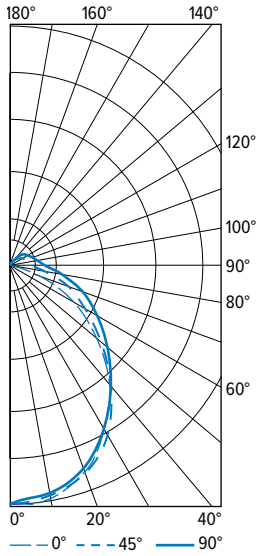
VERTICAL ANGLE	HORIZONTAL ANGLE			ZONAL LUMENS
	0°	45°	90°	
0	2896	2896	2896	
5	2917	2887	2876	275
15	2837	2799	2791	792
25	2663	2624	2610	1213
35	2415	2366	2338	1484
45	2066	2006	1990	1552
55	1634	1580	1560	1415
65	1124	1069	1048	1070
75	581	543	531	582
85	104	116	101	144
90	9	14	9	

LUMEN SUMMARY	ZONE	LUMENS	% FIXTURE
	0 - 30	2279	27
	0 - 40	3763	44
	0 - 60	6730	79
	0 - 90	8527	100
	0 - 180	8530	100



75 LED Narrow Strip

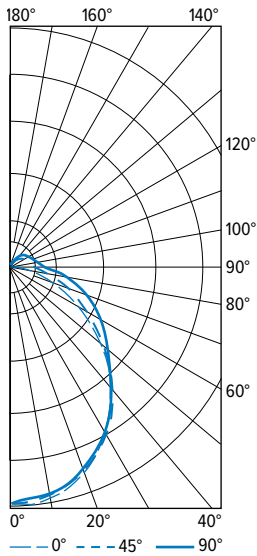
75R-4-L85/835 Total Luminaire Output: 8098 lumens; 56.2 Watts | Efficacy: 144 lm/W | 80 CRI; 3500K CCT



VERTICAL ANGLE	HORIZONTAL ANGLE			ZONAL LUMENS
	0°	45°	90°	
0	2594	2594	2594	
5	2622	2585	2553	246
15	2503	2497	2480	703
25	2256	2306	2324	1059
35	1915	2042	2111	1264
45	1481	1673	1824	1281
55	1003	1296	1488	1135
65	620	942	1117	891
75	267	630	775	613
85	63	401	501	378
90	9	311	407	
95	1	249	329	225
105	0	150	219	136
115	0	94	149	83
125	0	53	102	47
135	0	28	63	24
145	0	12	35	10
155	0	6	16	3
165	0	0	4	0
175	0	0	0	0
180	0	0	0	

	ZONE	LUMENS	% FIXTURE
LUMEN SUMMARY	0 - 30	2008	25
	0 - 40	3272	40
	0 - 60	5688	70
	0 - 90	7570	94
	90 - 120	443	6
	90 - 150	524	7
	90 - 180	527	7
	0 - 180	8098	100

75S-4-L85/835 Total Luminaire Output: 8098 lumens; 56.2 Watts | Efficacy: 144 lm/W | 80 CRI; 3500K CCT



VERTICAL ANGLE	HORIZONTAL ANGLE			ZONAL LUMENS
	0°	45°	90°	
0	2732	2732	2732	
5	2756	2720	2682	258
15	2633	2611	2579	734
25	2351	2362	2323	1083
35	1969	2010	1965	1247
45	1516	1554	1583	1209
55	1053	1160	1291	1051
65	618	840	1022	826
75	270	542	745	563
85	47	323	491	332
90	0	246	390	
95	0	230	344	223
105	0	200	291	185
115	0	171	256	149
125	0	139	216	110
135	0	96	166	71
145	0	58	113	38
155	0	36	63	16
165	0	17	31	4
175	0	0	0	0
180	0	0	0	

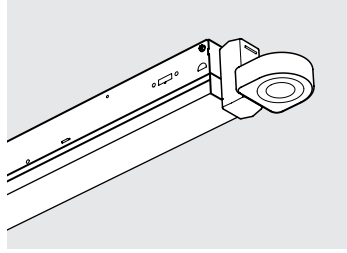
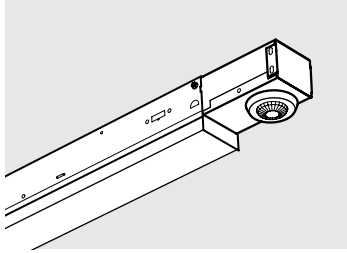
	ZONE	LUMENS	% FIXTURE
LUMEN SUMMARY	0 - 30	2075	26
	0 - 40	3321	41
	0 - 60	5581	69
	0 - 90	7301	90
	90 - 120	557	7
	90 - 150	777	10
	90 - 180	797	10
	0 - 180	8098	100

CONTROL DETAILS

SENSOR PLACEMENT


AVI-LVFA-PIR | LV-ZLS05 | WS-FSP | VDO

LV-OSFHU



AVI-LVFA-PIR

SPECIFICATIONS	
TYPE	PIR Motion + Daylight
MOUNTING HEIGHT	8' – 45'
LENS	Single lens detects high and low bay motion.
DETECTION ANGLE	360°
TEMPERATURE RANGE	-30° to 70°C
RELATIVE HUMIDITY	90 to 95% at 30°C
COMMISSIONING	App (iOS or Android)
SYSTEM REQUIREMENTS	Avi-On wireless fixture controls plus desktop and mobile apps
MANUFACTURER	Avi-On

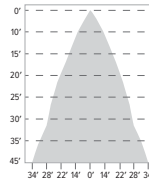


Bluetooth® Lighting Controls

SENSOR COVERAGE PATTERNS

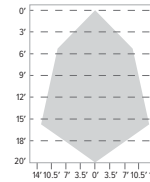
Large motion

45' height: ø68' coverage



Small motion

20' height: ø28' coverage

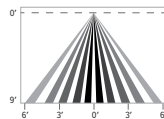


VDO

SPECIFICATIONS	
TYPE	PIR Motion + Daylight
MOUNTING HEIGHT	8' – 12'
DETECTION ANGLE	360°
TEMPERATURE RANGE	0° to 55°C
RELATIVE HUMIDITY	0 to 90%, non-condensing
COMMISSIONING	App (iOS or Android)
MANUFACTURER	Lutron

SENSOR COVERAGE PATTERNS

9' height: ø12' coverage



MOTION SENSOR COVERAGE

CEILING HEIGHT	COVERAGE AREA (SQ FT)
8'	114
9'	144
10'	178
12'	256

VIVE CONTROL OPTIONS

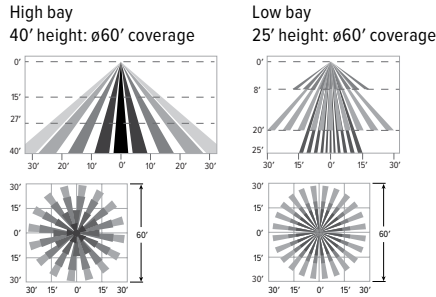
CATALOG NUMBER	DESCRIPTION
VDO	Lutron Vive integral fixture control, RF with daylight and occupancy sensor (DFCSJ-OEM-OCC), for use with sensor-ready driver
VRF	Lutron Vive integral fixture control, RF only (DFCSJ-OEM-RF), for use with sensor-ready driver
VDO/DBI	Lutron Vive integral fixture control, RF with daylight and occupancy sensor (DFCSJ-OEM-OCC) and digital link interface, for use with Lutron Hi-lume 1% EcoSystem dimming LED driver
VRF/DBI	Lutron Vive integral fixture control, RF only (DFCSJ-OEM-RF) and digital link interface, for use with Lutron Hi-lume 1% EcoSystem dimming LED driver



LV-OSFHU-ITW-120-347

SPECIFICATIONS	
TYPE	PIR Motion
MOUNTING HEIGHT	8' – 40'
LENS	Interchangeable high bay, low bay or aisle mask
DETECTION ANGLE	360°
TEMPERATURE RANGE	-10° to 71°C
RELATIVE HUMIDITY	20% to 90% non-condensing
MANUFACTURER	Leviton

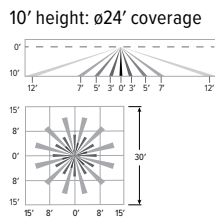
SENSOR COVERAGE PATTERNS



LV-ZLS05-ILW

SPECIFICATIONS	
TYPE	PIR Motion + Daylight
MOUNTING HEIGHT	8' – 10'
DETECTION ANGLE	120°
TEMPERATURE RANGE	-20° to 70°C
COMMISSIONING	DIP switches or optional remote: ZLSOR-RA1
MANUFACTURER	Leviton

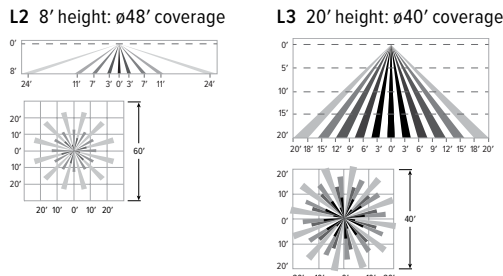
SENSOR COVERAGE PATTERNS



WS-FSP-311-L2-120/277

SPECIFICATIONS	
TYPE	PIR Motion + Daylight
MOUNTING HEIGHT	8' – 20'
DETECTION ANGLE	360°
TEMPERATURE RANGE	-40° to 75°C
COMMISSIONING	App (iOS or Android)
MANUFACTURER	Wattstopper

SENSOR COVERAGE PATTERNS



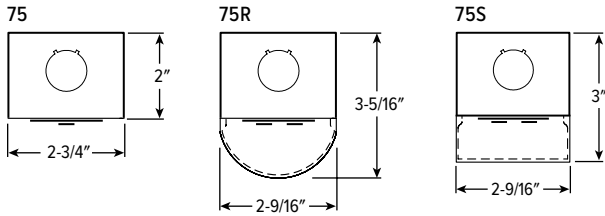
ADDITIONAL DRIVER OPTIONS

Note: Lumen restrictions apply, consult product builder at hew.com/product-builder.

CATALOG NUMBER	DESCRIPTION
DRV	Driver prewired for non-dimming applications
DIM	Dimming driver prewired for 0-10V low voltage applications
DIM1	1% dimming driver prewired for 0-10V low voltage applications
DIM LINE	Line voltage dimming driver (TRIAC and ELV compatible, 120V only)
DIM TRC	Line voltage dimming driver (TRIAC compatible, 120V only)
DA	Dimming driver with 12V auxiliary
DSR	Sensor-ready driver
SD40	40% step-dimming driver
SD50	50% step-dimming driver
DALI	DALI dimming driver
LTE LINE	Lutron Hi-lume 1% 2-wire dimming driver forward phase line voltage controls (120V only)
LDE1	Lutron Hi-lume 1% EcoSystem dimming LED driver
ELDO SOLOB	EldoLED Solodrive, 0.1% dimming driver for 0-10V controls
ELDO SOLOB DALI	EldoLED Solodrive, 0.1% dimming driver for DALI controls
ELDO ECO1	EldoLED Ecodrive, 1% dimming driver for 0-10V controls
ELDO ECO1 DALI	EldoLED Ecodrive, 1% dimming driver for DALI controls

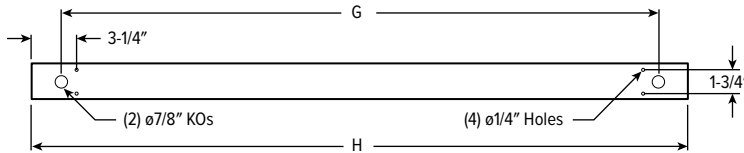


CROSS SECTIONS



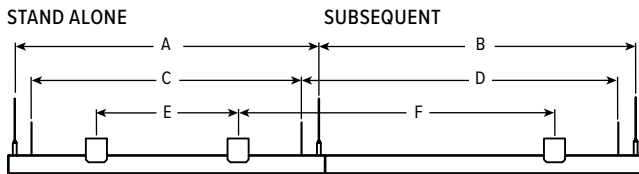
FIXTURE DETAILS

BACKVIEW



	7/8" KOs (G)	ACTUAL FIXTURE LENGTH (H)
2'	18-3/8"	22-1/2"
3'	29-1/2"	33-9/16"
4'	40-1/2"	44-5/8"
8'	85-1/8"	89-1/4"

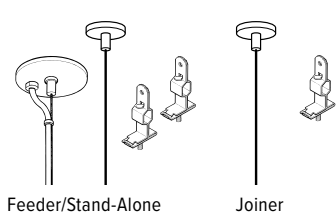
MOUNTING DETAILS



MOUNTING LENGTH

	AIRCRAFT CABLE		VBY HANGER		315 SPACER	
	A	B	C	D	E	F
2'	21-1/2"	22-1/2"	19"	22-1/2"	10"	22-1/2"
3'	32-1/2"	33-9/16"	30-1/16"	33-9/16"	21"	33-9/16"
4'	43-5/8"	44-5/8"	41-1/4"	44-5/8"	32"	44-5/8"
8'	88-3/16"	89-1/4"	85"	89-1/4"	77"	89-1/4"

STANDARD HARDWARE FOR SUSPENDED PRODUCT (Grid and Hardpan)



Notes:

- Fixtures are provided with adjustable length aircraft cables and mounting hardware, must specify.
- Electrical supply is brought into the feeder fixture, either as part of a row or as a stand-alone unit. Joiner fixtures complete the row.
- The feeder kits are standard with a 5" canopy to cover the junction box and a 2" canopy at the non-feed point. No J-box is required at non-feed points.

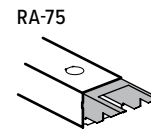
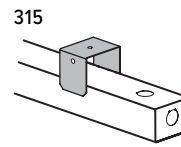
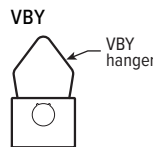
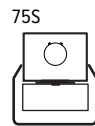
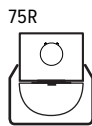
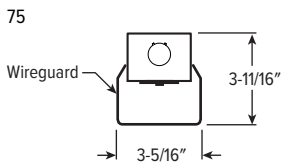
CORD FOR SUSPENDED PRODUCT

Units specified with aircraft cable require cord. Please specify cord type using ordering information below.

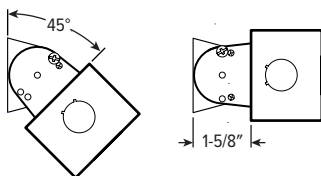
EXAMPLE: S2438/W					
CORD TYPE	LENGTH	# OF COND.	WIRE SIZE	COLOR	
S	24 24"	3	8	/W White /B Black	
	48 48"	4			
	96 96"	5			

MOUNTING ACCESSORIES DETAILS

WG-75



45AMB

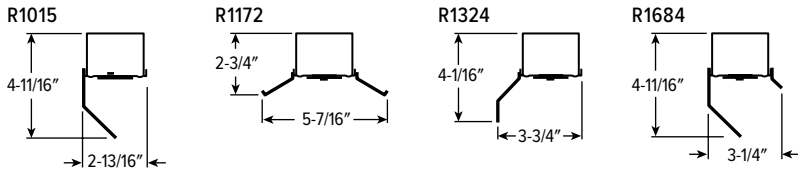


QUICK CONNECT OPTIONS

Note: Quick connect wiring required for row mounting. Length restrictions may apply, consult product builder at hew.com/product-builder.

DESIGNATION	NUMBER OF WIRES (EXCLUDING GROUND)	WIRE COLORS	WIRE COLOR/POWER SUPPLY FACTORY CONNECTIONS	TYPICAL USE
C2B	3	White, Black, Red	White, Black	Alternating Circuits
C2BR	3	White, Black, Red	White, Black, Red	ON/OFF Switching (DRV) or Line Voltage dimming (DIM LINE) when equipped w/EM Power Supply (EM/10W)
C2R	3	White, Black, Red	White, Red	Alternating Circuits
C2BW/RV	5	White, Black, Red, Gray, Green	White, Black/Red, Gray	0-10V 4-wire Low Voltage Dimming (DIM)

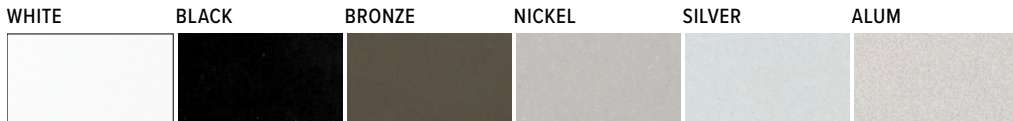
SPECIAL REFLECTORS



Reflectors are ordered separately, only available with 75, cannot be used with wireguard accessories.

Example: R1172-4-75LED REFL

FINISH OPTIONS



For custom color, please specify RAL code or a manufacturer code with description. All custom colors other than RAL require two sample swatches, minimum 1" square.





PLFRESNEL1 MKII LED Luminaire

The PLFRESNEL1 MKII LED Luminaire is a general purpose lighting fixture for theatre, small studio, and display lighting applications. It produces an adjustable cone of light with a soft edge which is easily blended with adjacent beams to provide even illumination. Using LED source technology combined with a traditional Fresnel lens, the PLFRESNEL1 MKII LED Luminaire delivers Philips Selecon’s industry benchmark quality without the compromising performance of spreader lenses.

A key benefit of the PLFRESNEL1 MKII LED Luminaire is that it is not necessary to change lamps or color filters. Combining the superior control and light quality of a Philips Selecon Fresnel with seamless fading between colors allows designers a new level of creativity. Less power consumption and no dimmer circuits makes the PLFRESNEL1 MKII LED Luminaire the obvious choice for any stage lighting need.

The PLFRESNEL1 MKII also hosts smart cable management with the inclusion of PLICB (PL Interconnect Box). The PLICB mounts to the luminaires yoke, between the C-Clamp and the yoke and swivels independently to allow for the luminaire to move freely through its focus range with no need for a cable service loop. The PLICB allows for all of the luminaires cabling with DMX and PowerCON in and through connections.



PLFRESNEL1 MKII LED Luminaire

Features

- Delivers the performance of a 500 watt fresnel fixture with a maximum power consumption of 140 watts
- Variable beam angle from 15 to 54 degrees
- Infinite color choice from the RGBW engine and color temperatures in white
- Homogenized fully mixed color output light, no multiple color shadows
- 50,000 hours of life expectancy
- Quick selection of Warm White, Cool White, and Daylight
- User defined on board presets states available to record your color composition
- Color presets simplifies matching existing light sources
- Constant color balance down to very low light levels irrespective of intensity setting
- DMX512 Input/Output with 8 or 16-bit resolution and a simple 5-channel control
- RDM controls and setup of fixture allows device settings to be configured remotely
- On-board LCD menu is updated for ease of luminaire set up and addressing
- No ultra-violet (wavelengths of less than 400nm) – for UVA, B or C or the Infrared spectrum (wavelengths of more than 775nm)
- Luminaire color: black
- Electronic universal power supply 100-240VAC
- PowerCON In and Through connectors (PLICB)
- cETLus listed, C-Tick, and CE marked (IP20 Rated)



SPECIFICATION SUBMITTAL

CONSULTANT: <input type="text"/>	PROJECT NAME: <input type="text"/>	MODEL NUMBER QUANTITY: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
DATE: <input type="text"/>	PROJECT NUMBER: <input type="text"/>	APPROVED BY: <input type="text"/>



PLFRESNEL1 MKII LED Luminaire

Advanced Control

The PLFRESNEL1 MKII LED luminaire has an on-board LCD menu system for luminaire setup, control, and addressing. The revised menu system is extremely user-friendly, offering all the configuration options within a few button presses, speeding up setup.

Console Control

All PLFRESNEL1 MKII luminaires now have added support for Remote Device Management (RDM) and DMX512 control. A choice of 8 or 16 bit control resolution or new, simple, 5-channel control is available. Extended color and color temperature control is provided by either the Strand Lighting NEO or Palette families of control consoles to simplify programming and luminaire color matching.

PLFRESNEL1 MKII LED Engine

The PLFRESNEL1 MKII luminaire's powerful LED engine offers exceptional performance and life. Under normal operating conditions our LED engine has a life expectancy in excess of 50,000 hours, however under worse case operating conditions with the luminaire set to continuous full output, it is possible that a small percentage of LEDs may require replacement sooner. With the new LED engine, power consumption has been reduced by approximately 7%, while color consistency has been greatly improved, ensuring unit-to-unit matching of colors.



PLFRESNEL1 MKII Luminaire Advanced Control

- ① LCD Menu Display
- ② Local controls offer the ability to access preset color temperatures; locally stored custom presets adjust intensity; colors and motorized focus.



For product photometric information, refer to the photometrics guide for this product on the Strand Lighting web site at www.strandlighting.com in the product downloads section.

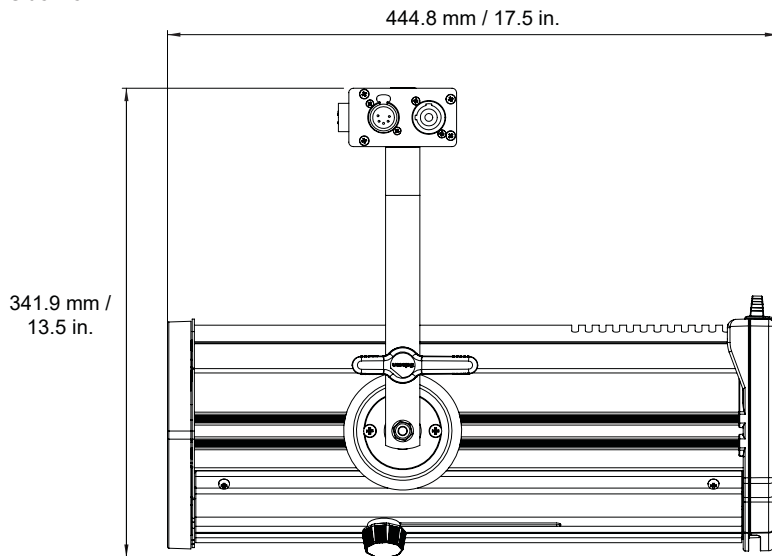
Technical Specifications

Source Specification		Control Specifications	
Source:	True RGBW 120W LED Engine, using custom designed LED array	Control:	On-Board Menu / DMX512 / RDM DMX512
		DMX512 Channels:	15 Channels (16-Bit Mode) 9 Channels (8-Bit Mode) 5 Channels (5-Channel Mode)
Optical Specifications		Mechanical Specifications	
Output:	> 2000 lumens (Full RGBW white light)	Construction:	Machined aluminum, sheet metal, and molded engineering grade plastic components
CRI:	>80 @ 4000K White LED only	Color:	Black
Beam Angle:	15-54 Degrees (user adjustable)	Weight:	11.4 lbs / 5.2 kg (luminaire and topbox)
Electrical Specifications		Shipping Specifications	
Operating Voltages:	100 to 240 Volts AC (auto-ranging)	Packed Size:	12.75" x 12.75" x 23.75" / 323.9 mm x 323.9 mm x 603.3 mm
Frequency:	50/60 Hz	Packed Weight:	15 lbs / 6.8 kg
Current Draw:	1.2 Amps (120V) / 0.6 Amps (240V)		
Power Consumption:			
- Maximum:	140W With all LEDs at full RGBW (100%)		
- Standby Power	5W (unit powered, LEDs off)		
Environmental Specifications			
Ambient Temperature:	0° to 40°C (32° to 104°F)		
IP Rating:	IP20 Indoor Use Only		
Conformity:	cETLus Listed, CE and C-Tick Marked		

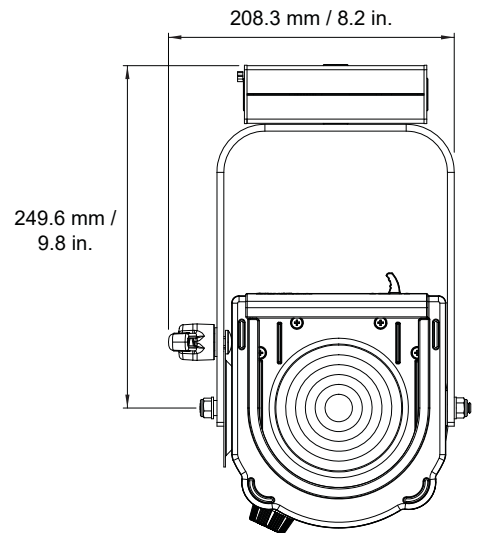


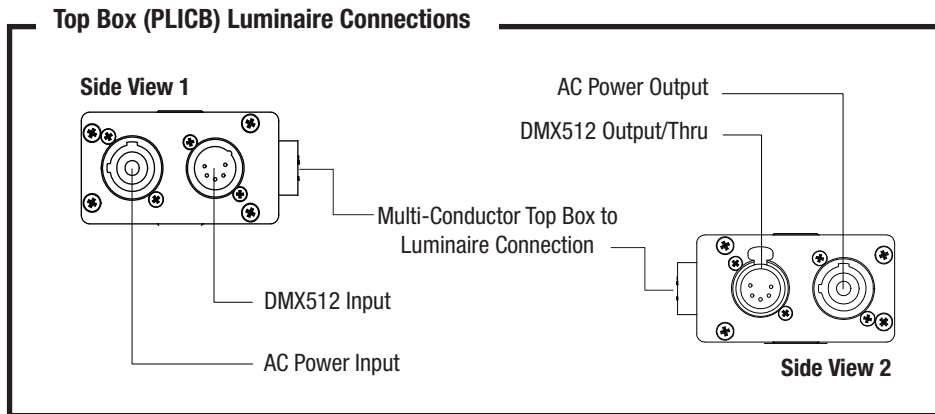
Dimensions

Side View



Front View





Ordering Information

Cat No. Description

PLFRESNEL1 MKII LED Luminaires		Accessories - AC Power Input Cables	
PLFR1MKII-03 *		PC1BE	PLFRESNEL1 MKII Luminaire AC Power Input Cable (39 inches / 1 meter), PowerCON without AC connector (bare end)
PLFRESNEL1 MKII LED Luminaire, 15-54 Degree Fresnel, Black, with Top Box (Interconnect) Assembly, SC C-Clamp, Safety Cable, and AC Input Cable		PC1GP	PLFRESNEL1 MKII Luminaire AC Power Input Cable (39 inches / 1 meter), PowerCON with Stagepin Connector
*This Luminaire utilizes a Neutrik PowerCON Type A blue power inlet and ships with a 39 inch PowerCON power input tail with no connector. If a factory-installed AC connector is required, for an additional charge, at time of ordering, specify AC input connector (GR - Edison / GP – Grounded Stagepin / GTL - Twistlock).		PC1GTL	PLFRESNEL1 MKII Luminaire AC Power Input Cable (39 inches / 1 meter), PowerCON with Twistlock Connector
		PC1GR	PLFRESNEL1 MKII Luminaire AC Power Input Cable (39 inches / 1 meter), PowerCON with Edison Connector
Accessories - Barndoors		Accessories - AC Interconnect Cables	
20BDMF	Acclaim Fresnel Barndoor, 4-Way, Black	PC3PC	PLFRESNEL1 MKII Luminaire PowerCON Male to PowerCON Female 2.5 Meter Cable for interconnection between units
Accessories - Clamps		Accessories - Luminaire Software Uploader Cable	
SC	Selecon Molded Yoke Rated C-Clamp	PEGASUS	USB Luminaire Software Programming Kit (for updating luminaire firmware) - includes USB Upload Cable, and Carry Bag
MC	Mega Claw, Black Anodized		
Accessories - Top Box Assembly			
PLICB	Spare Top Box (Interconnect) Assembly		

Philips Selecon

Dallas
 10911 Petal Street
 Dallas, TX 75238
 Tel: +1 (214) 647-7880
 Fax: +1 (214) 647-8031

Auckland
 19-21 Kawana Street
 Northcote, Auckland 0627
 New Zealand
 Tel: + 64 9 481 0100
 Fax: + 64 9 481 0101

www.seleconlight.com
 © Philips Group 2015
 All rights reserved.
 The Company reserves the right to make any variation in design, construction or descriptions contained herein, of the equipment, at any time without prior notice. E&OE

Asia
 Unit C, 14/F,
 Roxy Industrial Centre
 No. 41-49 Kwai Cheong Road
 Kwai Chung, N.T., Hong Kong
 Tel: +852 2796 9786
 Fax: +852 2798 6545

Europe
 European Service & Distribution Centre
 Rondweg zuid 85
 Winterswijk 7102 JD
 the Netherlands
 Tel: +31 (0) 543-542516





PLPROFILE1 MKII LED Luminaire

The PLPROFILE1 MKII LED luminaire is a variable beam profile with precise beam control and pattern projection from a high output beam. An innovative combination of LED source technology and precision optical design, the PLPROFILE1 MKII luminaire delivers Philips Selecon’s industry benchmark projection quality in a compact, robust fixture.

A key benefit of the PLPROFILE1 MKII luminaire is that it is no longer necessary to change lamps or color filter. Combining the superior control and light quality of a Philips Selecon Profile with seamless fading between colors allows designers a new level of creativity. Less power consumption and no dimmer circuits makes the PLPROFILE1 MKII luminaire the obvious choice for pattern projection and stage washes.

The PLPROFILE1 MKII also hosts smart cable management with the inclusion of PLICB (PL Interconnect Box). The PLICB mounts to the luminaires yoke, between the C-Clamp and the yoke and swivels independently to allow for the luminaire to move freely through its focus range with no need for a cable service loop. The PLICB allows for all of the luminaires cabling with DMX and PowerCON in and through connections.



PLPROFILE1 MKII LED Luminaire

Features

- Delivers the performance of a 500 Watt profile fixture with a maximum power consumption of 140 Watts
- Available in 18 to 34 or 24 to 44 degree beam angles
- Interchangeable lens tray between medium and wide versions
- Slot provided for iris, M-size pattern holder, or third party effect accessory
- Infinite color choices from the RGBW engine and color temperatures in white
- Homogenized fully mixed color output light, no multiple color shadows
- 50,000 hours of life expectancy
- Quick selection of Warm White, Cool White, and Daylight
- User defined on board presets states available to record your color composition
- Color presets simplifies matching existing light sources
- Constant color balance down to very low light levels irrespective of intensity setting
- DMX512 Input/Output with 8 or 16-bit resolution and a simple 5-channel control
- RDM controls and setup of fixture allows device settings to be configured remotely
- On-board LCD menu is updated for ease of luminaire set up and addressing
- No ultra-violet (wavelengths of less than 400nm) – for UVA, B or C or the Infrared spectrum (wavelengths of more than 775nm)
- Luminaire color: black
- Electronic universal power supply 100-240VAC
- PowerCON In and Through connectors (PLICB)
- cETLus listed, C-Tick, and CE marked (IP20 Rated)



SPECIFICATION SUBMITTAL

CONSULTANT: <input type="text"/>	PROJECT NAME: <input type="text"/>	MODEL NUMBER QUANTITY: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
DATE: <input type="text"/>	PROJECT NUMBER: <input type="text"/>	APPROVED BY: <input type="text"/>



PLPROFILE1 MKII LED Luminaire

Advanced Control

The PLPROFILE1 MKII LED luminaire has an on-board LCD menu system for luminaire setup, control, and addressing. The revised menu system is extremely user-friendly, offering all the configuration options within a few button presses, speeding up setup.

Console Control

All PLPROFILE1 MKII luminaires now have added support for Remote Device Management (RDM) and DMX512 control. A choice of 8 or 16 bit control resolution or new, simple, 5-channel control is available. Extended color and color temperature control is provided by either the Strand Lighting NEO or Palette families of control consoles to simplify programming and luminaire color matching.

PLPROFILE1 MKII LED Engine

The PLPROFILE1 MKII luminaire's powerful LED engine offers exceptional performance and life. Under normal operating conditions our LED engine has a life expectancy in excess of 50,000 hours, however under worse case operating conditions with the luminaire set to continuous full output, it is possible that a small percentage of LEDs may require replacement sooner. With the new LED engine, power consumption has been reduced by approximately 7%, while color consistency has been greatly improved, ensuring unit-to-unit matching of colors.



PLPROFILE1 MKII Luminaire Advanced Control

- ① LCD Menu Display
- ② Local controls offer the ability to access preset color temperatures; locally stored custom presets adjust intensity, colors and motorized focus.






Interchangeable lens trays for fast and easy choice of either medium zoom (18-34 degrees) or wide zoom (24-44 degrees) without the use of tools. Lens trays sold separately.



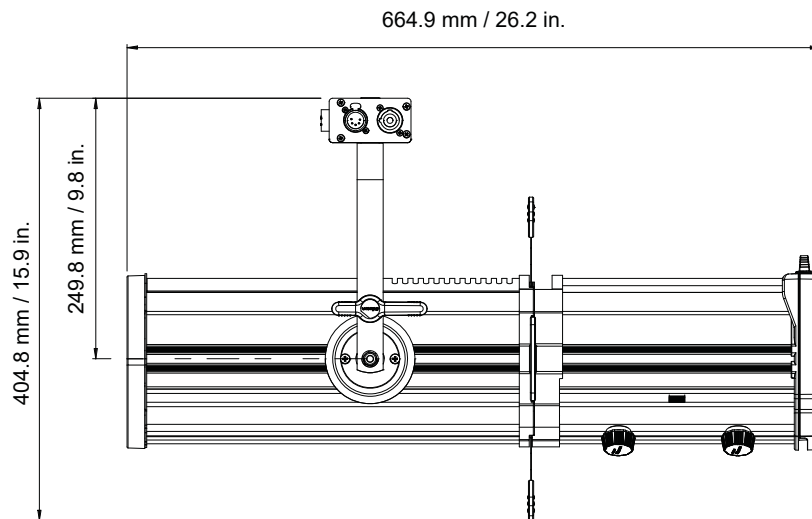
For product photometric information, refer to the photometrics guide for this product on the Strand Lighting web site at www.strandlighting.com in the product downloads section.

Technical Specifications

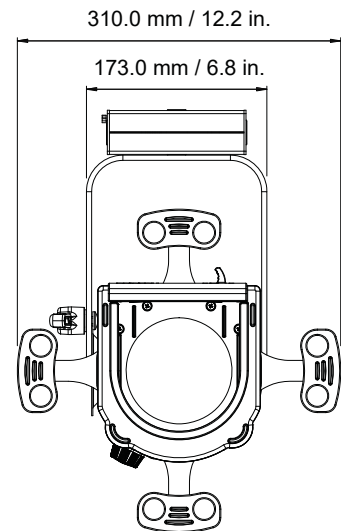
Source Specification		Control Specifications	
Source:	True RGBW 120W LED Engine, using custom designed LED array	Control:	On-Board Menu / DMX512 / RDM DMX512
Optical Specifications		DMX512 Channels:	15 Channels (16-Bit Mode) 9 Channels (8-Bit Mode) 5 Channels (5-Channel Mode)
Output:	> 2000 lumens (Full RGBW white light)	Mechanical Specifications	
CRI:	>80 @ 4000K White LED only	Construction:	Machined aluminum, sheet metal, and molded engineering grade plastic components
Beam Angle:	18-34 Degrees or 24-44 Degrees (depends on lens option purchased)	Color:	Black
Electrical Specifications		Weight:	17.2 lbs / 8.5 kg (luminaire and topbox)
Operating Voltages:	100 to 240 Volts AC (auto-ranging)	Shipping Specifications	
Frequency:	50/60 Hz	Packed Size:	12.75" x 13.00" x 32.50" / 323.9 mm x 330.2 mm x 825.5 mm
Current Draw:	1.2 Amps (120V) / 0.6 Amps (240V)	Packed Weight:	22 lbs / 10.0 kg
Power Consumption:			
- Maximum:	140W With all LEDs at full RGBW (100%)		
- Standby Power	5W (unit powered, LEDs off)		
Environmental Specifications		  	
Ambient Temperature:	0° to 40°C (32° to 104°F)		
IP Rating:	IP20 Indoor Use Only		
Conformity:	cETLus Listed, CE, and C-Tick Marked		

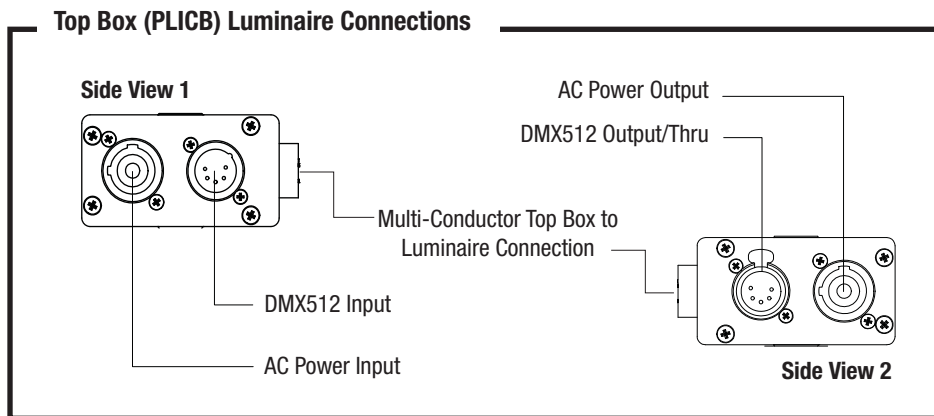
Dimensions

Side View



Front View





Ordering Information

Cat No. Description

PLPROFILE1 MKII LED Luminaires		Accessories - Top Box Assembly	
PLZS1MKII-1834-03 *		PLICB	Spare Top Box (Interconnect) Assembly
PLPROFILE1 MKII LED Luminaire, 18-34 Degree Zoomspot, Black, with Top Box (Interconnect) Assembly, SC C-Clamp, Safety Cable, and AC Input Cable		Accessories - AC Power Input Cables	
PLZS1MKII-2444-03 *		PC1BE	PLPROFILE1 MKII Luminaire AC Power Input Cable (39 inches / 1 meter), PowerCON without AC connector (bare end)
PLPROFILE1 MKII LED Luminaire, 24-44 Degree Zoomspot, Black, with Top Box (Interconnect) Assembly, SC C-Clamp, Safety Cable, and AC Input Cable		PC1GP	PLPROFILE1 MKII Luminaire AC Power Input Cable (39 inches / 1 meter), PowerCON with Stagepin Connector
*This Luminaire utilizes a Neutrik PowerCON Type A blue power inlet and ships with a 39 inch PowerCON power input tail. If a factory-installed AC connector is required, for an additional charge, at time of ordering, specify AC input connector (GR - Edison / GP - Grounded Stagepin / GTL - Twistlock).		PC1GTL	PLPROFILE1 MKII Luminaire AC Power Input Cable (39 inches / 1 meter), PowerCON with Twistlock Connector
Accessories - Zoomspot Lenses		PC1GR	PLPROFILE1 MKII Luminaire AC Power Input Cable (39 inches / 1 meter), PowerCON with Edison Connector
15ACAX1834LT	Acclaim Axial Zoomspot 18-34 Degrees Lens Tray, Black	Accessories - AC Interconnect Cables	
15ACAX2444LT	Acclaim Axial Zoomspot 24-44 Degrees Lens Tray, Black	PC3PC	PLPROFILE1 MKII Luminaire PowerCON Male to PowerCON Female 2.5 Meter Cable for interconnection between units
Accessories - Clamps		Accessories - Luminaire Software Uploader Cable	
SC	Selecon Molded Yoke Rated C-Clamp	PEGASUS	USB Luminaire Software Programming Kit (for updating luminaire firmware) - includes USB Upload Cable, QuickStart Guide, and Carry Bag
MC	Mega Claw, Black Anodized		

Philips Selecon

Dallas
 10911 Petal Street
 Dallas, TX 75238
 Tel: +1 (214) 647-7880
 Fax: +1 (214) 647-8031

Auckland
 19-21 Kawana Street
 Northcote, Auckland 0627
 New Zealand
 Tel: + 64 9 481 0100
 Fax: + 64 9 481 0101

www.seleconlight.com
 © Philips Group 2015
 All rights reserved.
 The Company reserves the right to make any variation in design, construction or descriptions contained herein, of the equipment, at any time without prior notice. E&OE

Asia
 Unit C, 14/F,
 Roxy Industrial Centre
 No. 41-49 Kwai Cheong Road
 Kwai Chung, N.T., Hong Kong
 Tel: +852 2796 9786
 Fax: +852 2798 6545

Europe
 European Service & Distribution Centre
 Rondweg zuid 85
 Winterswijk 7102 JD
 the Netherlands
 Tel: +31 (0) 543-542516



CV4180 – WAND™

24" x 2" Square Diffuser - Recessed Mount - Integral Power Supply



Type: _____ Project: _____

VisaLighting.com/products/Wand

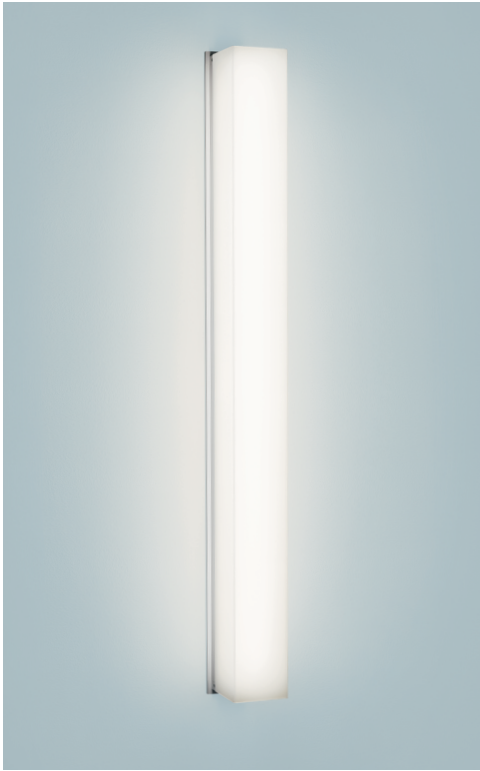
Fill in shaded boxes using information listed below

Order Code: **CV4180**
MODEL

A SOURCE - **MVOLT**
SOURCE VOLTAGE

B DIFFUSER RETAINER **C** HOUSING
Finishes

D OPTION(S)



The elegant square diffuser floats on the LED source enveloping it with light. Integrated into the architectural design with its sleek styling, the profile reveals the open void of the diffuser. Wand can be used as a sconce, ceiling luminaire, or as a vanity light.

DIMENSIONS

Depth is measured from wall to front of fixture

W = Width	H = Height	D = Depth
RW = Recessed Width	RH = Recessed Height	RD = Recessed Depth
W 23-1/2" (597 mm)	H 2" (51 mm)	D 2-3/4" (70 mm)
RW 23-3/4" (603 mm)	RH 1-7/8" (48 mm)	RD 3-1/4" (83 mm)

A SOURCE and and VOLTAGE

MVOLT fixture accepts 120 through 277 input voltage
Dimmable 0-10V to 1%
83CRI, within 3-step MacAdam

Source	CCT	Delivered Lumens	Power (Watts)	Voltage
• L30K-L	3000K	750	10	MVOLT
• L35K-L	3500K			
• L40K-L	4000K	1100	14	
• L30K-H	3000K			
• L35K-H	3500K			
• L40K-H	4000K			

FINISHES (Select one B Diffuser Retainer Finish and one C Housing Finish) See page 3 for color chart

Powder Coat Painted Finishes (Standard) May be selected for Diffuser Retainer or Housing

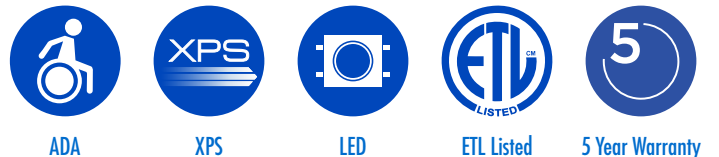
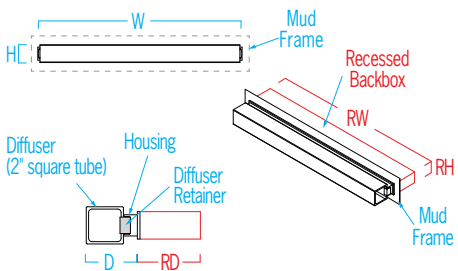
AG7038 Agate Grey	CVBL Cove Blue	GW9002 Grey White	PB1035 Pearl Beige
BMAT Bronze Matte	CW9001 Cream	HTHR Heather	RUST Rust
BRNZ Bronze	GLIM Glimmer	JB9005 Jet Black	SUNG Sungold
BSIL Blade Silver	GSIL Graphite Silver	OBZ Old Bronze	TW9016 Traffic White

Metal Finishes (Premium) May be selected for Diffuser Retainer

BA Brushed Aluminum	OBA Oil-Rubbed Bronze Alternative
BBA Brushed Brass Alternative	PRA Pewter Alternative
BCA Brushed Chrome Alternative	RBA Rustic Brass Alternative
BUA Brushed Copper Alternative	SNA Satin Nickel Alternative
BZA Brushed Bronze Alternative	

D OPTIONS (Multiple Selections Allowed)

- ⚠ Option availability may be interdependent with Voltage, Source or Other Options
- DCC** Damp clear coat for metal finishes (required for 5 year warranty when used in damp locations)
- RB** Pre-ship recessed backbox
- TTF** Tile trim flange; Painted - specify Finish Code (see finishes)
- XPS** Express 10 day shipping. Items marked with a bullet (•) are not available with XPS

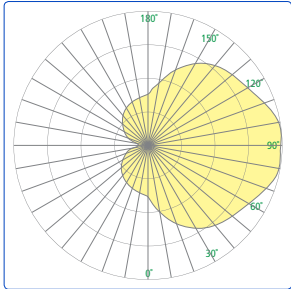


CV4180 – WAND

24" x 2" Square Diffuser - Recessed Mount - Integral Power Supply



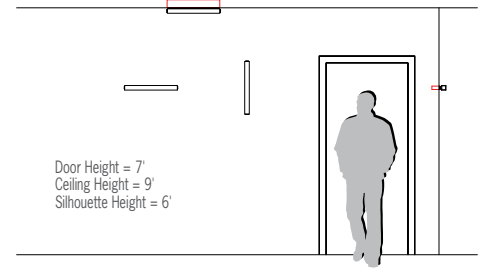
Photometrics



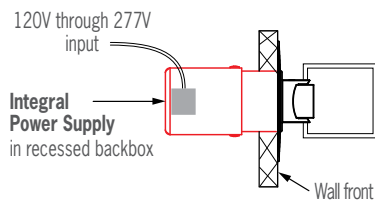
Technical Information

- Integral high power factor electronic power supply included
- Versatile mounting; ceiling or wall mount (vertical or horizontal orientation)
- Semi-recessed (mud required; mud frame included)
- Ceiling installations for drywall only
- Recessed backbox is available for pre-shipment for rough-in installation
- Diffuser is 1/8" thick extruded white acrylic with frosted finish
- No VOC powder coat paint finish; low VOC clear coat on metal finishes
- ETL listed for damp locations

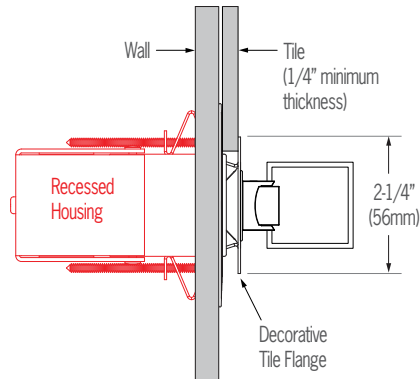
Relative Scale Drawing



Mounting Detail



Tile Trim Flange Detail (TTF Option)



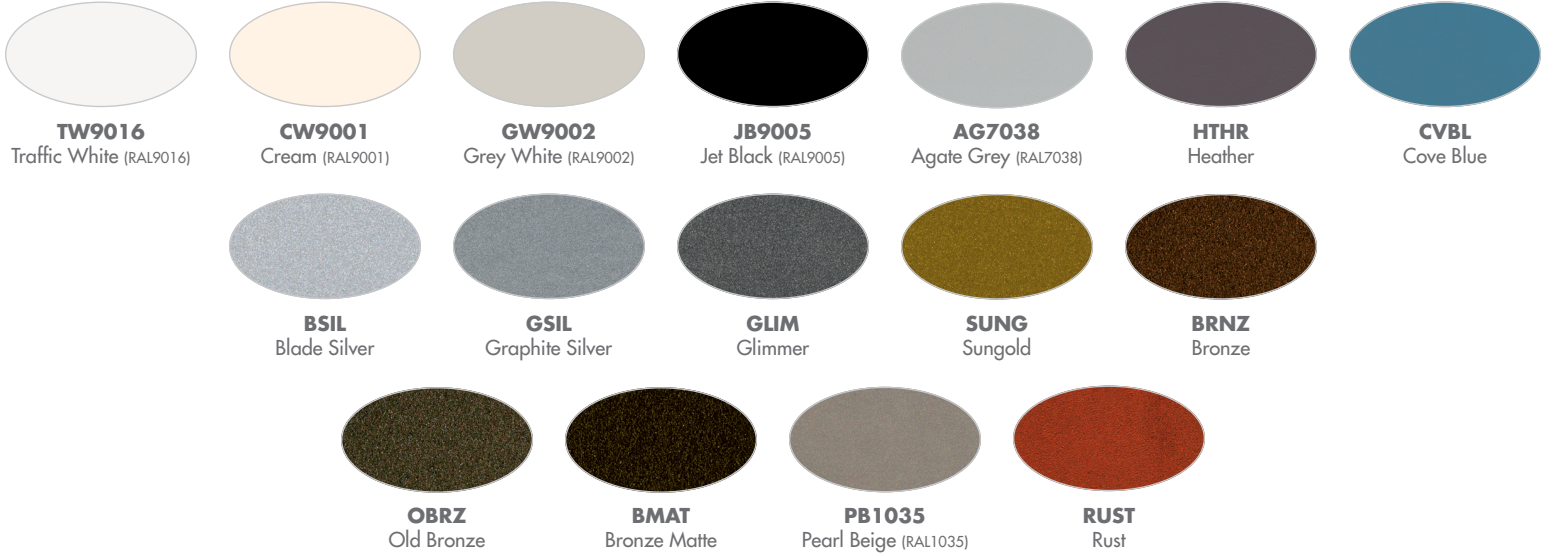
CV4180 – WAND

24" x 2" Square Diffuser - Recessed Mount - Integral Power Supply

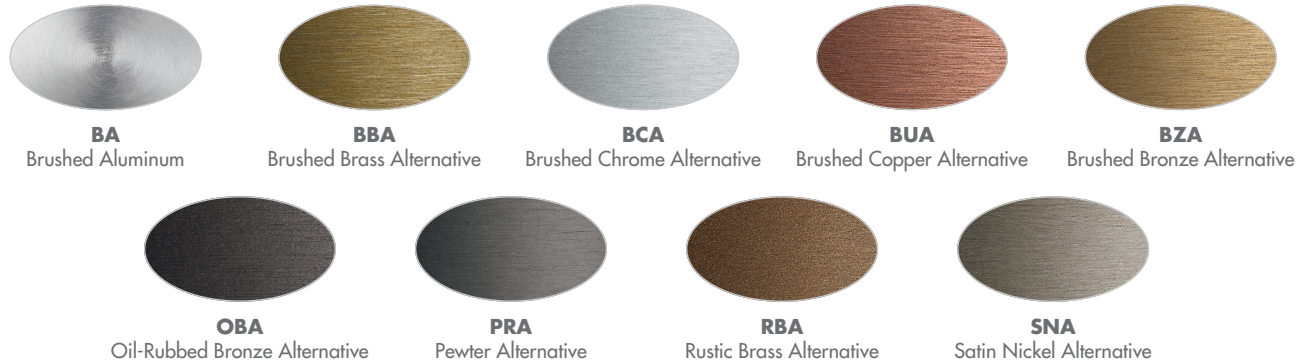


Specify color code when ordering. For accurate color matching, individual paint and finish samples are [available upon request](#)
For additional information see VisaLighting.com/materials-finishes

Painted Finishes (Standard)



Metal Finishes (Premium)



This document contains information which is the property of Visa Lighting, and may not, in whole or in part, be duplicated, disclosed, or used for design or manufacturing purposes without the prior written permission of Visa Lighting. ©Visa Lighting. Design Modification Rights Reserved.

Prestige™ Edge-Lit Series

Premium die-cast aluminum exit sign



Construction

- Housing, trim plate, trim ring and canopy made of die-cast aluminum
- U-shaped clear acrylic Legend panel features laser-etched letters and chevrons
- 6 inch EXIT lettering legend, available in red or green
- 8 inch EXIT lettering legend, available in red
- Choice of finishes: white, black or brushed aluminum, polished brass, polished chrome or bronze

Mounting

- Modular design allows for surface or recessed mount
- Canopy included for surface wall, end or ceiling mount applications
- Trim ring included for recessed wall or ceiling mount applications.
- Housing provided with conduit knock-out 1/2", top, back and end
- (C) circular or (A) angular trim plate used for surface or recessed wall or ceiling mount applications
- Hanger bars included for lay-in installation in T-bar grid

Special wording panels

- Available. Contact your sales representative with your design requirements

Electronics

- Optional Advanced Diagnostics
- Optional Nexus® monitoring system
- 120-277 50/60Hz

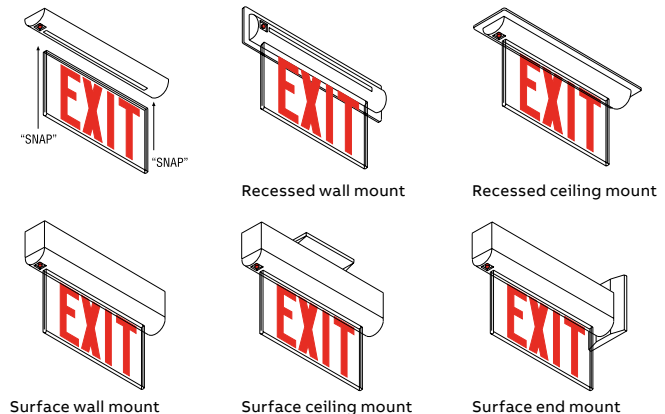
Approvals

- UL 924 listed
- Meets NFPA101 (Life Safety Code), NFPA 70 NEC, OSHA illumination standards
- E-California Energy Commission Title 20

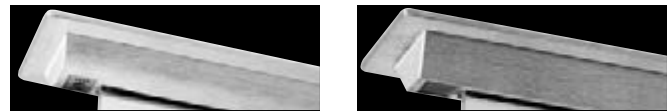
Warranty

- Unit has a five-year limited warranty
Detailed warranty terms located on page 202 or online at:
www.emergi-lite.com/usa/files/EL_Warranty.pdf

Mounting configurations



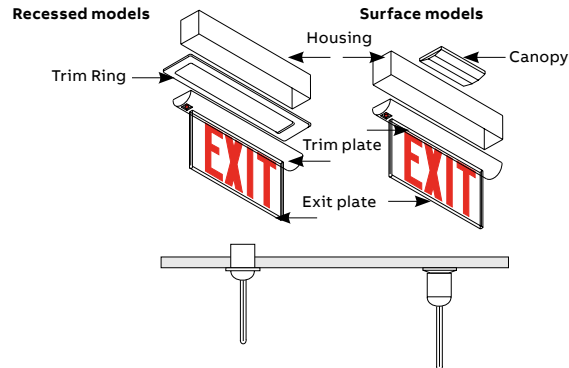
Trim plates



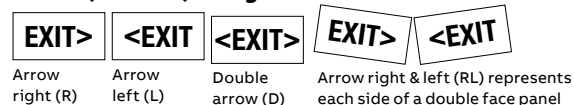
Circular trim plate

Angular trim plate

Recessed models

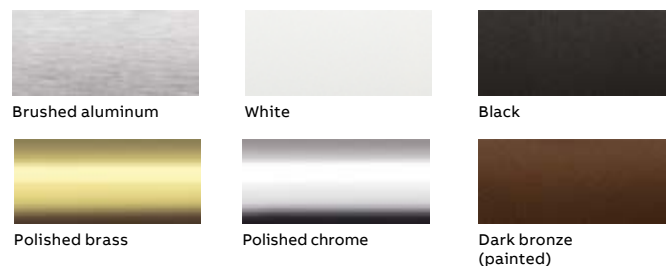


Arrow (chevron) designation



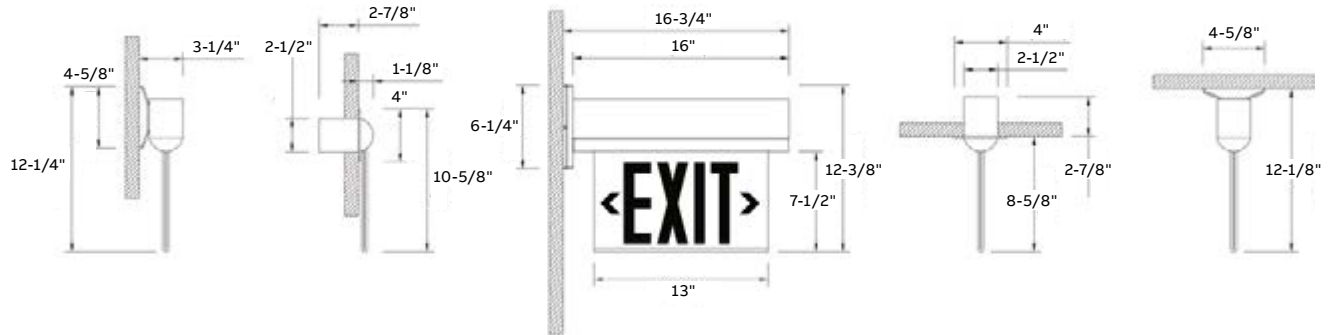
Wording and chevrons not to scale. For illustration purposes only.

Housing color



Dimensions

Dimensions are approximate and subject to change.



Power consumption

Model		AC specs		DC specs
AC-only	120 to 277VAC, 50/60Hz	Less than 1.4W	-	-
AC/DC-remote	120 to 277VAC, 50/60Hz	Less than 1.4W	6 to 24VDC	Less than 1.4W
Self-powered	120 to 277VAC, 50/60Hz	Less than 2.3W	Ni-Cd battery	Min. 90 minutes
Self-powered diagnostic	120/277VAC, 50/60Hz	Less than 2.3W	Ni-Cd battery	Min. 90 minutes

Accessories (order as a separate item)

Description	Suffix ¹
White pendant	P*-WT
Black pendant	P*-BK
Gray pendant	P*-GY

¹Custom pendant lengths and colors available, specify (12", 24", 36", etc.)

How to order

Housing color	Series	Faces	Designation	Legend color	Background color	Arrows
Blank = Brushed aluminum	LX = AC-only LXN = Self-powered	1 = Single face 2 = Double face	N = New design	R = Red G = Green	C = Clear (single face only) W = White M = Mirror	Blank = No arrow D = Double arrow L = Arrow left R = Arrow right RL = Right & left (double face) UA = Universal field installed arrows
W = White B = Black PB = Polished brass CH = Polished chrome BR = Bronze						
Trim	Mounting	Options	Legend size			
-C = Circular -A = Angular	Blank = Universal mount	Blank = No option -NEX = Nexus® wired ¹ (consult your sales representative) -NEXRF = Nexus® wireless ¹ (consult your sales representative) -D = Self-test and diagnostic ¹ -DC = AC/DC remote 6-24 VDC -FA = Fire alarm ¹ -FZ = Flasher & buzzer ¹ -2CKT = Two circuit, AC only	Blank = 6" EXIT legend -8 = 8" EXIT legend (red only) -LP = Panel shipped separately -X = Back box shipped separately			

Example: WLXN2NRWRL-A-D

¹Self-powered only

Survive-All™ SVX Series

NEMA-4X, vandal resistant and harsh environment exit sign



Construction

- Full gasketed NEMA-4X housing
- Frame: polyvinyl chloride enclosure, fully gasketed around the lens, backplate and canopy to prevent water infiltration
- Faceplate: heavy-duty, vandal-resistant polycarbonate
- Backplate: heavy aluminum
- Comes with both Phillips head for NSF location and tamper-proof screws
- 6 inch EXIT lettering legend, available in red or green
- Field-selectable chevrons
- Choice of finishes: black, white, gray or brushed aluminum

Mounting

- Surface mount
- Ceiling and wall mount are NEMA-4X
- End and pendant mount are not NEMA-4X
- Canopy included for end or ceiling mount applications
- Universal J-box mounting
- 1/2 inch conduit entry on top and sides

Special wording panels

- Available. Contact your sales representative with your design requirements

Electronics

- Magnetically operated test switch
- Standard Advanced Diagnostics (non-audible)
- Optional Nexus®Pro IoT monitoring system
- Optional Nexus® wired and wireless monitoring system
- 120/277 60Hz
- Compatible with Emergi-lite min inverters (contact your sales representative for more information)

Approvals

- UL 924 listed
- UL listed for wet and damp location self powered (50°F to 104°F), AC and AC/DC (-40°F to 104°F)
- Self powered model UL listed for cold weather option (-4°F to +104°F)
- Meets NFPA101 (Life Safety Code), NFPA 70 NEC, OSHA illumination standards
- E-California Energy Commission Title 20

Warranty

- Five-year limited warranty
Detailed warranty terms located on page 202 or online at:
www.emergi-lite.com/usa/files/EL_Warranty.pdf

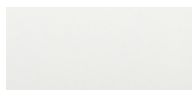
Power consumption

Model	AC specs	DC specs
AC-only	120-277VAC, 50/60Hz (1.2W)	-
AC/DC	120-277VAC, 50/60Hz (1.2W)	6 to 24VDC (less than 1.5W)
Self-powered	120-277VAC, 50/60Hz (3.7W)	Ni-Cd battery (min. 90 minutes)

Housing color



Black



White



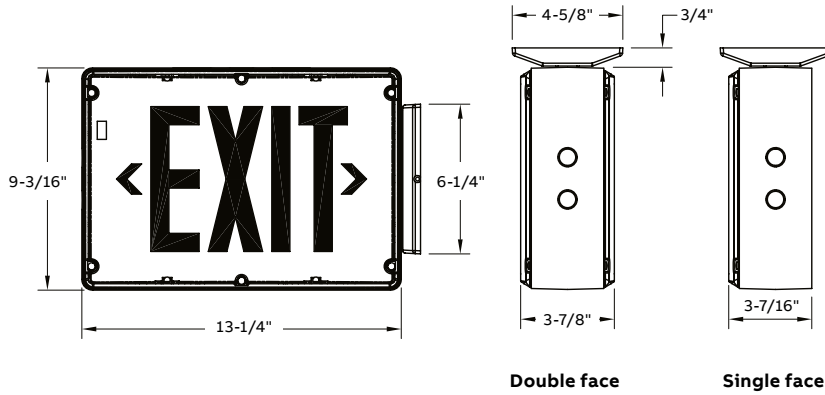
Gray



Brushed aluminum

Dimensions

Dimensions are approximate and subject to change.



Accessories (order as a separate item)

Description	Part number
Tamper-proof bit	690.0454-E
Convert single to double face, red	DFKR ¹
Convert single face to double face, green	DFKG ¹
Additional test magnet	199.0133-E

¹Colors available AL-BK-WT

How to order

Housing color	Series	Face	Legend	Charger type
BB = Black/black	SVX = AC only	1 = Single	R = Red	Blank = AC only
BW = Black/white	SVXN = Self-powered Ni-Cd	2 = Double	G = Green	-D = Diagnostic ¹
BA = Black/aluminum				-NEX = Nexus® wired ¹
GB = Gray/black				-NEXP = Nexus®Pro IoT ¹
GW = Gray/white				-NEXRF = Nexus® wireless ¹
GA = Gray/aluminum				
WB = White/black				
WW = White/white				
WA = White/aluminum				

Housing	Options
-4X = Wet/damp locations	Blank = No options
	-2CKT = Dual circuit (AC only) ²
	-CW = Cold weather (Self-powered -4°F to 104°F) ⁴
	-CM = Canopy pendant mount ⁵
	-DC = 6 to 24VDC ³
	-FA = Fire alarm activated flasher ²
	-FL = Flasher only ²
	-FZ = Flasher/buzzer (self-powered only) ²

Example: BBSVXN1R-D-4X-FA

¹Available with self-powered models only

²Not available with Nexus® option

³Not available with self-power

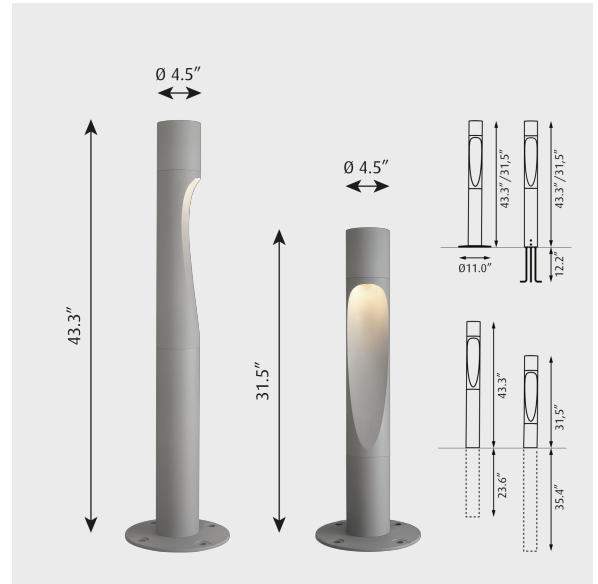
⁴Not required with AC model

Flindt Bollard

Project name:

Project type:

Notes:

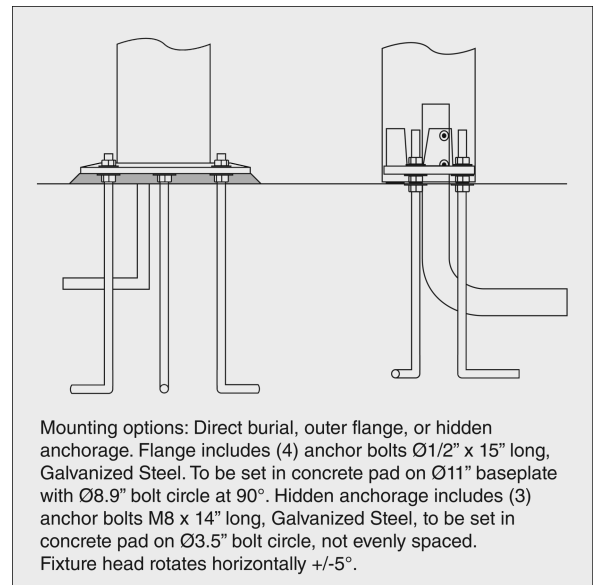


Design

Christian Flindt

Product description

Beautifully crafted slender post with a carved surface that is gently illuminated. Top section conceals downward facing LEDs that are positioned for wide distribution. Two horizontal connection lines underline the three parts of the bollard. A facet increases the visibility of the connection lines. Available in two heights, 43.3 IN and 31.5 IN. Available in three different mounting methods: with an 11 inch base plate and visible anchor bolts, with internally hidden anchor bolts, or direct burial in soil or gravel. Part of a family.



Variant options

Dimension	Color	Mounting	Light source	Lumen	Voltage frequency
31.5 IN	● Corten color	Post w/anchorage unit	15W LED/3000K	536	120-277V/60HZ
43.3 IN	● Natural paint aluminum	Post w/base plate	15W LED/4000K	548	
		Post w/direct burial		578	
				591	

Specification notes

a. Direct burial mounting only available with 43.3" size.

Light description

The luminaire provides a non-glaring wide characteristic asymmetrical and functional illumination. The design of the cut-out creates a reflector part which is gradually illuminated to emphasize the depth in the luminaire. The cut-out reflector and precise location of the LED's provides an wing-shaped light pattern on the ground. A white highly reflective material around the LED's ensure a wide distribution of light and high efficacy. The cut-out reflector part can be adjusted $\pm 10^\circ$ after installation to fine tune alignment of several luminaires and light distribution. Standard CCT in 3000K or 4000K, controlled by electronic dimmable driver.

Mounting

Top section housing holds driver and LED's connected with quick-disconnect plug for easy servicing. Terminal block is located in the reflector section. Thru wiring approved. Supplied with IP68 (water-tight) glands to seal mid-section for pass thru wiring. Mounted to a concrete base with (4) anchor bolts on a bolt circle of 8.9 inches.

Information

Electrical:
 System Wattage: 15W
 LED Wattage: 14W
 Delivered lumens: 536-591 lm
 Efficacy: 35.7-39.4 lm/W
 Certifications:
 cULus, Wet Location
 Protection class IP65
 IK class 10
 BUG Rating: B0-U2-G1
 Controllability: 0-10V Dimming
 Min.-Max. Ambient Temp: -40°C to $+70^\circ\text{C}$
 Color Rendering: Ra \geq 80

Other functions

Alternative mounting options include an 11" base plate, a hidden anchor base or for direct burial. LED in 2700K or 3500K. Amber LED available for sea turtle nesting areas. Custom finishes. Custom pole heights. Alternative dimming controls, including wireless systems.

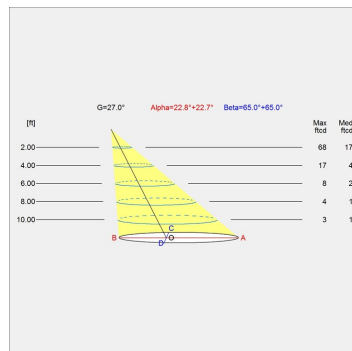
Voltage

120-277V/60HZ

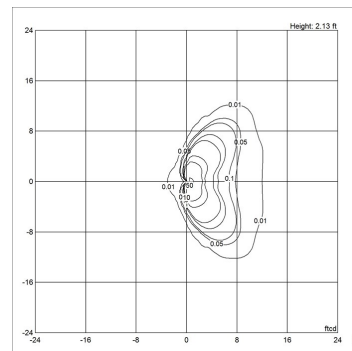
Light distribution diagrams

For the full data set on all variants, see louispoulsen.com.

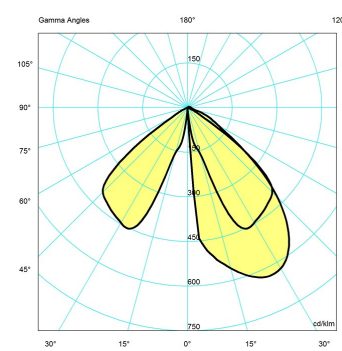
Cartesian



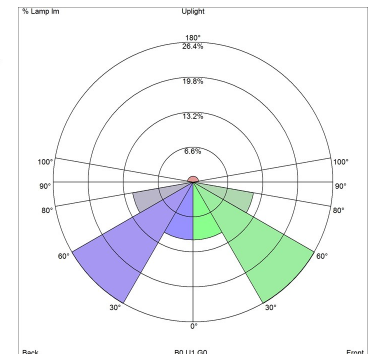
Isolux























Polar



Bug



Variant options

Dimension	Color	Mounting	Light source	Lumen	Voltage frequency	Variant number
43.3 IN	 Natural paint aluminum	Post w/anchorage unit	15W LED/3000K	591	120-277V/60HZ	10000139074
43.3 IN	 Natural paint aluminum	Post w/base plate	15W LED/3000K	578	120-277V/60HZ	10000126945
43.3 IN	 Natural paint aluminum	Post w/base plate	15W LED/4000K	591	120-277V/60HZ	10000126946
43.3 IN	 Natural paint aluminum	Post w/direct burial	15W LED/3000K	578	120-277V/60HZ	10000126947
43.3 IN	 Natural paint aluminum	Post w/direct burial	15W LED/4000K	591	120-277V/60HZ	10000126948
43.3 IN	 Corten color	Post w/base plate	15W LED/3000K	536	120-277V/60HZ	10000135834
43.3 IN	 Corten color	Post w/direct burial	15W LED/3000K	536	120-277V/60HZ	10000135835
43.3 IN	 Corten color	Post w/base plate	15W LED/4000K	548	120-277V/60HZ	10000135836
43.3 IN	 Corten color	Post w/direct burial	15W LED/4000K	548	120-277V/60HZ	10000135837
31.5 IN	 Corten color	Post w/base plate	15W LED/3000K	536	120-277V/60HZ	10000139024
31.5 IN	 Natural paint aluminum	Post w/base plate	15W LED/3000K	578	120-277V/60HZ	10000139067
31.5 IN	 Corten color	Post w/anchorage unit	15W LED/3000K	536	120-277V/60HZ	10000139066
31.5 IN	 Natural paint aluminum	Post w/anchorage unit	15W LED/3000K	578	120-277V/60HZ	10000139068
31.5 IN	 Corten color	Post w/base plate	15W LED/4000K	548	120-277V/60HZ	10000139069
31.5 IN	 Natural paint aluminum	Post w/base plate	15W LED/4000K	591	120-277V/60HZ	10000139071
31.5 IN	 Corten color	Post w/anchorage unit	15W LED/4000K	548	120-277V/60HZ	10000139070
31.5 IN	 Natural paint aluminum	Post w/anchorage unit	15W LED/4000K	591	120-277V/60HZ	10000139072
43.3 IN	 Corten color	Post w/anchorage unit	15W LED/3000K	548	120-277V/60HZ	10000139073
43.3 IN	 Corten color	Post w/anchorage unit	15W LED/4000K	548	120-277V/60HZ	10000139075
43.3 IN	 Natural paint aluminum	Post w/anchorage unit	15W LED/4000K	591	120-277V/60HZ	10000139076



Gardco PureForm LED area medium P26 features a sleek, low profile design and optimal performance. PureForm area medium is designed to achieve maximum pole spacing, with lumen output up to 28,900 lumens. Multiple distribution and shielding options are available to achieve maximum control. A full range of control options provides additional energy savings.

Project: _____

Location: _____

Cat.No: _____

Type: _____

Lumens: _____ Qty: _____

Notes: _____

Ordering guide

example: **P26-64L-800-NW-G2-AR-3-120-HIS-MGY**

Prefix	Number of LEDs	Drive Current	LED Color - Generation	Mounting	Distribution	Voltage		
P26								
P26 PureForm area medium, 26"	48L 48 LEDs (3 modules)	400 400mA	WW-G2 Warm White 3000K, 70 CRI Generation 2	AR Arm Mount (standard) ² <i>The following mounting kits must be ordered separately (See accessories)</i>	Type 2 2 Type 2 2-90 Rotated left 90° 2-270 Rotated right 270°	120 120V 208 208V 240 240V 277 277V 347 347V 480 480V		
		500 500mA						
		600 600mA						
	64L 64 LEDs (4 modules)	600 600mA	NW-G2 Neutral White 4000K, 70 CRI Generation 2				Type 3 3 Type 3 3-90 Rotated left 90° 3-270 Rotated right 270°	240 240V 277 277V 347 347V 480 480V UNV 120-277V (50/60Hz) HVU 347-480V (50/60Hz)
		700 700mA						
		800 800mA						
	80L 80 LEDs (5 modules)	600 600mA	CW-G2 Cool White 5000K, 70 CRI Generation 2		Type 4 4 Type 4 4-90 Rotated left 90° 4-270 Rotated right 270°			
		700 700mA						
		800 800mA						
		700 700mA	WY-G2 Warm Yellow 2700K, 80 CRI Generation 2 ¹			SF Slip Fitter Mount ³ (fits to 2 3/8" O.D. tenon)		
		800 800mA						
		900 900mA						
	700 700mA	BW-G2 Balanced White 3500K 80 CRI Generation 2 ¹	WS Wall mount with surface conduit rear entry permitted					
	800 800mA							
	900 900mA							
		AM-G2 Direct Amber (590nm) Generation 2 ^{1,15}		RAM Retrofit arm mount kit ²				

Options					
Dimming controls	Motion sensing lens	Photo-sensing	Electrical	Luminaire	Finish
DD 0-10V External dimming (by others) ⁴ DCC Dual Circuit Control ^{4,5,6} FAWS Field Adjustable Wattage Selector ^{4,5} SW Interface module for SiteWise ^{4,6,7} LLC Integral wireless module ^{4,6,8,19} BL Bi-level functionality ^{4,19} DynaDimmer: Automatic Profile Dimming CS50 Security 50% Dimming, 7 hours ^{4,8} CM50 Median 50% Dimming, 8 hours ^{4,8} CS30 Security 30% Dimming, 7 hours ^{4,8} CM30 Median 30% Dimming, 8 hours ^{4,8}	IMR13 Integral with #3 lens ¹⁶ IMR17 Integral with #7 lens ¹⁷	PCB Photocontrol Button ^{8,9} TLRD5 Twist Lock Receptacle 5 Pin ¹⁰ TLRD7 Twist Lock Receptacle 7 Pin ¹⁰ TLRPC Twist Lock Receptacle w/Photocell ^{9,11}	Fusing F1 Single (120, 277, 347VAC) ⁹ F2 Double (208, 240, 480VAC) ⁹ F3 Canadian Double Pull (208, 240, 480VAC) ^{9,12} Pole Mount Fusing FP1 Single (120, 277, 347VAC) ⁹ FP2 Double (208, 240, 480VAC) ⁹ FP3 Canadian Double Pull (208, 240, 480VAC) ⁹ Surge Protection (10kA standard) SP2 Increased 20kA	Square Pole Adapter included as standard TB Terminal Block ¹² RPA Round Pole Adapter (fits to 3"-3.9" O.D. pole) ¹³ HIS Internal Housing Side Shield ¹⁴	Textured BK Black WH White BZ Bronze DGY Dark Gray MGY Medium Gray Customer specified RAL Specify optional color or RAL (ex: RAL7024) CC Custom color (Must supply color chip for required factory quote)

- Extended lead times apply. Contact factory for details.
- Mounts to a 4-5" round pole with adapter included for square poles.
- Limited to a maximum of 45 degrees aiming above horizontal.
- Not available with other dimming control options.
- Not available with motion sensor.
- Not available with photocontrol.
- Available only in 120 or 277V.
- Not available in 347 or 480V.
- Must specify input voltage.
- Dimming will not be connected to NEMA receptacle if ordering with other control options.
- Not available in 480V. Order photocell separately with TLRD5/7.
- Not available with DCC.
- Not available with SF and WS. RPAs provided with black finish standard.
- HIS not available with Type 5, 5W, and BLC optics.
- Limited to max. 600mA configurations.
- Not available with DD, DCC, and FAWS dimming control options.
- Not available with DD, DCC, FAWS and LLC dimming control options.
- Not available with DD, DCC, FAWS, LLC, and BL dimming control options (SW or DynaDimmer required).
- Must specify a motion sensor lens.



P26 PureForm LED medium

Area light

PureForm P26 Accessories (ordered separately, field installed)

Shielding Accessories

House Side shield

Standard optic orientation:

HIS-48-H²⁰ Internal House Side Shield for 48 LEDs (3 modules)

HIS-64-H²⁰ Internal House Side Shield for 64 LEDs (4 modules)

HIS-80-H²⁰ Internal House Side Shield for 80 LEDs (5 modules)

Optic at 90 or 270 orientation:

HIS-48-V²⁰ Internal House Side Shield for 48 LEDs (3 modules)

HIS-64-V²⁰ Internal House Side Shield for 64 LEDs (4 modules)

HIS-80-V²⁰ Internal House Side Shield for 80 LEDs (5 modules)

Mounting Accessories

PureForm PTF2 (pole top fitter fits 2 3/8-2 1/2" OD x 4" depth tenon)

PTF2-P26/34-1-90-(F) 1 luminaire at 90°

PTF2-P26/34-2-90-(F) 2 luminaires at 90°

PTF2-P26/34-2-180-(F) 2 luminaires at 180°

PTF2-P26/34-3-90-(F) 3 luminaires at 90°

PTF2-P26/34-4-90-(F) 4 luminaires at 90°

PTF2-P26/34-3-120-(F) 3 luminaires at 120°

PureForm PTF3 (pole top fitter fits 3-3 1/2" OD x 6" depth tenon)

PTF3-P26/34-1-90-(F) 1 luminaire at 90°

PTF3-P26/34-2-90-(F) 2 luminaires at 90°

PTF3-P26/34-2-180-(F) 2 luminaires at 180°

PTF3-P26/34-3-90-(F) 3 luminaires at 90°

PTF3-P26/34-4-90-(F) 4 luminaires at 90°

PTF3-P26/34-3-120-(F) 3 luminaires at 120°

PureForm PTF4 (pole top fitter fits 3 1/2-4" OD x 6" depth tenon)

PTF4-P26/34-1-90-(F) 1 luminaire at 90°

PTF4-P26/34-2-90-(F) 2 luminaires at 90°

PTF4-P26/34-2-180-(F) 2 luminaires at 180°

PTF4-P26/34-3-90-(F) 3 luminaires at 90°

PTF4-P26/34-4-90-(F) 4 luminaires at 90°

PTF4-P26/34-3-120-(F) 3 luminaires at 120°

P26-SF-G2-(F) Slip Fitter Mount (fits to 2 3/8" O.D. tenon)

P26-RAM-G2-(F) Retrofit Arm mount kit

P26-WS-G2-(F) Wall mount with surface conduit rear entry permitted

P26-BD-G2 Bird deterrent

(F) = Specify finish

20. HIS not available with Type 5, 5W, and BLC optics.

P26 PureForm LED medium

Area light

LED Wattage and Lumen Values - 3000K

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 2			Type 3			Type 4		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
P26-48L-400-WW-G2-x	48	400	3000	60	7,673	B2-U0-G2	128	7,420	B1-U0-G2	124	7,698	B1-U0-G2	128
P26-48L-500-WW-G2-x	48	500	3000	74	9,380	B2-U0-G2	126	9,070	B2-U0-G2	122	9,409	B2-U0-G2	127
P26-48L-600-WW-G2-x	48	600	3000	89	10,967	B3-U0-G2	123	10,604	B2-U0-G2	119	10,999	B2-U0-G2	124
P26-48L-700-WW-G2-x	48	700	3000	101	12,477	B3-U0-G2	123	12,064	B2-U0-G2	119	12,514	B2-U0-G2	124
P26-64L-600-WW-G2-x	64	600	3000	114	14,493	B3-U0-G3	127	14,013	B2-U0-G3	123	14,536	B2-U0-G3	127
P26-64L-700-WW-G2-x	64	700	3000	133	16,402	B3-U0-G3	124	15,859	B2-U0-G3	119	16,451	B3-U0-G3	124
P26-64L-800-WW-G2-x	64	800	3000	153	18,384	B3-U0-G3	121	17,775	B3-U0-G3	117	18,438	B3-U0-G3	121
P26-80L-700-WW-G2-x	80	700	3000	169	20,727	B3-U0-G3	123	20,041	B3-U0-G4	119	20,788	B3-U0-G4	123
P26-80L-800-WW-G2-x	80	800	3000	192	22,735	B3-U0-G3	119	21,983	B3-U0-G4	115	22,803	B3-U0-G4	119
P26-80L-900-WW-G2-x	80	900	3000	219	24,409	B3-U0-G3	111	23,602	B3-U0-G4	108	24,482	B3-U0-G4	112

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 5			Type 5W			Type AFR			Type BLC		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
P26-48L-400-WW-G2-x	48	400	3000	60	7,916	B3-U0-G2	132	7,948	B3-U0-G2	132	7,854	B2-U0-G1	131	5,872	B0-U0-G2	98
P26-48L-500-WW-G2-x	48	500	3000	74	9,674	B3-U0-G2	130	9,716	B4-U0-G2	131	9,599	B2-U0-G2	129	7,178	B0-U0-G2	97
P26-48L-600-WW-G2-x	48	600	3000	89	11,308	B4-U0-G2	127	11,359	B4-U0-G2	128	11,223	B3-U0-G2	126	8,392	B1-U0-G2	94
P26-48L-700-WW-G2-x	48	700	3000	101	12,863	B4-U0-G2	127	12,923	B4-U0-G2	128	12,769	B3-U0-G2	126	9,548	B1-U0-G2	94
P26-64L-600-WW-G2-x	64	600	3000	114	14,940	B4-U0-G2	131	15,011	B4-U0-G2	131	14,832	B3-U0-G2	130	11,091	B1-U0-G2	97
P26-64L-700-WW-G2-x	64	700	3000	133	16,907	B4-U0-G2	127	16,988	B5-U0-G3	128	16,786	B3-U0-G2	126	12,552	B1-U0-G2	95
P26-64L-800-WW-G2-x	64	800	3000	153	18,949	B4-U0-G2	124	19,041	B5-U0-G3	125	18,814	B3-U0-G2	123	14,068	B1-U0-G3	92
P26-80L-700-WW-G2-x	80	700	3000	169	21,363	B5-U0-G3	127	21,468	B5-U0-G3	127	21,212	B3-U0-G2	126	15,861	B1-U0-G3	94
P26-80L-800-WW-G2-x	80	800	3000	192	23,463	B5-U0-G3	122	23,548	B5-U0-G3	123	23,267	B3-U0-G2	121	17,398	B1-U0-G3	91
P26-80L-900-WW-G2-x	80	900	3000	219	25,202	B5-U0-G3	115	25,282	B5-U0-G4	115	24,981	B3-U0-G2	114	18,679	B1-U0-G3	85

LED Wattage and Lumen Values - 4000K

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 2			Type 3			Type 4		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
P26-48L-400-NW-G2-x	48	400	4000	60	8798	B2-U0-G2	146	8509	B2-U0-G2	142	8827	B2-U0-G2	147
P26-48L-500-NW-G2-x	48	500	4000	74	10755	B2-U0-G2	145	10401	B2-U0-G2	140	10789	B2-U0-G2	145
P26-48L-600-NW-G2-x	48	600	4000	89	12574	B3-U0-G2	141	12160	B2-U0-G2	137	12614	B2-U0-G3	142
P26-48L-700-NW-G2-x	48	700	4000	101	14305	B3-U0-G3	142	13834	B2-U0-G3	137	14351	B2-U0-G3	142
P26-64L-600-NW-G2-x	64	600	4000	114	16617	B3-U0-G3	145	16069	B2-U0-G3	141	16670	B3-U0-G3	146
P26-64L-700-NW-G2-x	64	700	4000	133	18806	B3-U0-G3	142	18186	B3-U0-G3	137	18866	B3-U0-G4	142
P26-64L-800-NW-G2-x	64	800	4000	153	21078	B3-U0-G3	138	20383	B3-U0-G4	134	21145	B3-U0-G4	139
P26-80L-700-NW-G2-x	80	700	4000	169	23764	B3-U0-G3	141	22981	B3-U0-G4	136	23840	B3-U0-G4	141
P26-80L-800-NW-G2-x	80	800	4000	192	26067	B3-U0-G3	136	25208	B3-U0-G4	132	26150	B3-U0-G4	137
P26-80L-900-NW-G2-x	80	900	4000	219	27986	B3-U0-G3	128	27064	B3-U0-G4	123	28076	B3-U0-G4	128

Values from photometric tests performed in accordance with IESNA LM-79 and are representative of the configurations shown. Actual performance may vary due to installation and environmental variables, LED and driver tolerances, and field measurement considerations. It is highly recommended to confirm performance with a photometric layout.

NOTE: Some data may be scaled based on tests of similar (but not identical) luminaires. Contact factory for configurations not shown.

P26 PureForm LED medium

Area light

LED Wattage and Lumen Values – 4000K (continued)

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 5			Type 5W			Type AFR			Type BLC		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
P26-48L-400-NW-G2-x	48	400	4000	60	9068	B3-U0-G2	151	9114	B4-U0-G2	152	9006	B2-U0-G1	150	6735	B0-U0-G2	112
P26-48L-500-NW-G2-x	48	500	4000	74	11083	B4-U0-G2	149	11141	B4-U0-G2	150	11009	B3-U0-G2	148	8233	B1-U0-G2	111
P26-48L-600-NW-G2-x	48	600	4000	89	12954	B4-U0-G2	146	13025	B4-U0-G2	146	12871	B3-U0-G2	145	9626	B1-U0-G2	108
P26-48L-700-NW-G2-x	48	700	4000	101	14736	B4-U0-G2	146	14819	B4-U0-G2	147	14643	B3-U0-G2	145	10951	B1-U0-G2	108
P26-64L-600-NW-G2-x	64	600	4000	114	17116	B4-U0-G2	150	17214	B5-U0-G3	151	17009	B3-U0-G2	149	12721	B1-U0-G2	111
P26-64L-700-NW-G2-x	64	700	4000	133	19369	B5-U0-G3	146	19481	B5-U0-G3	147	19249	B3-U0-G2	145	14396	B1-U0-G3	108
P26-64L-800-NW-G2-x	64	800	4000	153	21708	B5-U0-G3	142	21834	B5-U0-G3	143	21575	B3-U0-G2	141	16136	B1-U0-G3	106
P26-80L-700-NW-G2-x	80	700	4000	169	24474	B5-U0-G3	145	24617	B5-U0-G4	146	24325	B3-U0-G2	144	18192	B1-U0-G3	108
P26-80L-800-NW-G2-x	80	800	4000	192	26880	B5-U0-G3	140	27003	B5-U0-G4	141	26682	B3-U0-G3	139	19955	B1-U0-G3	104
P26-80L-900-NW-G2-x	80	900	4000	219	28872	B5-U0-G3	132	28991	B5-U0-G4	132	28647	B4-U0-G3	131	21425	B1-U0-G4	98

LED Wattage and Lumen Values – 5000K

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 2			Type 3			Type 4		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
P26-48L-400-CW-G2-x	48	400	5000	60	8,237	B2-U0-G2	137	7,965	B1-U0-G2	133	8,262	B2-U0-G2	138
P26-48L-500-CW-G2-x	48	500	5000	74	10,069	B2-U0-G2	135	9,736	B2-U0-G2	131	10,100	B2-U0-G2	136
P26-48L-600-CW-G2-x	48	600	5000	89	11,772	B3-U0-G2	132	11,383	B2-U0-G2	128	11,807	B2-U0-G2	133
P26-48L-700-CW-G2-x	48	700	5000	101	13,393	B3-U0-G2	133	12,950	B2-U0-G2	128	13,433	B2-U0-G3	133
P26-64L-600-CW-G2-x	64	600	5000	114	15,557	B3-U0-G3	136	15,042	B2-U0-G3	132	15,603	B2-U0-G3	137
P26-64L-700-CW-G2-x	64	700	5000	133	17,607	B3-U0-G3	133	17,024	B3-U0-G3	128	17,659	B3-U0-G3	133
P26-64L-800-CW-G2-x	64	800	5000	153	19,734	B3-U0-G3	129	19,080	B3-U0-G3	125	19,792	B3-U0-G4	130
P26-80L-700-CW-G2-x	80	700	5000	169	22,248	B3-U0-G3	132	21,512	B3-U0-G4	128	22,315	B3-U0-G4	132
P26-80L-800-CW-G2-x	80	800	5000	192	24,404	B3-U0-G3	127	23,597	B3-U0-G4	123	24,477	B3-U0-G4	128
P26-80L-900-CW-G2-x	80	900	5000	219	26,201	B3-U0-G3	119	25,335	B3-U0-G4	115	26,280	B3-U0-G4	120

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 5			Type 5W			Type AFR			Type BLC		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
P26-48L-400-CW-G2-x	48	400	5000	60	8,497	B3-U0-G2	141	8,532	B4-U0-G2	142	8,430	B2-U0-G1	140	6,304	B0-U0-G2	105
P26-48L-500-CW-G2-x	48	500	5000	74	10,384	B4-U0-G2	140	10,429	B4-U0-G2	140	10,305	B2-U0-G2	139	7,705	B1-U0-G2	104
P26-48L-600-CW-G2-x	48	600	5000	89	12,138	B4-U0-G2	136	12,193	B4-U0-G2	137	12,047	B3-U0-G2	135	9,008	B1-U0-G2	101
P26-48L-700-CW-G2-x	48	700	5000	101	13,808	B4-U0-G2	137	13,872	B4-U0-G2	137	13,706	B3-U0-G2	136	10,249	B1-U0-G2	101
P26-64L-600-CW-G2-x	64	600	5000	114	16,037	B4-U0-G2	140	16,113	B5-U0-G3	141	15,921	B3-U0-G2	139	11,905	B1-U0-G2	104
P26-64L-700-CW-G2-x	64	700	5000	133	18,149	B4-U0-G2	137	18,236	B5-U0-G3	137	18,018	B3-U0-G2	136	13,473	B1-U0-G3	101
P26-64L-800-CW-G2-x	64	800	5000	153	20,340	B5-U0-G3	133	20,439	B5-U0-G3	134	20,195	B3-U0-G2	132	15,101	B1-U0-G3	99
P26-80L-700-CW-G2-x	80	700	5000	169	22,932	B5-U0-G3	136	23,044	B5-U0-G3	137	22,769	B3-U0-G2	135	17,026	B1-U0-G3	101
P26-80L-800-CW-G2-x	80	800	5000	192	25,186	B5-U0-G3	131	25,277	B5-U0-G4	132	24,975	B3-U0-G2	130	18,675	B1-U0-G3	97
P26-80L-900-CW-G2-x	80	900	5000	219	27,053	B5-U0-G3	123	27,138	B5-U0-G4	124	26,815	B3-U0-G3	122	20,051	B1-U0-G3	91

Values from photometric tests performed in accordance with IESNA LM-79 and are representative of the configurations shown. Actual performance may vary due to installation and environmental variables, LED and driver tolerances, and field measurement considerations. It is highly recommended to confirm performance with a photometric layout.

NOTE: Some data may be scaled based on tests of similar (but not identical) luminaires. Contact factory for configurations not shown.

P26 PureForm LED medium

Area light

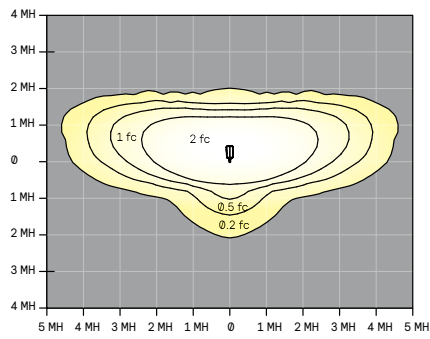
Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L₇₀ is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L₇₀ hours limited to 6 times actual LED test hours

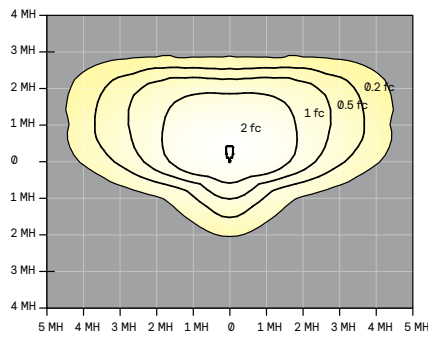
Ambient Temperature °C	Driver mA	Calculated L ₇₀ Hours	L ₇₀ per TM-21	Lumen Maintenance % at 60,000 hrs
25°C	up to 900 mA	>100,000 hours	>60,000 hours	>88%

Optical Distributions

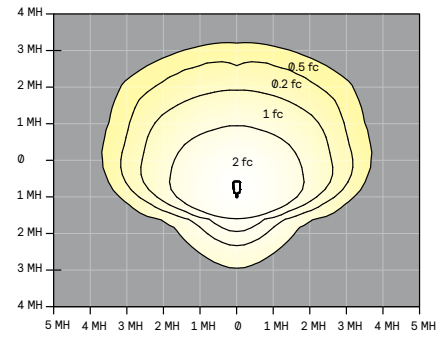
Based on 20' mounting height



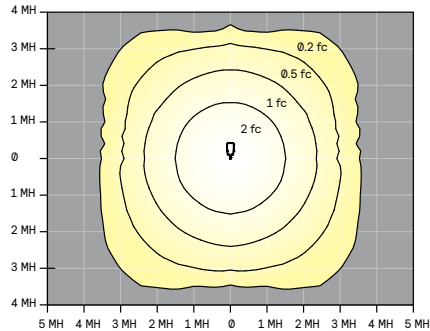
Type 2



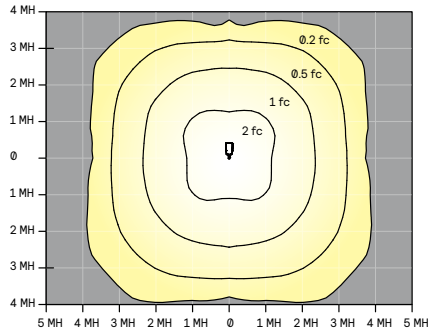
Type 3



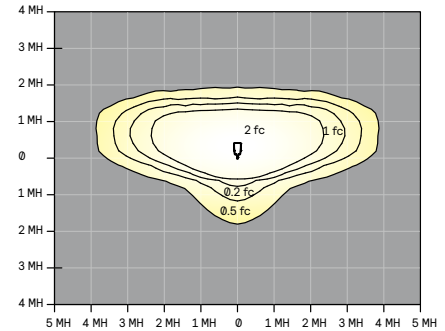
Type 4



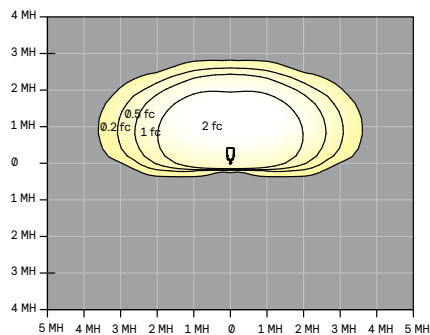
Type 5



Type 5W



AFR



BLC

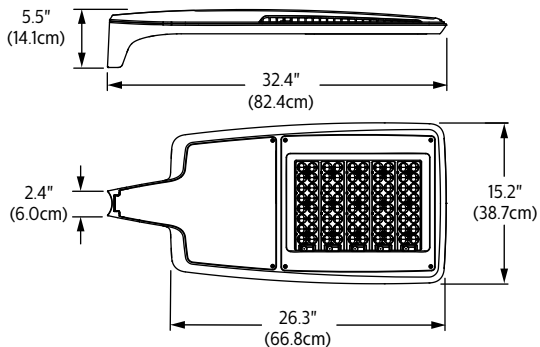
P26 PureForm LED medium

Area light

Dimensions

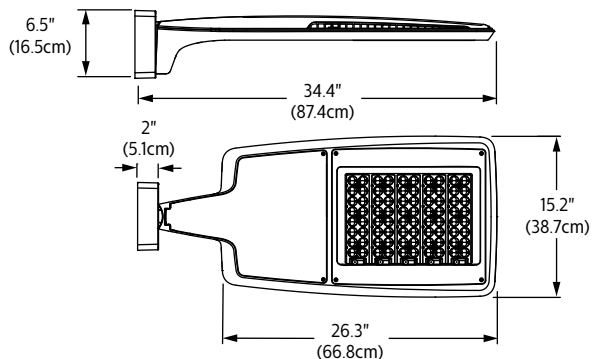
Standard Arm (AR)

Weight: 27 Lbs (12.4 Kg) EPA: 0.26ft² (.024m²)



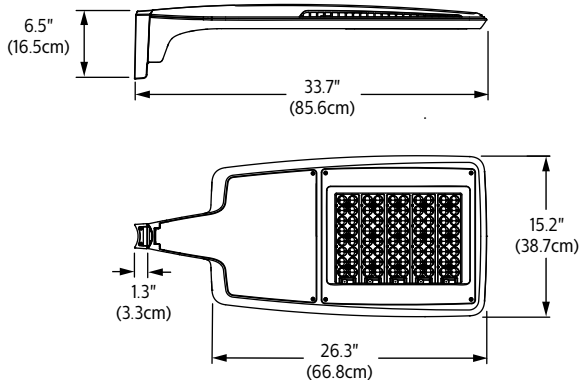
Wall (WS)

Weight: 30 Lbs. (13.7 Kg) EPA: 0.30ft² (.028m²)



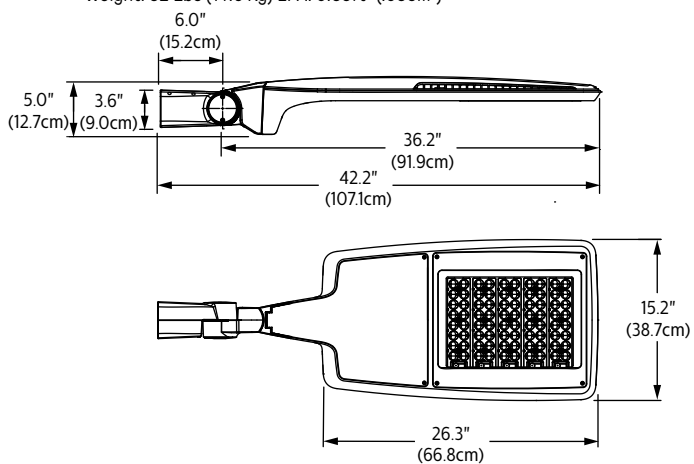
Retrofit Arm (RAM)

Weight: 28 Lbs (12.7 Kg) EPA: 0.28ft² (.026m²)

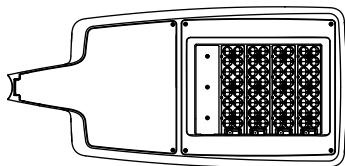


Slip fitter (SF)

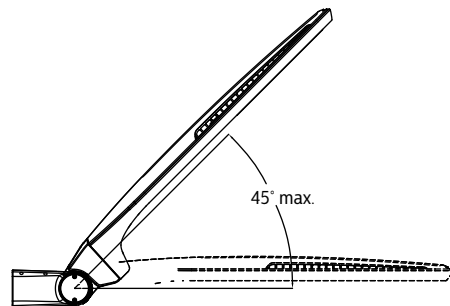
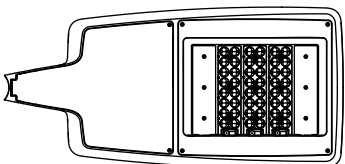
Weight: 32 Lbs (14.6 Kg) EPA: 0.38ft² (.035m²)



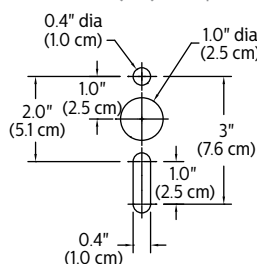
4 module configuration



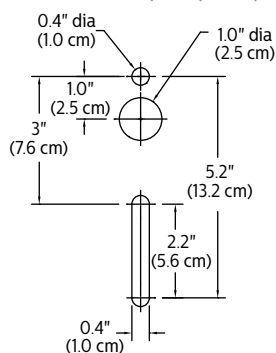
3 module configuration



Standard Arm (AR) drill pattern



Retrofit arm (RAM) drill pattern



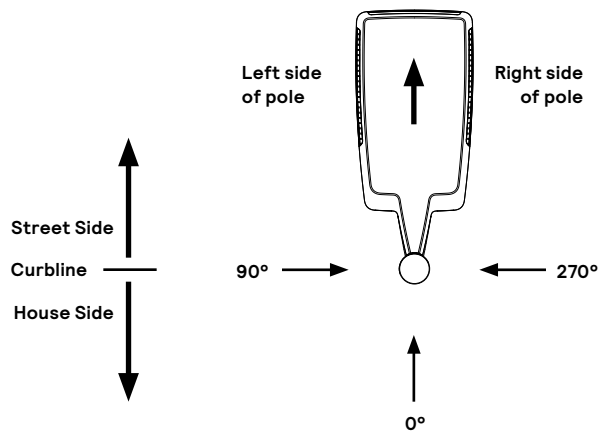
P26 PureForm LED medium

Area light

Optical Orientation Information

Standard Optic Position

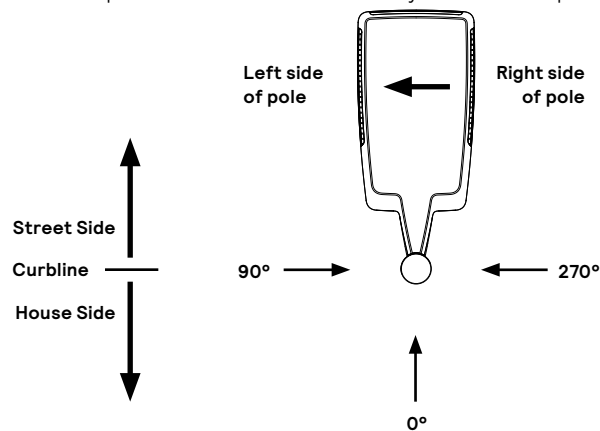
Luminaires ordered with asymmetric optical systems in the standard optic position will have the optical system oriented as shown below:



Note: The hand hole will normally be located on the pole at the 0° point.

Optic Rotated Left (90°) Optic Position

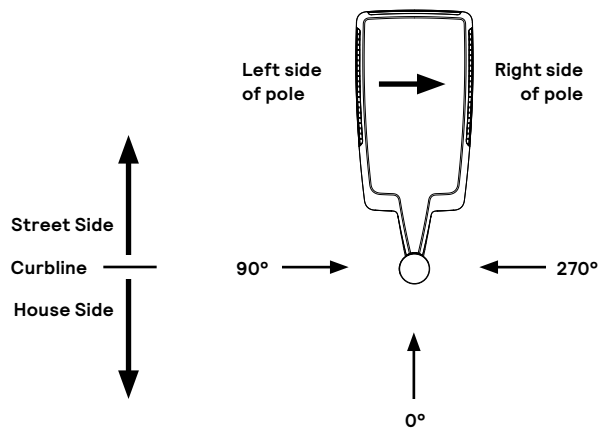
Luminaires ordered with optical systems in the Optic Rotated Left (90°) optic position will have the optical system oriented as shown below (Type 5 and 5W optics are not available with factory set rotatable optics):



Note: The hand hole will normally be located on the pole at the 0° point.

Optic Rotated Right (270°) Optic Position

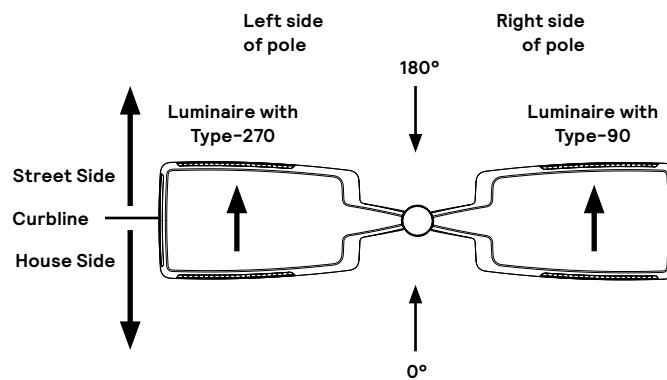
Luminaires ordered with optical systems in the Optic Rotated Right (270°) optic position will have the optical system oriented as shown below (Type 5 and 5W optics are not available with factory set rotatable optics):



Note: The hand hole will normally be located on the pole at the 0° point.

Twin Luminaire Assemblies with Type-90/Type-270 Rotated Optical Systems

Twin luminaire assemblies installed with rotated optical systems are an excellent way to direct light toward the interior of the site (Street Side) without additional equipment. It is important, however, that care be exercised to insure that luminaires are installed in the proper location.



Luminaires with Optic Rotated Right (270°) are installed on the LEFT Side of Pole

Luminaires with Optic Rotated Left (90°) are installed on the RIGHT Side of Pole

Note: The hand hole location will depend on the drilling configuration ordered for the pole.

P26 PureForm LED medium

Area light

Specifications

Housing

Two-piece sealed enclosure with main part of the housing designed as the structural and heat sink frame enclosed by cover to give its unique form. It also includes integral arm and separate, self-retained hinged, one-piece die cast door frame. All die-cast parts made of low copper die cast aluminum alloy for a high resistance to corrosion. The sleek profile with optimized surface area allows housing to provide excellent convection heat transfer with minimum use of heat fins, giving the freedom to have a clean minimalist aesthetic design. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated 3G over 100,000 cycles conforming to standards set forth by ANSI C136.31-2010. Testing includes vibration in three axes, all performed on the same luminaire.

Light engine

Light engine comprises of a module of 16-LED aluminum metal clad board fully sealed with optics offered in multiples of 3, 4 and 5 modules or 48, 64 and 80 LEDs. Module is RoHS compliant. Color temperatures: 3000K +/- 125K, 4000K, 5000K +/- 200K. Minimum CRI of 70. Also available in 2700K, 3500K, and Direct Amber with extended lead times. Direct Amber LED is narrow spectrum with dominant wavelength at 596 nm (peak wavelength at 601 nm). Contact factory for details. LED light engine is rated IP66 in accordance to Section 9 of IEC 60598-1.

Energy saving benefits

System efficacy up to 150 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

Type 2, 3, 4, 5, 5W, and AFR distributions available. Internal Shield option mounts to LED optics and is available with Type 2, 3, 4, and AFR distributions including a dedicated BLC optic to provide the best backlight control possible for those stringent requirements around property lines. Types 2, 3, 4, AFR, and BLC when specified and used as rotated, are factory set only. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (UO per IESNA TM-15).

Mounting

Standard luminaire arm mounts to 4" O.D. round poles. Can also be used with 5" O.D. poles. Square pole adapter included with every luminaire. Round Pole Adapter (RPA) required for 3-3.9" poles. PureForm features a retrofit arm kit. When specified with the retrofit arm (RAM) option, PureForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately. Also optional are slipfitter and wall mounting accessories. Note that only fixed mounts (AR, RAM, WS) are required to meet IDA compliance. SF mounting will not meet IDA.

Control options

0-10V dimming (DD): Access to 0-10V dimming leads supplied through back of luminaire (for secondary dimming controls by others). Cannot be used with other control options.

Dual Circuit Control (DCC): Luminaire equipped with the ability to have two separate circuits controlling drivers and light engines independently. Permits separate switching of separate modules controlled by use of two sets of leads, one for each circuit. Not recommended to be used with other control options, motion response, or photocells.

SiteWise (SW): SiteWise system includes a controller fully integrated in the luminaire that enables the luminaires to communicate with a dimming signal transmitter cabinet located on site using patented central dimming technology. A locally accessible mobile app allows users to access the system and set functionalities such as ON/OFF, dimming levels and scheduling. SiteWise is available with motion response options in order to bring the light back to 100% when motion is detected. Cannot be used with other control options or photocell options. Additional functionalities are available such as communication with indoor lighting and connection to BMS systems. Complete information on the control system can be found on the SiteWise website at philips.com/sitewise.

Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest position at the lumen output selected. Use chart below to estimate reduction in lumen output desired. Cannot be used with other control options or motion response.

FAWS Position	Percent of Typical Lumen Output
1	25%
2	50%
3	55%
4	65%
5	75%
6	80%
7	85%
8	90%
9	95%
10	100%

Note: Typical value accuracy +/- 5%

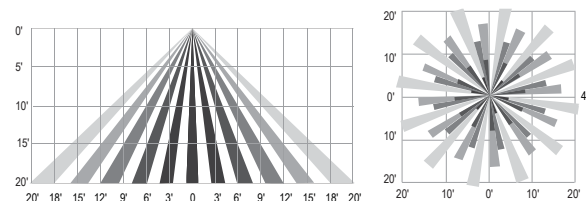
Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM - 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM - 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and for 2 hours before depending of the duration of dimming. Cannot be used with other dimming control options.

Wireless system (LLC): Optional wireless controller integral to luminaire ready to be connected to a Limelight system (sold by others). The system allows you to wirelessly manage the entire site, independent lighting groups or individual luminaires while on-site or remotely. Based on a high-density mesh network with an easy to use web-based portal, you can conveniently access, monitor and manage your lighting network remotely. Wireless controls can be combined with site and area, pedestrian, and parking garage luminaires as well, for a completely connected outdoor solution. Equipped with motion response with #3 lens for 8-25' mounting heights.

LLC-IMRI3 Luminaire with #3 lens



Motion response options

Bi-Level Infrared Motion Response (BL-IMRI): Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL-IMRI is set/operates in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. This can also be done with FSIR-100 Wireless Remote Programming Tool (contact Technical Support for details).

P26 PureForm LED medium

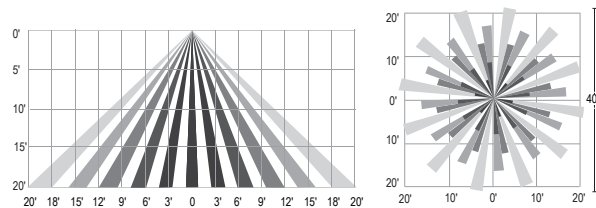
Area light

Specifications (cont'd)

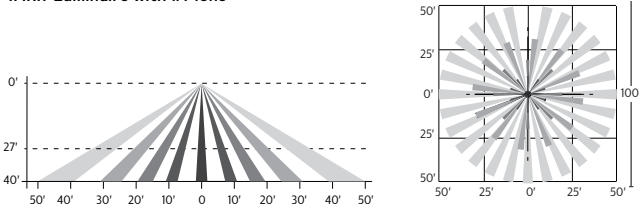
Infrared Motion Response with Other Controls: When used in combination with other controls (Automatic Dimming Profile and SiteWise), motion response device will simply override controller's schedule with the added benefits of a combined dimming profile and sensor detection. In this configuration, the motion response device cannot be re-programmed with FSIR-100 Wireless Remote Programming Tool. The profile can only be re-programmed via the controller.

Infrared Motion Response Lenses (IMRI3/IMRI7): Infrared Motion Response Integral module is available with two different sensor lens types to accommodate various mounting heights and occupancy detection ranges. Lens #3 (IMRI3) is designed for mounting heights up to 20' with a 40' diameter coverage area. Lens #7 is designed for higher mounting heights up to 40' with larger coverage areas up to 100' diameter coverage area. See charts for approximate detection patterns:

IMRI3 Luminaire with #3 lens



IMRI7 Luminaire with #7 lens



Electrical

Twist-Lock Receptacle (TLRD5/TLRD7/ TLRPC): Twist Lock Receptacle with 5 pins enabling dimming or with 7 pins with additional functionality (by others) can be used with a twistlock photoelectric cell or a shorting cap. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specifying receptacle with twistlock photoelectric cell, voltage must be specified. When ordering Twist-lock receptacle (TLRD5 or TLRD7), photocell or shorting cap is not included. TLRPC is shipped standard with 5 pin.

Driver: Driver efficiency (>90% standard). 120-480V available (restrictions apply). Open/short circuit protection. Optional 0-10V dimming to 10% power. RoHS compliant.

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Surge protection (SP1/SP2): Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with DOE MSSLC Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High test level 10kV/10kA. 20kV / 10kA surge protection device that provides extra protection beyond the SP1 10kV/10kA level

Listings

UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm P26 configurations are qualified under Premium DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

Warranty

PureForm luminaires feature a 5-year limited warranty. See signify.com/warranties for complete details and exclusions.

The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract.





Lumec **UrbanScape** LED post top luminaire features flexible, robust energy-saving solutions for heritage-styled urban architectural lighting. Crowned with an ornamental hood, the post top model comes with a flat lens to highlight the thinness of the LEDs. Includes Service Tag, innovative way to provide assistance throughout the life of the product.

Project: _____
 Location: _____
 Cat.No: _____
 Type: _____
 Lamps: _____ Qty: _____
 Notes: _____

Luminaire ordering guide

example: MPTC-C-140L650NW-G1-3-UNV-DMG-PH8-RCD-BKTX

Series	LED Module	Gen.	Optical System	Voltage	Driver Option ³	Luminaire option	Finish
<input type="text"/>	<input type="text"/>	G1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
MPTC-C MPTCCR-C MPTCRC-C MPTCRR-C UrbanScape LED post top luminaire with Comfort optics	3000K 140L450WW 140L650WW 140L1150WW 140L1675WW 140L2100WW 4000K 140L450NW 140L650NW 140L1150NW 140L1675NW 140L2100NW	G1 Gen 1	1 Type I 2 Type II 3 Type III 4 Type IV 5 Type V	UNV 120-277 VAC 347 347VAC 480 480VAC	CDMGE25¹ Economy 8 hrs. 25% reduction CDMGE50¹ Economy 8 hrs. 50% reduction CDMGE75¹ Economy 8 hrs. 75% reduction CDMGM25¹ Median 6 hrs. 25% reduction CDMGM50¹ Median 6 hrs. 50% reduction CDMGM75¹ Median 6 hrs. 75% reduction CDMGS25¹ Safety 4 hrs. 25% reduction CDMGS50¹ Safety 4 hrs. 50% reduction CDMGS75¹ Safety 4 hrs. 75% reduction DMG 0-10V SRD² Sensor ready driver, standard configuration SRD1² Sensor ready driver, alternate configuration	OVR Dynadimmer override function PH8⁴ Twist-lock Photoelectric Cell PH9⁴ Shorting cap PHXL^{1,4} Twist-lock Photoelectric Cell, extended life, UNV (120-277VAC) RCD² Receptacle for twist-lock photocell or shorting cap, 5-pin (standard) RCD7² Receptacle for twist-lock photocell or shorting cap, 7-pin (optional) SP2 20kV / 10kA Surge Protector (optional) TN3⁵ Fitter to fit over 3" (76 mm) O.D. by 4" (102 mm) long tenon TN3.5⁵ Fitter to fit over 3 1/2" (89 mm) O.D. by 4" (102 mm) long tenon	BE2TX BE6TX BE8TX BG2TX BKTX BRTX GN4TX GN6TX GN8TX GNTX GR GY3TX NP RD2TX RD4TX TG TS WHTX (consult pg 4 for code descriptions)

1. Not available with 347V and 480V.
 2. Use of photoelectric cell or shorting cap is required to ensure proper illumination.

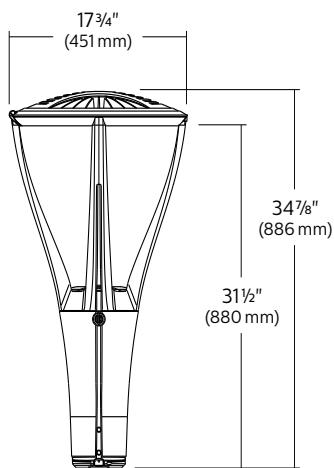
3. Select either CDMG or DMG mandatory option.
 4. Either RCD or RCD7 must be selected for this option.
 5. Not available with Motion Response.



MPTC-C MetroScape post top

urban luminaire with comfort optics

Dimensions



EPA: 1.97 sq ft
Weight: 31.1 lbs (14.1 kg)

Motion Response* (must be ordered as a separate item) Example: ACC-120-MR4PGI-BKTX

Series	Voltage	Motion Response module	Finish
ACC			
ACC Accessory	120 120 volt 277 277 volt	MR4PG1 Single grey MR4PG2 Double grey MR4PW1 Single white MR4PW2 Double white	Consult Lumec's Color Chart for complete specifications.

*OVR option is required for Motion Response Accessory

LED Wattage and Lumen Values for 3000K & 4000K fixtures

Ordering Code:	Total LEDs	System current (mA)	Ave. System Watts (W)	Type 1			Type 2			Type 3			Type 4			Type 5		
				Lumen Output	BUG rating	Efficacy (LPW)	Lumen Output	BUG rating	Efficacy (LPW)	Lumen Output	BUG rating	Efficacy (LPW)	Lumen Output	BUG rating	Efficacy (LPW)	Lumen Output	BUG rating	Efficacy (LPW)
MPTC-C 3000K																		
140L450WW-G1	140	450	22	1813	B1-U0-G1	82	1721	B1-U0-G1	78	1888	B1-U0-G1	86	1852	B1-U0-G1	84	1918	B1-U0-G1	87
140L650WW-G1	140	650	31	2597	B1-U0-G1	84	2465	B1-U0-G1	80	2704	B1-U0-G1	87	2653	B1-U0-G1	86	2747	B2-U0-G1	89
140L1150WW-G1	140	1150	51	4256	B2-U0-G2	83	4040	B2-U0-G2	79	4431	B2-U0-G2	87	4347	B1-U0-G1	85	4502	B2-U0-G1	88
140L1675WW-G1	140	1675	75	5964	B3-U0-G3	80	5662	B2-U0-G2	76	6209	B2-U0-G2	83	6092	B2-U0-G2	81	6310	B3-U0-G2	84
140L2100WW-G1	140	2100	95	7158	B3-U0-G3	75	6795	B3-U0-G3	72	7452	B3-U0-G3	78	7312	B2-U0-G2	77	7572	B3-U0-G2	80
MPTC-C 4000K																		
140L450NW-G1	140	450	22	1850	B1-U0-G1	84	1756	B1-U0-G1	80	1926	B1-U0-G1	88	1889	B1-U0-G1	86	1957	B1-U0-G1	89
140L650NW-G1	140	650	31	2649	B1-U0-G1	85	2515	B1-U0-G1	81	2758	B1-U0-G1	89	2706	B1-U0-G1	87	2802	B2-U0-G1	90
140L1150NW-G1	140	1150	51	4341	B2-U0-G2	85	4121	B2-U0-G2	81	4519	B2-U0-G2	89	4434	B2-U0-G2	87	4593	B3-U0-G1	90
140L1675NW-G1	140	1675	75	6084	B3-U0-G3	81	5775	B2-U0-G2	77	6334	B2-U0-G2	84	6214	B2-U0-G2	83	6436	B3-U0-G2	86
140L2100NW-G1	140	2100	95	7301	B3-U0-G3	77	6931	B3-U0-G3	73	7601	B3-U0-G3	80	7458	B2-U0-G2	79	7724	B3-U0-G2	81

Actual performance may vary due to installation variables including optics, mounting/ceiling height, dirt depreciation, light loss factor, etc.; highly recommended to confirm performance with a layout - contact Applications at signify.com/outdoorluminaires.

Note: Some data may be scaled based on tests of similar. But not identical luminaires.

MPTC-C MetroScape post top

urban luminaire with comfort optics

Specifications

Cage

In a round shape with 4 arms and a built-in mechanical ring, this cage is a one piece die cast A360 Aluminum alloy 0.100 (2.5mm) minimum thickness, mechanically assembled to the fitter.

Fitter

Made of die cast A360.1 Aluminum alloy 0.100 (2.5mm) minimum thickness, the fitter is complete with a watertight access door giving access to the driver rated IP66, and a terminal block that accepts (#2 max.) wires from the primary circuit. Comes with an easy self adjusting system with two (2) set screws 3/8 16 UNC for ease of maintenance and installation. Fits on a 4" (102mm) outside diameter by 4" (102mm) long tenon.

Finial

Decorative cast 356 aluminum, mechanically assembled.

Hood

Made of die cast A360.1 Aluminum alloy 0.1 (2.5mm) minimum thickness, mechanically assembled to the cast aluminum heat sink.

Access-Mechanism

A die cast A360.1 Aluminum alloy 0.1 (2.5mm) minimum thickness technical ring with latch and hinge.

Light Engine

Light guide technology provides low-glare, uniform illumination. Composed of 140 LEDs strategically positioned on the edge of the optical plate. Light engine luminous opening size optimized to best achieve a balance between lumen output and optical performance with the need to provide visual comfort. Light engine frame ensures contact with housing to provide heat conduction and sealing against the elements. Light engine is RoHS compliant. Maximum ambient operating temperature up to 40°C(104°F). Standard color temperatures: 3000K +/- 130K, 4000K +/- 130K, Minimum CRI of 70. Also available in 2700K, 3500K, 5000K and Amber (>590nm) with extended lead times. Contact factory for details.

Optical System

The advanced LED comfort optical system provides Types 1, 2, 3, 4 and 5. Composed of high performance UV-stabilized optical grade lens with molded micro-optics to achieve desired distribution optimized to get a exceptional lighting uniformity. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Street side indicated luminaire designed with 0% uplight (U0 per IESNA TM-15).

Driver

High power factor of 95%. Electronic driver, operating range 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 and 347 to 480 VAC rated for both application line to line or line to neutral, Class 2, THD of 20% max. Maximum ambient operating temperature from 40°F (40°C) to 130°F (50°C). Certified in compliance to UL1310 cULus requirement. Dry and damp location. Assembled on a unitized removable tray with Tyco quick disconnect plug resisting to 221°F (105°C). Dimmable driver 0-10V. The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built in driver surge protection of 2.5kV (min).

Surge Protector

Surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line Ground, Line Neutral and Neutral Ground, and in accordance with U.S. DOE (Department of Energy) MSSSLC (Municipal Solid State Street Lighting Consortium) model specification for LED roadway luminaires electrical immunity requirements for High Test Level 10kV / 10kA.

Optional SP2: 20kV / 10kA surge protection device that provides extra protection beyond the SP1 10kV/10kA level.

Driver options

DMG: Dimmable driver 0-10V.

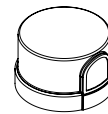
CDMG: Dynadimmer standard dimming functionalities including pre-programmed scenarios to suit many applications and needs from safety to maximum energy savings.

Order Code	Scenario	Dim. Time	Dim. Level
CDMG525	Safety	4 hours	25% power
CDMG550	Safety	4 hours	50% power
CDMG575	Safety	4 hours	75% power
CDMG25	Median	6 hours	25% power
CDMG50	Median	6 hours	50% power
CDMG75	Median	6 hours	75% power
CDMGE25	Economy	8 hours	25% power
CDMGE50	Economy	8 hours	50% power
CDMGE75	Economy	8 hours	75% power

SRD: Sensor Ready Driver including SR communication (used for dimming and other functionalities), 24V auxiliary supply and a logical signal input (LSI) connected to the top NEMA twist lock receptacle.

SRD1: Sensor Ready Driver including SR communication (used for dimming and other functionalities) but with 24V auxiliary supply and a logical signal input (LSI) not connected to the top NEMA twist lock.

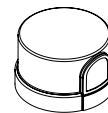
Luminaire options



PH8 (allows a 90° rotation) Photoelectric cell, twist-lock type complete with receptacle and decorative polycarbonate (grey) cap with a plastic lens.



PH9 Shorting cap, twist-lock type complete with receptacle.



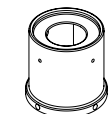
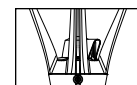
PHXL (allows a 90° rotation) Extended life Photoelectric cell, twist-lock type complete with receptacle and decorative polycarbonate (grey) cap with a plastic lens.



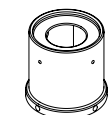
RCD Receptacle 5-pins allowing dimming, can be used with a twist-lock Starsense, shorting cap or a photoelectric cell.



RCD7 Receptacle 7-pins.



TN3 Fitter to fit over a 3" (76 mm) O.D. by 4" (102 mm) tenon.



TN3.5 Fitter to fit over a 3-1/2" (89 mm) O.D. by 4" (102 mm) tenon.

OVR Dynadimmer override function.

MPTC-C MetroScape post top

urban luminaire with comfort optics

Specifications (continued)

Luminaire accessories

Motion Response: Tenon mount motion response provides 270° coverage on an adjustable knuckle. The coverage equals to up to 6 times the sensor height. It is an option offered jointly with the Dynadimmer OVR option, that can bring the light up to 100% when the motion response is triggered. It is available in a single or double mounting option. Finish options for the motion response device are white or dark gray. Finish options for the tenon must be specified to match the luminaire and pole. The tenon mount is fully rotatable 360°. This option is available for a 4" OD x 4" long tenon. See instruction sheet for time setting functionality (12 second to 16 minute turn off options) and for mounting instructions.

Finish

The Thermosetting powder coating provided meets the color requirements of the AAMA 2604 specification as measured per ASTM D2244. The Thermosetting product is applied at a dry film of 2.5 to 4.0 mils (64-102 microns) on textured finishes, resulting in a durable long lasting finish.

Textured Finishes:

- BE2TX:** Midnight Blue
- BE6TX:** Ocean Blue
- BE8TX:** Royal Blue
- BG2TX:** Sandstone
- BKTX:** Black
- BRTX:** Bronze
- GN4TX:** Blue Green
- GN6TX:** Forest Green
- GN8TX:** Dark Forest Green
- GNTX:** Green
- GY3TX:** Medium Grey
- RD2TX:** Burgundy
- RD4TX:** Scarlet
- WHTX:** White

Other Finishes:

- GR:** Gray Sandtex
- NP:** Natural Alum.
- TG:** Hammer-tone Gold
- TS:** Hammer-tone Silver

Quality Control

Manufactured to ISO 9001 2008 and ISO 14001 2004 International Quality Standards Certification.

Service Tag

Each individual luminaire is uniquely identifiable, thanks to the Service tag application. With a simple scan of a QR code, placed inside the luminaire, you gain instant access to the luminaire configuration, making installation and maintenance operations faster and easier, no matter what stage of the luminaire's lifetime. Just download the APP and register your product right away.

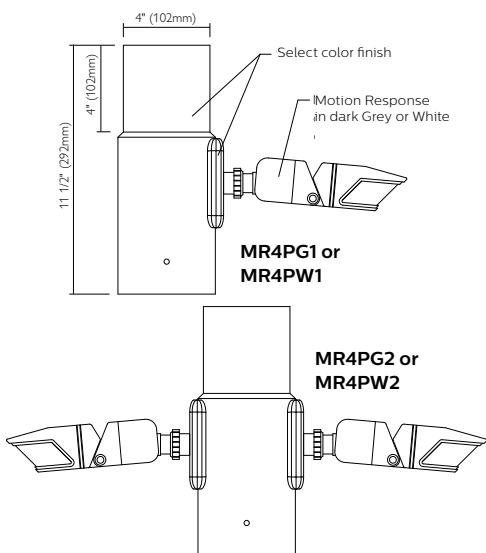
For more details visit: signify.com/servicetag

Certifications and Compliance

CSA, cULus Listed for Canada and USA. Compliant configurations listed on Design Lights Consortium (DLC) qualified products list.

LED manufacturing standard

The electronic components sensitive to electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340 5 1 and ANSI/ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.



Predicted Lumen Deprecation Data

Ambient Temperature	Driver mA	Calculated L ₇₀ ^{1,2}	L ₇₀ per TM-21 ^{2,3}	Lumen Maintenance %
25°C	Up to 2100 mA	>100,000 hrs	>60,000 hrs	84%

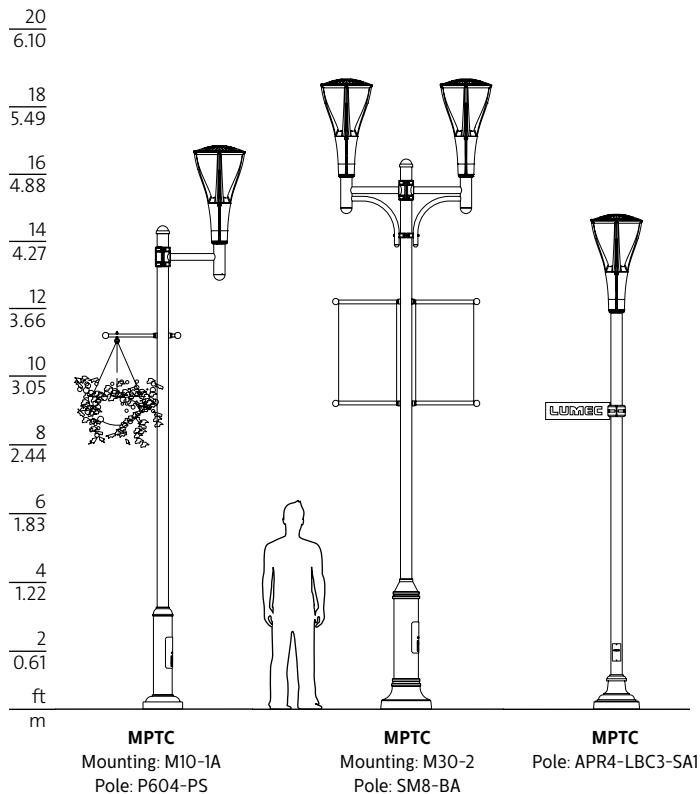
1. Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.
 2. L₇₀ is the predicted time when LED performance depreciates to 70% of initial lumen output.
 3. Calculated per IESNA TM21-11. Published L₇₀ hours limited to 6 times actual LED test hours.

MPTC-C MetroScape post top

urban luminaire with comfort optics

Specifications (continued)

Poles



Consult signify.com/outdoorluminaires for details and the complete line of Signify poles and brackets.



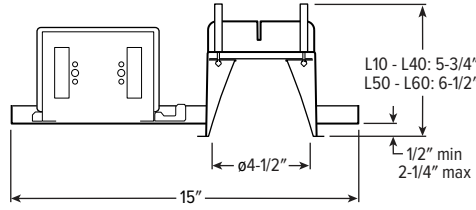
© 2020 Signify Holding. All rights reserved. The information provided herein is subject to change, without notice. Signify does not give any representation or warranty as to the accuracy or completeness of the information included herein and shall not be liable for any action in reliance thereon. The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract, unless otherwise agreed by Signify.

Signify North America Corporation
200 Franklin Square Drive,
Somerset, NJ 08873
Telephone 855-486-2216

Signify Canada Ltd.
281 Hillmount Road,
Markham, ON, Canada L6C 2S3
Telephone 800-668-9008

All trademarks are owned by Signify Holding or their respective owners.

4DR LED 4.5" Downlight – Round



CATALOG #: _____

TYPE: _____

PROJECT: _____

NEW CONSTRUCTION AND REMODEL

FEATURES

TrimLock®

- Innovative TrimLock reflector retention system ensures trim remains flush with ceiling plane
- Industry-leading efficacies as high as 113 lm/W – ENERGY STAR® certified
- Available on QuickShip

SPECIFICATIONS

- HOUSING** – Die-cast aluminum trim housing with forged aluminum heat sink. Galvanized steel splice compartment with driver mounting plate/enclosure. Swing-out mounting arms field adjust for ceiling thickness from 1/2" – 2-1/4".
- TRIMLOCK** – Innovative TrimLock reflector retention system ensures the trim remains flush with the ceiling plane.
- OPEN REFLECTOR** – Low-iridescent anodized aluminum. Clear semi-specular finish standard.
- LENSED TRIM** – Die-cast aluminum frame with micro-prismatic, acrylic lens.
- ELECTRICAL** – High-performance Class 2 C.O.B. LED array. Modular quick-connect plug for easy field-connection of LED light assembly to driver. Reported L70>55,000 hours. Reported L90>55,000 hours. Estimated L70 = 200,000 hours.
- MOUNTING** – Recessed. 20 ga. galvanized steel mounting pan for new construction or IC-rated enclosure. Remodel kit option includes receiver bracket hardware. Minimum 24" O.C. marked spacing required for L50 and L60 lumen packages.
- LISTINGS** –
 - cCSAus conforms to UL STD 1598; Certified to CAN/CSA STD C22.2 No. 250.0 for damp locations. LED light assembly conforms to UL 2108 for remote installation.
 - Suitable for wet location under covered ceiling when specified with WET/CC or TD options.
 - ENERGY STAR® certified in select configurations, see www.energystar.gov
 - IC-rated for direct contact with insulation when specified with I Mounting Type.
 - City of Chicago Environmental Air approved when specified with CP option.
 - Complies with ASTM-E283 when specified with ATH option.
 - RoHS compliant.
 - Title 24 (JA8) compliant in select configurations, see www.cacertappliances.energy.ca.gov.
- WARRANTY** – 5-year limited warranty, see hew.com/warranty.

ORDERING EXAMPLE: 4DR - TL - L20/835 - OPTIONS - DIM - UNV - OW - OF - CS - TRIM OPTIONS - N - F1

HOUSING

SERIES	LUMENS ^[1]	CRI	CCT	OPTIONS	CONTROL ^[2]	VOLTAGE
4DR - TL	L10 1,000lm ^[3]	8 80	27 2700K	SCA_	Sloped ceiling adapter ^[5]	UNV 120-277V
TrimLock	L15 1,500lm	9 90 ^[4]	30 3000K	ATH	Airtight construction	347 347V ^[6]
	L20 2,000lm		35 3500K	F	Fuse	
	L30 3,000lm		40 4000K	EM/7W	7-watt emergency battery ^[7]	
	L40 4,000lm		50 5000K	EM/10W	10-watt emergency battery ^[8]	
	L50 5,000lm			EM/10W/RTS	10-watt emergency battery with regressed test switch ^[9]	
	L60 6,000lm			CP	Chicago plenum (CCEA) ^[10]	
				SDT	Stepdown transformer ^[11]	

TRIM^[12]

TRIM TYPE	DISTRIBUTION ^[13]	FLANGE TYPE	REFLECTOR FINISH	TRIM OPTIONS
O Open reflector	W Wide	OF 1/2" standard flange	Open trim types	MWT Textured white trim flange ^[20]
L Flush lens	65° Open	SF 1/4" mud-in flange ^[19]	CS Clear semi-specular anodize	IP IP65 rated trim ^[21]
R Regressed lens	50° Flush		SG Satin-glow anodize	AD Diffuse acrylic lens ^[22]
A Angled lens ^[14]	50° Regressed		GD Gold anodize	PD Diffuse 1/8" polycarbonate lens ^[23]
S Non-conductive flush lens for shower applications ^[15]	M Medium ^[16]		CG Champagne gold anodize	TD Diffuse polycarbonate lens media at top of open reflector ^[24]
	45° Open		PW Pewter anodize	WET/CC Wet location, covered ceiling listed ^[25]
	35° Flush		SPC Clear specular anodize	AM Anti-microbial ^[26]
	30° Regressed		RG Rose gold anodize	
	N Narrow ^[17]		WH White texture powder coat	
	10° Open		BL Black texture powder coat	
	25° Flush		MB Black texture splay with white flange ^[27]	
	25° Regressed			
	WW Wall wash ^[18]			

MOUNTING

MOUNTING TYPE^[28]

- N Open pan for new construction
- I IC-rated enclosure for new construction^[30]
- R Remodel kit^[31]

MOUNTING HARDWARE^[29]

- F1 Integral 2-position fixed pan bracket, universal bar hanger included^[32]
- BA1 Adjustable butterfly pan bracket, bar hanger not included^[33]
- CA1 Adjustable caterpillar pan bracket, universal bar hanger included^[34]

NOTES

- Lumen output based on O trim type, W distribution and CS finish, 3500K/80CRI. Actual lumens may vary +/-5%, see page 2 for FIXTURE PERFORMANCE DATA.
- See page 3 for ADDITIONAL CONTROL OPTIONS.
- Not available with EM/10W emergency batteries.
- Extended lead times may apply. Consult factory for availability.
- 9" aperture, specify degrees of slope in 5° increments, 05°-30°. Not available with I Mounting Type, ATH or WET/CC options. Painted white. Other colors available, consult factory. See page 3 for SLOPED CEILING ADAPTOR DETAILS.
- Not available with EM batteries or DMX controls.
- N and R Mounting Types only. Not available with ATH or IP options.
- N and R Mounting Types only. Not available with ATH or IP options.
- Not available with WET/CC, ATH or IP options. N and R Mounting Types only. See page 5 for EM/10W/RTS DETAILS.
- I Mounting Type required.
- May be required for 347V, see product builder at hew.com/product-builder.
- Trim ships separately.
- Beam angle based on CS or WH reflector finish.
- Available with WW Distribution only.
- W Distribution, OF Flange Type, WH Reflector Finish only. Standard with AD diffuse acrylic lens. IP and WET/CC options standard.
- Not available with lumen stops L50 and higher when specified with flush or regressed trim types.
- Not available with lumen stops L50 and higher when specified with flush or regressed trim types.
- O and A Trim Types only.
- For use with mud-in plaster construction only, supplied with mud flange installation kit. See page 4 for FLANGE TYPE DETAILS. Not available with ATH or IP options.
- Not available with WH Reflector Finish, L or S Trim Types.
- L and R Trim Types only.
- Not available with O trim type. W and WW distributions only.
- O Trim Type only. WET/CC standard unless ordered with EM/RTS. L50 lumen package max.
- L50 lumen package max with O Trim Type. Not available with PD trim option.
- WH and BL Reflector Finishes only. Not available with S Trim Type.
- R Trim Type only. Not available with MWT. Mounting hardware required (N and I only), ordered separately, see MOUNTING HARDWARE ordering info. See page 4 for MOUNTING TYPE DETAILS.
- Additional mounting hardware options available. See page 5 for MOUNTING HARDWARE DETAILS.
- L20 lumen package max. L30 available, wide distribution only for lensed trims.
- Also used in new construction sheetrock ceilings.
- N and I Mounting Types only. I Mounting requires external brackets.
- N Mounting Type only.
- N Mounting Type only.



Available with BIOS® consult factory

4DR LED 4.5" Downlight – Round

FIXTURE PERFORMANCE DATA

	DISTRIBUTION	WATTAGE	OPEN REFLECTOR TRIM TYPE		FLUSH LENS TRIM TYPE		REGRESSED LENS TRIM TYPE	
			DELIVERED LUMENS	EFFICACY (lm/W)	DELIVERED LUMENS	EFFICACY (lm/W)	DELIVERED LUMENS	EFFICACY (lm/W)
L10	W	9.0	1027	113.6	674	74.6	660	73.0
	M	9.0	999	110.5	895	99.0	895	99.1
	N	9.0	1000	110.6	914	101.2	882	97.7
L15	W	13.9	1466	105.8	994	71.7	972	70.2
	M	13.9	1471	106.2	1319	95.1	1319	95.2
	N	13.9	1473	106.3	1347	97.2	1300	93.8
L20	W	19.8	2005	101.0	1352	68.3	1323	66.2
	M	19.8	2002	101.0	1794	90.6	1795	90.8
	N	19.8	2004	101.1	1833	92.6	1769	88.5
L30	W	27.8	2985	107.3	2022	72.7	1979	71.1
	M	27.8	2900	104.2	2683	96.5	2685	96.5
	N	27.8	2734	98.3	2741	98.6	2646	95.1
L40	W	38.0	3979	104.7	2695	70.9	2638	69.4
	M	38.0	3865	101.7	3577	94.1	3579	94.2
	N	38.0	3644	95.9	3654	96.2	3527	92.8
L50	W	45.2	5124	113.4	3364	74.4	3292	72.8
	M	45.2	4956	109.6	-	-	-	-
	N	45.1	4818	106.8	-	-	-	-
L60	W	47.7	6279	131.6	4234	88.8	4143	86.9
	M	47.7	6073	127.3	-	-	-	-
	N	47.7	5903	123.8	-	-	-	-

MULTIPLIER TABLES

	COLOR TEMPERATURE	
	CCT	CONVERSION FACTOR
80 CRI	2700K	0.92
	3000K	0.98
	3500K	1.00
	4000K	1.01
	5000K	1.02

	COLOR TEMPERATURE	
	CCT	CONVERSION FACTOR
90 CRI	2700K	0.76
	3000K	0.79
	3500K	0.82
	4000K	0.84
	5000K	0.88

TRIM	
CATALOG NUMBER	CONVERSION FACTOR
S	0.85
AD	0.85
PD	0.85
TD	0.75
WET/CC ²	0.85

	REFLECTOR FINISH	
	CATALOG NUMBER	CONVERSION FACTOR
O TRIM	CS	1.00
	SG ¹	0.92
	GD	0.93
	CG	0.96
	PW	0.86
	SPC	1.02
	RG	0.88
R TRIM	WH ¹	0.89
	BL ¹	0.47
	WH	1.00
	CS	0.98
	BL	0.79

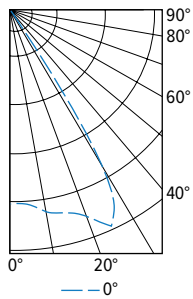
¹ Distribution will also be affected, consult factory.

² Use multiplier when specified with O Trim Type.

- Photometrics tested in accordance with IESNA LM-79. Results shown are based on 25°C ambient temperature.
- Wattage shown is based on 120V input.
- Results based on 3500K, 80 CRI, actual lumens may vary +/-5%
- Use multiplier tables to calculate additional options.

PHOTOMETRY

4DR-TL-L20/835-DIM-UNV-OW-OF-CS Report #: 20685; 12/13/18 | Total Luminaire Output: 2005 lumens; 19.8 Watts | Efficacy: 101.0 lm/W | 83.1 CRI; 3472K CCT

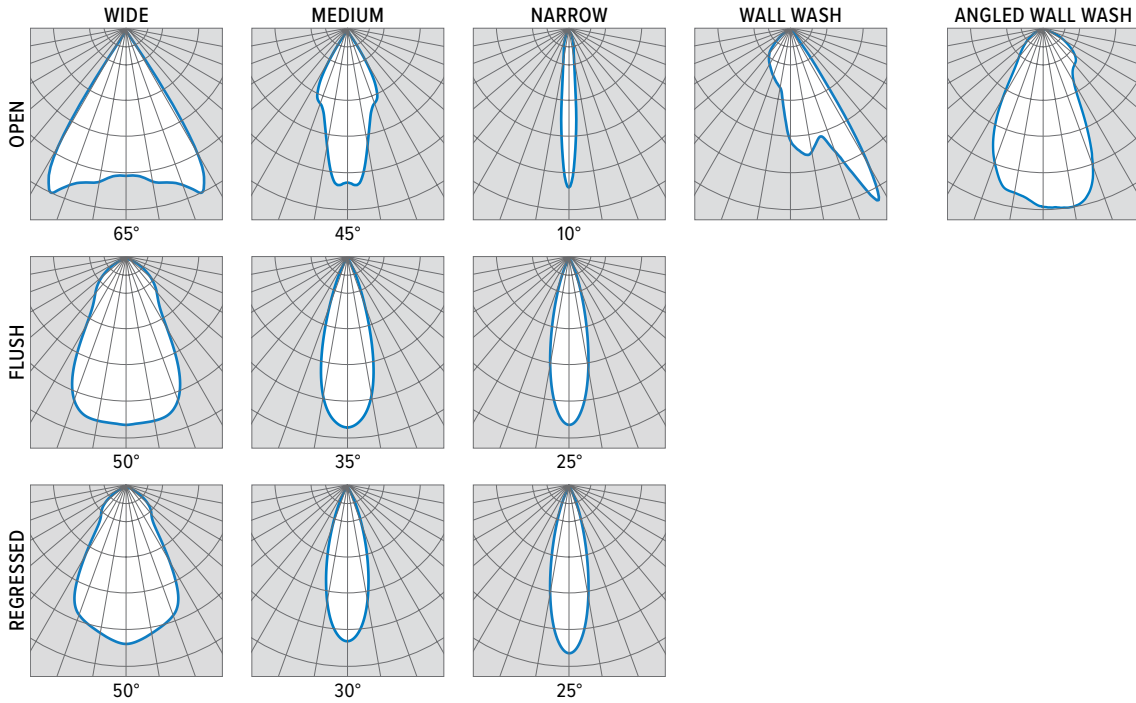


CANDLEPOWER DISTRIBUTION	VERTICAL ANGLE	HORIZONTAL ANGLE 0°	ZONAL LUMENS
		0	1810
	5	1864	178
	15	1960	556
	25	2231	1033
	35	307	193
	45	44	35
	55	11	10
	65	1	1
	75	0	0
	85	0	0
	90	0	0

LUMEN SUMMARY	ZONE	LUMENS	% FIXTURE
	0 - 40	1959	98
	0 - 60	2004	100
	0 - 90	2005	100
	0-180	2005	100



4DR LED 4.5" Downlight – Round



ADDITIONAL CONTROL OPTIONS

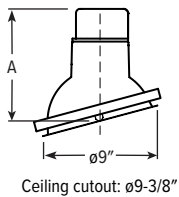
Lumen restrictions apply: L40 max for DMX driver, L40 max for Lutron drivers, L50 max for ELDO drivers, L15 minimum for DIM LINE driver, L60 max for DIM LINE driver. R Mounting Type not available with DMX or FCJS controls. R Mounting Type requires 12" minimum plenum depth when specified with VRF/DBI controls. 347V may require stepdown transformer, see product builder at hew.com/product-builder. I Mounting Type not available with Lutron controls.

CATALOG NUMBER	DESCRIPTION
DIM	Dimming driver prewired for 0-10V low voltage applications
DIM1	1% dimming driver prewired for 0-10V low voltage applications
DIM LINE	Line voltage dimming driver (TRIAC and ELV compatible at 120V only)
DMX	0.1% dimming driver for DMX controls
LTE LINE	Lutron Hi-lume 1% 2-wire dimming driver forward phase line voltage controls (120V only)
LDE1	Lutron Hi-lume 1% EcoSystem dimming LED driver
VRF/DBI/LDE1	Lutron Vive integral fixture control, RF only (DFCSJ-OEM-RF), Lutron Hi-lume 1% EcoSystem dimming LED driver, and digital link interface
FCJS/DIM	Lutron Vive PowPak wireless fixture control with dimming driver
FCJS/DIM1	Lutron Vive PowPak wireless fixture control with 1% dimming driver
ELDO SOLOB	EldoLED Solodrive, 0.1% dimming driver for 0-10V controls
ELDO SOLOB DALI	EldoLED Solodrive, 0.1% dimming driver for DALI controls
ELDO ECO1	EldoLED Ecodrive, 1% dimming driver for 0-10V controls
ELDO ECO1 DALI	EldoLED Ecodrive, 1% dimming driver for DALI controls

TRIMLOCK DETAILS



SLOPED CEILING ADAPTOR DETAILS



LUMENS	A (HEIGHT)						PLENUM HEIGHT
	5°	10°	15°	20°	25°	30°	
L10 - L30	8-13/16"	8-15/16"	9"	8-15/16"	8-7/8"	8-11/16"	9-1/4"
L40 - L60	9-9/16"	9-11/16"	9-11/16"	9-5/8"	9-1/2"	9-5/16"	10"

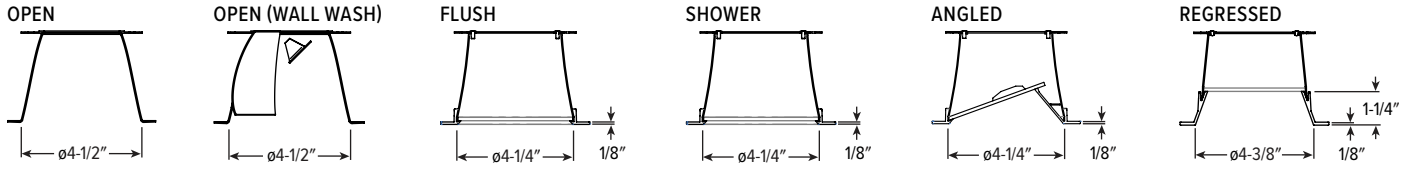
15° Shown

Ceiling cutout: ø9-3/8"

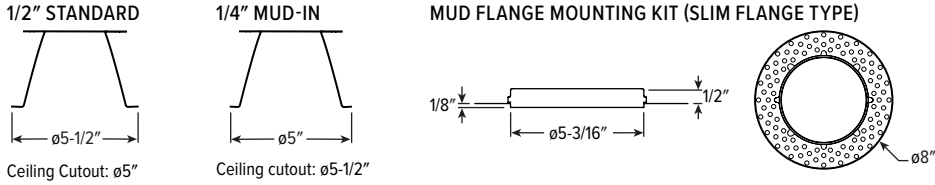


4DR LED 4.5" Downlight – Round

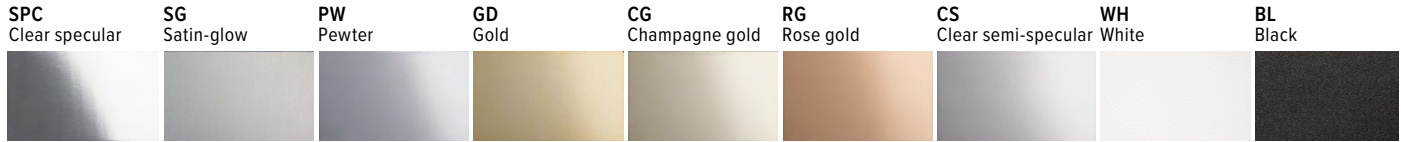
TRIM TYPE DETAILS



FLANGE TYPE DETAILS



REFLECTOR FINISH DETAILS



MOUNTING TYPE DETAILS

NEW CONSTRUCTION

IC-RATED

REMODEL

Cross Section

L10 - L40: 5-3/4"
 L50 - L60: 6-1/2"
 $\phi 4\text{-}1/2\text{'}$

Receiver Bracket

2-3/4"
 3-1/4"
 6-5/8"
 1-1/8" min space
 Ceiling cutout

Driver and Junction Box

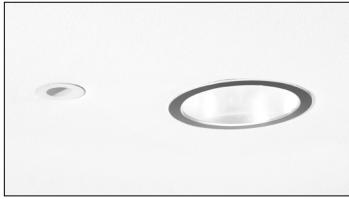
5-1/4"
 4-1/8"
 $\phi 6\text{-}15/16\text{'}$

LUMENS	LENGTH					
	A	B	C	D	E	F
L10 - L20	15-3/16"	16"	6-3/8"	12-1/8"	9-1/2"	6-1/16"
L30	16-5/8"	17-1/2"	7-7/8"	14"	10-1/4"	7"

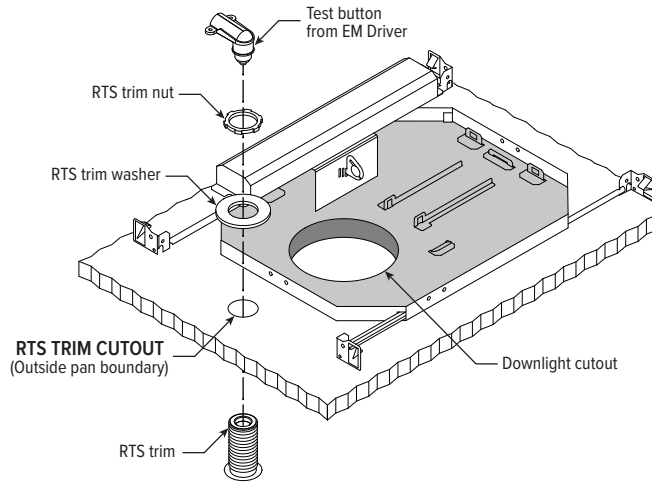


4DR LED 4.5" Downlight – Round

EM/10W/RTS DETAILS

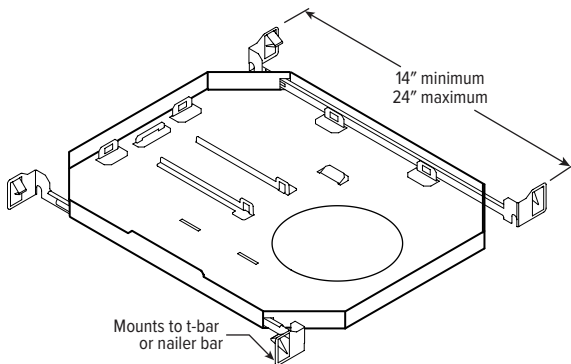


Shown Installed

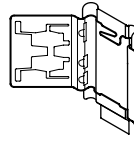


MOUNTING HARDWARE DETAILS

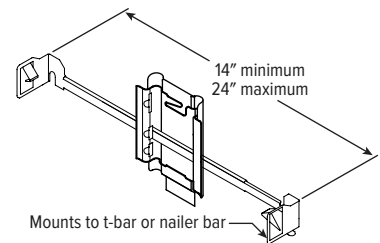
F1 Integral 2-position fixed pan bracket, universal bar hanger included



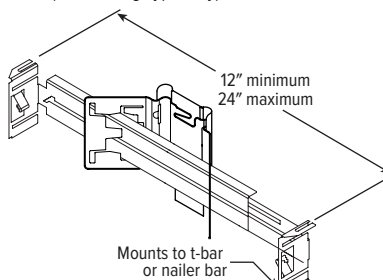
BA1 Adjustable butterfly pan bracket, bar hanger not included (N Mounting Type only)



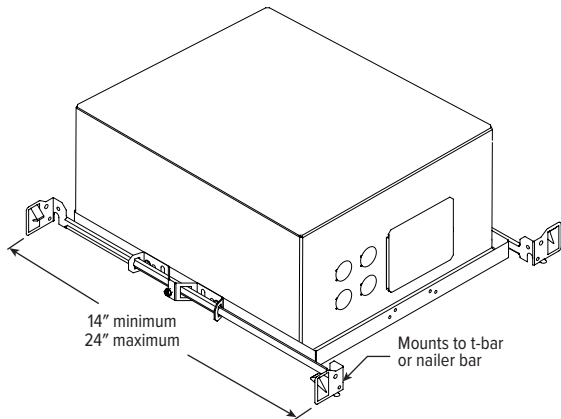
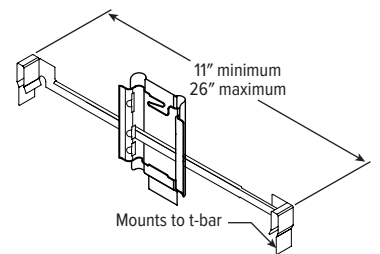
CA1 Adjustable caterpillar pan bracket, universal bar hanger included (N Mounting Type only)



BA2 Adjustable butterfly pan bracket, heavy-duty universal bar hanger included (N Mounting Type only)



CA2 Adjustable caterpillar pan bracket, t-bar hanger included (N Mounting Type only)



F1 with I Mounting Type



tivoli®



LITESPHERE

ADAPT

GINA



1900K



2700K



3000K



3500K

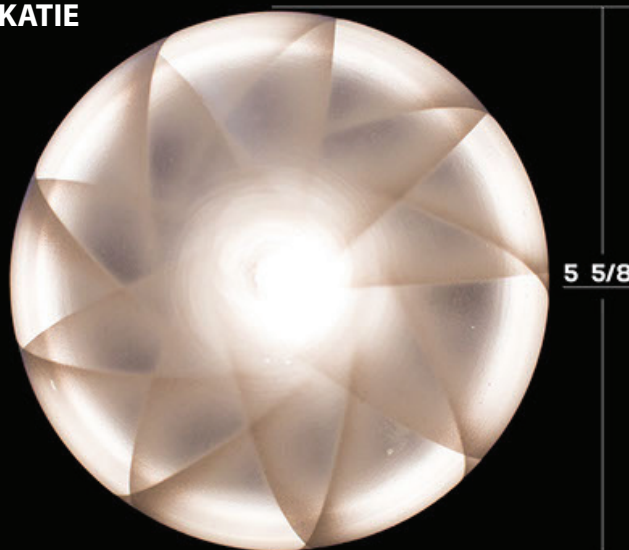


4000K



5000K

KATIE



1900K



2700K



3000K



3500K

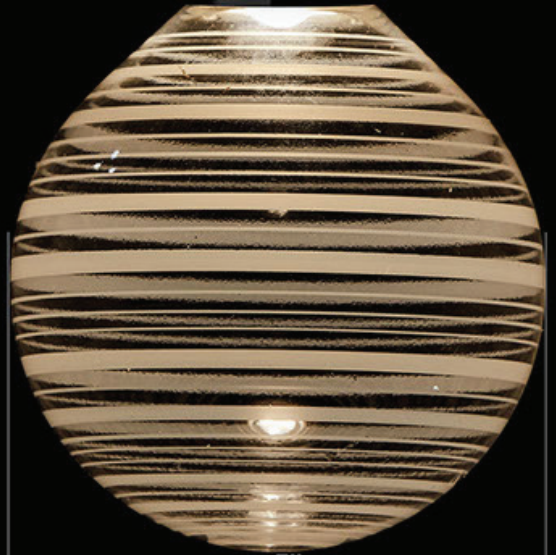
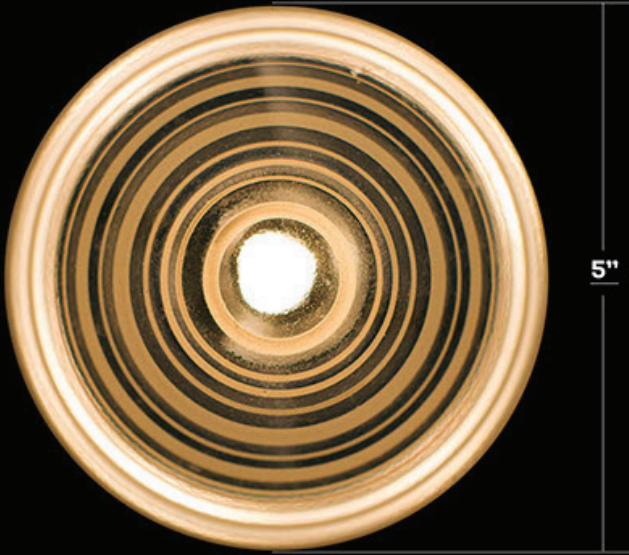


4000K



5000K

ANGELA



1900K



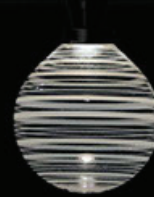
2700K



3000K



3500K



4000K



5000K

GABY



1900K



2700K



3000K



3500K

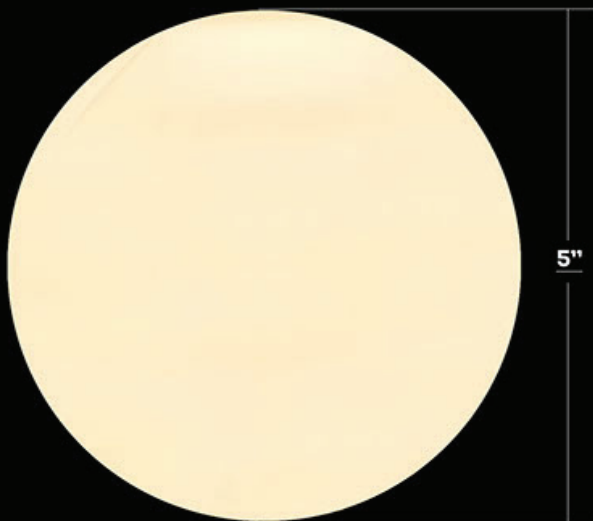


4000K



5000K

TONI



1900K



2700K



3000K



3500K



4000K



5000K

VICTORIA



1900K



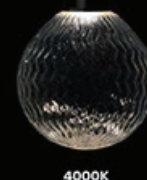
2700K



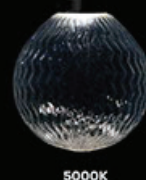
3000K



3500K

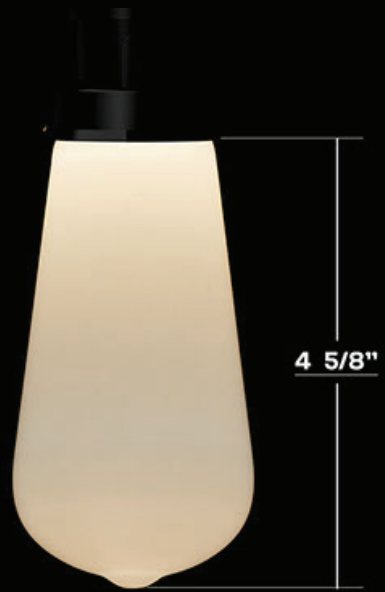


4000K



5000K

LAURA



1900K



2700K



3000K



3500K

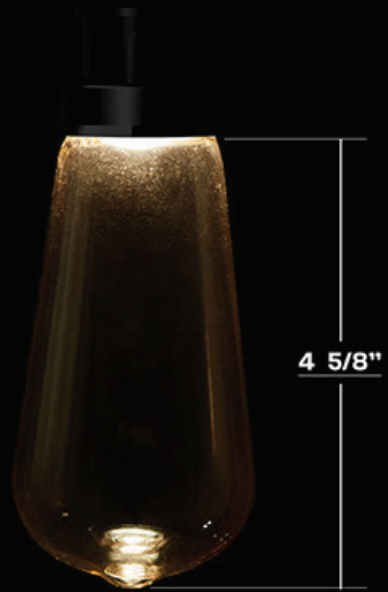


4000K



5000K

BRENDA



1900K



2700K



3000K



3500K

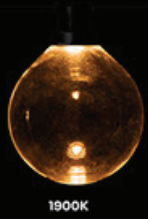
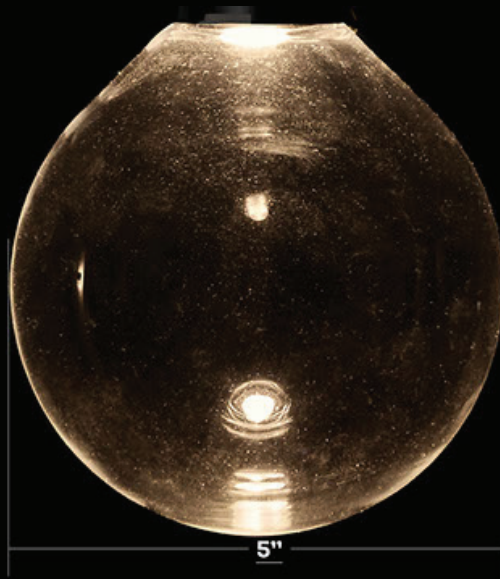


4000K

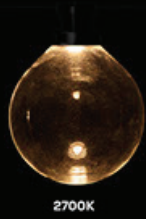


5000K

LUCIA



1900K



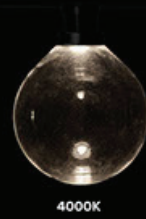
2700K



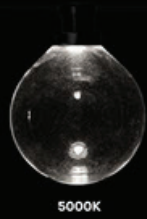
3000K



3500K



4000K



5000K

SUSAN



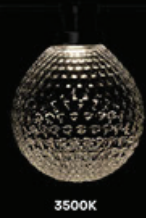
1900K



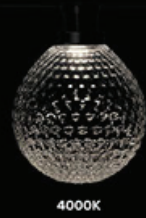
2700K



3000K



3500K



4000K



5000K

ANA



1900K



2700K



3000K



3500K



4000K



5000K



Project: _____ TYPE: _____

Product Features

- 12V Low voltage system
- Socket and cord color available in black or white
- 5 standard spacing options and custom spacing available
- Proprietary Litesphere screw base adapter
- Silicone-coated helps with shatter resistant ADAPT glassware
- Built to withstand temperatures ranging from -40°C to 65°C
- Fitted O-Ring
- IP65
- cULus listed
- 3 Year warranty

Dimensions



Order Guide

Product	Wire	Spacing	LED Type	CCT	Globe	Voltage
LSA Litesphere Adapt						12 12V DC
	B Black	12 12" OC	V Very High Output	19 1900K	ANA Clear Glass Globe Style: Ana	
	W White	18 18" OC		27 2700K	VIC** Clear Glass Globe Style: Victoria	
		24 24" OC		30 3000K	GAB Opal Glass Globe Style: Gaby	
		36 36" OC		35 3500K	BRE Bronze Glass Vintage Style: Brenda	
		48 48" OC		40 4000K	LAU** Opal Glass Vintage Style: Laura	
		CS Custom Spacing		50 5000K	GIN Scratched Glass Globe Style: Gina	
				AM Amber	ANG Striped Glass Globe Style: Angela	
				RD Red	KAT Frosted Glass Globe Style: Katie	
				RB Royal Blue	SUS** Clear Glass Globe Style: Susan	
				GN Green	TON** Frosted Glass Globe Style: Toni	
				YL Yellow	LUC** Clear Glass Globe Style: Lucia	
					CG* Varied Globes	



Tivoli manufactures Litesphere to your specified lengths. Individual lengths and runs must be specified at time of ordering. (see chart on page 6 for ordering details)

*Varied Globes - Use individual ADAPT globe part numbers with quantity to match total ordered socket count. All ADAPT globes come uninstalled. (see page 6 for ordering details)

Additional Globes ordered above socket count will be processed as replacement globes.

****Consult Factory for MOQ and Lead Time.**

Lengths & Run Order Guide

Lengths and Runs
see page below for ordering examples

Lead Wire Options (REQUIRED)

Length in feet - Quantity
L _____
 R Max Run

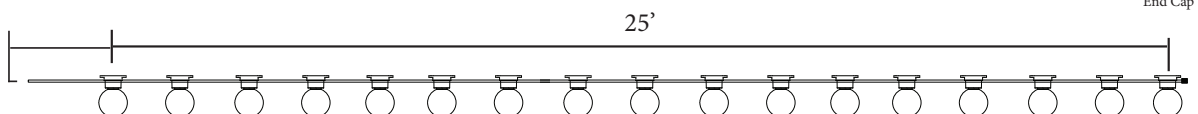
2 foot lead wire

LS-EP - **B** Black
W White

If extra lead wire is needed please add below part number

LS-XEP - **B** Black
W White Length in feet (18ft max)

2' power lead

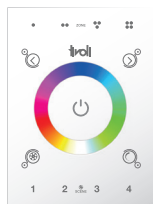


With the example above, you will receive 3 runs at 25' and a standard factory 2' power lead with black or white wire

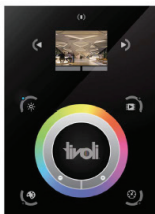
Specifications

Output (Based on 5000K VHO Chip in Lucia Globe)					
Kelvin Temperature	1900K, 2700K, 3000K, 35000K, 4000K, 5000K, Amber, Red, Royal Blue, Green, Yellow				
Socket Spacing	12"	18"	24"	36"	48"
Watts/ft.	0.96	0.64	0.48	0.32	0.24
Lumens/ft.	73				
Electrical					
Input Voltage	12V DC				
Maximum Run (based on O.C. spacing)	45'	55'	60'	90'	120'
Control					
Dimming	DMX, 0-10V, ELV, MLV, TRIAC				
Physical					
Dimensions	6 1/8"W x 5"H, 7 1/4"W x 2 3/8"H				
Socket Housing	PVC				
Globe	Glass (Shatter resistance assist with silicone coating - Glass may still break under certain conditions)				
Mounting	Surface Mount, Suspended				
Operating Temperature	-40°C to 65°C (-40°F to 149°F)				
Certification and Testing					
Certification	cULus				
Environment	Wet Location				
IP Rating	IP65				
Warranty	3 Years				

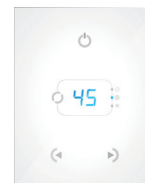
Controls & Software



TVOQ-1-WH
 WH (White only)
 512 DMX channel, 16 scene,
 4 zone, glass touch screen



TVOQ-10-XX-7
 XX = BK (Black), WH (White)
 1024 DMX channel, 500 scene,
 10 zone, glass touch screen



TVOQ-2-XX
 XX = BK (Black), WH (White)
 512 DMX channel, 99 scene,
 1 zone, glass touch screen



Cue™ and CuePro™ softwares are specifically designed for the TivoCUE™ in-wall DMX controls and includes an array of tools required by the latest DMX lighting fixtures. Intuitive, with easy-to-use effects that can be dropped into timelines, and multi-zone synchronization capabilities allow you to program a project effortlessly.

Mounting Accessories



LS-CABLE-60 Catenary Cable Kit - 60'
 (1/8" galvanized cable includes 2 cables locks for use with loads up to 200lbs)

LS-CABLE-110 Catenary Cable Kit - 110'
 (1/8" galvanized cable includes 2 cables locks for use with loads up to 200lbs)

LS-CABLE-500 Catenary Cable Kit - 500'
 (1/8" galvanized cable for use with loads up to 200lbs)



LS-LOCK-X Cable Lock
 X = 2 (2 Locks), 4 (4 locks) Includes (1) cable release key.
 Cable Lock for 1/8th inch cable, Heavy-duty lockable fasteners support loads up to 200 lbs. Can be easily adjusted without the use of tools.



LS-TT
 Catenary Cable Tensioning Tool up to 880lbs with minimal effort due to the 6:1 gear drive mechanism. Integral torque gauge controls the load applied to the wire, giving consistent tension every time and optimizing the life of the wire.



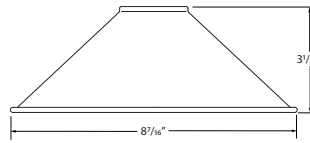
LS-UVZP-BK-50 UV Zip Ties
 50 pc Bag set. UV resistant, heavy duty ties. Maximum weight up to 100 lbs./per tie.



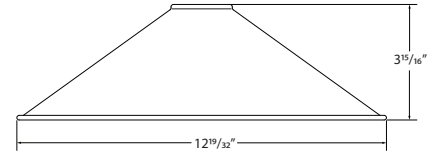
LS-UVZP-BK-30 UV Zip Ties
 30 pc Bag set. UV resistant, heavy duty ties. Maximum weight up to 100 lbs./per tie.

Shades

HAT



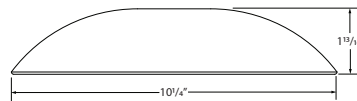
SHADE-HT-BK-BK-8
Light Shade - HAT
8.3" Black Top, Black Bottom



SHADE-HT-BK-BK-13
Light Shade - HAT
12.6" Black Top, Black Bottom
***SHADE-HT-BK-CO-13**
Light Shade - HAT
12.6" Black Top, Copper Bottom

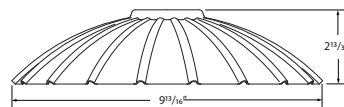
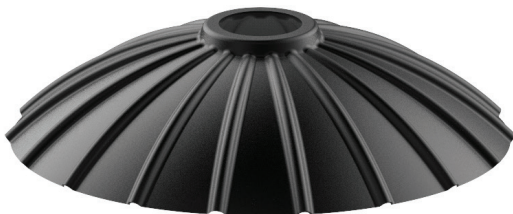
*Consult factory for lead time and MOQ

DISH

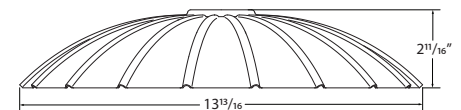


SHADE-DS-BK-BK-10
Light Shade - DISH
10.2" Black Top, Black Bottom

FLOWER



SHADE-FL-BK-BK-10
Light Shade - FLOWER
9.8" Light Shade, Black Top, Black Bottom



SHADE-FL-BK-BK-13
Light Shade - FLOWER
13.8" Light Shade, Black Top, Black Bottom

Accessories

SHADE-ADP-LSL-BK-01 Litesphere Light Shade Adapter

PVC Black Adapter - Sold individually. Includes (1) Adapters, (1) Adapter bracket, (2) set screws and (1) Allen Key

SHADE-ADP-LSL-BK-10 Litesphere Light Shade Adapter

PVC Black Adapter Kit - Sold in packs of 10. Includes (10) Adapters, (10) Adapter bracket, (20) set screws and (1) Allen Key

SHADE-ADP-LSL-BK-25 Litesphere Light Shade Adapter

PVC Black Adapter Kit - Sold in packs of 25. Includes (25) Adapters, (25) Adapter bracket, (50) set screws and (1) Allen Key

SHADE-ADP-LSL-BK-50 Litesphere Light Shade Adapter

PVC Black Adapter Kit - Sold in packs of 50. Includes (50) Adapters, (50) Adapter bracket, (100) set screws and (1) Allen Key





Shatter Resistant
Silicone Coating

Replacement Parts

LSA Globes: All ADAPT replacement globes come with (1) foam washer each.

G125 Globe



Gina
LSA-GIN



Victoria*
LSA-VIC



Ana
LSA-ANA



Gaby
LSA-GAB



Angela
LSA-ANG



Katie
LSA-KAT

G125 Globe



Susan*
LSA-SUS



Toni*
LSA-TON



Lucia*
LSA-LUC

S60 Globe



Brenda
LSA-BRE



Laura*
LSA-LAU

*Consult Factory for MOQ and Lead Time.

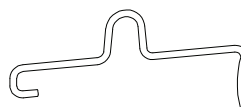


VERY HIGH OUTPUT
VHO wedge base LED chip
(Sold Each)

- LSL-19-V-12**
12V Wedge base
1900K
- LSL-27-V-12**
12V Wedge base
2700K
- LSL-30-V-12**
12V Wedge base
3000K
- LSL-35-V-12**
12V Wedge base
3500K

- LSL-40-V-12**
12V Wedge base
4000K
- LSL-50-V-12**
12V Wedge base
5000K
- LSL-AM-V-12**
12V Wedge base
Amber
- LSL-RD-V-12**
12V Wedge base
Red

- LSL-RB-V-12**
12V Wedge base
Royal Blue
- LSL-GN-V-12**
12V Wedge base
Green
- LSL-YL-V-12**
12V Wedge base
Yellow



LS-HANG-CLIP
Hangerclip for installation from 8 gauge
stainless steel aircraft cable (Sold Each)

Power Supplies

ADNM - NON DIMMING

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-D	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-D				1	60W	5A
	ADNM-150-2-5-12-D				2	2x60W	2x5A
	ADNM-240-3-5-12-D				3	3x60W	3x5A
	ADNM-320-4-5-12-D				4	4x60W	4x5A

ADNM - 0-10V DIMMING

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-DOT	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-DOT				1	60W	5A
	ADNM-150-2-5-12-DOT				2	2x60W	2x5A
	ADNM-240-3-5-12-DOT				3	3x60W	3x5A
	ADNM-320-4-5-12-DOT				4	4x60W	4x5A

ADNM - DMX SINGLE ADDRESS

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-60-1-5-12-DIN	Indoor / Outdoor	100-277V AC 50/60 HZ	12V DC	1	60W	5A
	ADNM-80-1-5-12-DIN				1	60W	5A
	ADNM-150-2-5-12-DIN				2	2x60W	2x5A
	ADNM-240-3-5-12-DIN				3	3x60W	3x5A
	ADNM-320-4-5-12-DIN				4	4x60W	4x5A

ADNM - DMX MULTI ADDRESS

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	CIRCUIT CAPACITY
ADNM Series Class 2 Transformer	ADNM-150-2-5-12-DIN-2	Indoor / Damp	100-277V AC 50/60 Hz	12V DC	2	2x60W	5A
	ADNM-240-3-5-12-din-3				3	3x60W	3x5A

Power Supplies

INFINITY - MLV / ELV / 0-10V / PWM / TRIAC

DESCRIPTION	CAT NO	APPLICATION	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CIRCUIT BREAKERS	MAX LOAD	MIN LOAD	CIRCUIT CAPACITY
Infinity Series Class 2 Transformer	INF-J-30-1-2.5-12	Indoor / Outdoor	100 - 277V AC	12V DC	1	30W	3W	2.5A
	INF-J-60-1-5-12				1	60W	6W	5A
	INF-J-180-3-5-12				3	3x60W	3x6W	3x5A
	INF-J-300-5-5-12				5	5x60W	5x6W	5x5A

NP LED Up Light **DESIGNER PLUS**



PROJECT

CATALOG #

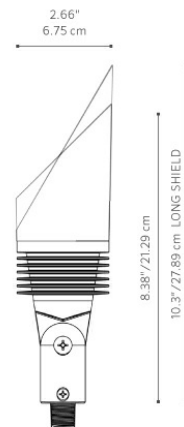
TYPE

NOTES

The NP is our most versatile LED Up Light, and is engineered to accommodate all aspects of your up-lighting needs.

Quick Facts

- Die-cast aluminum
- Lumileds® Integrated LEDs
- Beam angle lenses
- Phase and PWM dimmable
- Two-layer marine-grade anodization and powder coat finish
- ProAim™ adjustability
- Compatible with Luxor® technology
- Input voltage: 10-15V



NP LED Up Light SPECIFICATIONS

Output	3LED	6LED	9LED	ZDC
Total Lumens [†]	289	512	751	110
Input Voltage	10 to 15V	10 to 15V	10 to 15V	11 to 15V
Input Power	4.0 W	7.7 W	11.1 W	9.1 W
Power Consumption (VA)	4.4 W	9.3 W	12.2 W	11.0 W
Efficacy (Lumens/Watt)	74	66	68	21
Color Rendering Index (CRI)	83	83	83	80+
Center Beam Candlepower*				
Flood (35)	464	1,094	1446	172
Dimming				
Primary Dimming (Transformer)	Consult transformer specifications			
Secondary Dimming (Fixture)	Phase-cut**	Phase-cut**	Phase-cut**	Luxor
RGBW Available	No	No	No	Yes
Luxor Compatibility				
Default	Zoning	Zoning	Zoning	--
ZD Option	Zoning/Dimming	Zoning/Dimming	Zoning/Dimming	--
ZDC Option	--	--	--	Zoning/Dimming/Color
Minimum Rated Life L70 (Hrs)	72,000	72,000	72,000	55,000

* Information for Spot or Wide Flood available in IES files

** For optimal performance, use a trailing-edge, phase-cut dimmer.

† Measured using the 2,700K CCT option.

NP LED Up Light SPECIFICATIONS

FX Luminaire

FX Luminaire is an industry-leading manufacturer of landscape and architectural lighting products with a focus on the advancement of LED technology and digital lighting control with zoning, dimming, and color adjustment capabilities. We offer a full spectrum of specification-driven lighting fixtures that can be utilized to create elegant, cutting-edge landscape lighting systems for commercial or residential applications. Our products are available exclusively via our extensive professional distributor network.

Materials

Die-cast aluminum A380 housing and shroud with stainless steel hardware. Die-cast zinc/aluminum alloy knuckle.

Knuckle

Die-cast zinc/aluminum alloy knuckle with 1/2"-14 (13 mm) NPSM threads. Compress and lock features prevent slip after installation. 9° increments adjustability over 220° of vertical adjustment.

Lamp

Integrated LED module with Lumileds LEDs. Gold-plated connectors and conformal coated for maximum reliability and corrosion resistance. Proprietary on-board intelligent driver uses firmware-controlled temperature regulation, maximizing LED life. Field upgradeable and replaceable, the LEDs are rated to 72,000 hrs. Maximum drive current: 1 A.

Optics

Color temperature defined by part number. Beam angle lenses included with fixture: 35° (pre-installed) and 60°. For additional color filters, spread lenses, hex baffles, etc., use MR-16 sized accessories (MR16: 1.95" (49.5 mm) dia. x 1.1 mm thickness). Beam angle is calculated using LM-79 method for SSL luminaires.

Finish

Two-layer protection of sulfuric acid anodization and polyester TGIC powder coat, providing superior outdoor weathering in all conditions. Tested to ASTM standards.

Hardware

Stainless steel angle lock screw. Includes 10" (254 mm) ABS slotted installation spike.

Wiring

18 AWG (1 mm); SPT-1W; 220°F (105°C); 300V; 10' (3 m) length, pre-stripped.

Sockets

Socket contains MoistureBlock™ technology, preventing moisture from wicking up into sealed areas of the fixture.

Power

Input 10-15VAC/VDC 50/60Hz. Remote transformer required (specify separately)

Shroud

Die-cast aluminum shroud with 45° cutoff (standard) or 60° long shroud option.

Weight

1.9 lbs. (0.9 kg)

Housing

Die-cast aluminum housing with capacity for 3LED, 6LED, 9LED, or ZDC integrated LEDs.

Lens

Tempered glass lens with shock resistance and high tolerance for thermal expansion and stress.

International Compliance

Compliant per IEC 60598-1 and IEC 60598-2-4 when used with International Spike Kit ("EKITSPIKE") or alternate mount greater than or equal to IP65, or by selecting the "e" version.

Ambient Operating Temperature

0°F to 140°F (-18°C to 60°C)

Sustainability

Innovation meets conservation in the design and manufacturing of our products. Where we can, we use recycled materials while maintaining superior functionality. Our LED products provide high-quality light at optimal energy efficiency, lifespan, and durability.

Installation Requirements

Designed for installation in the upward direction only.

Control

ZD or ZDC options utilize Luxor technology to zone light fixtures in up to 250 groups, dim each group in 1% increments between 0 and 100%, or change to one of 30,000 colors with RGBW LEDs. Select the ZD option for zoning/dimming or ZDC for zoning/dimming/color. Standard fixture is zoneable with Luxor.








Warranty

10-year limited warranty.

Listings



NP LED Up Light ORDERING INFORMATION

Fixture	Luxor Option	Lamp	Shroud	Compliance	Finish
NP	[default] Zone	3 LED 4.2W/4.5VA	[default] 45° Angled Shroud	CE	BZ Bronze Metallic 
	ZD Zone/Dim	6 LED 8.2W/9.7VA	LS 60° Angled Long Shroud	ULNorth America (UL-listed)	DG Desert Granite 
	ZDC Zone/Dim/Color	9 LED 10.0W/10.7VA			WI Weathered Iron 
		[default ZDC option] 9.1W/11.0VA			SB Sedona Brown 
					FB Black 
					FW Flat White 
				SV Silver 	



EXAMPLE FIXTURE CONFIGURATION: *NP-ZD-6LED-BZ*
 * Ships with Super Slot Spike (753900)

NP-3LED Illuminance at a Distance		
Feet	Center Beam fc	Beam Width
5ft	22.8 fc	3.2 ft 3.2 ft
10ft	5.71 fc	6.4 ft 6.5 ft
15ft	2.54 fc	9.6 ft 9.7 ft
20ft	1.43 fc	12.8 ft 12.9 ft
25ft	0.91 fc	16 ft 16.1 ft
30ft	0.63 fc	19.2 ft 19.4 ft

■ Vert. Spread: 35.5°

■ Horz. Spread: 35.8°

NP-6LED Illuminance at a Distance		
Feet	Center Beam fc	Beam Width
5ft	43.6 fc	2.9 ft 3.1 ft
10ft	10.9 fc	5.8 ft 6.1 ft
15ft	4.84 fc	8.7 ft 9.2 ft
20ft	2.73 fc	11.6 ft 12.2 ft
25ft	1.74 fc	14.5 ft 15.3 ft
30ft	1.21 fc	17.4 ft 18.3 ft

■ Vert. Spread: 32.3°

■ Horz. Spread: 34.0°

NP-9LED Illuminance at a Distance		
Feet	Center Beam fc	Beam Width
5ft	57.8 fc	3.0 ft 3.1 ft
10ft	14.5 fc	5.9 ft 6.2 ft
15ft	6.43 fc	8.9 ft 9.2 ft
20ft	3.62 fc	11.8 ft 12.3 ft
25ft	2.31 fc	14.8 ft 15.4 ft
30ft	1.61 fc	17.7 ft 18.5 ft


























■ Vert. Spread: 32.9°

■ Horz. Spread: 34.2°

Beam angle is calculated using LM-79 method for SSL Luminaires: "Beam angle is defined as two times the vertical angle at which the intensity is 50% of the maximum."


NP LED Up Light ORDERING INFORMATION

MOUNTING OPTIONS: Specify Separately

Mounts	Catalog No.		Mounts	Catalog No.	
CDS Spike	250011560000		Long Slot Spike	250015840000	
3-Prong Spike	250020020000		Lock Ring	250030410000SP	
Super Slot Spike	753900		Straight Coupling	COUP-XX*	
CE-Approved Spike	eKitSpike		90-Degree Coupling	ELBW-050-XX*	
Gutter Mount, Stainless, 1/2" Thread	GM-SS		Ground Mount, 1/2" Thread	GM-XX*	
Mini J-Box	MJB-050-XX		Mini Mount	MM-050-XX*	
ProAim® Ratcheting Spike	PARS		Post Mount	PM-XX*	
Super J-Box Spike	SJ-XX*		TreeBox, 1/2" Thread	TB-XX*	
T-Mount Coupling, 1/2" Thread	TMNT-050-XX*		Tree Ring	TR-YY*-6P-XX*	
VersaBox, 1/2" Thread	VB-050-XX*		Variable Height Riser	VHR-UL	
Wall Mount Knuckle	WM-XX*		Single-Gang Wall Plate, 1/2" Thread	WP-1G-050-XX*	
Round Wall Plate, 1/2" Thread	WP-RD-050-XX*		Sign Light Riser, Aluminum	YY*-R-SL-XX*	
Aluminum Riser, 3/4"	YY*-R-XX*				


NP LED Up Light ORDERING INFORMATION


GLARE OPTIONS: Specify Separately

Glare	Catalog No.		Glare	Catalog No.
Hex Baffle, MR-16	250015260000			

NP LED Up Light ORDERING INFORMATION



LENS OPTIONS: Specify Separately

Lenses	Catalog No.
	Z*-LEDFLENS 

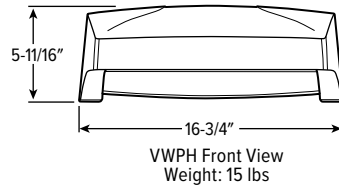
Lenses	Catalog No.
	Z*-LEDWFLENS 

NP LED Up Light ORDERING INFORMATION

POWER OPTIONS: Specify Separately

Power	Catalog No.	
Plug-in transformer, 6W	MT-6W	
Lighting Fixture Surge Module	SURGE-MOD	

Power	Catalog No.	
Step Down Transformer, UV	ST-UV	



CATALOG #: _____

TYPE: _____

PROJECT: _____

FEATURES

- Designed to illuminate sidewalks, entryways, perimeters or facades
- Intended for use in both uplight and downlight applications
- Savings of up to 80% energy compared to HID systems
- Blends seamlessly with a variety of architectural styles
- Made Right Here® in the USA

SPECIFICATIONS

- HOUSING** – Die-cast aluminum enclosure.
- THERMAL MANAGEMENT** – Integral die-cast aluminum heatsink and LED assembly provide passive thermal management. Rated -30°C to 40°C ambient operating temperature (-20°C to 40°C with EM/10WC; 0°C to 39°C with EM/4W).
- OPTICAL SYSTEM** – Precision, injection-molded, refractive acrylic lensing produces standard IES distributions.
- LED ASSEMBLY** – ANSI 3000K, 4000K, or 5000K CCT, minimum 70 CRI LEDs.
- LED DRIVER** – 0-10V dimming.
- ELECTRICAL** – 120-277, 347, and 480 VAC input range; 50-60Hz; power factor >.90; THD <20% at full load. FCC Class A compliant. 10kA/10kV surge protection standard. Quick-disconnect wiring provided. L70 >50,000 hours per IES TM-21.
- FINISH** – Super durable polyester powder coat bonded to phosphate-free, multi-stage pretreated metal, meets and exceeds AAMA 2604 specifications for outdoor durability.
- MOUNTING** – Surface mounts directly over a 4" maximum outlet box. Must be anchored to adequate structure that can safely support fixture weight (VWPH = 15 lbs, VWPV = 23 lbs).
- LISTINGS** –
 - cCSAus certified as luminaire suitable for wet locations.
 - DesignLights Consortium qualified product. Not all versions of this product may be DLC qualified, see the DLC Qualified Products List at www.designlights.org/QPL.
 - IDA Dark-Sky approved (downlight applications only).
 - RoHS compliant.
 - IP65 rated.
 - Title 24 compliant with OCCWS FSP-311-L_ option.
- WARRANTY** – 5-year limited warranty, see hew.com/warranty.

ORDERING EXAMPLE: VWP H - L30/740 - T3 - DBZ - SDGL - OPTIONS - DIM - UNV

ORDERING INFO

SERIES	TYPE	LUMENS ^[1]	CRI	CCT	DISTRIBUTION ^[2]
VWP	H Horizontal	L30 3,000lm	7 70	30 3000K	T3 Type III
	V Vertical	L60 6,000lm		40 4000K	TFT Type forward throw
				50 5000K	

FINISH OPTIONS ^[3]

- BLK** Black (RAL #9004)
- DBZ** Dark bronze
- DBR** Medium bronze
- GRAY** Standard gray
- SLV** Satin aluminum (RAL #9006)
- WHT** White (RAL #9003)

SHIELDING

- SDGL** Micro-prismatic tempered glass lens
- CGL** Clear tempered glass lens

OPTIONS

- EM/4W** 4-watt integral emergency LED driver ^[4]
- SF** Single fuse ^[5]
- DF** Double fuse ^[6]
- PC** Factory-installed button-style photocell ^[7]
- HSGX** Empty housing extension used to match units with EM, OCC, or conduit entry options.
- TP** Tamper-resistant Torx head screws ^[8]

CONTROL

- DIM** Dimming driver prewired for 0-10V controls

VOLTAGE

- 120** 120V
- 208** 208V
- 240** 240V
- 277** 277V
- UNV** 120-277V
- 347** 347V ^[14]
- 480** 480V ^[15]

CONDUIT ENTRY ^[9]

- CR** Right side conduit entry ^[10]
- CL** Left side conduit entry ^[11]
- CD** Dual conduit entry

VWPH ONLY

- EM/10WC** 10-watt emergency LED driver ^[12]
- OCCWS FSP-311-L_** Factory-installed occupancy sensor ^[13]

ACCESSORIES

- TPTX-25 TOOL** Tamper-resistant tool for Torx head screws. ^[16]

NOTES

- Lumen output based on 3500 CCT. Actual lumens may vary +/-5%, see page 2 for FIXTURE PERFORMANCE DATA. Additional lumen package available, see options
- See page 2 for DISTRIBUTION DETAILS.
- See page 3 for FINISH OPTIONS.
- 120-277V only; VWPH includes housing extension, increases fixture depth. See page 2 for FIXTURE DETAILS.
- 120V, 277V, or 347V only; must specify voltage
- 208V, 240V, or 480V only; must specify voltage.
- 120V, 208V, or 277V only; must specify voltage. Not available when specified with OCCWS option. See page 3 for OPTIONS DETAILS. Right side when viewed from behind fixture.
- Silver finish only. Safety screws providing added support to the lens are not tamper-resistant (lens is sealed to the fixture via adhesion). Requires a tamper-resistant tool, see Accessories.
- Fixtures require housing extension when specified with conduit entry. Increases fixture depth. Conduit entry provided with 1/2" NPT tapered pipe thread and plug. Increases fixture height. Conduit fitting to be supplied by others. Left and right when viewed from behind fixture.
- Left and right when viewed from behind fixture.
- Left and right when viewed from behind fixture.
- Low temperature, includes housing extension increases fixture depth; 120-277V only; not available with CR and CD options. See page 2 for FIXTURE DETAILS.
- Includes housing extension (increases fixture depth), must specify lens. See page 3 for OCCUPANCY SENSOR DETAILS.
- Includes stepdown transformer.
- Includes stepdown transformer.
- Tamper-resistant tool must be ordered separately. Please specify quantity required per project.

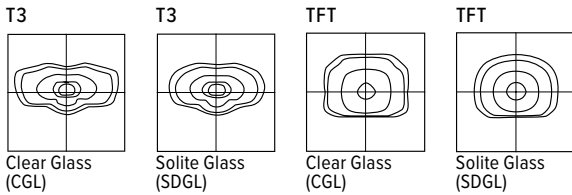


FIXTURE PERFORMANCE DATA

	LED PACKAGE	DISTRIBUTION	WATTAGE	CCT	CLEAR GLASS (CGL)		SOLITE GLASS (SDGL)		BUG RATINGS	
					DELIVERED LUMENS	EFFICACY (lm/W)	DELIVERED LUMENS	EFFICACY (lm/W)		
VWPH	L30	T3	36	3000	3174	88.2	2963	82.3	B1-U0-G1	
				4000	3327	92.4	3106	86.3		
				5000	3438	95.5	3209	89.1		
		TFT		3000	2713	75.4	2533	70.4		B1-U0-G1
				4000	2844	79.0	2655	73.8		
				5000	2939	81.6	2743	76.2		
	L60	T3	70	3000	5933	84.8	5887	84.1	B1-U0-G1	
				4000	6611	94.4	6172	88.2		
				5000	6831	97.6	6376	91.1		
		TFT		3000	5470	78.1	5065	72.4		B2-U0-G1
				4000	5688	81.3	5309	75.8		
				5000	5876	83.9	5486	78.4		
VWPV	L30	T3	36	3000	3115	86.5	2908	80.8	B1-U0-G1	
				4000	3403	94.5	3177	88.3		
				5000	3385	94.0	3160	87.8		
		TFT		3000	2840	78.9	2651	73.6		B2-U0-G1
				4000	3103	86.2	2896	80.4		
				5000	3086	85.7	2881	80.0		
	L60	T3	70	3000	6171	88.2	5813	83.0	B2-U0-G2	
				4000	6804	97.2	6351	90.7		
				5000	6767	96.7	6317	90.2		
		TFT		3000	5822	83.2	5126	73.2		B3-U0-G1
				4000	5999	85.7	5600	80.0		
				5000	5967	85.2	5570	79.6		

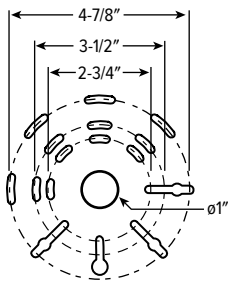
- Photometrics tested in accordance with IESNA LM-79. Results shown are based on 25°C ambient temperature.
- Wattage shown is average for 120V through 277 input.

DISTRIBUTION DETAILS



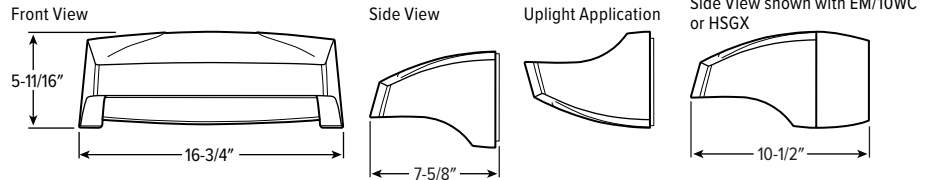
FIXTURE DETAILS

BOLT PATTERN DETAIL



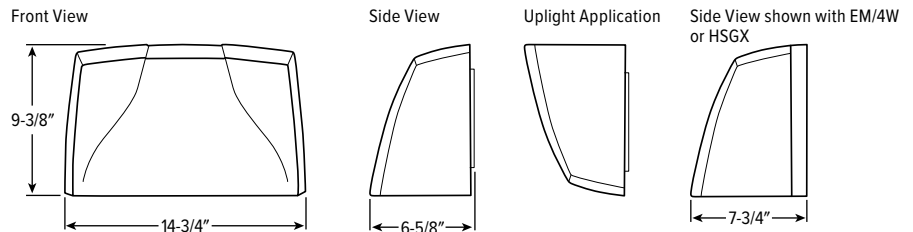
VWPH

Weight: 15 lbs; maximum weight with EM/10WC or HSGX: 27 lbs.



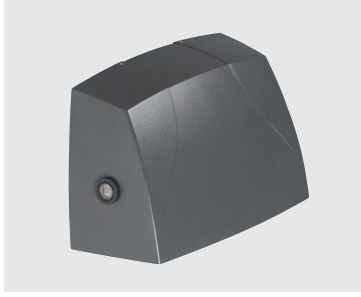
VWPV

Weight: 23 lbs



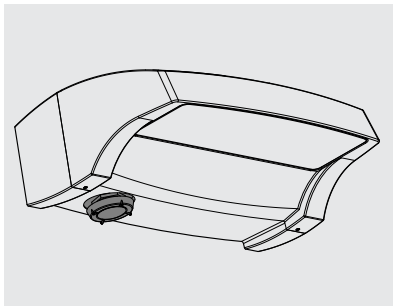
OPTIONS DETAILS

PC OPTION



Factory-installed button-style photocell, right side when viewed from behind fixture. (120V, 208V, or 277V only; must specify voltage)

OCCUPANCY SENSOR DETAILS



EXAMPLE: OCCWS FSP-311-L2

FEATURES

- Fully adjustable high and low dimmed light levels.
- Designed for LED fixtures; rated for extreme temperatures and up to 200,000 on/off cycles.
- Hold-off setpoint with automatic calibration option for convenience and added energy savings.
- Adjustable via sensor configuration app.
- IP66 rated with choice of lenses for wet and outdoor locations, and mounting heights from 8' to 20'.
- Adjustable time delay and cutoff delay.
- Factory set to 10% dimming at 5 minutes, cutoff at 1 hour.

ORDERING INFORMATION

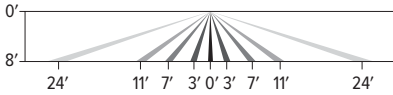
OCCWS FSP-311__ Factory-installed occupancy sensor, must specify lens (120V or 277V only)

LENS

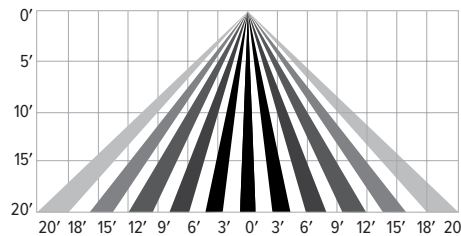
- L2 Coverage at 8' mounting height: $\phi 48'$
- L3 Coverage at 20' mounting height: $\phi 40'$

COVERAGE PATTERNS

L2 LENS



L3 LENS



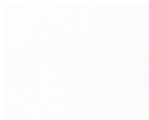
SENSOR CONFIGURATION APP

Initial setup and subsequent sensor adjustments are made using the iOS or Android Sensor Configuration App. This app enables adjustment of parameters including high and low modes, sensitivity, time delay, cut off and more. The smartphone app is also used to initiate automatic calibration of the FSP-3x1B ambient light level setpoint. The setpoint is used to hold the controlled lighting off or at low level when there is sufficient daylight. The wireless tool stores an unlimited number of sensor parameter profiles to speed configuration of multiple sensors.

Visit www.wattstopper.com for more information.

FINISH OPTIONS

WHITE



BLACK



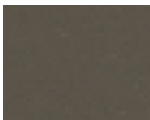
GREEN



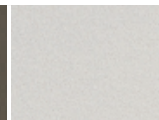
MEDIUM BRONZE



DARK BRONZE



SILVER



GRAY



For custom color, please specify RAL code or a manufacturer code with description. All custom colors other than RAL require two sample swatches, minimum 1" square.



Application

This LED wall luminaire has a partially shielded light source and is designed for the down lighting of interior and exterior locations with glare-free illumination.

Materials

Luminaire housing constructed of die-cast and spun marine grade, copper free ($\leq 0.3\%$ copper content) A360.0 aluminum alloy
 Three-ply opal glass
 High temperature silicone gasket

NRTL listed to North American Standards, suitable for wet locations
 Protection class IP44
 Weight: 4.0lbs

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-20° C
LED module wattage	8.9W
System wattage	12W
Controllability	0-10V dimmable
Color rendering index	Ra > 90
Luminaire lumens	724 lumens (3000K)
Lifetime at Ta = 15° C	500,000 h (L70)
Lifetime at Ta = 40° C	268,000 h (L70)

LED color temperature

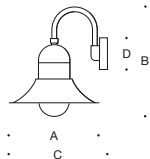
- 4000K - Product number + **K4**
- 3500K - Product number + **K35**
- 3000K - Product number + **K3**
- 2700K - Product number + **K27**

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish

All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors	Black (BLK)	White (WHT)	RAL:
	Bronze (BRZ)	Silver (SLV)	CUS:



LED wall luminaire · partially shielded

	LED	A	B	C	D
66411	8.9W	12 5/8	14 1/2	13 1/2	4 3/8



Application

LED recessed wall luminaire with asymmetrical light distribution for the illumination of ground surfaces, building entrances, stairs and footpaths.

Materials

Luminaire housing constructed of die-cast aluminum marine grade, copper free ($\leq 0.3\%$ copper content) A360.0 aluminum alloy
 Clear safety glass
 Silicone applied robotically to casting, plasma treated for increased adhesion
 High temperature silicone gasket
 Mechanically captive stainless steel fasteners
 Stainless steel screw clamps
 Composite installation housing

NRTL listed to North American Standards, suitable for wet locations
 Protection class IP65
 Weight: 1.5 lbs

Electrical

Operating voltage 120-277V AC
 Minimum start temperature -40°C
 LED module wattage 4.1 W
 System wattage 6.0W
 Controlability 0-10V dimmable
 Color rendering index $Ra > 80$
 Luminaire lumens 231 lumens (3000K)
 LED service life (L70) 60,000 hours

LED color temperature

- 4000K - Product number + **K4**
- 3500K - Product number + **K35**
- 3000K - Product number + **K3**
- 2700K - Product number + **K27**
- Amber - Product number + **AMB**

Wildlife friendly amber LED - Optional

Luminaire is optionally available with a narrow bandwidth, amber LED source (585-600nm) approved by the FWC. This light output is suggested for use within close proximity to sea turtle nesting and hatching habitats. Electrical and control information may vary from standard luminaire.

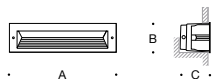
LED module wattage 3.6W (Amber)
 System wattage 4.6W (Amber)
 Luminaire lumens 56 lumens (Amber)

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish

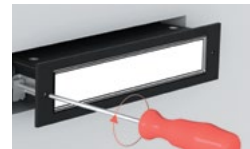
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors	Black (BLK)	White (WHT)	RAL:
	Bronze (BRZ)	Silver (SLV)	CUS :

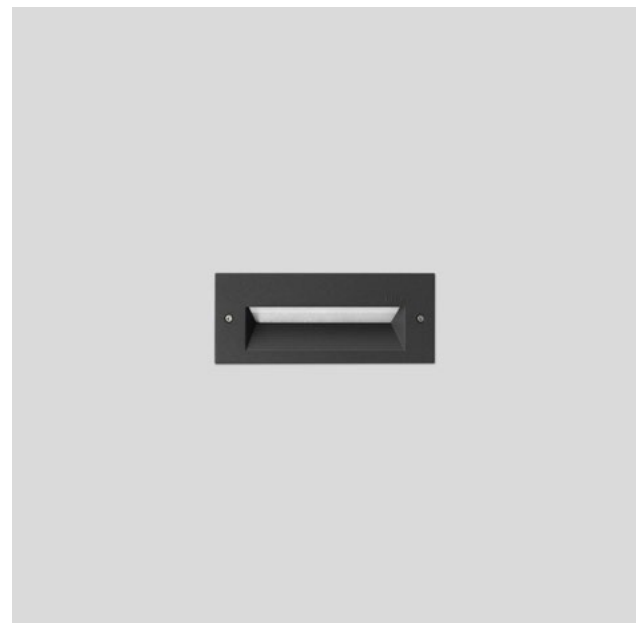


LED recessed wall luminaires · asymmetrical				
	LED	A	B	C
33053	4.1 W	6%	2 3/4	5

Type:
 BEGA Product:
 Project:
 Modified:



Fully enclosed luminaire with installation housing ensures seamless integration and weathertight operation.



Application

LED recessed wall luminaire with asymmetrical light distribution for the illumination of ground surfaces, building entrances, stairs and footpaths.

Materials

Luminaire housing constructed of die-cast aluminum marine grade, copper free ($\leq 0.3\%$ copper content) A360.0 aluminum alloy
 Clear safety glass
 Silicone applied robotically to casting, plasma treated for increased adhesion
 High temperature silicone gasket
 Mechanically captive stainless steel fasteners
 Stainless steel screw clamps
 Composite installation housing

NRTL listed to North American Standards, suitable for wet locations
 Protection class IP65
 Weight: 2.1 lbs

Electrical

Operating voltage 120-277V AC
 Minimum start temperature -40°C
 LED module wattage 8.4W
 System wattage 11.0W
 Controlability 0-10V, TRIAC, and ELV dimmable
 Color rendering index $R_a > 80$
 Luminaire lumens 480 lumens (3000K)
 LED service life (L70) 60,000 hours

LED color temperature

- 4000K - Product number + **K4**
- 3500K - Product number + **K35**
- 3000K - Product number + **K3**
- 2700K - Product number + **K27**
- Amber - Product number + **AMB**

Wildlife friendly amber LED - Optional

Luminaire is optionally available with a narrow bandwidth, amber LED source (585-600nm) approved by the FWC. This light output is suggested for use within close proximity to sea turtle nesting and hatching habitats. Electrical and control information may vary from standard luminaire.

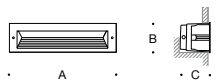
LED module wattage 8.7W (Amber)
 System wattage 10.7 (Amber)
 Luminaire lumens 111 lumens (Amber)

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish

All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors	Black (BLK)	White (WHT)	RAL:
	Bronze (BRZ)	Silver (SLV)	CUS:



LED recessed wall luminaires · asymmetrical

	LED	A	B	C
33055	8.4 W	12 1/2	2 3/4	5

Type:
 BEGA Product:
 Project:
 Modified:



Fully enclosed luminaire with installation housing ensures seamless integration and weathertight operation.



NFS2-3030 Intelligent Addressable Fire Alarm Control Panel

General

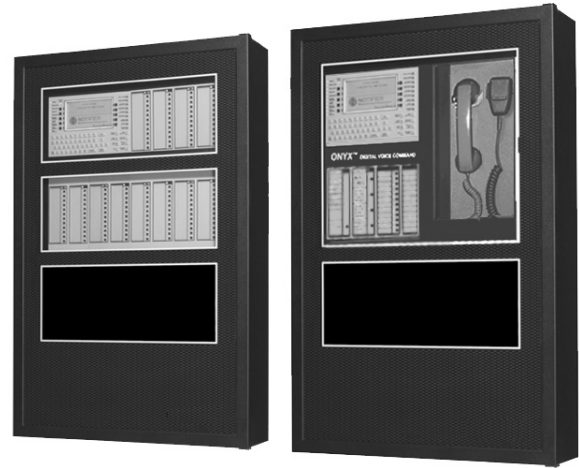
The NFS2-3030 is an intelligent Fire Alarm Control Panel (FACP) designed for medium- to large-scale facilities. Fire emergency detection and evacuation are extremely critical to life safety, and the NFS2-3030 is ideally suited for these applications. The NFS2-3030 is part of the ONYX® Series of products from NOTIFIER. The NFS2-3030 is ideal for virtually any application because it features a modular design that is configured per project requirements. With one to ten Signaling Line Circuits (SLCs), the NFS2-3030 supports up to 3,180 intelligent addressable devices.

Information is critical to fire evacuation personnel, and the NFS2-3030's large 640-character Liquid Crystal Display (LCD) presents vital information to operators concerning a fire situation, fire progression, and evacuation details.

A host of other options are available, including single- or multi-channel voice; firefighter's telephone; LED, LCD, or PC-based graphic annunciators; networking; advanced detection products for challenging environments; wireless fire protection; and many additional options.

Features

- Certified for seismic applications when used with the appropriate seismic mounting kit.
- Approved for Marine applications when a marine-listed version is used with marine-listed compatible equipment. *See DN-60688.*
- Complies with UL 2572 Mass Notification Systems (NFS2-3030 version 20 or higher).
- One to ten isolated intelligent Signaling Line Circuits (SLC) Class A, B, or X.
- Wireless fire protection using SWIFT Smart Wireless Integrated Fire Technology. *See DN-60820.*
- Up to 159 detectors and 159 modules per SLC; 318 devices per loop/3,180 per FACP or network node.
 - Detectors can be any mix of ion, photo, thermal, or multi-sensor; wireless detectors are available for use with the FWSG.
 - Modules include addressable pull stations, normally open contact devices, two-wire smoke detectors, notification, or relay; wireless modules are available for use with the FWSG.
- Large 16 line, 640 character LCD backlit display or use display-less as a network node.
- Network options:
 - High-speed network for up to 200 nodes (NFS2-3030, NFS2-640, NFS-320(C), NFS-320SYS, NCD, NCA-2, DVC-EM, ONYXWorks, NFS-3030, NFS-640, and NCA).
 - Standard network for up to 103 nodes (NFS2-3030, NFS2-640, NFS-320(C), NFS-320SYS, NCD, NCA-2, DVC-EM, ONYXWorks, NCS, NFS-3030, NFS-640, NCA, AFP-200, AFP-300/400, AFP-1010, and AM2020). Up to 54 nodes when DVC-EM is used in network paging.
- Built-in Alarm, Trouble, Security, and Supervisory relays.
- VeriFire® Tools online/offline program option.
- With built-in Degraded Mode operation, the system is capable of general alarm if a fire alarm condition is present even if the central processing unit (CPU) fails.
- Weekly Occupancy Schedules allow changing sensitivity by time of day and day of week.
- EIA-485 annunciators, including custom graphics.



NFS2-3030 (left) and NFS2-3030 with DVC audio option (right)

- History file with 4000-event capacity in nonvolatile memory, plus separate 1000-event alarm-only file.
- Advanced history filters allow sorting by event, time, date, or address.
- Alarm Verification selection per point, with automatic counter.
- Autoprogramming and Walk Test reports.
- Multiple central station communication options:
 - Standard UDACT
 - Internet
 - Internet/GSM
- Positive Alarm Sequence (PAS) Presignal.
- Silence Inhibit and Auto Silence timer options.
- Field-programmable on panel or on PC, with VeriFire Tools program, also check, compare.
- Non-alarm points for lower priority functions.
- Remote ACK/Signal Silence/System Reset/Drill via monitor modules.
- Up to 1000 powerful Boolean logic equations.
- Supports SCS Series smoke control system in both HVAC and FSCS modes.
- FM6320 approved Gas Detection System with FMM-4-20 module and any FM listed gas detector.
- EIA-232 printer port.
- EIA-485 annunciator port.

640-CHARACTER DISPLAY FEATURES

- Backlit, 640-character display.
- Program keypad: full QWERTY keypad.
- Up to nine users, each with a password and selectable access levels.
- **11 LED indicators:** Power; Fire Alarm; Pre-Alarm; Security; Supervisory; System Trouble; Other Event; Signals Silenced; Point Disabled; CPU Failure; Controls Active.
- **Membrane Switch Controls:** Acknowledge; Signal Silence; Drill; System Reset; Lamp Test.

- **LCD Display:** 640 characters (16 lines x 40 characters) with long-life LED backlight.

SWIFT WIRELESS

- Self-healing mesh wireless protocol.
- Each SWIFT Gateway supports up to 50 devices: 1 wireless gateway and up to 49 SWIFT devices.
- Up to 4 wireless gateways can be installed with overlapping network coverage.

RELEASING FEATURES

- Ten independent hazards.
- Sophisticated cross-zone (three options).
- Delay timer and Discharge timers (adjustable).
- Abort (four options).

VOICE AND TELEPHONE FEATURES

- Up to eight channels of digital audio.
- 35 watt, 50 watt, 75 watt, and 100/125 watt digital amplifiers (DAA2/DAX series and DS series).
- Solid state message generation.
- Hard-wired voice control module options.
- Firefighter telephone option.
- 30- to 120-watt analog amplifiers (AA Series).
- Backup tone generator and amplifier option.

FLASHSCAN® INTELLIGENT FEATURES

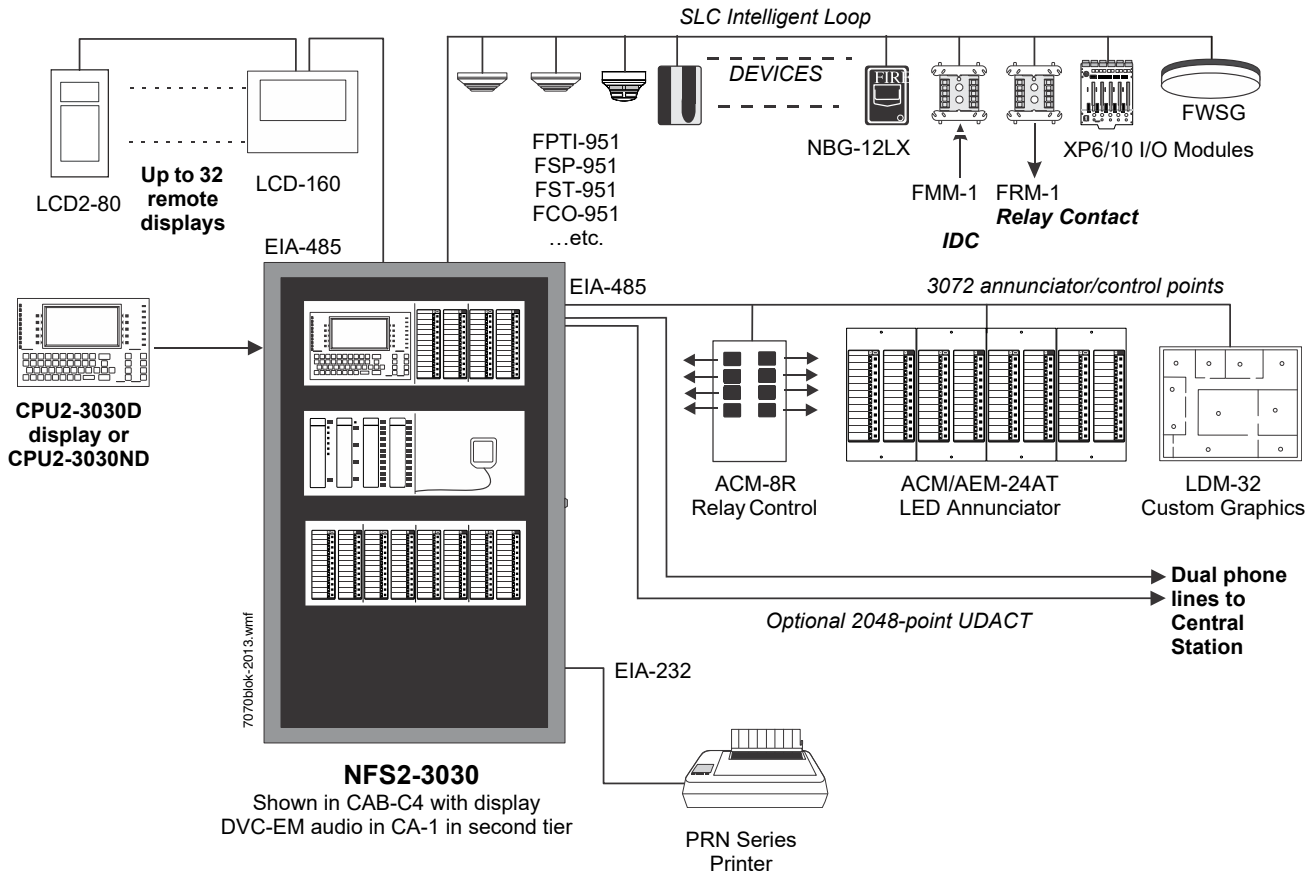
- Polls up to 318 devices on each loop in less than two seconds.
- Activates up to 159 outputs in less than five seconds.
- Multicolor LEDs blink device address during Walk Test.

- Fully digital, high-precision protocol (U.S. Patent 5,539,389).
- Manual sensitivity adjustment — up to nine levels.
- Pre-alarm ONYX intelligent sensing — up to nine levels.
- Sensitivity levels:
 - **Photo** – 0.5 to 2.35%/foot obscuration.
 - **High-Sensitivity Photoelectric (VIEW®)** – Open Air Protection (0.5% - 2.0%/ft. obscuration), Special Applications (0.02%-0.5%/ft. obscuration)
 - **Multi-Criteria Detector** – Open Air Protection (2.52-3.89%/ft. obscuration), Special Applications (1.13-2.52%/ft. obscuration)
- Drift compensation (U.S. Patent 5,764,142).
- Multi-detector algorithm involves nearby detectors in alarm decision (U.S. Patent 5,627,515).
- Automatic detector sensitivity testing (NFPA-72 compliant).
- Maintenance alert (two levels).
- Self-optimizing pre-alarm.
- Programmable activation of sounder/relay bases during alarm or pre-alarm.
- Read Status displays the level of detector cleanliness.

FSV-951 SERIES VIEW® (VERY INTELLIGENT EARLY WARNING) HIGH-SENSITIVITY SMOKE DETECTOR

- Advanced ONYX intelligent sensing algorithms differentiate between smoke and non-smoke signals.
- Addressable operation pinpoints the fire location.
- Ivory models (-IV) support CLIP mode as well as FlashScan.
- ULC listed models available; "A" models are ULC Listed.
- -R is retrofit, backwards compatible for use with older panels.

Sample System Options



NOTE: CPU2-3030 firmware version 14.0 (and higher) can support LCD-160 on the RDP port, or LCD2-80 in terminal mode, but not both at the same time.

FCO-951(A)-IV ADVANCED MULTI-CRITERIA FIRE/CO DETECTOR

- Detects all four major elements of a fire (smoke, heat, CO, and flame).
- 135°F (57.2°C) fixed-temperature heat detector.
- Transmits an alarm signal due to heat.
- Separate signal for life-safety CO detection.
- Optional addressable sounder base for Temp-3 (fire) or Temp-4 (CO) tone.
- Automatic drift compensation of smoke sensor and CO cell.
- High nuisance-alarm immunity.
- ULC listed models available; “A” models are ULC Listed.

FPTI-951(A) INTELLIGENT MULTI-CRITERIA DETECTOR

- Combined Photoelectric Thermal and Infrared Sensor
- UL 268 7th Edition and UL 521 Listed; Canadian models CAN/ULC S529 and CAN/ULC S530
- Microprocessor-based technology; combination photo, thermal, and infrared technology.

FPC-951(A) PHOTOELECTRIC/CO SENSOR

- Combined photoelectric and carbon monoxide sensor

FSCO-951(A) INTELLIGENT CO SENSOR

- Carbon monoxide sensor

FS-OSI-RI(A) ADDRESSABLE INTELLIGENT SINGLE-ENDED BEAM SMOKE DETECTOR

- Intelligent addressable reflector-type linear optical beam smoke detector
- Fast, easy, and intuitive beam alignment indicated by directional LED arrows
- Long range coverage of 16-328 ft (5-100 m) is standard; no separate long-range kit required

FMM-4-20 GAS DETECTION MODULE

- Interface to industry-standard linear scale 4-20 mA sensors.
- Five programmable thresholds.
- FM Approved, Class 6320 (Stationary Gas Sensors/Detectors).

INTELLIGENT VESDA® DETECTORS

- Intelligent aspiration smoke detectors connect directly to the SLC loop of compatible ONYX® Series panels:
 - VEA-040-A00-NTF, VEA-040-A10-NTF
 - VEP-A00-P-NTF, VEP-A10-P-NTF, VEP-A00-1P-NTF
 - VEU-A00-NTF, VEU-A10-NTF
- Models offer LED display, LCD display, or both
- Coverage options for spaces up to 69,965 square feet

FlashScan® Exclusive World-Leading Detector Protocol

At the heart of the NFS2-3030 is a set of detection devices and device protocol — FlashScan (U.S. Patent 5,539,389). FlashScan is an all-digital protocol that gives superior precision and high noise immunity.

As well as giving quick identification of an active input device, this protocol can also activate many output devices in a fraction of the time required by competitive protocols. This high speed also allows the NFS2-3030 to have the largest device per loop capacity in the industry — 318 points — yet every input and output device is sampled in less than two seconds. The microprocessor-based FlashScan® detectors have bicolor LEDs that can be coded to provide diagnostic information, such as device address during Walk Test.

ONYX Intelligent Sensing

ONYX Intelligent Sensing is a set of software algorithms that provide the NFS2-3030 with industry-leading smoke detection capability. These complex algorithms require many calculations on each reading of each detector, and are made possible by the very high-speed microcomputer used by the NFS2-3030.

Drift Compensation and Smoothing. Drift compensation allows the detector to retain its original ability to detect actual smoke, and resist false alarms, even as dirt accumulates. It reduces maintenance requirements by allowing the system to automatically perform the periodic sensitivity measurements required by NFPA 72. Smoothing filters are also provided by software to remove transient noise signals, usually caused by electrical interference.

Maintenance Warnings. When the drift compensation performed for a detector reaches a certain level, the performance of the detector may be compromised, and special warnings are given. There are three warning levels: (1) Low Chamber value; (2) Maintenance Alert, indicative of dust accumulation that is near but below the allowed limit; (3) Maintenance Urgent, indicative of dust accumulation above the allowed limit.

Sensitivity Adjust. Nine sensitivity levels are provided for alarm detection. These levels can be set manually, or can change automatically between day and night. Nine levels of pre-alarm sensitivity can also be selected, based on predetermined levels of alarm. Pre-alarm operation can be latching or self-restoring, and can be used to activate special control functions.

Self-Optimizing Pre-Alarm. Each detector may be set for “Self-Optimizing” pre-alarm. In this special mode, the detector “learns” its normal environment, measuring the peak analog readings over a long period of time, and setting the pre-alarm level just above these normal peaks.

Cooperating Multi-Detector Sensing. A patented feature of ONYX Intelligent Sensing is the ability of a smoke sensor to consider readings from nearby sensors in making alarm or pre-alarm decisions. Without statistical sacrifice in the ability to resist false alarms, it allows a sensor to increase its sensitivity to actual smoke by a factor of almost two to one.

Field Programming Options

Autoprogram is a timesaving feature. The FACP “learns” what devices are physically connected and automatically loads them in the program with default values for all parameters. Requiring less than one minute to run, this routine allows the user to have almost immediate fire protection in a new installation, even if only a portion of the detectors are installed.

Keypad Program Edit. The NFS2-3030, like all NOTIFIER intelligent panels, has the exclusive feature of program creation and editing capability from the front panel keypad, while continuing to provide fire protection. The architecture of the NFS2-3030 software is such that each point entry carries its own program, including control-by-event links to other points. This allows the program to be entered with independent per-point segments, while the NFS2-3030 simultaneously monitors other (already installed) points for alarm conditions.

VeriFire® Tools is an offline programming and test utility that can greatly reduce installation programming time, and increase confidence in the site-specific software. It is Windows® based and provides technologically advanced capabilities to aid the installer. The installer may create the entire program for the NFS2-3030 in the comfort of the office, test it, store a backup file, then bring it to the site and download from a laptop into the panel.

Product Line Information

- “Configuration Guidelines” on page 4
- “Main System Components” on page 4
- “Networking Options” on page 4
- “Auxiliary Power Supplies and Batteries” on page 4
- “Audio Options” on page 4
- “Compatible Devices, EIA-232 Ports” on page 5
- “Compatible Devices, EIA-485 Ports” on page 5
- “Compatible Intelligent Devices” on page 5
- “Enclosures, Chassis, and Dress Plates” on page 6
- “Backboxes” on page 7
- “Other Options” on page 7

CONFIGURATION GUIDELINES

Stand-alone and network systems require a main display. On single-FACP systems (one NFS2-3030D), the display option is the CPU2-3030D. On network systems (two or more networked fire panel nodes), at least one NCD, NCA-2, NCS, or ONYXWorks annunciation device is required. Options listed as follows.

MAIN SYSTEM COMPONENTS

CPU2-3030D: NFS2-3030 Primary Display. CPU2-3030D ships with keypad/display installed; includes 640-character backlit LCD display, QWERTY programming and control keypad. CPU2-3030 is a central processing unit and requires an AMPS-24(E) power supply. For English ULC applications, use CPU2-3030DC. Non-English versions are available: CPU2-3030D-FR, CPU2-3030D-HE, CPU2-3030D-KO, CPU2-3030D-PO, CPU2-3030D-SC, CPU2-3030D-SP, CPU2-3030D-TC, and CPU2-3030D-TH. For English Marine applications order CPU2-3030D-M; for non-English Marine applications order CPU2-3030D-M and the appropriate KP-KIT-XX. (See DN-60688.)

CPU2-3030ND: CPU2-3030 without display. Non-English versions are available: CPU2-3030ND-FR, CPU2-3030ND-HE, CPU2-3030ND-KO, CPU2-3030ND-PO, CPU2-3030ND-SC, CPU2-3030ND-SP, CPU2-3030ND-TC.

AMPS-24(E): One required for each NFS2-3030. Addressable power supply and battery charger with two 24 VDC outputs. Addressable by any FlashScan® or CLIP mode FACP. Charges 7 to 200 AH batteries. Occupies up to five addresses on an SLC, depending on configuration. Primary input power for panel. See DN-6883.

LCM-320: Loop Control Module. Provides one SLC. NFS2-3030 supports up to five LCM-320s and five LEM-320 expanders for a total of ten SLCs. See DN-6881.

LEM-320: Loop Expander Module. Expands an LCM-320. See DN-6881.

SAMPLE SYSTEM: Four-loop NFS2-3030 with display: CPU2-3030D, DP-DISP, two BMP-1s, CHS-M3, two LCM-320s, two LEM-320s, AMPS-24, SBB-A4, DR-A4, BP2-4, BB-100, batteries.

NETWORKING OPTIONS

NCA-2: Network Control Annunciator, 640 characters. An alternate primary display for CPU2-3030 can be provided by the NCA-2, NCS, or ONYXWorks. Using NCA-2 as primary display enables non-English languages. On network systems (two or more networked fire panel nodes), one network display (either NCA-2, NCS, or ONYXWorks) is required for every system. On network systems, the NCA-2 connects (and requires) a standard Network Communication Module or High-Speed Network Communication Module. Mounts in a row of FACP node or in two annunciator positions. Mounting options include the DP-DISP, ADP-4B, or in an annunciator box, such as the ABS-2D. In CAB-4 top-row applications, a DP-DISP and two BMP-1 blank modules are required for mounting. Non-English versions are available: NCA-2-FR, NCA-2-HE, NCA-2-KO, NCA-2-PO, NCA-2-SC, NCA-2-SP, NCA-2-TC, NCA-2-TH. For English ULC applications, order NCA-2C; for marine applications, order NCA-2-M; for

non-English marine applications order NCA-2-M and appropriate KP-KIT-XX. See DN-7047.

NCD: Network control display, with a high-definition 10” touch screen. As part of a standalone NFS2-3030 system, the NCD can serve as Primary Display for the panel, to provide control and status capabilities on displayless nodes. On network systems, the NCD connects to (and requires) a standard Network Communication Module or High-Speed Network Communication Module. Mounting options include the ABS-TD for standalone applications. In the CAB-4 series the NCD can be mounted in the top row with a DP-GDIS1 or lower rows using a DP-GDIS2. See DN-60974.

NCM-W, NCM-F: Standard Network Communications Modules. Wire and multi-mode fiber versions available. See DN-6861.

HS-NCM-W(-2), HS-NCM-MF, HS-NCM-SF, HS-NCM-WMF(-2), HS-NCM-WSF(-2), HS-NCM-MFSF: High-speed Network Communications Modules that can connect to two nodes. Wire, single-mode fiber, multi-mode fiber, and media conversion models are available. See DN-60454.

RPT-W, RPT-F, RPT-WF: Standard-network repeater board with wire connection (RPT-W), multi-mode fiber connection (RPT-F), or allowing a change in media type between wire and fiber (RPT-WF). Not used with high-speed networks. See DN-6971.

ONYXWorks: UL/ULC-listed graphics PC workstation, ONYXWorks GUI software, and computer hardware. See DN-7048 for specific part numbers.

NFN-GW-EM-3: NFN Gateway, embedded. (Replaces NFN-GW-EM.) See DN-60499.

NWS-3: NOTI•FIRE•NET™ Web Server. See DN-6928.

CAP-GW: Common Alerting Protocol Gateway. See DN-60756.

VESDA-HLI-GW: VESDAnet high-level interface gateway. See DN-60753.

LEDSIGN-GW: UL-listed sign gateway. Interfaces with classic and high-speed NOTI•FIRE•NET networks through the NFN Gateway. See DN-60679.

OAX2-24V: UL-listed LED sign, used with LEDSIGN-GW. See DN-60679.

AUXILIARY POWER SUPPLIES AND BATTERIES

APS2-6R: Auxiliary Power Supply. Provides up to 6.0 amperes of power for peripheral devices. Includes battery input and transfer relay, and overcurrent protection. Mounts on two of four positions on a CHS-4L or CHS-4 chassis. See DN-5952.

ACPS-610: 6.0 A or 10.0 A addressable charging power supply. See DN-60244.

FCPS-24S6/-24S8: Remote 6 A and 8 A power supplies with battery charger. See DN-6927.

BAT Series: Batteries. AMPS-24 uses two 12 volt, 7 to 200 AH batteries. See DN-6933.

AUDIO OPTIONS

NOTE: See “Enclosures, Chassis, and Dress Plates” on page 6 for mounting hardware.

DVC-EM: Digital Voice Command, digital audio processor with message storage for up to 32 minutes of standard quality (4 minutes at high quality) digital audio. See DN-7045.

DVC-RPU: Digital Voice Command Remote Paging Unit for use with DVC-EM. Includes the keypad/display. See DN-60726.

DS-DB: Digital Series Distribution Board, provides bulk amplification capabilities to the DVC-EM while retaining digital audio distribution capabilities. Can be configured with up to four DS-AMPs, supplying high-level risers spread throughout an installation. See DN-60565.

DVC-KD: DVC-EM keypad for local annunciation and controls; status LEDs and 24 user-programmable buttons. See DN-7045.

DS-AMP/E: 125W, 25 VRMS, or 100W, 70VRMS. 70VRMS requires DS-XF70V step-up transformer. Digital Series Amplifier, part of the DS-DB system. *See DN-60663.*

DS-RFM, DS-FM, DS-SFM: Fiber conversion modules for DVC-EM, DS-DB distribution board, and DAA2/DAX Series amplifiers. *See DN-60633.*

DAA2-5025(E): 50W, 25 Vrms Digital Audio Amplifier assembly with power supply; includes chassis. *See DN-60556.*

DAA2-5070(E): 50W, 70.7 Vrms Digital Audio Amplifier assembly with power supply; includes chassis. *See DN-60556.*

DAA2-7525(E): 75W, 25 Vrms digital audio amplifier assembly with power supply; includes chassis. *See DN-60556.*

DAX-3525(E): 35W, 25 Vrms Digital Audio Amplifier assembly with power supply, includes chassis. *See DN-60561.*

DAX-3570(E): 35W, 70.7 Vrms Digital Audio Amplifier assembly with power supply, includes chassis. *See DN-60561.*

DAX-5025(E): 50W, 25 Vrms Digital Audio Amplifier assembly with power supply, includes chassis. *See DN-60561.*

DAX-5070(E): 50W, 70.7 Vrms Digital Audio Amplifier assembly with power supply, includes chassis. *See DN-60561.*

TELH-1: Firefighter's Telephone Handset for use with the DVC-EM when mounted in the CA-2 chassis. *See DN-7045.*

CMIC-1: Microphone used with DVC/DVC-EM. Included with CA-2 chassis assembly. *See DN-7045.*

RM-1/RM-1SA: Remote microphone assemblies, mount on ADP-4 (RM-1) dress panel or CAB-RM/-RMR (RM-1SA) stand-alone cabinets. *See DN-6728.*

AA-30: Audio Amplifier, 30 watts, 25 Vrms. Includes amplifier and audio input supervision, backup input, and automatic switchover, power supply, cables. *See DN-3224.*

AA-120/AA-100: Audio Amplifier. AA-120 is 120 watts, 25 Vrms. AA-100 is 100 watts, 70.7 Vrms. The amplifier contains an integral chassis for mounting to a CAB-B4, -C4, or -D4 backbox (consumes one row). Includes audio input and amplified output supervision, backup input, and automatic switchover to backup tone. *See DN-3224.*

DAA Series Digital Audio Amplifiers: Legacy DAA Series amplifiers are compatible with DVC systems running SR4.0. For specific information on DAA-50 series amplifiers, refer to DN-7046. For information on DAA-7525 Series, refer to DN-60257.

COMPATIBLE DEVICES, EIA-232 PORTS

PRN-7: 80-column printer. *See DN-60897*

VS4095/5: Printer, 40-column, 24 V. Order from Keltron, Inc. *See DN-3260.*

DPI-232: Direct Panel Interface, specialized modem for extending serial data links to remotely located FACPs and/or peripherals. *See DN-6870.*

COMPATIBLE DEVICES, EIA-485 PORTS

ACM-24AT: ONYX® Series ACS annunciator – up to 96 points of annunciation with Alarm or Active LED, Trouble LED, and switch per circuit. Active/Alarm LEDs can be programmed (by powered-up switch selection) by point to be red, green, or yellow; the Trouble LED is always yellow. *See DN-6862.*

AEM-24AT: Same LED and switch capabilities as ACM-24AT; expands the ACM-24AT to 48, 72, or 96 points. *See DN-6862.*

ACM-48A: ONYX® Series ACS annunciator – up to 96 points of annunciation with Alarm or Active LED per circuit. Active/Alarm LEDs can be programmed (by powered-up switch selection) in groups of 24 to be red, green, or yellow. Expandable to 96 points with one AEM-48A. *See DN-6862.*

AEM-48A: Same LED capabilities as ACM-48A; expands the ACM-48A to 96 points. *See DN-6862.*

ACM-8R: Remote Relay Module with eight Form-C contacts. Can be located up to 6,000 ft. (1828.8 m) from panel on four wires. *See DN-3558.*

LCD-160: Liquid Crystal Display annunciator, 160-character backlit. Can store character sets for multiple languages. LCD-160C is used for ULC applications. *See DN-6940.*

LCD2-80: Terminal and ACS mode. 80-character, backlit LCD display. Mounts up to 6,000 ft. (1828.8 m) from panel. Up to 32 per FACP. *See LCD2-80 (DN-60548).*

SCS Series: Smoke control station; eight (expandable to 16) circuits. *See DN-4818.*

TM-4: Transmitter Module. Includes three reverse-polarity circuits and one municipal box circuit. Mounts in panel module position (as in single-address mode applications) or in CHS-M3 position. *See DN-6860.*

UDACT-2: Universal Digital Alarm Communicator Transmitter, 636 channel. *See DN-60686.*

UZZ-256: Programmable Universal Zone Coder provides positive non-interfering successive zone coding. Microprocessor-controlled, field-programmable from IBM®-compatible PCs (*requires optional programming kit*). Mounts on a CHS-4 series chassis within NFS2-3030.

COMPATIBLE INTELLIGENT DEVICES

NOTE: "A" suffix indicates ULC-Listed model.

FWSG Wireless SWIFT Gateway: Addressable gateway supports wireless SLC devices. Not appropriate for ULC applications. *See DN-60820.*

FCO-951-IV FlashScan, Addressable intelligent multi-criteria smoke sensors, photo, carbon monoxide, fixed temperature heat detector and infra-red (IR). ULC: FCO-951A-IV

FPC-951. FlashScan, Combined photoelectric and carbon monoxide sensor. ULC: FPC-951A.

FSCO-951. FlashScan, Addressable carbon monoxide sensor. ULC: FSCO-951A.

FPTI-951, FPTI-951-IV: Addressable intelligent multi-criteria photoelectric, thermal and IR sensors. ULC: FPTI-951A, FPTI-951A-IV.

FS-OSI-RI: Addressable intelligent single-ended beam smoke detector. ULC: FS-OSI-RIA. .

FSP-951: White, low-profile intelligent photoelectric sensor, FlashScan only. ULC: FSP-951A.

FSP-951-IV: Ivory, low-profile intelligent photoelectric sensor. ULC: FSP-951A-IV

FSP-951T: White, same as FSP-951 but includes a built-in 135°F (57°C) fixed-temperature thermal device. FlashScan only. ULC: FSP-951TA.

FSP-951T-IV: Ivory, same as FSP-951T but includes a built-in 135°F (57°C) fixed-temperature thermal device. ULC: FSP-951TA-IV.

FSP-951R: White, low-profile intelligent photoelectric sensor, remote test capable. For use with DNR/DNRW. FlashScan only. ULC: FSP-951RA

FSP-951R-IV: Ivory, low-profile intelligent photoelectric sensor, remote test capable. FlashScan only. ULC: FSP-951RA-IV, for use with DNRA.

FST-951: White, low-profile intelligent 135°F fixed thermal sensor, FlashScan only. Must be mounted to one of the bases listed below. ULC: FST-951A. *See DN-60975.*

FST-951-IV: Ivory, low-profile intelligent 135°F fixed thermal sensor, FlashScan and CLIP. Must be mounted to one of the bases listed below. ULC: FST-951A-IV.

FST-951R: White, low-profile intelligent rate-of-rise thermal sensor, FlashScan only. Must be mounted to one of the bases listed below. ULC: FST-951A

FSP-951R-IV: Ivory, low-profile intelligent photoelectric sensor, remote test capable. FlashScan only. ULC: FSP-95RA-IV, for use with DNRA.

FST-951H: White, low-profile intelligent 190°F fixed thermal sensor, FlashScan only. Must be mounted to one of the bases listed below. ULC: FST-951HA.

FST-951H-IV: Ivory, low-profile intelligent 190°F thermal sensor, FlashScan and CLIP. Must be mounted to one of the bases listed below. ULC: FST-951HA-IV.

FSV-951, FSV-951R: White, intelligent high-sensitivity photoelectric smoke detector. ULC: FSV-951A, FSV-951RA

FSV-951-IV, FSV-951R-IV: Ivory, intelligent high-sensitivity photoelectric smoke detector. ULC: FSV-951A-IV, FSV-951RA-IV.

VEP-A00-P-NTF: Intelligent aspiration smoke detector with LED display, 4 pipes, covers up to 21,520 square feet. UL/ULC. *See DN-61029.* UL/ULC Listed.

VEP-A10-P-NTF: Intelligent aspiration smoke detector with LED and LCD display, 4 pipes, covers up to 21,520 square feet. UL/ULC. *See DN-61029.* UL/ULC Listed.

VEP-A00-1P-NTF: Intelligent aspiration smoke detector with LED display, single pipe, covers up to 10,760 square feet. UL/ULC. *See DN-61029.* UL/ULC Listed.

VEU-A00-NTF: Intelligent aspiration smoke detector with LED display, 4 pipes, covers up to 69,965 square feet. UL/ULC. *See DN-61034.* UL/ULC Listed.

VEU-A10-NTF: Intelligent aspiration smoke detector with LED and LCD display, 4 pipes, covers up to 69,965 square feet. UL/ULC. *See DN-61034.* UL/ULC Listed.

VEA-040-A00-NTF: Intelligent aspiration with LED display, 40 point-addressable detection points. Covers 36,000 square feet. UL/ULC. *See DN-61036.* UL/ULC Listed.

VEA-040-A10-NTF: Intelligent aspiration with LED and LCD display, 40 point-addressable detection points. Covers 36,000 square feet. UL/ULC. *See DN-61036.* UL/ULC Listed.

DNR: InnovairFlex low-flow non-relay duct-detector housing. ULC: DNRA. (Order FSP-951R(A) separately.) *See DN-60429.*

DNRW: Same as above with NEMA-4 rating, watertight. *See DN-60429.*

B224RB-WH: White, low-profile relay base. *See DN-60054.* ULC: B224RBA-WH.

B224RB-IV: Ivory, plug-in System Sensor relay base. ULC: B224RBA-IV.

B224BI-WH: White, isolator base for low-profile detectors. *See DN-60054.* ULC: B224BIA-WH.

B224BI-IV: Ivory isolator detector base. ULC: B224BIA-IV.

B300-6: White, standard flanged low-profile mounting base. (For 10-pack order B300-6-BP.) ULC: B300A-6.

B300-6-IV: Ivory, standard flanged low-profile mounting base. ULC: B300A-6-IV.

B501-WHITE: European-style, 4" (10.16 cm) base. *See DN-60054.* (For 10-pack order B501-WHITE-BP.) UL/ULC listed.

B501-BL: Black, 4" standard European flangeless mounting base. UL/ULC listed.

B501-IV: Ivory color, 4" standard European flangeless mounting base. UL/ULC listed.

B200S-WH: White, intelligent programmable sounder base, capable of producing a variety of tone patterns including ANSI Temporal 3. Compatible with synchronization protocol. *See DN-60054.* ULC: B200SA-WH.

B200S-IV: Ivory intelligent, programmable sounder base. ULC: B200SA-IV.

B200SCOA-WH: White intelligent, programmable sounder base in English/French (required in Canada for ULC applications with CO detectors. Based on B200SA. ULC listed.

B200SCOA-IV: Ivory intelligent, programmable sounder base in English/French (required in Canada for ULC applications with CO detectors. Based on B200SA. ULC listed.

B200S-LF-WH: White, low-frequency version of B200S. *See DN-60054.*

B200S-LF-IV: Ivory, low-frequency version of B200S.

B200SR-WH: White intelligent programmable sounder base, Temporal 3 or Continuous tone. For retrofit installations replacing B501BH series bases. *See DN-60054.* ULC: B200SRA-WH.

B200SR-IV: Ivory intelligent programmable sounder base, Temporal 3 or Continuous tone. For retrofit installations replacing B501BH series bases. ULC: B200SRA-IV.

B200SR-LF-WH: White, low-frequency version of B200SR. *See DN-60054.*

B200SR-LF-IV: Ivory, low-frequency version of B200SR.

FMM-1(A): FlashScan monitor module. *See DN-6720.*

FDM-1(A): FlashScan dual monitor module. *See DN-6720.*

FZM-1(A): FlashScan two-wire detector monitor module. *See DN-6720.*

FMM-101(A): FlashScan miniature monitor module. *See DN-6720.*

FMM-4-20: FlashScan 4-20 mA protocol monitor module. *See DN-60411.*

FTM-1(A): Firephone Telephone Module connects a remote firefighter telephone to a centralized telephone console. Reports status to panel. Wiring to jacks and handsets is supervised. *See DN-6989.*

FCM-1(A): FlashScan control module. *See DN-6724.*

FCM-1-REL(A): FlashScan releasing control module. *See DN-60390.*

FRM-1(A): FlashScan relay module. *See DN-6724.*

FDRM-1(A): FlashScan dual monitor/dual relay module. *See DN-60709.*

NBG-12LX: Manual pull station, addressable. *See DN-6726.*

N-MPS series: Manual pull stations, addressable and conventional. ULC-listed; for use in Canada only. *See DN-5497 and DN-60629.*

ISO-X(A): Isolator module. *See DN-2243.*

ISO-6(A): Six fault isolator module. *See DN-60844.*

XP6-C(A): FlashScan six-circuit supervised control module. *See DN-6924.*

XP6-MA(A): FlashScan six-zone interface module; connects intelligent alarm system to two-wire conventional detection zone. *See DN-6925.*

XP6-R(A): FlashScan six-relay (Form-C) control module. *See DN-6926.*

XP10-M(A): FlashScan ten-input monitor module. *See DN-6923.*

ENCLOSURES, CHASSIS, AND DRESS PLATES

CAB-4 Series Enclosure: NFS2-3030 mounts in a standard CAB-4 Series enclosure (available in four sizes, "A" through "D"). Backbox and door ordered separately; requires BP2-4 battery plate. A trim ring option is available for semi-flush mounting. *See DN-6857.*

EQ Series Cabinets: EQ series cabinets will house amplifiers, power supplies, battery chargers and control modules. EQ cabinets are available in three sizes, "B" through "D". *See DN-60229.*

CAB-BM Marine System: Protects equipment in shipboard and waterfront applications. Order CPU2-3030D-M; for non-English marine applications order CPU2-3030D and appropriate KP-KIT-XX. Also order **BB-MB** for systems using 100 AH batteries. For a full list of required and optional equipment, *see DN-60688.*

CHS-M3: Mounting chassis for CPU2-3030. One required for each CPU2-3030D/3030ND.

DP-DISP: Dress panel for top row in cabinet with CPU2-3030D installed.

DP-1B: Blank dress panel. Provides dead-front panel for unused tiers; covers DAA2/DAX series or AA-series amplifier. *See DN-7046.*

CHS-BH1: Battery chassis; holds two 12.0 AH batteries. Mounts on the left side of DAA2 chassis. *See DN-7046.*

CA-1: Chassis, occupies one tier of a CAB-4 Series enclosure. The left side accommodates one DVC-EM and a DVC-KD (optional); and the right side houses a CMIC-1 microphone and its well (optional). *See DN-7045.*

CA-2: Chassis assembly, occupies two tiers of a CAB-4 Series enclosure. The left side accommodates one DVC-EM mounted on a half-chassis and one NFS2-3030 or NCA-2 mounted on a half-chassis. The right side houses a microphone/handset well. The CA-2 assembly includes CMIC-1 microphone. ADDR Series doors with two-tier visibility are available for use with the CA-2 configuration: ADDR-B4, ADDR-C4, ADDR-D4 (below).

ADDR-B4*: Two-tier-sized door designed for use with the CA-2 chassis configuration. ADDR Series doors are similar to CAB-4 Series "DR" doors, but a clear window space exposes the top two tiers of the CAB-4 enclosure. Use an SBB-B4 backbox with the ADDR-B4. *See DN-7045, DN-6857.*

ADDR-C4*: Three-tier-sized door designed for use with the CA-2 chassis configuration. ADDR Series doors are similar to CAB-4 Series "DR" doors, but a clear window space exposes the top two tiers of the CAB-4 enclosure. Use an SBB-C4 backbox with the ADDR-C4. *See DN-7045, DN-6857.*

ADDR-D4*: Four-tier-sized door designed for use with the CA-2 chassis configuration. ADDR Series doors are similar to CAB-4 Series "DR" doors, but a clear window space exposes the top two tiers of the CAB-4 enclosure. Use an SBB-D4 backbox with the ADDR-D4. *See DN-7045, DN-6857.*

* Note: Use ADDR-B4/C4/D4 when CA-2 chassis is installed in top two rows with NCA-2 or BP-CA2. Use standard door when CA-2 is not installed in top two rows. For additional configuration information, see the DVC application guide on <http://esd.notifier.com>.

DPA-1: Dress panel, used with the CA-1 chassis when configured with a DVC-EM, DVC-KD, and CMIC-1. *See DN-7045.*

DPA-2: Dress Panel used with the CA-2 chassis assembly.

DPA-1A4: Dress panel, used with the CA-1 chassis when the CMIC-1 is not used. Provides mounting options on right two bays for two ACS annunciators, or for blank plates. *See DN-7045.*

ADP-4B: Annunciator dress plate. Mounts in rows 2, 3 or 4 of a CAB-4 series enclosure. Used with ACS series annunciators.

BMP-1: Blank module for unused module positions.

DP-1B: Blank dress panel. Provides dead-front panel for unused tiers; covers DAA2/DAX series or AA-series amplifier.

BP2-4: Battery plate, required.

CHS-4L: Low-profile four-position Chassis. Mounts two AA-30 amplifiers.

CHS-4N: Chassis for mounting up to four APS-6Rs.

CHS-6: Chassis used with the XP6 and XP10 Multi-Modules. Mounts up to six modules in any CAB-4 series row.

NFS-LBB: Battery Box. The NFS-LBB is used to mount up to two 55 AH batteries. Dimensions: Box: 24" (610 mm) wide x 14" (356 mm) high x 7.75" (197 mm) deep. Door: 24.125" (613 mm) wide x 14.25" (362 mm) high; door adds 0.0625" (approx. 1.6 mm) to depth.

BACKBOXES

NOTE: "C" suffix indicates ULC-Listed model.

ABF-1B(C) Annunciator Flush Box

ABF-1DB(C) Annunciator Flush Box with Door. UL/ULC Listed.

ABF-2B Annunciator Flush Box

ABF-2DB(C) Annunciator Flush Box with Door

ABF-4B Annunciator Flush Box

ABS-1TB(C) Annunciator Surface Box

ABS-1B(C) Annunciator Surface Box

ABS-2B Annunciator Surface Box

ABS-2D(C) Annunciator Surface Box

ABS-4D(C) Annunciator Surface Box

BB-100: Backbox for batteries and power supplies. The BB-100 mounts up to two 100 AH batteries and power supply, if needed. 30" (76.20 cm) wide x 25" (63.50 cm) high x 7.5" (19.05 cm) deep; depth includes door.

BB-200: Backbox for batteries and power supplies. Holds up to four 100 AH batteries (200 AH capacity) and power supply. 30" (76.20 cm) wide x 36" (91.44 cm) high x 7.5" (19.05 cm) deep; depth includes door.

BB-UZC: Backbox for housing the UZC-256 for applications where the UZC will not fit in panel enclosure. Black; for red, order BB-UZC-R. *See DN-3404.*

SEISKIT-CAB: Seismic mounting kit. Required for seismic-certified applications with NFS2-3030 and other equipment in CAB-4 Series Enclosures. Includes battery bracket for two 26 AH batteries.

SEISKIT-LBB: Seismic kit for the NFS-LBB. Includes battery bracket for two 55 AH batteries.

OTHER OPTIONS

411: Slave digital alarm communicator. *See DN-6619.*

411UDAC: Digital alarm communicator. *See DN-6746.*

IPDACT-2, IPDACT Internet Monitoring Module: Connects to primary and secondary DACT telephone output ports for internet communications over customer-provided Ethernet connection. Requires compatible Teldat VisorALARM Central Station Receiver. Can use DHCP or static IP. *See DN-60408.*

IPCHSKIT: IP Communicator Chassis Mounting Kit. For mounting an IPDACT-2/2UD onto the panel chassis or CHS-4 series chassis. Use IPENC for external mounting applications.

IPSPLT: Y-adaptor option allow connection of both panel dialer outputs to one IPDACT-2/2UD cable input.

IPENC: External enclosure for IPDACT, includes IPBRKT mounting bracket; Red; for black, order IPENC-B.

HWF2V-COM: LTE Digital Cellular Fire Alarm Communicator and Internet Panel, Verizon LTE / IP. Provides selectable configurable paths: cellular only, IP only, or IP primary with cellular backup. Connects to the primary and secondary ports of a DACT. *See DH-62010.* (For Canadian applications order IPGSM-4GC. *See DH-60771.*)

HWF2A-COM: LTE Digital Cellular Fire Alarm Communicator and Internet Panel, AT&T LTE / IP. Provides selectable configurable paths: cellular only, IP only, or IP primary with cellular backup. Connects to the primary and secondary ports of a DACT. (For Canadian applications order IPGSM-4GC. *See DH-60771.*)

NOTE: For other options including compatibility with retrofit equipment, refer to the panel's installation manual, the SLC manual, and the Device Compatibility Document.

SPECIFICATIONS

SYSTEM CAPACITY

- Intelligent Signaling Line Circuits..... 1 expandable to 10
- Intelligent detectors 159 per loop
- Addressable monitor/control modules 159 per loop
- Programmable software zones over 2000
- ACS annunciators
per CPU2-3030..... 32 address x 64 or 96 points
NOTE: The CPU2-3030 can support up to 96 annunciator address points per ACM-24AT/-48A.

ELECTRICAL SPECIFICATIONS

Primary Input Power:

- AMPS-24: 110-120 VAC, 50/60 Hz, 4.5 A maximum.
- AMPS-24E: 240 VAC, 50/60 Hz, 2.25 A maximum.

DC Output:

- Main 24 VDC: Up to 5.0 A
- Aux 24 VDC: Up to 5.0 A
- 5 VDC: Up to 0.15 A.

Current draw (Standby/Alarm):

- CPU2-3030D board: 0.340 A.
- CPU2-3030ND board: 0.120 A.
- LCM-320: 0.130 A.
- LEM-320: 0.100 A.
- AMPS-24(E)*: 0.13 A.
(Draws power from secondary power source only.)

NOTE: See AMPS-24(E) Manual 51907 for a complete current draw calculation sheet and details of input and output values.

Battery charger range: 7 AH – 200 AH. Use separate cabinet for batteries over 26 AH.

Float Rate: 27.6 V.

SHIPPING WEIGHT

- CPU2-3030D: 5.95 lb (2.70 kg).
- CPU2-3030ND: 2.90 lb (1.32 kg).

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL Listed:** S635.
- **ULC Listed:** S527-11.
- **MEA:** 232-06-E.
- **Fire Dept. of New York:** COA#6211.
- **CSFM:** 7165-0028:0224 (Commercial).
- **FM Approved.**
- **FM6320 Approved.** Class 6320 for Gas Detection.
- **City of Chicago.**
- **City of Denver.**
- **Singapore Productivity and Standards Board (PSB).**
- CCCF listed.
- **Fire Services Department (Hong Kong).**

Marine Applications: Marine approved systems must be configured using components itemized in this document. (See Main System Components, in "Product Line Information.") Specific connections and requirements for those components are described in the installation document, PN 54756. When these requirements are followed, systems are approved by the following agencies:

- **US Coast Guard** 161.002/55/0 (Standard 46 CFR and 161.002).
- **Lloyd's Register** 11/600013 (ENV 3 category).
- **American Bureau of Shipping (ABS)** Type Approval.

NOTE: For information on marine applications, see DN-60688.

STANDARDS

The NFS2-3030 complies with the following UL Standards and NFPA 72, International Building Code (IBC), and California Building Code (CBC) Fire Alarm Systems requirements:

- **UL 864** (Fire).
- **UL 1076** (Burglary).
- **UL 2572** (Mass Notification Systems). (NFS2-3030 version 20 or higher)
- **ULC-S527-11** Standard for the Installation of Fire Alarm Systems.
- **LOCAL** (Automatic, Manual, Waterflow and Sprinkler Supervisory).
- **AUXILIARY** (Automatic, Manual and Waterflow) (requires TM-4).
- **REMOTE STATION** (Automatic, Manual, Waterflow and Sprinkler Supervisory) (requires TM-4).
- **PROPRIETARY** (Automatic, Manual, Waterflow and Sprinkler Supervisory). *Not applicable for FM.*
- **EMERGENCY VOICE/ALARM.**
- **OT, PSDN** (Other Technologies, Packet-switched Data Network).
- **IBC 2012, IBC 2009, IBC 2006, IBC 2003, IBC 2000** (Seismic).
- **CBC 2007** (Seismic).



This document is not intended to be used for installation purposes.
We try to keep our product information up-to-date and accurate.
We cannot cover all specific applications or anticipate all requirements.
All specifications are subject to change without notice.

NOTIFIER

12 Clintonville Road
Northford, CT 06472
203.484.7161
www.notifier.com

NOTIFIRE[®]NET[™] and ONYXWorks[™] are trademarks; and FlashScan[®], NOTIFIER[®], ONYX[®], SWIFT[®], VeriFire[®] Tools, VESDA[®], and VIEW[®] are all registered trademarks of Honeywell International Inc.
©2019 by Honeywell International Inc. All rights reserved. Unauthorized use of this document is strictly prohibited.

Country of Origin: USA





ZOOM COLLABORATION SYSTEMS

DESIGN GUIDE

Extron

THE POWER OF COLLABORATION

Organizations are continually rethinking how to best leverage space and technology to enable their workforce to collaborate. Along with the rising demand for collaboration comes the need for properly designed and equipped meeting spaces. Businesses seek technology solutions to help them meet the demand while also making efficient use of their available floorspace. In addition to updating existing conference rooms and boardrooms, technology can be used to transform unused office areas into open meeting spaces and huddle rooms. Options like these enable more productive meetings and provide areas that are frequently used by groups for quick meetings and project collaboration.

Extron has teamed up with Zoom Video Communications to extend our Pro Series control capabilities to any Zoom Room. With Extron control for Zoom Rooms, a single user interface on your Apple iPad or Extron Pro Series touchpanel is all you need to control every conferencing and audiovisual function in your room. Extron and Zoom have simplified the conferencing experience and provide turn-key, centralized control of AV devices, shades, lighting, audio, and much more.

Extron and **zoom**



KEYS TO SUCCESSFUL COLLABORATION SYSTEMS

Extron collaboration technology supports the modern workspace by creating meeting rooms that are easy to use, schedule, and manage remotely. In addition, we have the system design experience, customer support, and enterprise software solutions to help ensure your success. Whether designing a large conference room, a training room, or smaller huddle spaces, it's critical to provide the right communication and collaboration technology to simplify and enhance meetings.

A successful collaboration technology plan should support these key capabilities:

- **Scalable Solutions** – The technology solution must be customizable to meet the needs of various collaboration spaces from the smallest and simplest to larger and more complex.
- **Intuitive Operation** – Users must be able to enter the space and get going immediately without any training on the system.
- **Flexible Capabilities** – Users should be able to easily share the content from their laptops, tablets or phones with a wired or wireless connection.
- **Secure Network Connectivity** – To support scalability to dozens or hundreds of rooms in the enterprise, systems must be network connected to provide remote support, monitoring and firmware updates.





POWERFUL MANAGEMENT TOOLS

Integrated meeting solutions from Extron combine application-specific hardware along with powerful AV resource management tools. We offer a complete AV technology platform that makes meetings more productive and optimizes use of available resources. This combination further enhances collaboration by delivering connected meeting spaces with automated functionality, consistent user experiences, and convenient room scheduling.

- **Extron Room Scheduling** simplifies the room booking experience. Elegant TouchLink Scheduling panels connect directly to popular calendar services for simple and convenient room booking. *For more information on Extron Room Scheduling, see page 6.*
- **Extron GlobalViewer Enterprise** is a powerful tool that allows efficient management, monitoring, and control of AV systems across the entire enterprise. The integrated Help Desk displays a detailed view of room and equipment status for convenient remote support. *For more information on GlobalViewer Enterprise, see page 8.*





ROOM SCHEDULING SYSTEMS

Book a Room the Easy Way

In today's business environment, meeting rooms are in high demand, and finding an available space can be a time-consuming experience. We have simplified the room booking experience with Extron Room Scheduling.

This stand-alone system consists of elegantly-designed TouchLink

Scheduling panels that connect directly to Microsoft Exchange, Office 365, Google Calendar, EMS, or 25Live.

Users can make reservations directly from these panels, a computer, or any smartphone or tablet that connects to any one of the supported mail servers.



Conference Room 401
Available

Reserve

February 5, 9:24am

9:30 10am 10:30 11pm 11:30 12pm 12:30 ...

Extron

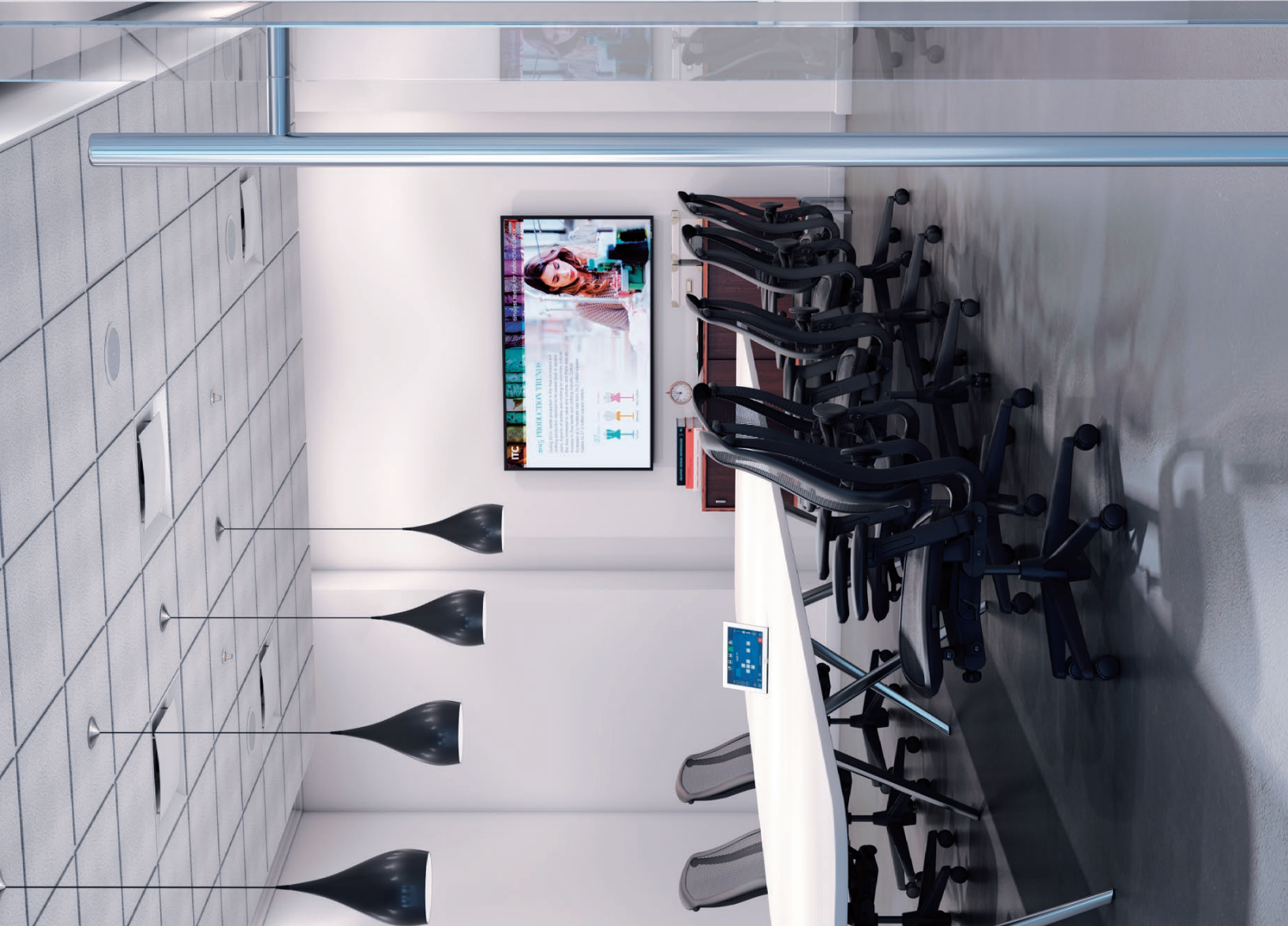
ITC

2015 PEDIACTIVA THINKS

Leading the way in digital marketing for the health and pharmaceutical industry. We help you reach your target audience through a combination of traditional and digital marketing channels. Our expertise includes:

- Brand positioning and strategy
- Content marketing and social media
- Search engine optimization (SEO)
- Display advertising and retargeting
- Mobile marketing and app development
- Analytics and reporting

Contact us today to learn more about our services and how we can help you achieve your marketing goals.



GLOBALVIEWER ENTERPRISE

AV Resource Management

GlobalViewer Enterprise software simplifies AV system resource management with intuitive control for hundreds of common AV tasks. Whether you're working with 5 or 5000 rooms, GVE provides a powerful, flexible way to manage, monitor, and control nearly any device over a standard network. It's quite common for corporations, universities, and government agencies to have hundreds of collaboration spaces spread over broad areas. GVE allows you to manage this ever-increasing AV technology while effectively leveraging valuable help desk resources. The Help Desk view in GVE provides all the information you need from the entire enterprise or campus, all in one easy-to-navigate interface.



GLOBALVIEWER ENTERPRISE FEATURES

Designed to Enhance Productivity



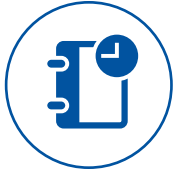
REMOTE HELP DESK

The Help Desk view provides a balance between power and usability. Easily navigate between rooms, manage each system with multiple tools, remotely interact with the Extron control products using visual representations, and see system notifications all within one view.



TRACK AND ANALYZE USAGE TRENDS

Reporting tools help you make informed decisions about inventory and maintenance plans. View device and room usage trends to help improve equipment standardization across rooms, identify energy usage forecasts, and maintain inventory lists.



SIMPLIFY TASKS WITH SCHEDULES

It's easy to create schedules based on location or device type. Set a global schedule to turn off all displays in an entire building at the end of the day, schedule multiple actions to lock the front panel of multiple controllers, or schedule reminders for maintenance and support tasks.



CREATE USER ROLES FOR ALL TEAM MEMBERS

GlobalViewer Enterprise minimizes the burdens of user administration. By simplifying access control for team members and creating custom user roles, administrators can easily govern security policies while still allowing users or user groups access to the specific features they need.



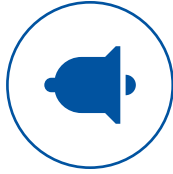
MONITOR THE STATUS OF AV EQUIPMENT

Proactively monitor the status of AV equipment based on locations or device types throughout the enterprise. Get detailed email or text alerts on projector lamp life or if a device unexpectedly goes offline. Enhanced monitoring and scheduling tools provide significant time and cost savings.



USE FACILITY SCHEDULING SYSTEMS

Instantly access room scheduling and availability for popular facility scheduling applications including Microsoft Exchange, Office 365, iCalendar, Google Calendar, CollegenET R25, and 25Live.



CONVENIENT NOTIFICATIONS

Simplify operations with notifications that appear in the Help Desk view. Get status notification of your system configuration import or re-import, devices, controllers, and additional system events. These notifications and event logs add insight into system monitoring and help maximize efficiency.

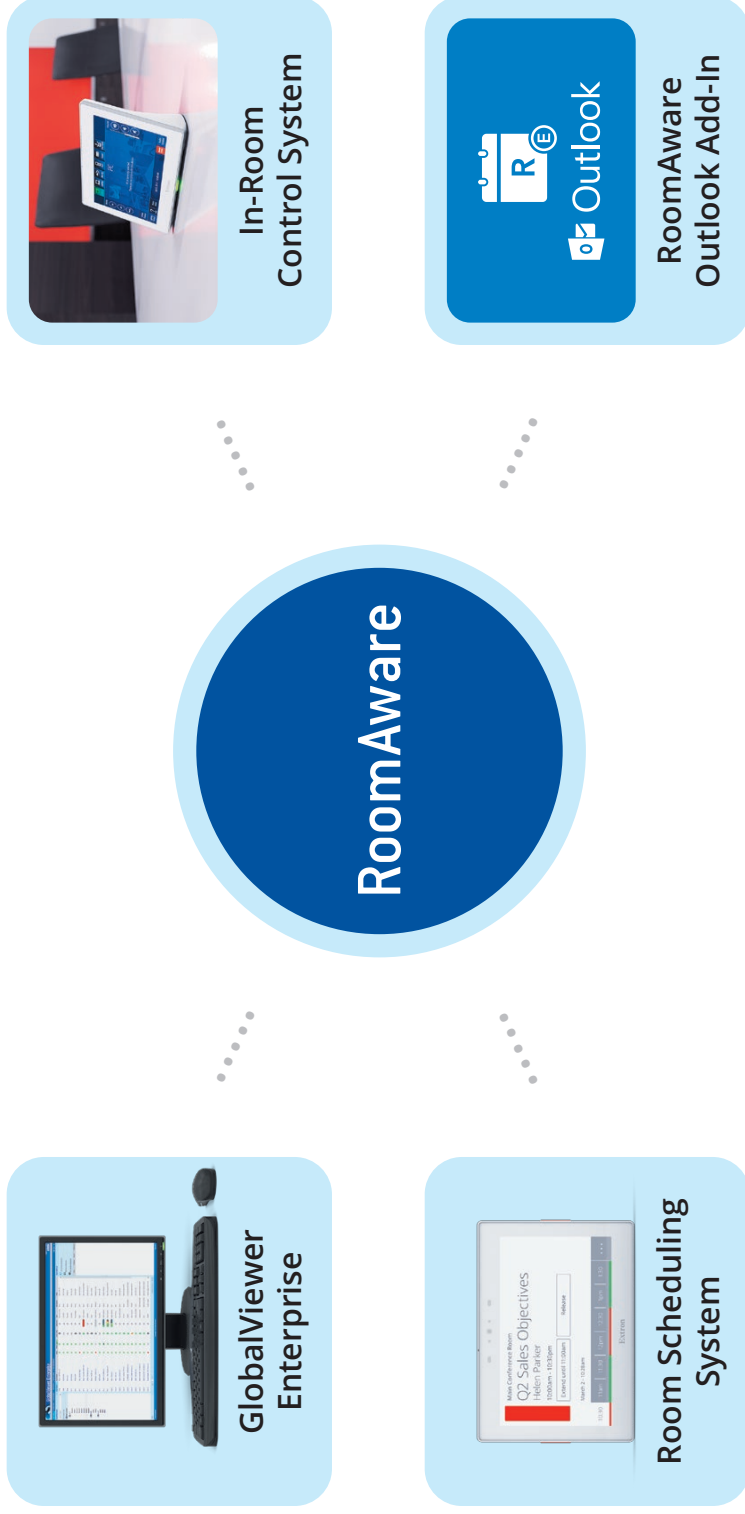


iGVE MOBILE APP

Use the iGVE App to effectively manage and control AV installations on-the-go from Apple iPad, iPhone, and iPod touch devices.

RoomAware

Automation for the Modern Workspace



Extron RoomAware Workspace Automation is a suite of time-saving features that anticipate user needs and intelligently deliver room automation and control across the enterprise. RoomAware enables smart connections between Extron devices and services to save valuable time by preparing the room for the participant prior to their arrival.

SEAMLESS INTEGRATION WITH LEADING UNIFIED COMMUNICATIONS TECHNOLOGIES

Extron has developed the technology to integrate with the leading UC solution providers, providing a one-touch user experience for conferencing, collaboration, and control. Through our partnerships, we can extend Extron control capabilities to spaces that use Zoom, Cisco, Logitech, and many other popular providers. We offer complete system integration for convenient, centralized control of conferencing systems, audio, video, lighting, window shades, and much more.

zoom

logitech



Google



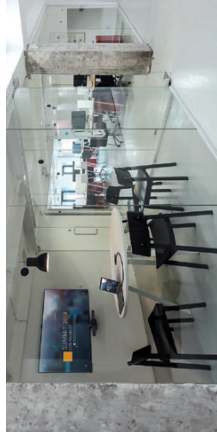
StarLeaf





EXTRON MEETING SPACE DESIGN SOLUTIONS

Collaboration spaces run the gamut from small collaboration spaces and conference room systems, to large-scale AV distribution systems. Rarely, if ever, is a presentation system limited to a single source and a single display, connected with one HDMI cable. Even the smallest AV system design generally includes a variety of signal types and resolutions. The following designs represent a cross-section of typical collaboration spaces and applications. System drawings depict the sources and displays, signal flows between them, and a recommended approach for an effective system design.



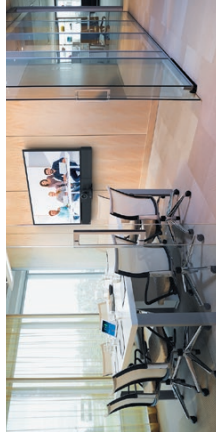
HUDDLE SPACE – PAGE 16

BYOD Zoom Conferencing, Wireless Presentation, Sound Reinforcement, Digital Signage, Up to 4 People



HUDDLE ROOM WITH LOGITECH TAP – PAGE 18

Sound Reinforcement, Device Control, Up to 4 People



MEETING ROOM – PAGE 20

AV Switching, Signal Extension, Sound Reinforcement, Device Control, Up to 8 People



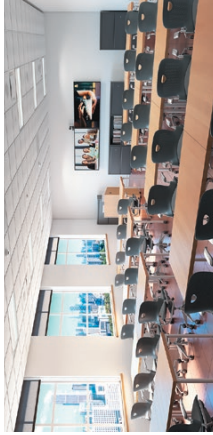
CONFERENCE ROOM – PAGE 22

Wireless Presentation, Signal Extension, Sound Reinforcement, Device Control, Up to 12 People



LARGE CONFERENCE ROOM – PAGE 24

AV Switching, Signal Extension, Sound Reinforcement, Device Control, Up to 16 People



TRAINING ROOM – PAGE 26

AV Switching, Signal Extension, Sound Reinforcement, Device Control, Up to 40 People



CLASSROOM WITH RECORDING – PAGE 28

AV Switching, Signal Extension, Sound Reinforcement, Device Control, Up to 30 People

HUDDLE SPACE



SPACE REQUIREMENTS

The huddle room is designed for a small group of team members to concentrate on the specific details of a project without the distractions that often occur in an open office. The space is smaller than a typical meeting room, accommodating just a few people. A minimalist technology approach is taken within these rooms. This system is managed over the network and supports a wide variety of smartphones, tablets, and laptops. An Extron ShareLink wireless presentation system enables secure connection to the display and prevents unauthorized access to the corporate network.

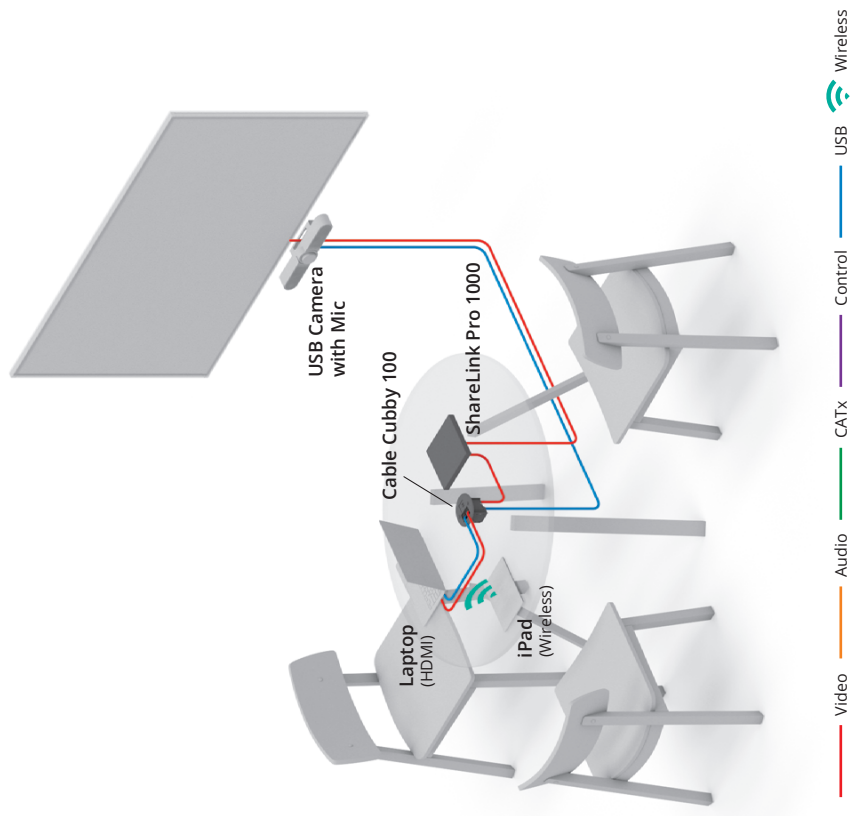
EXTRON EQUIPMENT LIST

	Qty.
ShareLink Pro 1000	1
HDMI Pro Cable	1
Cable Cubby 100 USB	1
Cable Cubby 100 Switch Kit	1
HDMI SM Cable	1
Wireless and Wired Presentation System	1
4K Premium High Speed HDMI Cable	1
Cable Access Enclosure for Connectivity & Power	1
Switch for Cable Cubby 100	1
HDMI Show Me Cable	1

HUDDLE SPACE

CAPABILITIES

- Supports Zoom conferencing on your own device
- Basic display control is provided by the Extron ShareLink Pro 1000 either by a button press or via signal detection by utilizing HDMI-CEC
- Wirelessly share content from mobile devices utilizing Extron ShareLink Pro 1000
- Supports Mac® and Windows® computers as well as Apple® and Android™ tablets and smartphones
- Simple presentation with Show Me button on HDMI input cable
- Easily switch between wired and wireless sources by pressing a button on the Cable Cubby



Huddle Room with Logitech Tap



SPACE REQUIREMENTS

Huddle rooms with video conferencing capability enable collaboration with team members at different geographical locations. This system uses Logitech® Tap for Zoom, taking advantage of the intuitive touch control interface and transforming this workspace into a Zoom Room with one-touch join. The system also supports wireless (Direct Share) and wired (HDMI) content sharing and center of room control. In addition, this system provides convenient HDMI connectivity at the table. Cable management and AC power provide easy accessibility. A Logitech MeetUp Camera is mounted below the display. AV signals are sent from the Tap through a NUC and Extron HD CTL 100 Workspace Controller together with the OCS 100C to the display, enabling automatic display control whenever the room is occupied.

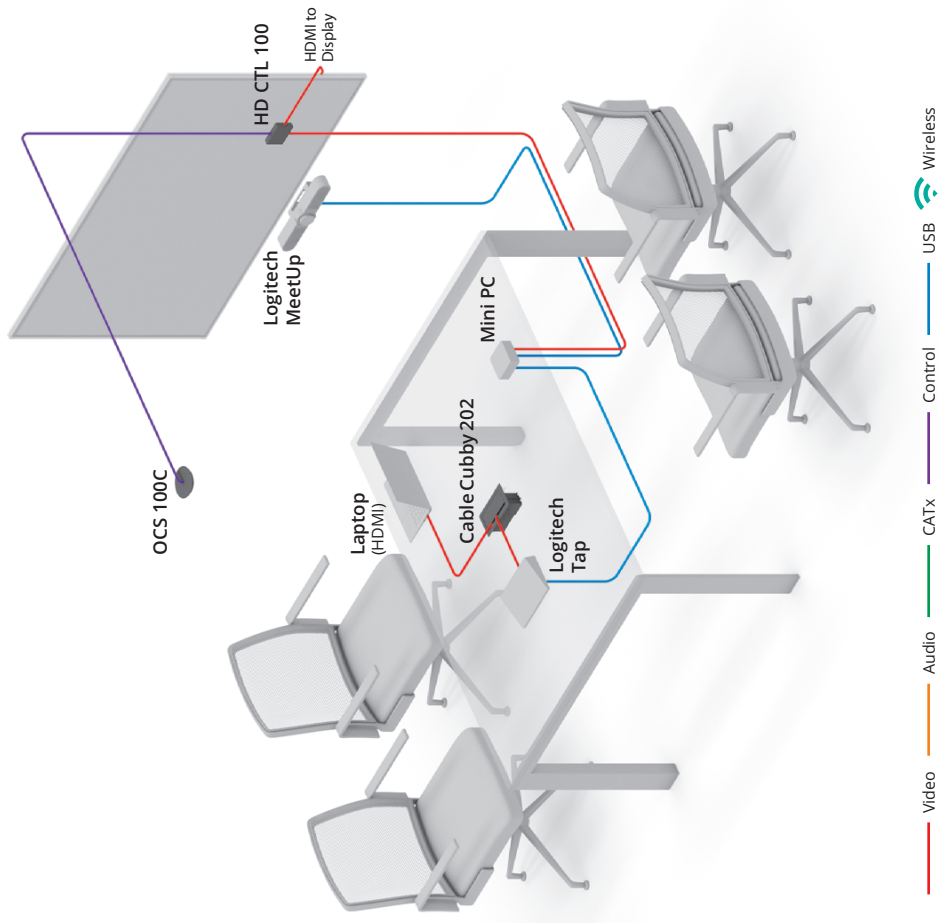
EXTRON EQUIPMENT LIST

	Qty.
Cable Cubby 202	1
Retractor HDMI	1
Retractor Network	1
Retractor DC	1
HD CTL 100	1
OCS 100C	1
Cable Access Enclosure for Connectivity & Power	1
Cable Retraction System - HDMI	1
Cable Retraction System - Network CAT 6	1
Cable Retraction System - DC Power	1
Workspace Controller	1
Occupancy Sensor - Ceiling Mount	1

Huddle Room with Logitech Tap

CAPABILITIES

- Connect with team members using Logitech Tap for Zoom Rooms System soft codec
- Cable Cubby 202 provides easy access to cables and AC power with an elegant, finished appearance
- Supports convenient connection of HDMI-equipped devices
- Extron OCS 100 occupancy sensor enables Extron HD CTL 100 to automatically start the system along with providing control of the display via HDMI-CEC
- Switch easily between local presentation or conferencing



MEETING ROOM



SPACE REQUIREMENTS

A meeting room with video conferencing offers more functionality and space than typical huddle rooms, and enables presenters to share content with remote team members. This system combines Zoom Room System conferencing with intuitive AV system control. The switching system supports HDMI, USB-C, and VGA at the table plus control of the display. A USB microphone and soundbar provide room audio and a Logitech Rally camera is mounted below the display. The microphone, camera, and display are connected to the resident PC running the Zoom Rooms application. The soundbar receives the de-embedded audio signal from the HAE 100 4K. The room also features cable management and AC power connectivity at the table, and USB extension for the microphone.

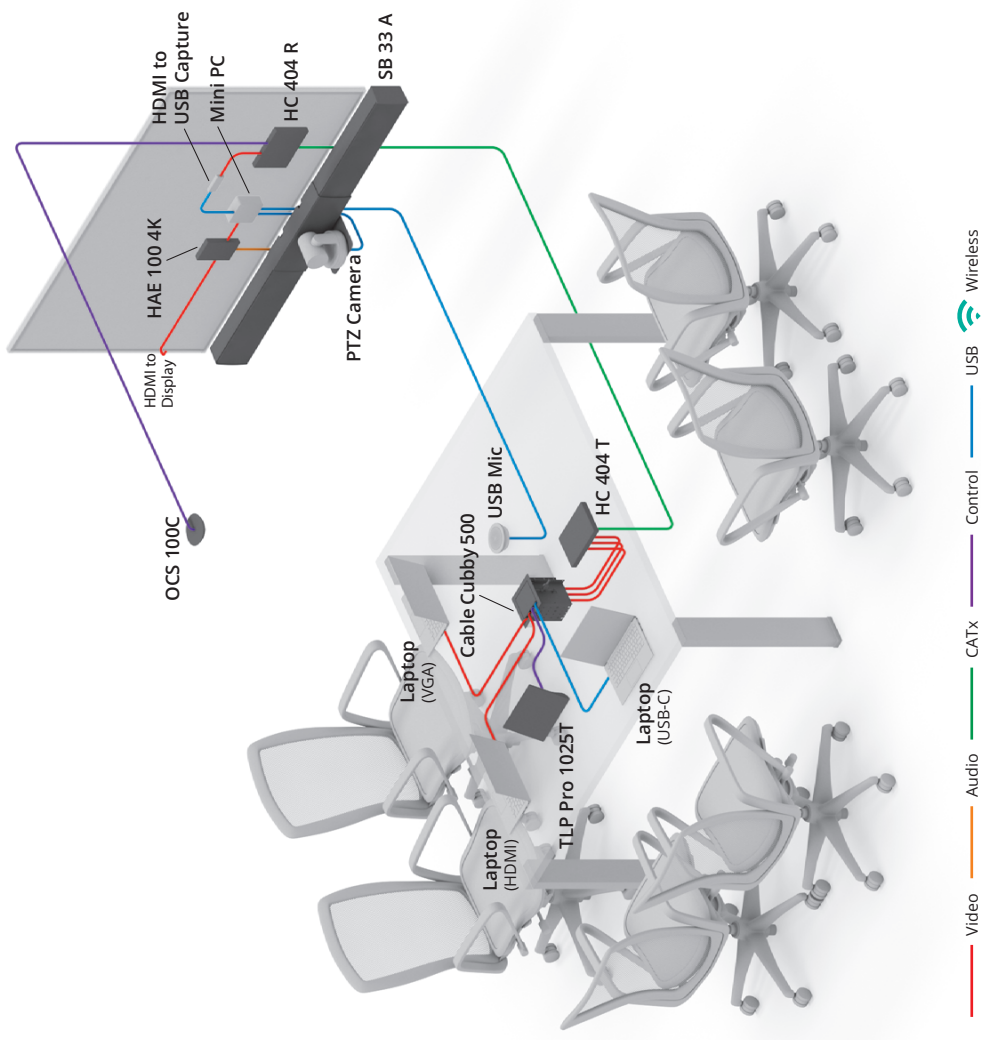
EXTRON EQUIPMENT LIST

	Qty.
TLP Pro 1025T	1
HC 404 with Zoom	1
HAE 100 4K	1
SB 33 A 75-80	1
Cable Cubby 500	1
Retractor HDMI	1
Retractor USB-C - HDMI	1
Retractor VGA	1
AC+USB 311	1
OCS 100C	1
10" Tabletop TouchLink Pro Touchpanel	1
Meeting Collaboration System - Zoom Room	1
HDMI Audio De-Embedder	1
Adjustable Sound Bar for 75" to 80" Display	1
Cable Access Enclosure for Connectivity & Power	1
Cable Retraction System - HDMI	1
Cable Retraction System - USB-C - HDMI	1
Cable Retraction System - VGA	1
AC and USB Power Module for Cable Cubby	1
Occupancy Sensor - Ceiling Mount	1

MEETING ROOM

CAPABILITIES

- Connect with team members using the Zoom Room System soft codec
- 10" touch-panel provides control of the Zoom Room System soft codec and well as display and room controls
- Switch easily between local presentation or conferencing
- Extron Cable Cubby 500 provides easy access to cables and AC power with an elegant, finished appearance
- Supports convenient connection of HDMI, USB-C and VGA-equipped devices
- Extron OCS 100 occupancy sensor enables the room's controller to automatically start the system using ethernet control from Extron HC 404 R to display
- Easy integration with Extron GlobalViewer Enterprise for complete AV resource management



CONFERENCE ROOM



SPACE REQUIREMENTS

Conference rooms provide a more formal setting for meetings and collaboration. Accommodating up to a dozen people or more, they are larger than typical meeting rooms and are generally equipped for multi-purpose gatherings. This system supports one HDMI at the table and BYOD wireless source connections with the ShareLink Pro 1000. It includes TLP Pro 1025T device control and a Cable Cubby 100 for cable and AC power management. CATx cable is used for signal transmission within the room. Rooms of this size require an audio system for sound reinforcement and the SF 26 CT ceiling speakers deliver consistent sound levels across the entire listening area.

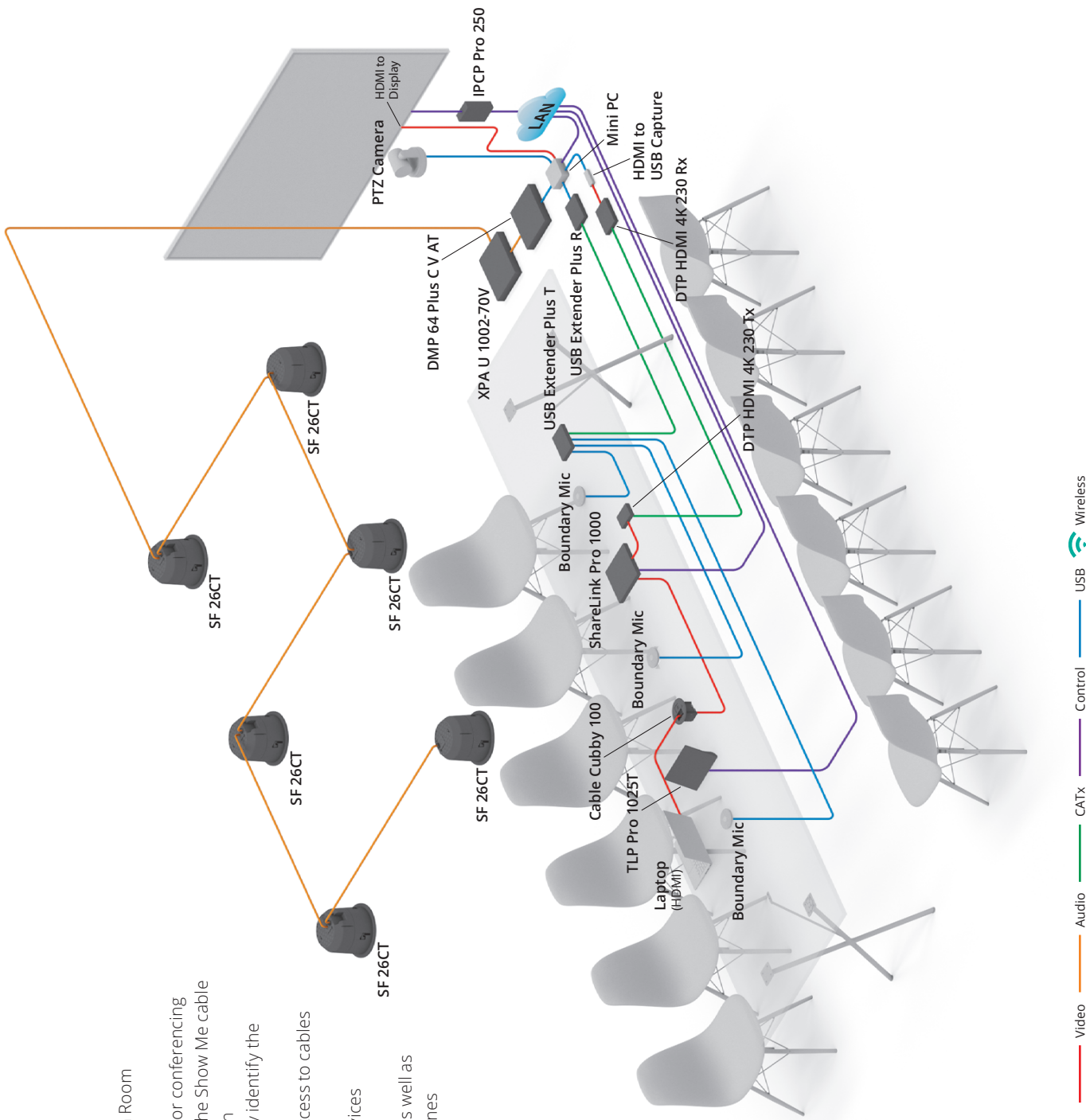
EXTRON EQUIPMENT LIST

		Qty.
ShareLink Pro 1000	Wireless and Wired Presentation System	1
Cable Cubby 100 USB	Cable Access Enclosure for Connectivity & Power	1
DMP 64 Plus C V AT	6x4 Digital Matrix Processor w/ AEC, VoIP, & Dante	1
XPA U 1002-70V	Two Channel Amplifier, 100 watts at 70 volts	1
SF 26CT	6.5" Two-Way Ceiling Speakers, 70/100V, Pair	3
IPCP Pro 250	IP Link Pro Control Processor	1
TLP Pro 1025T	10" Tabletop TouchLink Pro Touchpanel	1
USB Extender Plus T	Twisted Pair Extender Transmitter	1
USB Extender Plus R	Twisted Pair Extender Receiver	1
DTP HDMI 4K 230 Tx	DTP Transmitter for HDMI	1
DTP HDMI 4K 230 Rx	DTP Receiver for HDMI	1

CONFERENCE ROOM

CAPABILITIES

- Connect with team members using Zoom Room conferencing
- Switch easily between local presentation or conferencing
- Simple and intuitive operation: Connect the Show Me cable to your device and press the Share button
- Share button lights as it switches to easily identify the connected source device
- Extron Cable Cubby 100 provides easy access to cables while providing USB charging
- Wirelessly share content from mobile devices utilizing Extron ShareLink Pro 1000
- Supports Mac and Windows computers as well as Apple and Android tablets and smartphones



LARGE CONFERENCE ROOM



SPACE REQUIREMENTS

This large conference room accommodates up to 20 people and includes Zoom Room conferencing capabilities, enabling team members in remote locations to participate in meetings. The room includes advanced control capabilities and can be used for collaboration, presentations, and video conference calls. This system supports connection of four HDMI sources at the table. It includes dual displays, touchpanel control, a resident PC for Zoom Room conferencing as well as cable and AC power management. The room size requires an audio system with full-range, ceiling mounted speakers for sound reinforcement.

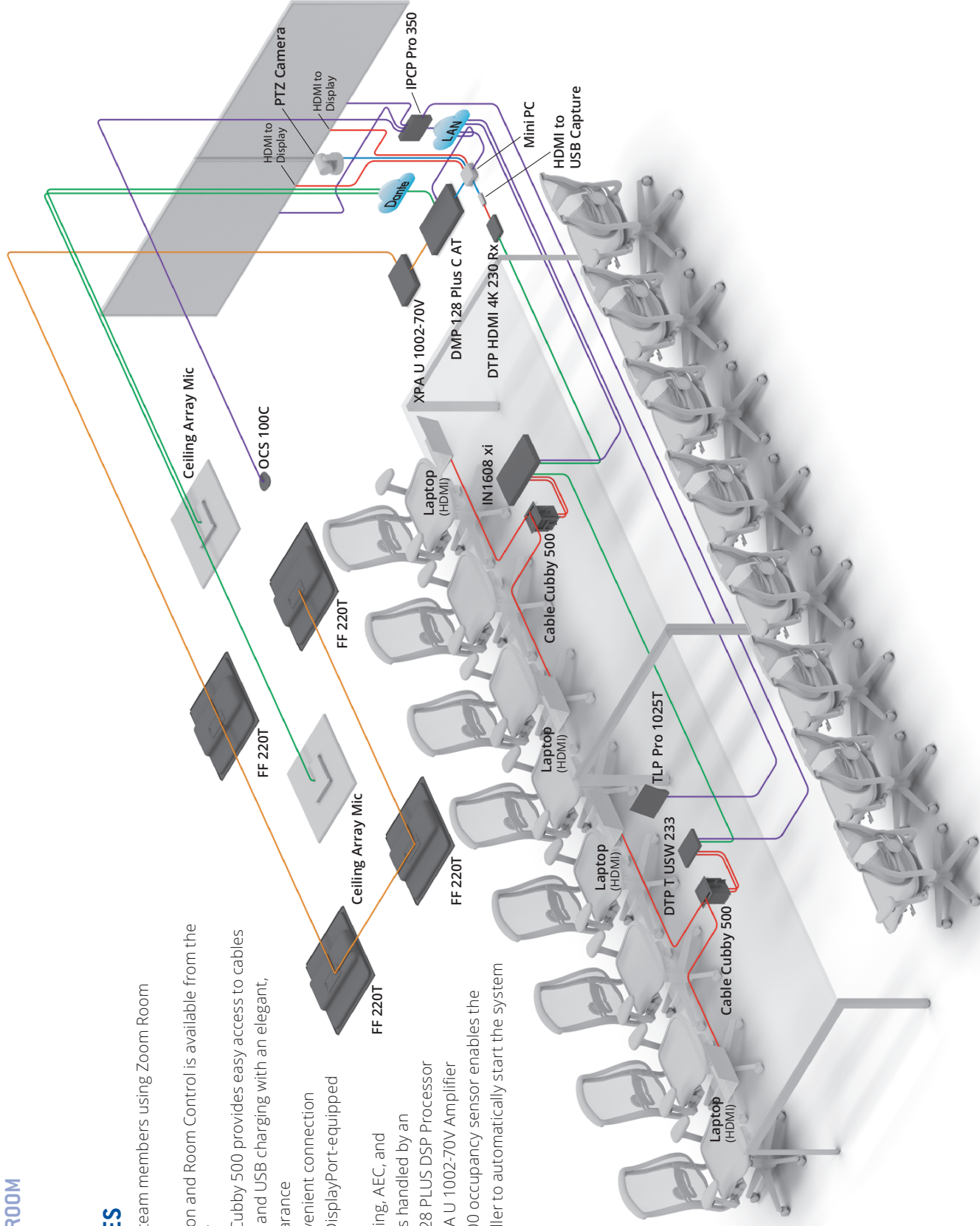
EXTRON EQUIPMENT LIST

	Qty.
Cable Cubby 500	2
AC+USB 311	2
IPCP Pro 350	1
OCS 100C	1
DMP 128 PLUS CAT	1
XPA U 1002-70V	1
FF 220T	2
TLP Pro 1025T	1
DTP T USW 233	1
IN1608 xi	1
DTP HDMI 4K 230 Rx	1
Cable Access Enclosure for Connectivity & Power	2
AC and USB Power Module for Cable Cubby	2
IP Link Pro Control Processor	1
Occupancy Sensor - Ceiling Mount	1
Audio DSP Processor with AEC and Dante	1
Two Channel Amplifier, 100 watts at 70 volts	1
Full-Range Flat Field Speakers with 70V Transformer	2
10" Tabletop TouchLink Pro Touchpanel	1
Three Input Switcher with DTP Transmitter	1
Eight Input Switcher with DTP Extension	1
DTP Receiver for HDMI	1

LARGE CONFERENCE ROOM

CAPABILITIES

- Connect with team members using Zoom Room conferencing
- Source selection and Room Control is available from the TLP Pro 1025T
- Extron Cable Cubby 500 provides easy access to cables and AC power and USB charging with an elegant, finished appearance
- Supports convenient connection of HDMI and DisplayPort-equipped devices
- Audio Processing, AEC, and amplification is handled by an Extron DMP 128 PLUS DSP Processor and Extron XPA U 1002-70V Amplifier
- Extron OCS 100 occupancy sensor enables the room's controller to automatically start the system



— Video
 — Audio
 — CATx
 — Control
 — USB
 — Wireless

TRAINING ROOM



SPACE REQUIREMENTS

This large training room accommodates up to 40 people and includes Zoom Room conferencing capabilities, enabling team members in remote locations to participate in training or large meetings. The room includes advanced control capabilities and can be used for collaboration, presentations, and video conference calls. This system supports connection of one HDMI source at the lectern. It includes two displays in the front of the room and two displays in the rear of the room, touchpanel control, a resident PC for Zoom Room conferencing as well as cable and AC power management. The room size requires an audio system with full-range, ceiling mounted speakers for sound reinforcement.

EXTRON EQUIPMENT LIST

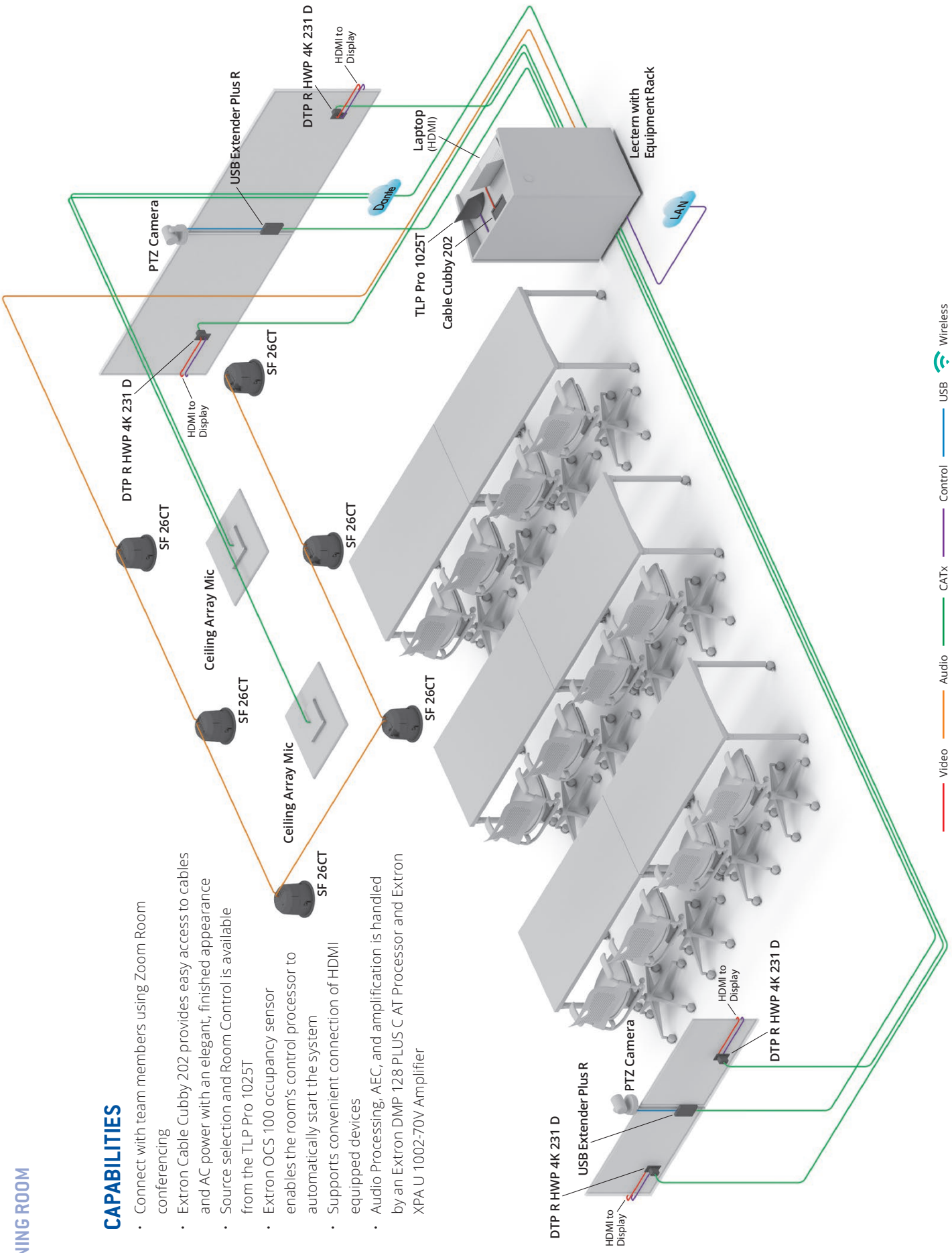
	Qty.
Cable Cubby 202	1
DA2 HD 4K	2
DTP HDMI 4K 230 Tx	4
DTP R HWP 4K 231 D	4
USB Extender Plus T	2
USB Extender Plus R	2
DMP 128 PLUS CAT	1
XPA U 1002-70V	1
SF 26CT	3
IPCP Pro 550	1
TLP Pro 1025T	1

Cable Access Enclosure for Connectivity & Power	1
Two Output HDMI DA	2
DTP Transmitter for HDMI	4
DTP Receiver for HDMI	4
Twisted Pair Extender Transmitter	2
Twisted Pair Extender Receiver	2
Audio DSP Processor with AEC and Dante	1
Two Channel Amplifier, 100 watts at 70 volts	1
6.5" Two-Way Ceiling Speakers, 70/100V, Pair	3
IP Link Pro Control Processor	1
10" Tabletop TouchLink Pro Touchpanel	1

TRAINING ROOM

CAPABILITIES

- Connect with team members using Zoom Room conferencing
- Extron Cable Cubby 202 provides easy access to cables and AC power with an elegant, finished appearance
- Source selection and Room Control is available from the TLP Pro 1025T
- Extron OCS 100 occupancy sensor enables the room's control processor to automatically start the system
- Supports convenient connection of HDMI equipped devices
- Audio Processing, AEC, and amplification is handled by an Extron DMP 128 PLUS C AT Processor and Extron XPA U 1002-70V Amplifier



CLASSROOM WITH RECORDING



SPACE REQUIREMENTS

The Zoom Room includes the capability to record video conference calls, enabling direct integration with enterprise video platforms, publishing live and on-demand video content. The Extron SMP 352 series includes a high-performance recording and streaming processor for capturing and distributing dual AV sources and presentations as recorded media or live streaming. The room includes advanced control capabilities and can be used for collaboration, presentations, and video conference calls. This system supports connection of HDMI sources (one is for the room PC), wireless audio, touchpanel control, a PC for Zoom Room, and cable and AC power management at the lectern. Extron's OCS 100 provides room occupancy sensing to drive room automation. The room size requires an audio system with full-range, ceiling mounted speakers for sound reinforcement.

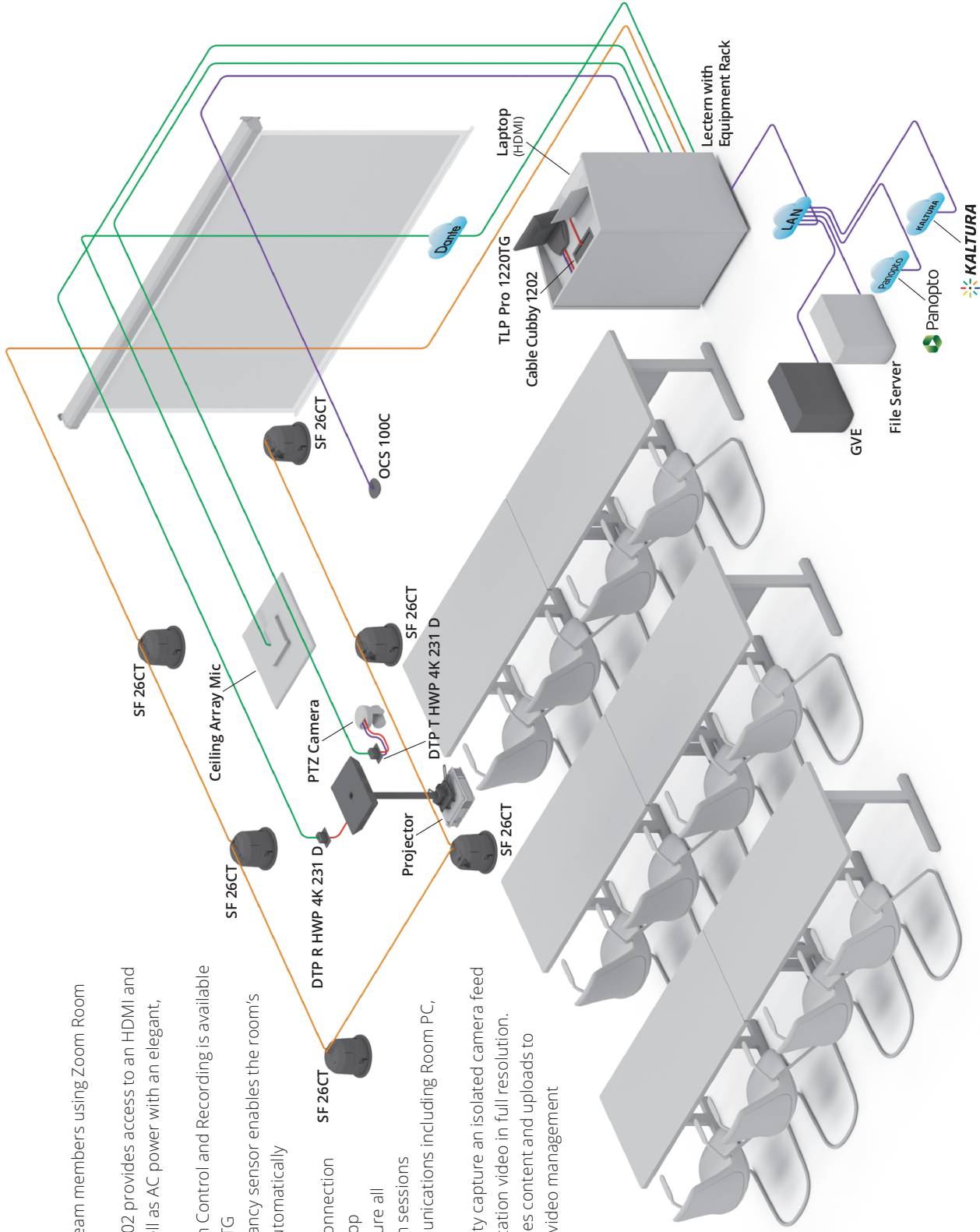
EXTRON EQUIPMENT LIST

	Qty.
SMP 352	Dual Recording H.264 Streaming Media Processor 1
DTP CrossPoint 86 4K	8x6 Scaling Presentation Matrix Switcher with DTP 1
DMP 64 Plus C V AT	Audio DSP Processor with AEC and Dante 1
MediaPort 200	HDMI and Audio to USB Scaling Bridge 1
Cable Cubby 1202	Cable Access Enclosure for Connectivity & Power 1
DTP T HWP 4K 231 D	DTP Transmitter for HDMI 1
DTP R HWP 4K 231 D	DTP Receiver for HDMI 1
SF 26CT	6.5" Two-Way Ceiling Speakers, 70/100V, Pair 3
TLP Pro 1220TG	12" Tabletop TouchLink Pro Touchpanel 1
OCS 100C	Occupancy Sensor - Ceiling Mount 1

CLASSROOM WITH RECORDING

CAPABILITIES

- Connect with remote team members using Zoom Room conferencing
- Extron Cable Cubby 1202 provides access to an HDMI and USB connections as well as AC power with an elegant, finished appearance
- Source selection, Room Control and Recording is available from the TLP Pro 1220TG
- Extron OCS 100 occupancy sensor enables the room's control processor to automatically start the system
- Supports convenient connection of HDMI equipped laptop
- Provides ability to capture all content in room - Zoom sessions along with other communications including Room PC, Laptop, etc.
- Dual recording capability capture an isolated camera feed and a separate presentation video in full resolution.
- Extron SMP 352 captures content and uploads to Kaltura or Panopto for video management



DESIGN CONSIDERATIONS

HOW WILL THE SPACE BE USED?

The function of the space will largely drive the form and configuration it takes. To accommodate impromptu, ad hoc meetings, a seating area with a whiteboard or flat panel display could be all that's needed. Small, informal focused discussions may require an enclosed area along with a way for meeting participants to share ideas using personal devices. For larger gatherings, a formal room equipped with a projector and sound reinforcement may be necessary, so that all participants can be fully engaged in the proceedings. In each of these environments, the inclusion of teleconferencing technology allows meeting participants to be located off site and still collaborate effectively.

WHAT IS THE BUDGET FOR THIS SPACE?

Sound purchasing decisions are driven by return on investment - weighing costs against benefits, and when facing several alternatives, choosing the one that maximizes return. An initial needs assessment should be performed to determine how many collaboration spaces are needed and what is the required functionality to be included in each space, based on the anticipated benefit that the functionality will bring to the organization. The collaboration systems shown in this document have varying levels of features and capabilities to fit a range of budgets – and all are backed by Extron service and reliability regardless of the price.

WHO WILL BE USING THE SPACE?

Effective collaboration spaces need to satisfy the objectives and requirements of meeting participants as well as the organization. Depending on the personnel and their functional roles, meeting space requirements may be different. Customer-facing facilities might merit a higher level of décor and superior audio and video quality. Access levels to the internal network need to be enforced for meetings between outside guests and internal staff. Capabilities such as annotation and ultra high definition displays might be critical for some activities such as engineering and content creation, but may not be required for other activities.

WHAT IS NEEDED IN EACH SPACE?

Choosing collaboration and meeting space equipment depends on room size, how users will share content, whether users will be remotely located, and end user aesthetic and operational preferences. For smaller meeting spaces used exclusively by local personnel, a single display without additional audio equipment could be enough. Larger rooms may require multiple display screens and careful evaluation of audio performance, especially when equipped with video conferencing to accommodate several speakers and microphones.



DESIGN CONSIDERATIONS CONTINUED

HOW WILL THE SPACE BE MANAGED?

Central management of AV system resources across a facility improves ROI at many different levels. Each connected room can be remotely monitored and accessed to provide help desk support in the event users are experiencing difficulties. This offers increased efficiency and minimizes downtime so events in the room can quickly continue as planned. Enterprise asset management tools give at-a-glance equipment status, support convenient event scheduling, and include valuable usage reports that can be used for inventory management, scheduling of maintenance tasks, and future system planning.

USABILITY OF THE SPACE.

When multiple users want to present content on the main display using their personal devices, there must be some way for them to connect to the display and to switch between each user's device. This can be accomplished by connecting physical cables, wirelessly, or by a combination of both for maximum flexibility.

HOW WILL THE SPACE BE OPERATED?

Meeting room technology can be controlled by a variety of methods including physical buttons attached to the equipment, handheld remote controls, touch displays, voice, and automated via occupancy sensors. Each method has its merits in terms of cost, capability, and ease of use. Fully automated rooms are also possible, where the system powers up and configures itself automatically when the meeting starts. For an organization with meeting rooms of varied sizes containing different equipment, a consistent user experience should be maintained. Successful solutions will need to be intuitive and consistent while satisfying the preferences of the users.

CABLE MANAGEMENT WITHIN THE SPACE.

Cable management solutions such as Extron Cable Cubby enclosures and cable retractors help maintain a professional room appearance regardless of whether a wired or wireless presentation is chosen. Although wireless devices don't require a video cable connection to the display, most still require a cable for charging.



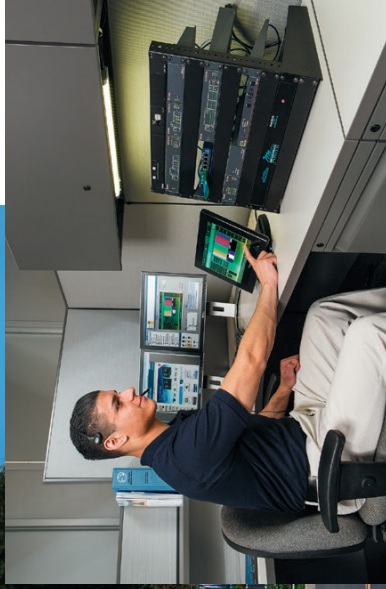


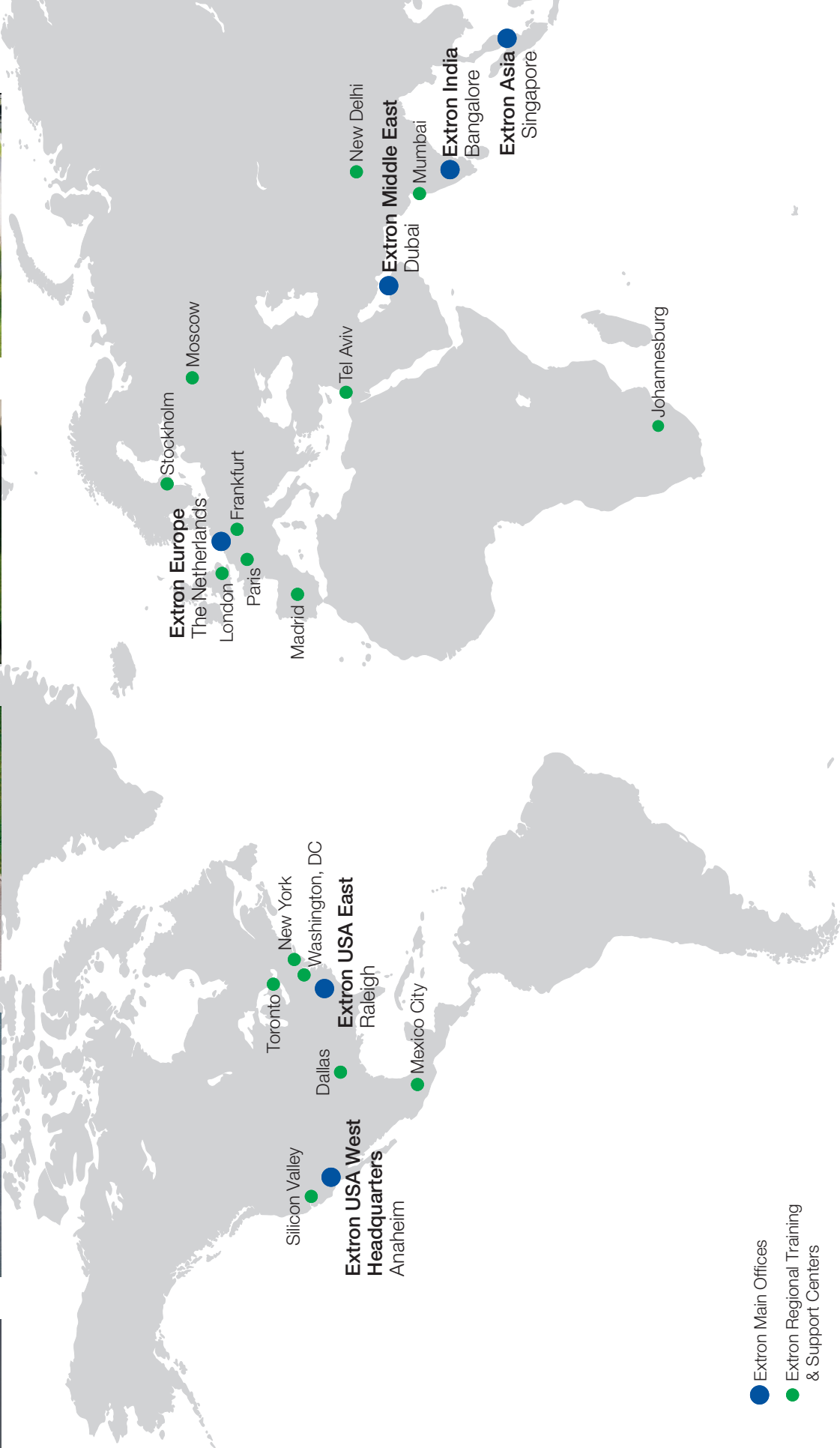


Extron

EXTRON – THE AV TECHNOLOGY LEADER

Every day, millions of people around the world are having their experiences enhanced by Extron audiovisual signal processing, distribution, and control solutions. We design advanced technologies to create better-looking images, higher quality sound, and systems that are easier to control and work more reliably. Our powerful asset management tools are helping technology professionals efficiently manage large numbers of audiovisual systems deployed throughout their enterprises and institutions. Extron AV technology solutions serve the diverse needs of organizations around the world and are deployed in a wide variety of corporate, educational, government, healthcare, retail, and entertainment applications.





GLOBAL SUPPORT

Extron was built on the core value of professional integrity with the ultimate goal of complete customer satisfaction. This commitment is reflected in our three guiding principles of Service, Support, and Solutions.

With offices around the globe, Extron is able to provide dedicated, full-service support to customers worldwide. Extron's global presence means that we are here for you, wherever you are.



Extron

www.extron.com/zoom

12-2019
68-3489-01
REV. A1
English

© 2019 Extron Electronics. All rights reserved. All trademarks mentioned are the property of their respective owners.

Three Phase Inverters for the 120/208V Grid For North America

SE14.4KUS / SE17.3KUS



INVERTERS

The best choice for SolarEdge enabled systems

- Specifically designed to work with power optimizers
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for superior efficiency (97.5%) and longer strings
- Built-in type 2 DC and AC Surge Protection, to better withstand lightning events
- Small, lightest in its class, and easy to install outdoors or indoors on provided bracket
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- Built-in module-level monitoring with Ethernet, wireless or cellular communication for full system visibility
- Integrated Safety Switch
- UL1741 SA certified, for CPUC Rule 21 grid compliance

/ Three Phase Inverters for the 120/208V Grid⁽¹⁾

For North America

SE14.4KUS / SE17.3KUS

MODEL NUMBER	SE14.4KUS	SE17.3KUS	UNITS
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXX-USX2IXXXX		
OUTPUT			
Rated AC Power Output	14400	17300	W
Maximum apparent AC output power	14400	17300	VA
AC Output Line Connections	3W + PE, 4W + PE		
AC Output Voltage Minimum-Nominal-Maximum ⁽²⁾ (L-N)	105-120-132.5		Vac
AC Output Voltage Minimum-Nominal-Maximum ⁽²⁾ (L-L)	183-208-229		Vac
AC Frequency Min-Nom-Max ⁽²⁾	59.3 - 60 - 60.5		Hz
Continuous Output Current (per Phase)	40	48.25	Aac
GFDI Threshold	1		A
Utility Monitoring, Islanding Protection, Country Configurable Set Points	Yes		
THD	≤ 3		%
Power Factor Range	+/- 0.85 to 1		
INPUT			
Maximum DC Power (Module STC)	21600	26000	W
Transformer-less, Ungrounded	Yes		
Maximum Input Voltage DC+ to DC-	600		Vdc
Operating Voltage Range	370 - 600		Vdc
Maximum Input Current	40	48.25	Adc
Maximum Input Short Circuit Current	55		Adc
Reverse-Polarity Protection	Yes		
Ground-Fault Isolation Detection	167kΩ Sensitivity ⁽³⁾		
CEC Weighted Efficiency	97.5		%
Night-time Power Consumption	< 4		W
ADDITIONAL FEATURES			
Supported Communication Interfaces	2 x RS485, Ethernet, Cellular (optional)		
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection		
Rapid Shutdown	NEC2014, NEC2017 and NEC2020 compliant/certified		
RS485 Surge Protection Plug-in	Supplied with the inverter, Built-in		
AC, DC Surge Protection	Type II, field replaceable, Built-in		
DC Fuses (Single Pole)	25A, Built-in		
Smart Energy Management	Export Limitation		
DC SAFETY SWITCH			
DC Disconnect	Integrated		
STANDARD COMPLIANCE			
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07		
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)		
Emissions	FCC part15 class A		
INSTALLATION SPECIFICATIONS			
AC output conduit size /AWG range	¾" or 1" / 6 - 10 AWG		
DC input conduit size / AWG range	¾" or 1" / 6 - 12 AWG		
Number of DC inputs pairs	4		
Dimensions with Safety Switch (H x W x D)	31.8 x 12.5 x 11.8 / 808 x 317 x 300		in / mm
Weight with Safety Switch	78.2 / 35.5		lb / kg
Cooling	Fans (user replaceable)		
Noise	< 62		dBA
Operating Temperature Range	-40 to +140 / -40 to +60 ⁽⁴⁾		°F / °C
Protection Rating	NEMA 3R		
Mounting	Bracket provided		

(1) For 277/480V inverters refer to: <https://www.solaredge.com/sites/default/files/se-three-phase-us-inverter-277-480v-setapp-datasheet.pdf>

(2) For other regional settings please contact SolarEdge support

(3) Where permitted by local regulations

(4) For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>



SunPower® X-Series Commercial Solar Panels | X21-470-COM

More than 21% Efficiency

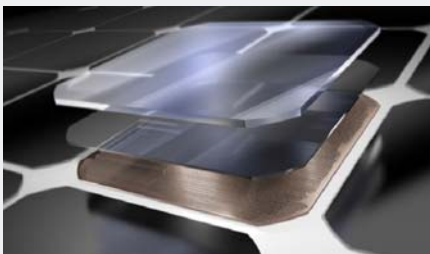
Captures more sunlight and generates more power than conventional panels.

Maximum Performance

Delivers excellent performance in real-world conditions, such as high temperatures, clouds and low light.¹

Utility Grade

Optimized to maximize returns, the X-Series panel is a bankable solution for large-scale power plants.



Maxeon® Solar Cells: Fundamentally better
Engineered for performance, designed for reliability.

Engineered for Peace of Mind

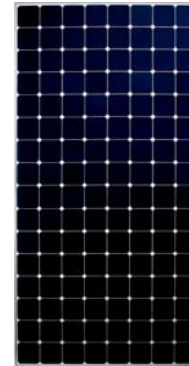
Designed to deliver consistent, trouble-free energy over a very long lifetime.²

Designed for Reliability

The SunPower Maxeon solar cell is the only cell built on a solid metal foundation. Virtually impervious to the corrosion and cracking that degrade conventional panels.

Same excellent durability as E-Series panels.
#1 Rank in Fraunhofer durability test.³

High Performance & Excellent Reliability



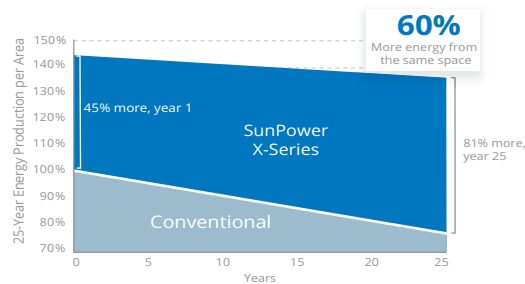
SPR-X21-470-COM



High Efficiency

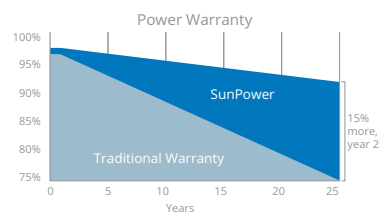
Generate more energy per square foot

More energy to power your operations. X-Series commercial systems convert more sunlight to electricity by producing 45% more energy in the first year. This advantage increases over time, producing 60% more energy over the first 25 years to meet your needs.¹

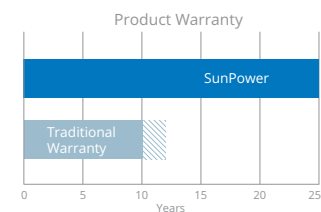


Best Reliability, Best Warranty

A better warranty starts with a better product. Proven performance backs up our industry-best coverage, including out warranted 0.25% per year degradation rate.⁴



More guaranteed power: 98% for first year, -0.25%/yr. to year 25



Combined Power and Product defect 25-year coverage



SunPower® X-Series Commercial Solar Panels | X21-470-COM

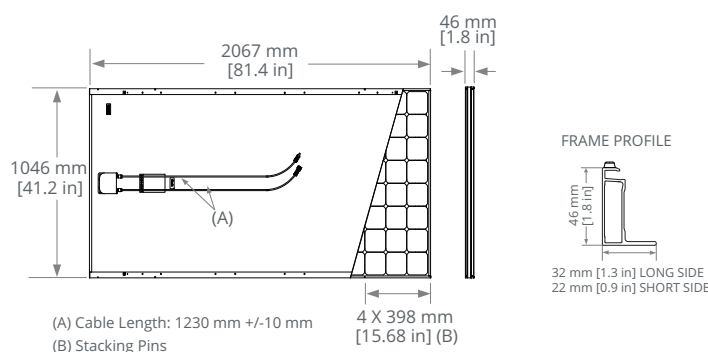
Electrical Data			
	SPR-X21-470-COM	SPR-X21-460-COM	SPR-X20-445-COM
Nominal Power (P _{nom}) ⁵	470 W	460 W	445 W
Power Tolerance	+5/-0%	+5/-0%	+5/-0%
Avg. Panel Efficiency ⁶	21.7%	21.3%	20.6%
Rated Voltage (V _{mpp})	77.6 V	77.3 V	76.5 V
Rated Current (I _{mpp})	6.06 A	5.95 A	5.82 A
Open-Circuit Voltage (V _{oc})	91.5 V	90.5 V	90.0 V
Short-Circuit Current (I _{sc})	6.45 A	6.39 A	6.24 A
Max. System Voltage	1000 V UL & 1000 V IEC		
Maximum Series Fuse	15 A		
Power Temp Coef.	-0.29% / ° C		
Voltage Temp Coef.	-223.2 mV / ° C		
Current Temp Coef.	2.9 mA / ° C		

Tests And Certifications	
Standard Tests ⁷	UL1703 (Type 2 Fire Rating), IEC 61215, IEC 61730
Management System Certs	ISO 9001:2015, ISO 14001:2015
EHS Compliance	RoHS, OHSAS 18001:2007, lead free, REACH SVHC-163, PV Cycle
Sustainability	Cradle to Cradle Certified™ Silver (contributes to LEED categories) ⁸
Ammonia Test	IEC 62716
Desert Test	10.1109/PVSC.2013.6744437
Salt Spray Test	IEC 61701 (maximum severity)
PID Test	1000V: IEC62804, PVEL 600hr duration
Available Listings	UL, TUV, CEC

Operating Condition And Mechanical Data	
Temperature	-40° F to +185° F (-40° C to +85° C)
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)
Appearance	Class B
Solar Cells	128 Monocrystalline Maxeon Gen III
Tempered Glass	High-transmission tempered anti-reflective
Junction Box	IP-65, 1230 mm cables / MC4 compatible
Weight	56 lbs (25.4 kg)
Max. Load	Wind: 50 psf, 2400 Pa front & back Snow: 112 psf, 5400 Pa front
Frame	Class 2 silver anodized; stacking pins

REFERENCES:

- 1 SunPower 360W compared to a Conventional Panel on same sized arrays (260W, 16% efficient, approx. 1.6 m²), 4% more energy per watt (based on 3pty module characterization and PVSIM), 0.75%/yr slower degradation (Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013).
- 2 "SunPower Module 40-Year Useful Life" SunPower white paper, May 2015. Useful life is 99 out of 100 panels operating at more than 70% of rated power.
- 3 X-Series same as E-Series, 5 of top 8 panel manufacturers tested in 2013 report, 3 additional panels in 2014. Ferrara, C., et al. "Fraunhofer PV Durability Initiative for Solar Modules: Part 2". Photovoltaics International, 2014.
- 4 See us.sunpower.com/home-solar-system-warranty/ for more details.
- 5 Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25° C). NREL calibration Standard: SOMS current, LACCS FF and Voltage.
- 6 Based on average of measured power values during production.
- 7 Type 2 fire rating per UL1703:2013, Class C fire rating per UL1703:2002.
- 8 See salesperson for details.



Please read the safety and installation guide.

Document # 524935 Rev B /LTR_US

C&I Solutions: POWERPACK | POWERWALL

Tesla has been building integrated battery systems in cars for over 10 years. The same degree of expertise, quality control, and technological innovation has informed our process of developing high-performance energy storage systems. Tesla offers Powerpack and Powerwall systems to meet the site-specific needs of C&I sites.

Tesla includes a 10-year warranty at no additional cost. Extensions are also available under certain conditions.

The Powerpack System scales to the space, power and energy requirements of any site from 100 kWh+ to 100 MWh+. The Powerwall System is available for light commercial applications from 30kWh to 200 kWh.



Powerpack System includes an Inverter, DC Battery Packs, and a Tesla Site Controller



Powerwall includes a fully-integrated AC battery system and Energy Gateway

FULLY INTEGRATED SYSTEM

A complete energy storage system including DC batteries, bi-directional inverter, and a site controller with intelligent software. This turnkey system is designed to maximize savings and prolong battery life.

INTELLIGENT SOFTWARE

Systems come with the most advanced autonomous control software available to ensure C&I customers realize maximized economic benefits. Tesla's software learns and predicts energy patterns, optimizes battery dispatch to reduce electricity bills and increase consumption of on-site solar, and enables various grid services.

ENHANCED SYSTEM SAFETY

Powerpack and Powerwall's battery architecture consists of a low voltage battery with a DC/DC converter for added electrical isolation and safety. It also has an integrated liquid cooling and heating system for thermal safety and enhanced performance and reliability.

APPLICATIONS



PEAK SHAVING

Discharge at times of peak demand to reduce expensive demand charges



EMERGENCY BACKUP

Powers a facility when the grid goes down (Powerpack only)



DEMAND RESPONSE

Discharge or charge in response to signals from a demand response administrator



LOAD SHIFTING

Shift energy consumption from one point in time to another



ANCILLARY SERVICES

Provide service to the grid in response to signals sent



SOLAR SELF-CONSUMPTION

Charge from solar when possible to increase renewable consumption

POWERPACK

Tesla Powerpack is a modular, fully-integrated, AC battery system for commercial and industrial use. Each Powerpack Unit houses 16 rechargeable Tesla lithium ion battery packs, which provide energy storage for a variety of on-grid and grid-tied energy storage applications.

Powerpack is designed to be highly configurable. Its flexible architecture enables different power-to-energy ratios, allowing customers to benefit from a custom system addressing their unique needs.



INVERTER SPECIFICATIONS

AC Voltage	400–480 VAC 3-phase
Nominal Frequency	50 or 60 Hz
Inverter Size (at 480 V)	Scalable up to 700 kVA

POWERPACK SPECIFICATIONS

Part Number	Configuration	Power/Energy ¹	Roundtrip ¹ System
1083932-00-F	Peak Power ²	130 kW / 160 kWh	84.5%
	High Power	109 kW / 174 kWh	86.0%
	2 hr	90 kW / 180 kWh	87.5%
1083931-00-E	4 hr	55 kW / 220 kWh	89.5%
1490027-XX-Y ³	Peak Power ²	130 kW / 166 kWh	83.5%
	High Power	118 kW / 169 kWh	85.5%
	2 hr	90 kW / 176 kWh	88.0%
1490026-XX-Y ³	2 hr	111.5 kW / 223 kWh	85.5%
1490025-XX-Y ³	4 hr	58 kW / 232 kWh	89.5%

Note: All ratings provided are AC and factor in all parasitic loads.

¹ Net energy delivered at 25°C (77°F) including thermal control

² Represents frequency regulation and peak power options, available under certain conditions

³ Where X is a digit between 0 and 9, and Y is a letter

COMMUNICATIONS

Protocol	Modbus TCP DNP3 Rest API
----------	--------------------------------

MECHANICAL AND MOUNTING

Enclosure	IP67 (Pod) NEMA 3R / IP35 (Powerpack) NEMA 4 / IP66 (Inverter)
Powerpack Unit Dimensions	L: 1317 mm (50.9 in) W: 968 mm (38.1 in) H: 2187 mm (86.1 in)
Powerpack Unit Max Shipped Weight	2199 kg (4847 lbs)
Inverter Dimensions	L: 1044 mm (41.1 in) W: 1394 mm (54.9 in) H: 2191 mm (86.2 in)
Inverter Max Shipped Weight	1120 kg (2470 lbs)
Operating Ambient Temperature	-30°C to 50°C (-22°F to 122°F)

REGULATORY

Lithium-Ion Cells	NRTL listed to UL 1642
System	NRTL listed to UL 1973, 9540, 1741 SA IEEE 1547 Compliant to grid codes and safety standards of all major markets. Full list provided upon request.