

# SPECIFICATIONS

for Prefabricated Control Enclosure at

Jacksonville Electric Authority (JEA)  
Caldwell 230kV Switchyard

Revision 0  
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Prepared by  
Burns & McDonnell Engineering Co.  
Maitland, FL



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**1.0 GENERAL:**

This specification outlines the minimum requirements for a prefabricated and preassembled switchyard control enclosure that will be utilized by Jacksonville Electric Authority (JEA). The enclosure will be purposefully designed to house control panels, supervisory remotes, AC and DC distribution systems, and switchyard batteries in a secure environment. The Enclosure Vendor shall design, fabricate, assemble, factory test, deliver, install and field test the prefabricated control enclosure as outlined in this specification. All requirements of this specification and applicable codes shall be followed throughout the Enclosure Vendor's scope of work, from design to field acceptance testing of the control enclosure.

The final control enclosure design is the responsibility of the Enclosure Vendor. The overall enclosure structure dimensions will be specified by the Enclosure Vendor, based on the requirements of this specification, shipping practicality and the vendor's preferences. A preliminary control enclosure layout has been provided for reference only (Appendix A) to show the required equipment, door/cable tray entrance locations, and panel arrangements. The enclosure structure may consist of multiple modules split for shipping convenience. Spaces or gaps resulting from misaligned modular sections will not be allowed. If either occurs during installation, the Enclosure Vendor shall remediate at their own expense. Any remediation of spaces or gaps shall be approved by JEA before applying to the enclosure.

**2.0 PROJECT LOCATION AND SCOPE:**

The greenfield 230kV Caldwell Switchyard is located in Duval County, FL at coordinates 30°19'31.24"N, 81°55'51.67"W. The project scope includes the design, fabrication, assembly, delivery and installation of a prefabricated control enclosure as detailed in Appendix A. The Enclosure Vendor shall provide, install and wire all relay panels associated with the project prior to the enclosure delivery to site. The Enclosure Vendor shall provide and install fully functional HVAC equipment, HVAC disconnect switches, primary and back-up batteries, two (2) two-tier battery racks, two (2) battery chargers, two (2) battery cart boxes, relay panels, provisions for telecommunication and security racks, cable tray, communication tray, AC and DC load panels, eye wash station, laydown tables and filing cabinets, completely internal equipment grounding cable and connections (including single point bus bar), interior/exterior lighting, windows, exhaust fans, ventilation system, receptacles, conduit and all completely internal cables (control/power/communication) as listed in Section 3.3 and shown in the Appendices below.

**The complete control enclosure shall be delivered and set on the foundation by April 27, 2026.**

### 3.0 TECHNICAL SPECIFICATIONS:

#### 3.1 APPLICABLE CODES AND STANDARDS:

Design, construct, test, and assemble the enclosure, all equipment and materials in conformance with the latest revisions and supplements of all applicable including: Florida Building code, ACI, ASCE, ASHRAE, AWS, NEC, NFPA, NEMA, IEEE, ASTM and OSHA standards including, but not limited to, the following:

- A. 2020 Florida Building Code, 5<sup>th</sup> Edition.
- B. ACI 117-10, "Specification for Tolerances for Concrete Construction and Materials"
- C. ACI-305R-10, "Guide to Hot Weather Concreting"
- D. ACI-318-19, "Building Code Requirements for Structural Concrete"
- E. ACI-530-13, "Building Code Requirements and Specification for Masonry Structures"
- F. ASCE-7-16, "Minimum Design Loads for Buildings and Other Structures"
- G. ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning
- H. ASTM: American Society for Testing and Materials
- I. AWS: American Welding Society
- J. BOCA, "Building Officials and Code Administrators"
- K. Concrete Reinforcing Institute, "Manual of Standard Practice"
- L. ICEA: Insulated Cable Engineers Association
- M. IEEE: Institute of Electrical and Electronics Engineers
- N. NEC: National Electrical Code
- O. NEMA: National Electrical Manufacturers Association
- P. NESC: National Electrical Safety Code
- Q. NFPA: National Fire Protection Association
- R. OSHA: Occupational Safety and Health Administration
- S. SDI-108-10, "Recommended Specifications for Standard Steel Doors and Frames"
- T. UBC Standards for 2-Hour Fire Rating
- U. UL-752 Test Method Level Four (4) for Bullet Resistance
- V. The control enclosure shall comply with NERC CIP-006 physical security for six (6) wall criteria physical security guidelines, additional NERC CIP requirements may be required.

**3.2 EQUIPMENT AND MATERIAL MANUFACTURER EXPERIENCE:**

The manufacturer of each item of equipment or material furnished by the Enclosure Vendor shall be regularly engaged in the fabrication of the item and it shall have demonstrated satisfactory historical performance, and reliable service in outdoor switchyards for a period of at least five (5) years under comparable environmental conditions.

**3.3 DESIGN:**

**3.3.1 STRUCTURE**

- A. Location: Outdoor
- B. Wall Material: Concrete Panels or Blocks
- C. Wind Loading (Fully Assembled): 149 mph (ASCE 7-16)
- D. Risk Category III
- E. Exposure Category C
- F. Outdoor Temperature Range: -30 degrees C to + 50 degrees C
- G. Unusual Conditions: Salt Spray
- H. Altitude: Under 1000 meter (3300 ft)
- I. Seismic Design Category: B
- J. Two-hour fire resistance on walls and ceiling is required
- K. 200 psf uniform floor live load while on foundation
- L. 125 psf uniform floor live load during lifting and transport
- M. 20 psf uniform roof live load
- N. Exterior wall must withstand the design loads listed in this specification
- O. Insulation ratings:
  - a. Minimum R-value of 13 on exterior walls
  - b. Minimum R-value of 38 on ceiling
- P. Minimum indoor ceiling height of 11'-0" above finished floor.
- Q. Roof shall be pitched using slope recommended by Enclosure Vendor
- R. Enclosure to be waterproof under any weather conditions, as well as animal and insect proof.
  - a. Seal exterior wall surfaces with two coats of Thoroglaize H or equal sealer.
  - b. Building joints to be waterproof with a positive means to prevent water entry. A caulk is not sufficient unless used with flashing or something similar.

- S. Exterior wall penetrations shall be 45 degrees sloped down & outward to avoid water incursion.
- T. Enclosure shall have a means for anchoring the enclosure to the foundation. All anchor bolts and connection hardware shall be provided by Enclosure Vendor.
- U. Ballistic Protection: Exterior walls, doors, and roof shall be designed to comply with UL 752 Level 2 requirements, stopping the penetration of Caliber .22 Long Rifle, Caliber .38 pistol and Caliber .45 pistol rounds, fired at 15-foot range and 90 degrees normal to the surface.

3.3.2 LIFTING PROVISIONS

The floor panel shall be provided with integral and flush lifting provisions that permit crane lift without use of separate bolt-on devices, but make use of readily available crane hardware, e.g., hooks, shackles, or D-rings. The enclosure shall be designed with lifting provision for enclosure tie-down. The tie-down hardware in the wall is not permitted.

3.3.3 HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

The Enclosure Vendor shall provide and install an HVAC system for electric heating, cooling, and humidity control of the enclosure. The system shall be capable of maintaining the normal operation 75°F summer cooling, 65°F winter heating, and humidity less than 60% for ambient temperatures ranging from 10°F to 110°F. The HVAC system shall also provide sufficient ventilation to meet requirements for ventilation of the batteries. The HVAC system shall be comprised of two (2) wall mounted units and shall be sized appropriately for enclosure's total square footage. Each HVAC unit shall have one (1) outdoor compressor and one (1) indoor air-handler. Each unit shall include one (1) adjustable thermostat for automatic temperature control with high/low temp. alarms, one (1) indoor safety disconnect switch, and one (1) outdoor safety disconnect switch. The disconnect safety switches shall be Square D Heavy-duty non-fused safety switches rated appropriately for each HVAC unit. The exterior safety switches shall be furnished with NEMA 3R enclosures with Myers Hub (or equal). Each safety switch shall be capable of completely disconnecting all AC power supply to the air conditioners. The Enclosure Vendor shall complete all conduit installations to the HVAC units from the disconnect switches.

**3.3.4 ENCLOSURE DOORS**

The control enclosure shall be supplied with one (1) set of double doors, six-feet wide by eight-feet high (6'-0"W x 8'-0"H), each door having a three-foot width, and one (1) single steel entry door, four-feet wide by eight-feet high (4'-0"W x 8'-0"H). Each door shall be located as shown on the preliminary enclosure layout drawing in Appendix A. The doors shall swing outwards and be fitted with an automatic closure device. Doors shall open from the inside by means of a "panic-bar". Card reader provisions with necessary conduit and boxes shall be provided for both doors by the Enclosure Vendor (see Appendix D for details). Card reader provisions and door mechanisms shall be installed by Enclosure Vendor in the locations shown on provided preliminary enclosure layout drawing and as detailed in JEA drawings SD-02 and SD-04 (Appendix D). Card readers and wiring shall be provided and installed by JEA Security.

Aluminum awnings shall be supplied large enough to cover each of the doors while in the fully open position. The awnings shall be constructed to meet local building wind loading codes. Enclosure Vendor shall provide outdoor stoppers with hooks to keep doors in the open position during installation traffic.

The interior doorway to the switchyard yard shall be labeled "SWITCHYARD HARD HAT REQUIRED". The interior doorway to the public access shall be labeled "EXIT".

**3.3.5 EXTERIOR CABLE RISER TRAY**

The Enclosure Vendor shall supply and install two (2), 12-inch-deep completely enclosed, aluminum cable riser trays on the exterior wall of the enclosure for bringing cable from the precast cable trench to the overhead cable tray inside the control enclosure. The riser trays shall have removable aluminum panels for easy access to the cable for pulling. Each cable riser tray elbow that connects the outside vertical riser tray to the interior building cable tray shall have a 12" radius. Each cable riser tray shall be secured and supported to the enclosure's exterior wall in a minimum of three (3) locations by a method approved by JEA. The control enclosure shall have two (2), thirty-six (36) inch wide by sixteen (16) inch high openings near the top of the wall (riser entrance) for cables to enter the control enclosure and feed into the indoor cable trays in the approximate locations shown on the control enclosure layout Appendix A. The Enclosure Vendor shall seal

exterior wall openings with two coats of Thorglaze H Sealer.

**3.3.6 CONTROL CABLE TRAY AND FIBER OPTIC TRAY**

An aluminum overhead cable tray system shall be supplied and installed by the Enclosure Vendor. The tray shall be thirty-six (36) inches wide and eight (8) inches high (36" x 8"). The tray is to be suspended from the ceiling with enough supports for the weight of the tray and all cables. The bottom of the cable tray shall be nine-feet (9'-0") above the finished floor.

An aluminum overhead fiber optic tray system shall be supplied and installed by the Enclosure Vendor. The fiber optic tray shall be nine (9) inches wide and eight (8) inches high (9" x 8"). The communication tray shall be designed to run under the control cable tray, suspended from ceiling with enough supports for the weight of the tray and all cables. The bottom of the cable tray to be eight (8) feet (8'-0") above the finished floor.

Both the control cable and fiber optic trays shall be designed to fit the dimensions of the enclosure and cover areas above relay panels, AC/DC load centers, battery chargers/cart. boxes.

**3.3.7 INTERIOR LIGHTING**

The Enclosure Vendor shall provide and install two (2) combo EXIT light / emergency lights, one (1) at each entry point to the enclosure (Lithonia ECR LED M6 or equal) and mounted above the entry/exit door.

The Enclosure Vendor shall provide and install primary interior lighting. Interior lighting shall be 120VAC LED fixtures controlled by two (2) 3-way switches, one (1) located near each entry door along with a duplex grounding receptacle. The enclosure shall also be provided with back up lighting consisting of 125VDC LED fixtures controlled by two (2) 3-way switches, one (1) located near each entry door. Lighting fixtures to meet the minimum lighting levels per NESC Table 111-1 for type B control rooms. All light switches shall be mounted 4'-0" above the finished floor.

The Enclosure Vendor shall provide and install two (2) explosion-proof 45W LED lights (Hubbell, HLEML-45-30-X2-G-AN) to the ceiling of each section of the Battery Room (four (4) total lights). Battery Room lights shall not be switched Battery Room exhaust fans. Enclosure Vendor shall run ¾" Aluminum conduit to



battery room lights. Conduits shall be surface mounted, with any wall/ceiling penetrations PVC coated and sealed.

**3.3.8 EXTERIOR LIGHTING**

The Enclosure Vendor shall provide and install two (2) wall mounted LED photocell 70-watt, 120VAC lights (Hubbell WGH2-70W-4K or equal), one (1) adjacent to each door. The wall mounted 70-watt LED lights shall be controlled by switches mounted to interior walls 4'-0" above finished floor and adjacent to each doorway. Exterior lights shall be mounted 7'-0" above the finished floor. All outdoor lighting junction boxes shall be flush with exterior walls.

**3.3.9 INTERIOR AND EXTERIOR RECEPTACLES**

The Enclosure Vendor shall provide and install one (1) weatherproof 120VAC, 20A exterior GFCI receptacle at approximately the midpoint of each of the long sides of the enclosure and one (1) weatherproof in-use 240VAC, 30A exterior GFCI receptacle at the corner of the long side of the enclosure that faces the switchyard equipment. Each interior wall shall have one (1) 120VAC, 20A industrial grade duplex receptacle. The Enclosure Vendors shall provide and install one (1) 120VAC, 20A circuit and duplex receptacle near the EXIT light/emergency lights for power.

Enclosure Vendor shall provide and install four (4) drop ceiling style locking receptacles (Type L5), evenly dispersed above the relay panels. For the drop ceiling receptacles, one (1) ¾" EMT conduit shall be installed from each receptacle to the cable tray. Power feeds to the receptacles from the AC panel(s) shall be routed through the cable tray system.

Wall receptacles shall not to be placed around the battery equipment. All receptacles shall be wired to two (2) branch circuit breakers in the AC panelboard. All receptacles shall be mounted 2'-6" above the finished floor, except for the ceiling mounted receptacle boxes and Emergency Light receptacles. Receptacles shall be connected using ¾" EMT conduit within enclosure walls. The Enclosure Vendor shall permanently label all receptacles with a laminated plate listing the AC panel and circuit numbers.

**3.3.10 GROUNDING**

The Enclosure Vendor shall provide and install grounding for all circuits and equipment in accordance with the appropriate articles of the National Electric Code (NEC). Enclosure Vendor shall install two (2) 7#5 copperweld ground conductors throughout the entire length of the cable tray, connected to the outside of each cable tray section and at intervals not exceeding four (4) feet. Ground connectors to be Burdy GB or GC connectors (with the head of bolt on the interior of the cable tray). Enclosure Vendor to install two (2) 7#5 copperweld ground conductors (per cable tray entrance) from the switchyard yard ground grid, through the exterior cable riser tray, and connect each conductor to the enclosure cable tray (within 3 feet of each other). Each direct connection to the ground grid shall be an exothermic weld.

The Enclosure Vendor shall install one (1) 7#5 copperweld ground conductor throughout the 36" cable tray grounding system, with ground connections to the outside of each fiber optic tray section and at intervals not exceeding four (4) feet, using Burndy GB and GC connectors (with the head of the connector bolt on the interior of the fiber optic tray).

The Enclosure Vendor shall provide and install an insulated (600 V) #4 AWG copper ground conductor from the 7#5 copperweld cable tray ground to each power panel, battery charger, battery cart. box, switchboard panel, SCADA RTU, each HVAC disconnect switch, each temperature alarm thermostat, and each irrigation controller using Burndy GC-CT connectors.

The enclosure will have two grounding pads, interior and exterior, located at opposite diagonal corners as shown on the preliminary enclosure layout drawing provided in Appendix A. The ground pads will be compatible with a standard NEMA two-hole ground lug.

### **3.3.11 BATTERY SYSTEM VENT FANS**

The enclosure shall have two (2) exhaust fans that will be ceiling mounted, one (1) mounted above each battery. Each fan shall be wired to an adjustable timer on a separate AC circuit and shall not be switched with the battery room lights. Three-quarter inch aluminum conduit shall run in the battery room to each exhaust fan. All conduits in the battery room shall be aluminum and surface mounted, with any wall penetrations being sealed by PVC coating. Interlock exhaust fans with fire suppression system to prevent operation during a fire.

**3.3.12 FIRE PROTECTION SYSTEM**

The Enclosure Vendor shall provide/install all raceway and power feeds for fire protection system. JEA Security will provide system components which include two (2) AC powered smoke detectors, two (2) explosion proof heat detectors, two (2) alarm pull stations, two (2) horn/strobes devices and one (1) fire alarm panel (Potter, IPA-100), which are all shown on the preliminary enclosure layout drawing (Appendix A). The fire alarm panel details are included in Appendix C. The Enclosure Vendor shall provide and install two (2) fire extinguishers (rated for electrical equipment fires).

**3.3.13 TABLES AND FILE CABINETS**

The Enclosure Vendor shall provide and install two (2) thirty-six inch by seventy-two inch (36" x 72") tables (HON UTM3672 QQCHR or equal) mounted against the walls as shown on the preliminary enclosure layout drawing (Appendix A). The Enclosure Vendor shall also provide and install one (1) 4-drawer legal file cabinet (HON 370 or equal) and two (2) vertical drawing storage cabinets with hanging clamps (SAFCO 5041 with 50036 or equal) as shown on the provided preliminary enclosure layout drawing (Appendix A). All furniture must be constructed of noncombustible material.

**3.3.14 AC LOAD CENTER**

The Enclosure Vendor shall provide and install two (2) single-phase, 42 space, 240/120V AC load centers, which will feed all the AC power needs of the control enclosure. The load centers shall have stainless steel cabinets rated for NEMA 3R (EATON POW-R-LINE or equal). Each load center shall include a 225-amp main breaker, copper bus and main lugs, solid neutral, a cover complete with lockable hinged door, a ground bar kit and all required breakers (EATON Type QBHW or equal). The top of AC load center enclosures shall be mounted 6'-6" above finished floors. Enclosure Vendor shall mount load center cabinets as shown on equipment manufacturer's drawings or manuals, with any wall penetrations being sealed by PVC coating.

A surge suppressor (Model #SKLA3D1 or equal) shall be installed on the load center panels and shall be sized to provide complete protection to all devices connected within the enclosure. The suppressors shall be mounted on back of

panels MBP1-3P and in accordance with the manufacturer's recommendations.

The source for both AC load centers will be provided from the load side of an automatic transfer switch (ATS). The 4-pole 240 VAC, 400A ATS switch shall be located in the station yard and will be furnished/installed by JEA.

### 3.3.15 STATION BATTERIES

The Enclosure Vendor shall provide, deliver to site and install two (2) switchyard batteries in the locations shown in Appendix A. The batteries shall meet the following descriptions and specifications:

3.3.15.1 Each battery shall have a rating of 125 VDC, 200Ah, Flooded Cell, Lead Acid, Tubular rating. Enersys 3CC-9M battery is required.

3.3.15.2 Each 125VDC, 200AH battery shall consist of sixty (60) cells.

3.3.15.3 Each container shall be permanently labeled with information such as manufacturer, Volt per cell, and Ah capacity at 8-hour rate of discharged at 77° Fahrenheit.

3.3.15.4 Battery shall be shipped charged and full of electrolyte ready for service.

3.3.15.5 Battery cell containers shall be transparent, clear flame retardant, shock absorbing plastic. The cell covers shall be high impact thermoplastic with tongue and groove seals and be permanently sealed to exclude foreign material to reduce evaporation of water from electrolyte. The covers shall have explosion preventing/flame arresting vent plugs which may be removed for taking thermometer and hydrometer readings. Addition of water shall be possible without removal of the plugs.

3.3.15.6 Numbers shall be included for labeling cases (i.e. a 60 cell bank needs labels 1 through 60). Polarity identification marks shall be permanently marked on the covers.

3.3.15.7 All cables jumpers needed between rows or tiers for the battery banks shall be at least #2 copper.

3.3.15.8 Lead acid batteries shall meet or exceed battery tests as per IEEE 450.

3.3.15.9 Intercell connectors will be lead with no copper inserts and have a portion exposed for measuring cell voltage. Posts and jumpers can be copper encased with lead.

3.3.15.10 The following accessories are to be included:

3.3.15.10.1 Portable thermometer

3.3.15.10.2 Flame arrester vents

3.3.15.10.3 Inter-cell, inter-tier / inter-step cable and connectors

3.3.15.10.4 All external connector hardware

Battery capacity is determined by 1-minute discharge rate (Peak in Ampere) and

the Ampere-hour (Ah) capacity of 8-hour rate of discharge. Based on IEEE Std 485-2020 “Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications”, the battery capacity is determined by the Ampere hour (Ah) as calculated in the IEEE Cell Sizing worksheet. The battery banks and battery chargers shall be fully tested at the factory (including load bank test). The battery banks shall be re-tested by the control Enclosure Vendor if they are disassembled prior to shipping.

**3.3.16 BATTERY RACKS**

The Enclosure Vendor shall provide and install two (2) Battery Racks. Each rack shall be seismic and two (2) tiers. The racks shall be made of steel coated with an acid-resistant paint and have an acid-resistant insulation between the cell and rack. The racks shall be designed so the bottom edge of the battery is plainly visible. The racks shall be installed to support two (2) battery banks in the locations shown on the preliminary enclosure layout drawing shown in Appendix A. At least one 9/16” hole shall be provided on all frame support legs of the battery rack for grounding connections. The Enclosure Vendor shall firmly anchor battery racks to the enclosure floor.

**3.3.17 STATION BATTERY CHARGERS**

The Enclosure Vendor shall provide and install two (2) 125VDC, 40A battery chargers (Hindle ATEV1-130-040-F240SS1XXXXXL1) which will be floor mounted in the locations shown on the preliminary enclosure layout drawing in Appendix A. Anchor to the floor using ½” diameter minimum bolts. Enclosure vendor shall connect to the DC system according to the DC system diagrams that will be provided by JEA.

**3.3.18 SPILL TRAY AND EYE WASH STATION**

The Enclosure Vendor shall provide and install an approved spill tray for the control and neutralization of an electrolyte spill from the batteries. It shall be capable of containing and neutralizing a spill from the largest lead-acid battery. The spill tray shall have at least a 4-inch lip and be treated to make it resistant to the electrolyte.

The Enclosure Vendor shall provide and install a self-contained eye/face wash unit (wall-mounted).

**3.3.19 DC DISTRIBUTION PANELS**

The Enclosure Vendor shall provide and install two (2) 225A, 30 circuit DC distribution panels for the 125VDC system in the locations shown on the preliminary enclosure layout drawing in Appendix A. These panels will feed all the DC power needs of the control enclosure, and the other equipment associated with this project. The panels shall include a non-interrupting main disconnect and distribution breakers to serve all loads at shown in the DC system diagram provided by JEA. A surge suppressor shall be installed at the panel and shall be sized to provide protection to all connected devices. The output of the battery charger will be the source for DC distribution panels. Enclosure vendor shall mount panels as shown on equipment manufacturer's drawings or manuals, with any wall penetrations being sealed by PVC coating.

**3.3.20 RELAY PANELS**

The Enclosure Vendor shall procure, install, wire and test all relay panels in the locations shown on the preliminary enclosure layout drawing (Appendix A) prior to delivery to JEA's Caldwell Switchyard. The Enclosure Vendor shall deliver the enclosure with relay panels firmly anchored to final station floor and wiring as complete as possible. Enclosure vendor shall reference the provided relay panel front views, schematic diagrams and wiring diagrams for a list of required relays, associated equipment and panel wiring connections. The detailed panel front views, schematic diagrams, wiring diagrams will be provided according to the schedule listed in Table 6.1.1 below.

The standard JEA relays are listed below:

<b>Manufacturer</b>	<b>Type</b>	<b>Estimated Quantity</b>
SEL	411L	4*
SEL	451	3*
SEL	421	2*
Electroswitch	LOR	3*
Electro Industries/ Gaugetech	SHARK 100	3*
APP	601	3*
Ametek	Jemstar II	2*
Solid State	SPR-24	2*
Powermea	ION 95030	1*

\*-Estimated quantities to be finalized after panel fronts are finalized.

\*\*.-Part numbers will be provided with the 30% preliminary engineering package.

**3.3.21 COMMUNICATION RACKS:**

The Enclosure Vendor is responsible for providing and installing two (2) communication racks in the locations shown on the preliminary enclosure layout drawing in Appendix A. JEA Telecom will install the equipment and wiring with the rack. Each rack shall be Universal Racks; 19" W x 7' H x 3" D; Black; 45 RMU; No. of Posts - 2; (with Two Top Angles); UL Listed. The Enclosure Vendor shall provide and install two (2) 125VDC, 50A circuits from the enclosure's DC distribution panels to the communication racks. Each circuit shall be run from a separate DC distribution panel, with one (1) DC circuit per distribution panel. Each rack shall be powered by a dedicated 125VDC source from its respective circuit, ensuring one (1) independent DC source per rack. The racks shall be installed with three Velocity Double-Sided Vertical Cable Manager; for 7'H (2.1 m) 45U Racks; 80.5"H (2045 mm) x 6"W (152 mm) x 16.6" (422 mm); Black, with one on the outside of each rack and one in between the racks. There shall be one (1) 120VAC, 20A outlet provided at one of the racks. Additional miscellaneous accessories to be included are as follows: Rack Bonding Busbar; for 19"W (482.6 mm) Rack. Rack Base Dust Cover; For use with 19" Rack; 3"D (80 mm) Rack Channel; Black. Combination Pan Head; Pilot Point Mounting Screws; 12-24 Nominal Size; Black; Package of 50. Rack Base Insulator Kit.

**3.3.22 SECURITY RACK, INFRASTRUCTURE FOR CARD READER & CAMERAS**

The Enclosure Vendor is responsible for providing and installing one (1) security rack in the location shown on the preliminary enclosure layout drawing (Appendix A). The rack shall be 19" W x 7' H x 3" D; Black; 45 RMU; No. of Posts - 2; (with Two Top Angles); UL Listed (as detailed in Appendix B). JEA Security will install equipment and wiring within racks. The Enclosure Vendor shall provide and install one (1) 120VAC, 20A outlet provided at one (1) of the racks.

The Enclosure Vendor shall provide and install one (1) single-gang junction box mounted flush with exterior wall (42" above the finished floor) at each Card Reader location to support Card Reader installation in the locations shown on the preliminary enclosure layout drawing shown in Appendix A. JEA Security will

install Card Readers. Enclosure Vendor will also provide and install 3/4" conduit to junction boxes where required.

The Enclosure Vendor shall provide and install one (1) single-gang junction box (2 feet above the finished floor) at each exterior camera location and one (1) standard 4" junction box below interior cameras. JEA Security will install cameras. Enclosure Vendor shall install conduits to boxes to support camera installation in the locations shown on the preliminary enclosure layout drawing (Appendix A). Enclosure Vendor will also provide and install 3/4" conduit to junction boxes where required.

### 3.3.23 ENCLOSURE WIRING

The Enclosure Vendor is responsible for providing and installing all electrical wiring wholly contained within the control enclosure as detailed in the drawings listed in Table 6.1.1 This wiring includes, but is not limited to, wiring for control relays, AC and DC load centers, batteries, battery chargers, HVAC system, interior and exterior lighting, receptacles, etc. If Enclosure Vendor is unable to install particular wiring due to the enclosure being separated into modules, vendor shall install remaining wiring on-site once enclosure is delivered and fully assembled.

- A. All wiring shall be run neatly and correctly in appropriate metallic conduit or metal tray with necessary labeling, fittings and hangers for proper support and routing.
- B. All conductors shall be labeled with opposite termination designations at both ends via slide on label.
- C. All CT wiring is to be No. 10 AWG, 600 volts rated. Color code shall be black, red, green and white for phases 1, 2, 3, and neutral respectively.
- D. Terminal connectors shall be solderless, uninsulated, ring-tongue terminals.
- E. Only copper Type TC-ER rated, FR-XLPE insulation, thermoplastic black CPE jacket cable shall be used in cable tray.
- F. Power cable is to be rated 600 volts and sized adequately for its intended purpose according to the latest NEC code. Voltage drop calculation shall be provided to JEA as a part of the submittal.
- G. General control and secondary wiring after protective device shall be flame-resistant, 600 volts, stranded, flexible, type SIS as listed in ANSI C37.20, or equal #12 AWG Copper; minimum size.
- H. The multi-conductor cable shall be suitable for wet or dry locations in ducts, conduits, cable trench or trays. The cable shall be designed for operation at ac and dc potentials of positive and negative polarity up to and including 600 volts. The control and power cables shall be listed by UL as Type TC-ER per Standard



1277 for Electrical Power and Control Tray Cables.

- I. Conductors will be soft drawn, annealed, uncoated or tinned, copper wire. The physical and electrical properties shall comply with ASTM standards. All conductors shall have class “B” stranding.
- J. The individual conductor insulation shall be flame retardant, cross-linked polyethylene FR-XLPE, rated 90-degree C wet and dry locations. It shall be approved by the Underwriter’s Laboratories as Type XHHW-2 per UL Standard 44. Insulation shall be free stripping.
- K. Jacket material shall be 90-degree C, black thermoplastic chlorinated polyethylene CPE, and shall be moisture, sunlight, heat, oil and abrasion-resistant.
- L. The cable shall comply with UL 1581 VW-1 and UL 1581 Vertical Tray or IEEE 383 Vertical Tray flame tests.
- M. The required number of conductors shall be cabled in accordance with NEMA standards. Non-hygroscopic flame retardant fillers shall be used to provide a firm, circular cross-section.
- N. The cable shall be identified throughout its entire length by a “permanent type” marking embossed in or white printed onto the outer jacket. The marking shall include the manufacturer of cable, conductor size (AWG), conductor material (CU), rated voltage, shield and insulation type and thickness, year of manufacture, UL label, number of conductors, and footage markings. The above marking shall be printed on the jacket at not more than 24 inch intervals or as approved.
- O. Identify individual conductors of multiple-conductor cable by coloring insulation with standard color sequence. Color coding will be in accordance with ICEA S-73- 532/NEMA WC57 except for 2 conductor no. 10 and 3 conductor no. 6 which shall be black and red. Cables coded by printing name of color on each conductor will not be acceptable except for 3 conductor no. 6 power cable which can be identified using ICEA S-58-679 Method 4. Tracer lines shall be affixed to the conductor insulation so as to not easily be worn off or removed.

Cond. #    Color – Tracer

1	Black
2	White
3	Red
4	Green
5	Orange
6	Blue
7	White-Black
8	Red-Black
9	Green-Black
10	Orange-Black
11	Blue-Black
12	Black-White
13	Red-White

14	Green-White
15	Blue-White
16	Black-Red
17	White-Red
18	Orange-Red
19	Blue-Red
20	Red-Green
21	Orange-Green

#### 4.0 TESTING:

Complete circuitry tests on all installed wiring shall be conducted in accordance with the latest applicable rules of NEMA. These tests shall include, but are not limited to, the following:

- A. Point to point continuity checks and verification with the wiring diagrams.
- B. Energizing panel with AC and DC for verifying panel polarity of respective source

After the control enclosure is installed at site, testing of the following systems shall be performed to demonstrate full functionality and correct operation. Final acceptance test for enclosure shall be performed at the station.

- A. HVAC system (including safety switches)
- B. Indoor/outdoor lighting systems (including emergency lighting)
- C. Indoor/outdoor receptacles
- D. Battery Room exhaust fans

Deficiencies - Deficiencies in ratings or characteristics of any equipment or device specified to be supplied under this contract, that should be revealed inadequate during the course of preparation of this study, shall be brought to the immediate attention of JEA for resolution.

#### 5.0 SHIPPING:

5.1 The control enclosure shall be shipped to the Job Site (30°19'31.24"N, 81°55'51.67"W). The control enclosure shall be assembled to the degree that shipping restrictions will allow.

5.2 The control enclosure shall be protected from damage during shipment.

5.3 The electrical and mechanical integrity of the equipment as demonstrated by factory tests shall be maintained during shipment to and storage at the Job Site.

5.4 All control enclosure shall be shipped FOB to destination in open top or on flat bed trucks.

5.5 Notification of shipping shall be sent to the Engineer (Brendan Murphy: [btmurphy@burnsmcd.com](mailto:btmurphy@burnsmcd.com) and Randy Koncelik: [rjkoncelik@burnsmcd.com](mailto:rjkoncelik@burnsmcd.com), and Project

- Manager Clint Barker: [barkbc@jea.com](mailto:barkbc@jea.com) at least fifteen (15) working days prior to the expected ship date and three (3) working days prior to delivery of the Goods.
- 5.6 The control enclosure shall be shipped as fully assembled as possible. The Contractor shall identify and provide to JEA the shipping splits.
- 5.7 All shipping container(s) shall be labeled with JEA's Contract number, switchyard name, and number of container(s) (1 of 6, etc.). If multiple control enclosure are sent in one (1) shipment, each container(s) shall be clearly identified so that all parts can be matched.
- 5.8 The Equipment and accessories shall be adequately anchored, braced, and packed to prevent damage from vibration, shock, or dampness that might reasonably be encountered in transportation and handling.
- 5.9 Spare parts for each control enclosure shall be provided as listed in JEA's Contract.
- 5.10 All Equipment furnished which requires packaging shall be labeled with the following information:
- a. JEA Contract & Project Number: 8009569
  - b. Item Number per Manufacturer's Bill of Material
  - c. Content Description
- 5.11 All packages shall be shipped either on pallets or bundled in an acceptable manner for off-loading.
- 5.12 Packing shall be such as to adequately protect the contents from any damage that might be reasonably encountered during transportation and handling.
- 5.13 Packing crates shall be sturdy enough to withstand up to one (1) year of outdoor storage without deterioration of crates or damage to the contents.
- 5.14 Any packages that require indoor storage shall be clearly marked.
- 5.15 Prior to shipment, the Engineer shall receive a complete packing list of all the items to be shipped in order for JEA to verify complete shipment.
- 5.16 Spare parts shall be packed separately and clearly marked "SPARE PARTS". In addition, they shall be marked with their respective part numbers, descriptive information and JEA Contract number.
- 5.17 Delivery:
- a. The building supplier is responsible for ensuring delivery routes can support building delivery including roadway limitations, such as bridge load restrictions, railroad crossings, overhead clearances, and the like.
  - b. Provisions for the delivery such as road escorts, road blocks, and the like are the building supplier's responsibility, including necessary blockages outside the switchyard. For

assistance with blockages outside the switchyard, contact the JEA representative.

- c. The purchaser is not responsible for problems incurred during delivery.
- d. The Enclosure Vendor shall ship the Control Enclosure F.O.B. to JEA's Caldwell Switchyard near Baldwin, Florida (30°16'31.56"N, 81°55'51.62"W).
- e. The manufacturer shall assume responsibility for safe arrival of the control enclosure and shall handle all claims, if damaged in transit.
- f. Delivery shall include unloading control enclosure onto associated foundation at the switchyard site.
- g. Delivery schedule shall be in accordance with the JEA Contract. The Enclosure Vendor shall immediately notify JEA in writing of any situations detrimental to the proper and timely completion of the work.
- h. The Contractor shall provide, at a minimum, impact indicators to be affixed on each shipping unit to ensure safe delivery to the Job Site. If control enclosure is shipped in separate pieces/sections, one (1) indicator per item shall be provided.
- i. The Material Supplier shall prepare all Materials and Equipment for shipment in such manner as to protect them from damage in transit. Equipment shall be suitably skidded, crated, boxed sealed or otherwise protected from damage during shipment.
- j. Any articles or Materials that might otherwise be lost shall be boxed or wired in bundles and plainly marked with an identification number, delivery point and any other designation required to permit positive identification for unloading, storage and rehauling purposes.
- k. All parts shall be prepared for shipment so that slings for handling may be attached readily while the parts are on the transporting vehicle. Where it is unsafe to attach slings to the box, boxed parts shall be packed with slings attached to the part.
- l. Equipment covered by this Specification shall be fabricated in the minimum number of subassemblies necessary for transportation. Equipment shall be shipped assembled unless stated otherwise.
- m. Prior to shipment all Equipment shall be thoroughly cleaned internally to remove dirt, weld rod stubs, and other foreign material, drained and all pipe connections or other openings shall be fitted for temporary covers to prevent entrance of foreign matter. Such covers shall be standard plastic pipe thread connectors, 3/8" plywood or 3/16" steel flange covers with temporary gaskets if necessary.
- n. Where necessary to prevent internal rusting, desiccant bags or vapor phase inhibitors shall be used prior to sealing. Their use shall be stated in installation instructions and tags on

the Equipment.

- o. Nuts, bolts, studs, etc., used for packaging and intended for reuse in installation will not be allowed. New, unused hardware shall be supplied by vendor for installation purposes.
- p. Machined surfaces shall be coated with a suitable, easily removable rust preventive and then covered and taped.
- q. If mechanical seals are present they shall be lightly coated with "lubriplate" or approved equal to prevent seizing prior to start-up.
- r. Special tools when required for maintenance shall be furnished with the Equipment.

**6.0 DELIVERABLE SUBMITTALS SCHEDULES AND DETAILS:**

6.1 JEA will provide the Enclosure Vendor with the following Recievables to support the enclosure design as shown in Table 6.1.1 below. The Enclosure Vendor shall submit shop drawings, information and equipment data in accordance with the schedule as shown in Table 6.1.2 below based on contract award date (NTP), with the dates shown as durations after the "Notice to Proceed":

Table 6.1.1: Vendor Recievables Schedule

a.	Relay Panel Front Views, Nameplate Lists and Panel Bill of Materials	NTP + 2 business days
b.	Relay Panel Internal Schematics and Wiring Diagrams	NTP + 16 weeks

Table 6.1.2: Vendor Deliverables Schedule

a.	30% Preliminary Engineering Package	NTP + 2 weeks
b.	60% Engineering Package	NTP + 5 weeks
c.	90% Detailed Engineering Package	NTP + 21 weeks
d.	IFC Stamped Final Package	NTP + 30 weeks
e.	Control Enclosure Delivered Onsite	4/27/2026

The above Vendor Deliverables above shall include but are not limited to the following:

- i. 30% Design Deliverables:
  - 1. Enclosure Layout drawing(s) showing equipment and panel locations, overall dimensions of enclosure.
  - 2. A detailed list of exceptions or deviations from this specification. JEA must approve any exceptions or deviations from this specification before Enclosure Vendor proceeds to 60% design.
- ii. 60% Design Deliverables:
  - 1. 30% Deliverables with a list of any design changes made to the 30% deliverables submitted.
  - 2. Enclosure loading information
  - 3. Cable Tray Layout drawing(s) showing dimensions and clearances.
  - 4. Elevation drawings showing dimensions and clearances.
  - 5. A detailed list of exceptions or deviations from this specification. JEA must approve any exceptions or deviations from this specification before Enclosure Vendor proceeds to 90% design.
- iii. 90% Design Deliverables:
  - 1. 60% Deliverables with a list of any design changes made to the 60% deliverables submitted.
  - 2. Complete Bill of Material (BOM) with all parts identified on the drawings.
  - 3. A detailed schedule to show engineering, procurement, production, fabrication and shipping that meets the expected delivery date.
  - 4. A detailed list of exceptions or deviations from this specification. JEA must approve any exceptions or deviations from this specification before Enclosure Vendor proceeds to IFC package drawings and completion of design.
- iv. IFC Stamped Final Package Deliverables
  - 1. 90% Deliverables Signed and Sealed by a Florida Licensed Professional Engineer, with a list of any design changes made to the 90% deliverables submitted.

2. Documents listed in Section 6.5 and 6.6 below.
3. A detailed list of exceptions or deviations from this specification. JEA must approve any exceptions or deviations from this specification before Enclosure Vendor proceeds to IFC package drawings and completion of design.

6.2 Deliverables for JEA's Review: The Vendor deliverables shall be submitted to JEA Engineering at the dates listed in Table 6.1.2 above for approval prior to manufacturing/fabrication. Manufacturing shall not be started, under any circumstance, until the JEA Engineer has approved the deliverables submitted. Drawings shall be provided electronically in PDF and MicroStation 2023 or newer, format and (1) hard copy set in 24 inch x 36 inch size.

6.3 Each Drawing shall include the JEA Contract number, project number, manufacturer's name, Equipment voltage, Drawing number, and Drawing revision number.

6.4 All final Drawings shall be provided within one (1) week after shipment. Drawings shall be provided electronically in PDF and MicroStation 2023 or newer, format and (1) hard copy set in 24 inch x 36 inch size.

6.5 Documents include, but are not limited to, the following:

- a. Manufacturer's Specifications.
- b. General outline Drawings of Equipment showing overall dimensions, location of major components, weights, and locations of conduit entrance plates.
- c. Outline Drawings of bushings with maximum cantilever withstand in all three axis, if applicable.
- d. Nameplate
- e. Detail design Drawings
- f. Calculations
- g. Bill of materials, spare parts list, and list of parts shipped loose.
- h. Type test, design test, routine test, and production test reports.
  - Test reports shall be provided within one (1) week after shipment.
- i. Where standard Drawings are furnished which cover a number of variations of the general class of Equipment, each such Drawing shall be individually annotated to describe exactly which parts of the Drawing apply to the Equipment being furnished. Such annotation shall also include proper identification of the submittal permanently attached to the Drawing.
- j. Drawings shall be submitted in MicroStation that meet JEA CAD standard. PDF format of all the CAD Drawings, test reports, and other documentations that are also required.

- k. Electronic copies shall be provided for all Drawings, test reports, and other documents related to the control enclosure.
  - l. Three (3) instruction books with all the information listed above. One (1) instruction book as approved by the control enclosure Contractor/Sub-Contractor's Engineer and JEA shall be shipped with each control enclosure for storing inside the control cabinet in addition to those required for approval. The inside and outside cover of each instruction book is to be identified with the JEA project name, JEA Contract number, the control enclosure's serial number, and model/type. The manufacturer's job order number is not an acceptable substitute for the serial number.
- 6.6 Each Equipment shall have an Instruction Manual. The Instruction Manual shall contain the following:
- a. Table of contents and index tabs
  - b. Specifications
  - c. Description of the Equipment
  - d. Operating instructions (including but not limited to safety precautions and operating limits)
  - e. Instructions in the methods of receiving, inspection, storage, and handling
  - f. Complete installation, start-up, initial test, and maintenance instructions
  - g. Schedule of required lubricants
  - h. Nameplate information and shop order numbers for each item of Equipment and component part
  - i. Instructions of accessories
  - j. Separate sheet defining measurements to be performed by customer on installation of the control enclosure and associated Equipment.
  - k. List of maintenance tools furnished with the Equipment, if applicable
  - l. Warranty details and instructions, including contact name(s) and phone number(s)
  - m. Along with the actual Instruction Manual, each shall contain the following:
    - n. One complete set of 11 inch x 17 inch Drawings
    - o. Detailed parts list for each component and device including replacement parts, if different.
    - p. Mechanism serial number
    - q. Serial numbers

**7.0 SOURCE QUALITY CONTROL:**

JEA requires Enclosure Vendor to have quality programs in place to ensure the material and equipment furnished and installed under this specification meets Purchaser's requirements. These



programs shall cover all design and manufacturing operations of the Enclosure Vendor, including work by any subsupplier, designer of record, consultant, architect/engineer (A/E), fabricator, and purchasing agent. The programs shall ensure all services required by this contract are performed and provided in a manner that meets professional engineering quality standards.

7.1 Contractor shall have an ISO 9000/9001 certified Quality Assurance Program covering quality control and assurance measures. The ISO certified program shall be imposed by Contractor the work within the scope of these Specifications and upon sub-suppliers or Subcontractors.

7.2 JEA shall at any time be permitted to have representatives visit the Enclosure Vendor's factory site to examine the control enclosure or any part to ascertain if the Material and processes conform to this Specification.

7.3 JEA shall have the option of witnessing production tests.

7.4 Contractor shall submit the test protocol to JEA for approval before conducting the routine tests for which there are no standards procedures.

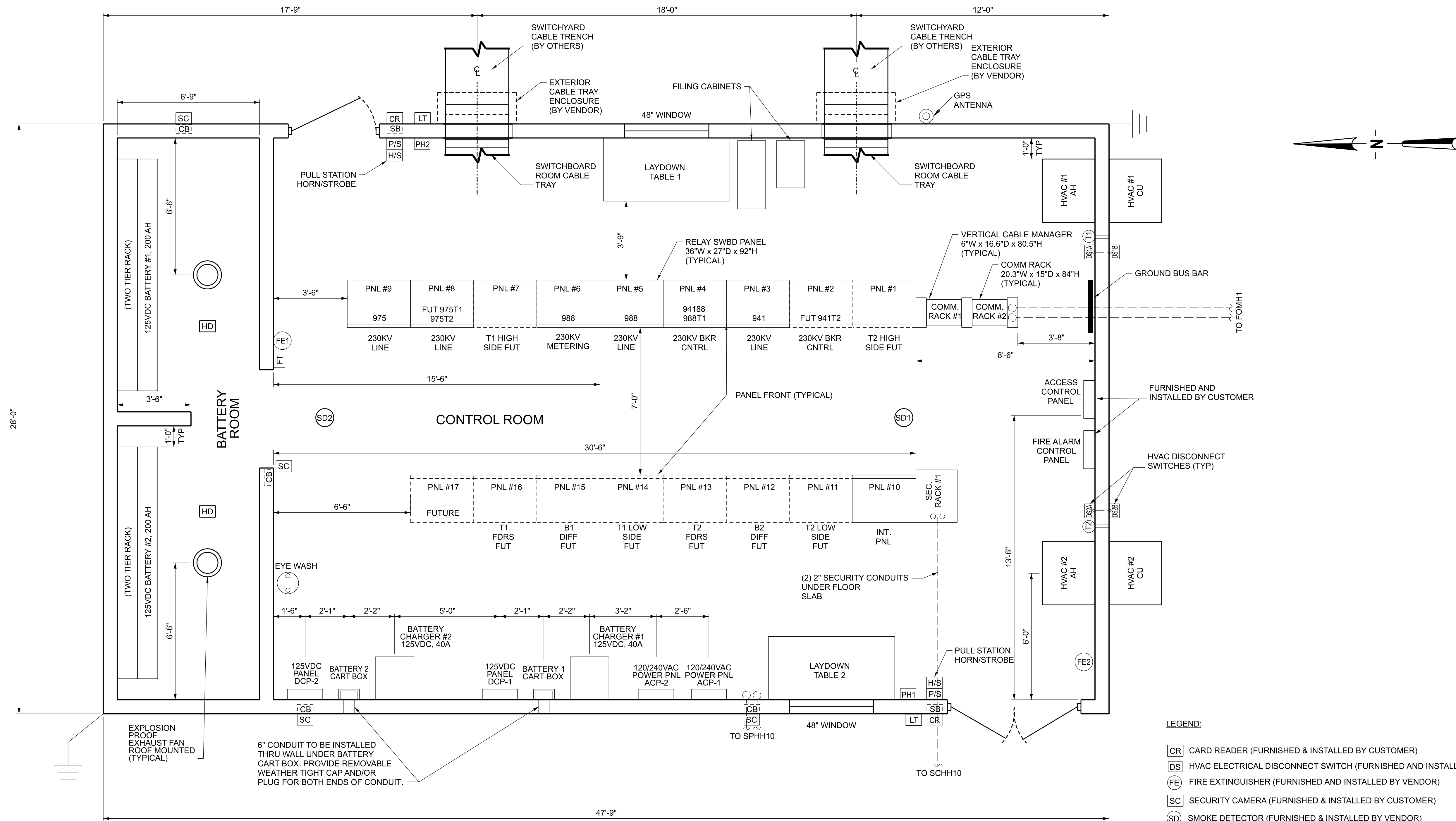
#### 8.0 ADDITIONAL WARRANTY REQUIREMENTS:

8.1 The Seller or Manufacturer shall provide a minimum fifteen (15) year warranty on all roofing materials and installation.

8.2 The Seller or Manufacturer shall provide a minimum five (5) year warranty on all waterproofed vertical control joints.

8.3 The Seller or Manufacturer shall provide a minimum five (5) year warranty on all painted surfaces both interior and exterior.

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- LEGEND:
- [CR] CARD READER (FURNISHED & INSTALLED BY CUSTOMER)
  - [DS] HVAC ELECTRICAL DISCONNECT SWITCH (FURNISHED AND INSTALLED BY VENDOR)
  - [FE] FIRE EXTINGUISHER (FURNISHED AND INSTALLED BY VENDOR)
  - [SC] SECURITY CAMERA (FURNISHED & INSTALLED BY CUSTOMER)
  - [SD] SMOKE DETECTOR (FURNISHED & INSTALLED BY VENDOR)
  - [T] HVAC UNIT THERMOSTAT (FURNISHED & INSTALLED BY VENDOR)
  - [HD] EXPLOSION PROOF HEAT DETECTOR (FURNISHED & INSTALLED BY VENDOR)
  - CONDUITS PLACED IN SLAB/UNDERGROUND (FURNISHED & INSTALLED BY OTHERS)
  - [FT] INTERMATIC FAN TIMER MODEL T1975 (FURNISHED AND INSTALLED BY VENDOR)
  - [PH] TELEPHONE (FURNISHED & INSTALLED BY CUSTOMER)
  - [SB] SECURITY JUNCTION BOX, 4" x 4", OUTDOOR SINGLE-GANG, FLUSH MOUNT (FURNISHED AND INSTALLED BY VENDOR)
  - [CB] CAMERA JUNCTION BOX, 4" x 4", OUTDOOR SINGLE-GANG, FLUSH MOUNT (FURNISHED AND INSTALLED BY VENDOR)
  - [P/S] PULL STATION (FURNISHED & INSTALLED BY CUSTOMER)
  - [H/S] HORN STROBE (FURNISHED & INSTALLED BY CUSTOMER)
  - [LT] EXTERIOR LIGHT FIXTURE, 90W, LED, HUBBELL WGH2-90W-4K (FURNISHED AND INSTALLED BY VENDOR)

SCALE: 3/8"=1'-0"

PRELIMINARY  
FOR BID ONLY

<div><div>JEA</div><div>21 W CHURCH ST. JACKSONVILLE, FLORIDA 32202</div></div>	CONSULTANT INFORMATION	PROFESSIONAL ENGINEER'S SEAL	REV	DATE	PROJ #	REVISION DESCRIPTION	BY	REVIEW	ENGINEERING	MILLER SUBSTATION INSTALLATION			FILE NAME: ML2024-CE1.dgn			
	<div><div><div><div></div><div>BURNS MCDONNELL</div></div><div>495 N KELLER ROAD, SUITE 300 MAITLAND, FL 32751 WWW.BURNSMCD.COM</div></div></div>	ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF	A	10/22/24	-	ISSUED FOR 30% REVIEW	BMCD	BTM	DATE	11/05/24	CONTROL ENCLOSURE ELECTRICAL PLAN			DRAWING SET ML2024		
PE: <u>Brandon T. Murphy</u>	B	1/8/25	-	ISSUED FOR BID	BMCD	BTM	BY	JS	REVIEW	BTM				DRAFTING	SHEET NAME: 1 of 1	
ISSUED FOR REVIEW	LIC. NO.: <u>98687</u>	DATE: <u>-</u>	-	-	-	-	-	-	-	DATE	11/05/24	MILLER SUBSTATION		SCALE: AS SHOWN	SUBSTATION & TRANSMISSION ENGINEERING	PROJ #:
	STATE: <u>FL</u>	-	-	-	-	-	-	-	-	BY	KN	SUBSTATION & TRANSMISSION ENGINEERING				
	DATE: <u>-</u>	-	-	-	-	-	-	-	-	REVIEW	JB					
		-	-	-	-	-	-	-	-							



Middle Atlantic Products

EXCEPTIONAL SUPPORT &amp; PROTECTION™



EIA/TIA Compliant

SEISMIC CERTIFIED

CULUS LISTED

## The MRK Series 19" gangable enclosures Narrow design for large multi-bay jobs

### Features

- Fully welded construction provides the following weight capacities:  
UL Listed load capacity: 2,500 lbs., Static load capacity: 10,000 lbs., seismic certified capacity - 1,050 lbs.
- 1/8" thick structural steel internal braces
- 22" OD width with multiple depths available
- 1/2", 3/4", 1" & 1-1/2" electrical knockouts on split rear plates top & bottom, easily removable for cable pass-through, top plates additionally include UHF/VHF knockouts
- Two wide pairs of 11-gauge, 10-32 threaded rackrail with numbered rackspace increments
- Optional solid, fully vented, plexi and vented plexi front doors available
- Open top with configurable top panel options
- Durable black textured powder coat finish
- Seismic certified (when used with MRK-Z4 option) with an Ip value of 1.5
- UL Listed in the US and Canada



MRK-4426

### Architects' and Engineers' Specifications

EIA compliant 19" gangable equipment rack shall be Middle Atlantic Products model # MRK-\_\_\_ (refer to chart). Overall dimensions shall be \_\_\_"H x 22"W x \_\_\_"D (refer to chart). Useable height shall be \_\_\_ rackspaces, useable depth shall be \_\_\_" (refer to chart). Fully welded construction shall provide a static capacity of 10,000 lbs. and a UL Listed load capacity of 2,500 lbs. Rack shall be constructed of the following materials: top and bottom shall be 14-gauge steel, horizontal braces shall be 16-gauge steel and all structural elements shall be finished in a durable black powder coat. Rack shall include a locking, latching rear door. Rack shall come equipped with two pairs of 11-gauge steel rackrail with tapped 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rackspaces (select models also available with cage nut style rackrail, refer to chart). Rack shall have removable split rear knockout panels with 1/2", 3/4", 1" and 1-1/2" electrical knockouts and top BNC knockouts for UHF/VHF antennae. Grounding and bonding stud shall be 1/4-20 threaded, installed in base of enclosure. MRK Series enclosures shall satisfy the 2007 & 2010 CBC; 2006, 2009 & 2012 IBC; ASCE 7-05 (2005 Edition) & ASCE 7-10 (2010 Edition) and the 2006 & 2009 editions of NFPA 5000 for use in areas of high seismicity, Seismic Use Group III, Zone 4 or Seismic Design Category (SDC) "D" with lateral force requirements for protecting 1,050 lbs. of essential equipment in locations with the highest level of seismicity and top floor or rooftop installations with an Importance factor (Ip) of 1.5 when used with MRK-Z4 seismic floor anchor bracket. Rack shall be OSHPD approved for fixed equipment anchorage in California healthcare facilities. Rack shall be UL Listed in the US and Canada. MRK shall be GREENGUARD Indoor Air Quality Certified and GREENGUARD Gold certified. MRK enclosure shall comply with the requirements of RoHS EU Directive 2002 / 95 / EC. MRK shall be manufactured by an ISO 9001 and ISO 14001 registered company. MRK enclosure shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the rack.

#### OPTIONS

- Front doors shall be reinforced 16-gauge steel, model # FD-x (solid), VFD-x (vented, 25% open area), LVFD-x (vented, 64% open area), PFD-x (plexi), PVFD-44 (vented plexi) (x = # of rackspaces)
- Vented rear doors shall be 16-gauge steel, model # MW-VRD-44 (vented top and bottom), MW-LVRD-x (vented, 64% open area, excludes 24 and 37 space rack) (x = # of rackspaces), MW-CLVRD-44 (split rear door, vented, 79% open area)
- Removable keylocked side panels shall be model # SPN-x-(267/312/36/423) (x = # of rackspaces), 267 = 26-1/2" cabinet depth, 312 = 31-1/2" cabinet depth, 36 = 36" cabinet depth, 423 = 42" cabinet depth
- Top panels shall be 16-gauge steel, multiple styles available including model # MW-ST (solid), MW-10FT (10" fan), MW-4FT (four 4-1/2" fans), MW-6FT (three 6" fans), MW-VT (vented), MW-LA (accepts 6" and 12" wide cable ladders) and MV-PVT (26/31/36/42) (Vented pagoda adds 1.41" to top of rack)
- Caster base shall add 1" to overall height, featuring four casters with a 1,300 lb. weight capacity, UL Listed in the US and Canada. Model # CBS-MRK-x (x = cabinet depth)
- Fine floor friendly caster base shall have a 700 lb. weight capacity. Model # CBS-MRK-xR (x = cabinet depth)
- Rail bracket adapters shall allow for mounting of panels vertically between rackrail brackets. Available for 44 space enclosures. Model # RBA-MV44-x (x = 1, 2 or 3 rackspaces)
- Seismic Zone-4 and Seismic Use Group III compliancy floor anchor kit shall be model # MRK-Z4
- Slide-out AXS enclosure option available (See AXS Spec sheet # 96-0555)

CUSTOMIZABLE SPECIFICATION CLIPS AVAILABLE AT MIDDLEATLANTIC.COM

# MRK Configured A/V Enclosure



EIA/TIA Compliant

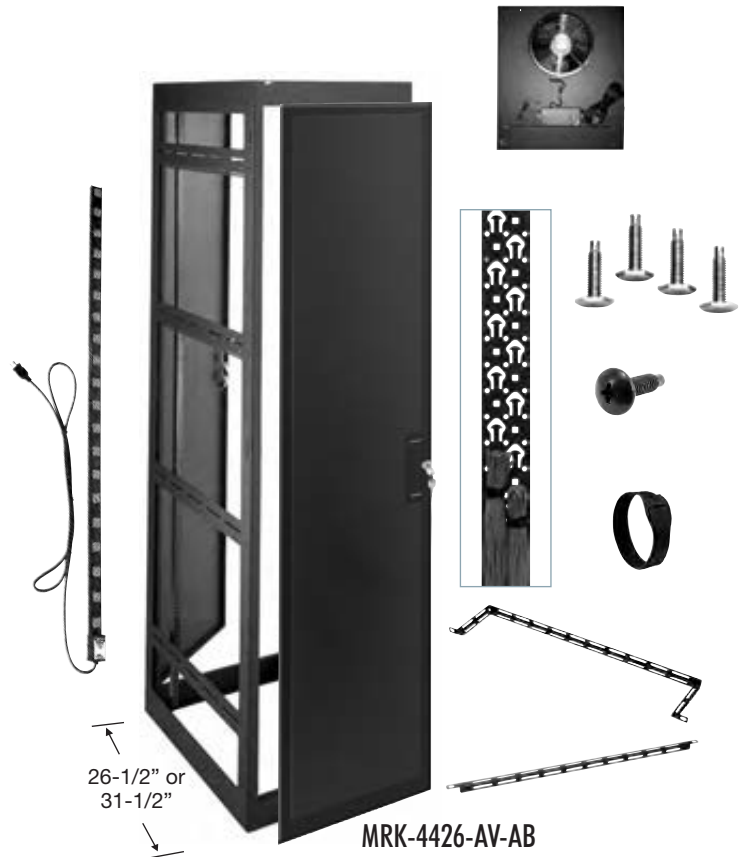
SEISMIC CERTIFIED

UL US LISTED

**Configured A/V enclosure ships complete with the most commonly used accessories**

## Includes

- Integrated fan top with proportional speed fan controller
- Configurable rear door with bottom vent, solid locking front door
- 3-1/4" wide, 44 space vertical lacer strip
- Six horizontal lacer bars
- Twelve 8" Velcro® cable management straps
- Thin power strip, 20 Amp, 20 outlet with cord
- Leveling feet
- 100 qty. 10-32 mounting hardware
- Available with or without sides
- Ganging hardware available for add-a-bay models without sides



## Architects' and Engineers' Specifications

EIA compliant 19" gangable equipment rack shall be Middle Atlantic Products model # MRK-\_\_\_-AV (refer to chart). Overall dimensions of rack shall be 83-1/8" H x \_\_\_" W x \_\_\_" D (refer to chart). Useable height shall be 44 rackspace, useable depth shall be \_\_\_" (refer to chart). Fully welded construction shall provide static capacity of 10,000 lbs. and a UL Listed load capacity of 2,500 lbs. Rack shall be constructed of the following materials: top and bottom shall be 14-gauge steel, horizontal braces shall be 16-gauge steel, solid front door shall be 18-gauge steel and all structural elements shall be finished in a durable black powder coat. Rack shall include a locking, latching rear door. Rack shall come equipped with two pairs of 11-gauge steel rackrail with tapped 10-32 mounting holes in universal EIA spacing, black e-coat finish and numbered rackspace. Rack shall include 100 qty. 10-32 mounting screws. Rack shall be equipped with one vertical lacer strip, Middle Atlantic Products model # LACE-44-OP. The LACE-44-OP is 3-1/4" wide and the useable height is 44 rackspace. Rack shall also include four 'L' shaped straight and two 4" offset horizontal lacer bars and twelve, 8" Velcro® straps for cable management. Models intended for ganging (MRK-\_\_\_-AV-AB) (refer to chart) shall include ganging hardware for multi-bay installations. Rack shall feature integrated fan top, Middle Atlantic Products model # MW-10FT-FC for active thermal management. MW-10FT-FC shall feature proportional speed fan control and maximum airflow shall be 550 CFM. Rack shall have removable split rear knockout panels with 1/2", 3/4", 1" and 1-1/2" electrical knockouts and top BNC knockouts for UHF/VHF antennae. Grounding and bonding stud shall be 1/4-20

threaded, installed in base of enclosure. MRK Series enclosures shall satisfy the 2007 & 2010 CBC; 2006, 2009 & 2012 IBC; ASCE 7-05 (2005 Edition) & ASCE 7-10 (2010 Edition) and the 2006 & 2009 editions of NFPA 5000 for use in areas of high seismicity, Seismic Use Group III, Zone 4 or Seismic Design Category (SDC) "D" with lateral force requirements for protecting 1,050 lbs. of essential equipment in locations with the highest level of seismicity and top floor or rooftop installations with an Importance factor (Ip) of 1.5 when used with MRK-Z4 seismic floor anchor bracket. Rack shall be OSHPD approved for fixed equipment anchorage in California healthcare facilities. Rack shall include a high-density thin power distribution and shall be Middle Atlantic Products model # PDT-2020C-NS with 20 outlets and 20 amps. Thin power distribution shall be 72-3/4" long x 1" deep x 1.9" wide. J-Box shall be 2" deep x 2" wide. Thin power distribution shall feature 20 NEMA 5-20R outlets. Corded power strip includes 20-amp protection and mounting hardware. Corded model shall be terminated with 10 foot power cord and NEMA 5-20P plug. PDT Series shall feature a black anodized finish. MRK and PDT Series shall be UL Listed in the US and Canada. MRK-\_\_\_-AV shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. MRK-\_\_\_-AV shall be RoHS EU Directive 2002/95/EC compliant. MRK-\_\_\_-AV shall be manufactured by an ISO 9001 and ISO 14001 registered company. PDT-2020C-NS and MW-10FT-FC shall be warrantied to be free from defects in material or workmanship under normal use and conditions for a period of 3 years. MRK enclosure shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the rack.

# MRK Configured NVR / DVR Enclosures



EIA/TIA Compliant

SEISMIC CERTIFIED

UL US LISTED

**Complete NVR / DVR enclosure addresses the cable and thermal management needs of both network and digital video recording devices**

## Includes

- Two pairs cage nut style rackrail (NVR enclosure)
- Two pairs 10-32 threaded rackrail (DVR enclosure)
- One pair of cage nut style Z-rail adapters (NVR enclosure)
- Fully vented top
- Fully perforated vented front door and vented split rear door
- 3-1/4" wide, 44 space vertical lacer strip
- Six horizontal lacer bars
- Twelve 8" Velcro® cable management straps
- Thin power strip, 20 Amp, 20 outlet with cord
- One each 1 space and 2 space brush grommet
- Leveling feet
- 100 qty. 6mm threaded cage nuts and rack screws (NVR enclosure)
- 50 qty. 10-32 threaded cage nuts and rack screws (NVR enclosure)
- 100 qty. 10-32 mounting hardware (DVR enclosure)
- Available with or without sides
- Ganging hardware available for add-a-bay models without sides



MRK-4436-NVR-AB

## Architects' and Engineers' Specifications

EIA compliant 19" gangable equipment rack shall be Middle Atlantic Products model # MRK-\_\_\_-DVR (NVR) (refer to chart). Overall dimensions of rack shall be 83-1/8" H x \_\_\_" W x \_\_\_" D (refer to chart). Useable height shall be 44 rackspace, useable depth shall be \_\_\_" (refer to chart). Fully welded construction shall provide a static capacity of 10,000 lbs. and a UL Listed load capacity of 2,500 lbs. Rack shall be constructed of the following materials: top and bottom shall be 14-gauge steel, horizontal braces shall be 16-gauge steel, perforated vented front door shall be 18-gauge steel and all structural elements shall be finished in a durable black powder coat. Rack shall include a locking, latching rear door. Rack shall come equipped with two pairs of 11-gauge steel rackrail with tapped mounting holes in universal EIA spacing, black e-coat finish and numbered rackspace. Rack shall include 100 qty. 10-32 mounting screws (DVR enclosure) or 100 qty. 6mm cage nuts and rack screws with 50 qty. 10-32 threaded cage nuts and rack screws (NVR enclosure). Rack shall be equipped with one vertical lacer strip, Middle Atlantic Products model # LACE-44-OP. The LACE-44-OP is 3-1/4" wide and the useable height is 44 rackspace. Rack shall also include four 'L' shaped straight and two 4" offset horizontal lacer bars and twelve, 8" Velcro® straps for cable management. Models intended for ganging (MRK-\_\_\_-AB) (refer to chart) shall include ganging hardware for multi-bay installations. Rack shall have removable split rear knockout panels with 1/2", 3/4", 1" and 1-1/2" electrical knockouts and top BNC knockouts for UHF/VHF antennae. Grounding and bonding stud shall

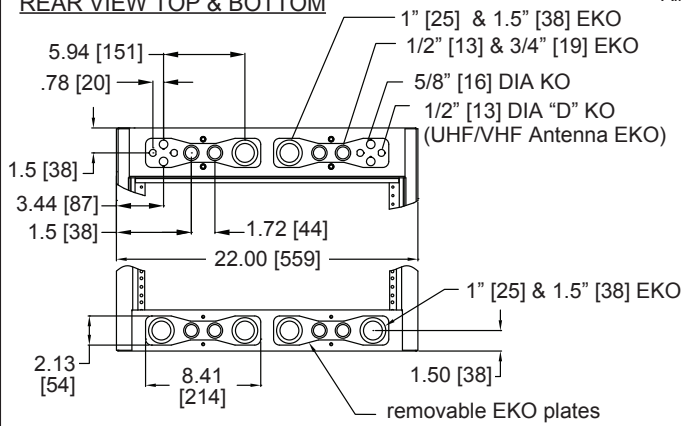
be 1/4-20 threaded, installed in base of enclosure. MRK Series enclosures shall satisfy the 2007 & 2010 CBC; 2006, 2009 & 2012 IBC; ASCE 7-05 (2005 Edition) & ASCE 7-10 (2010 Edition) and the 2006 & 2009 editions of NFPA 5000 for use in areas of high seismicity, Seismic Use Group III, Zone 4 or Seismic Design Category (SDC) "D" with lateral force requirements for protecting 1,050 lbs. of essential equipment in locations with the highest level of seismicity and top floor or rooftop installations with an Importance factor (Ip) of 1.5 when used with MRK-Z4 seismic floor anchor bracket. Rack shall be OSHPD approved for fixed equipment anchorage in California healthcare facilities. Rack shall include a high-density thin power distribution and shall be Middle Atlantic Products model # PDT-2020C-NS with 20 outlets and 20 amps. Thin power distribution shall be 72-3/4" long x 1" deep x 1.9" wide. J-Box shall be 2" deep x 2" wide. Thin power distribution shall feature 20 NEMA 5-20R outlets. Corded power strip includes 20 amp protection and mounting hardware. Corded model shall be terminated with 10 foot power cord and NEMA 5-20P plug. PDT Series shall feature a black anodized finish. MRK and PDT Series shall be UL Listed in the US and Canada. MRK-\_\_\_-DVR (NVR) shall be GREENGUARD Indoor Air Quality Certified for Children and Schools. MRK-\_\_\_-DVR (NVR) shall be RoHS EU Directive 2002/95/EC compliant. MRK-\_\_\_-DVR (NVR) shall be manufactured by an ISO 9001 and ISO 14001 registered company. PDT-2020C-NS shall be warrantied to be free from defects in material or workmanship under normal use and conditions for a period of 3 years. MRK enclosure shall be warrantied to be free from defects in material or workmanship under normal use and conditions for the lifetime of the rack.



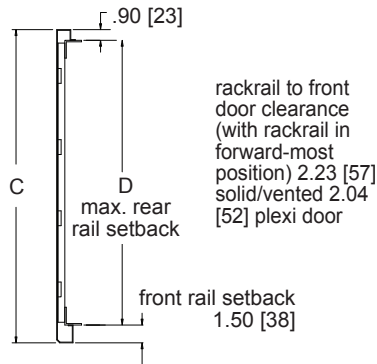
# MRK basic dimensions

All dimensions in inches unless otherwise noted [All dimensions in brackets are in millimeters]

## REAR VIEW TOP & BOTTOM



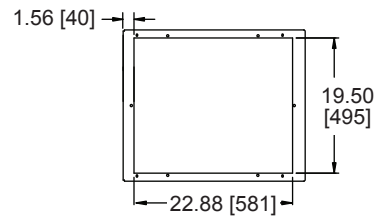
## TOP VIEW OF MRK SIDE SECTIONAL DETAIL



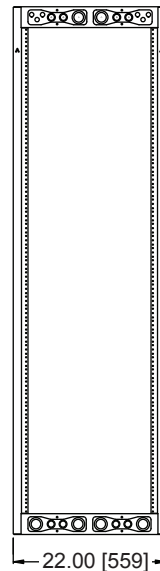
Part #	A Overall Height	B Useable Height	C Overall Depth	D Useable Depth
MRK-4426	83.125" [2112]	77.125" [1959]	26.40" [671]	24.00" [610]
MRK-4426-AV-AB*	83.125" [2112]	77.125" [1959]	26.40" [671]	24.00" [610]
MRK-4026	76.125" [1934]	70.125" [1781]	26.40" [671]	24.00" [610]
MRK-3726	70.875" [1800]	64.875" [1648]	26.40" [671]	24.00" [610]
MRK-2426	48.125" [1223]	42.125" [1070]	26.40" [671]	24.00" [610]
MRK-4431**	83.125" [2112]	77.125" [1959]	31.40" [798]	29.00" [737]
MRK-4431-AV-AB*	83.125" [2112]	77.125" [1959]	31.40" [798]	29.00" [737]
MRK-4431-DVR-AB*	83.125" [2112]	77.125" [1959]	31.40" [798]	29.00" [737]
MRK-4031	76.125" [1934]	70.125" [1781]	31.40" [798]	29.00" [737]
MRK-3731	70.875" [1800]	64.875" [1648]	31.40" [798]	29.00" [737]
MRK-2431	48.125" [1223]	42.125" [1070]	31.40" [798]	29.00" [737]
MRK-4436**	83.125" [2112]	77.125" [1959]	36.00" [914]	33.60" [853]
MRK-4436-NVR-AB*	83.125" [2112]	77.125" [1959]	36.00" [914]	33.60" [853]
MRK-4036**	76.125" [1934]	70.125" [1781]	36.00" [914]	33.60" [853]
MRK-3736	70.875" [1800]	64.875" [1648]	36.00" [914]	33.60" [853]
MRK-2436	48.125" [1223]	42.125" [1070]	36.00" [914]	33.60" [853]
MRK-4442**	83.125" [2112]	77.125" [1959]	42.00" [1067]	39.60" [1006]
MRK-4042**	76.125" [1934]	70.125" [1781]	42.00" [1067]	39.60" [1006]

\* Denotes that AV, DVR and NVR models are also available configured with optional side panels (remove AB suffix for part no. e.g. MRK-4426-AV). Side panels add 1-5/16" [33mm] to overall width of rack.  
 \*\* Available configured with 2 pairs cage nut style rackrail, suffix model number with 'PRO'.

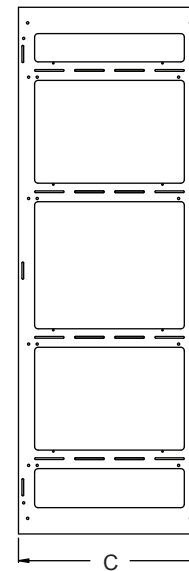
## TOP VIEW



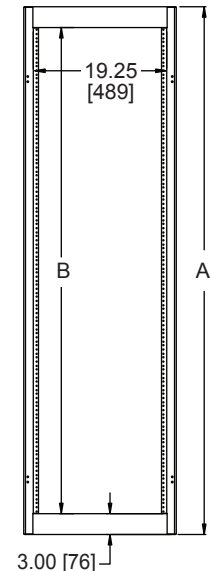
## REAR VIEW



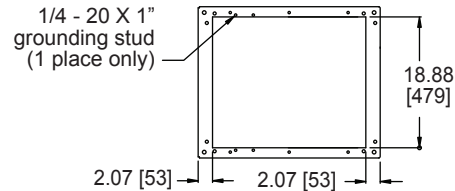
## SIDE VIEW



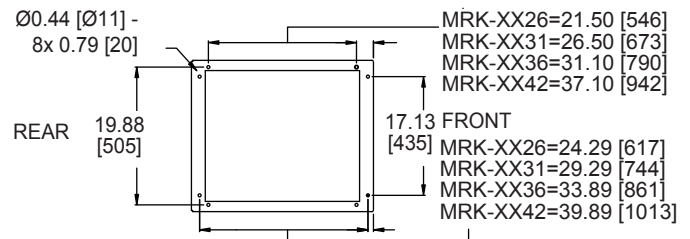
## FRONT VIEW



## BOTTOM VIEW

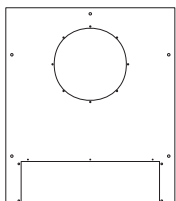


## FLOOR MOUNTING LOCATIONS

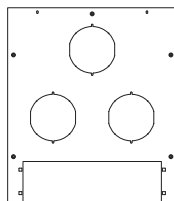


## TOP OPTIONS

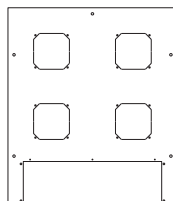
(removable plate opening accommodates 2 space panel)



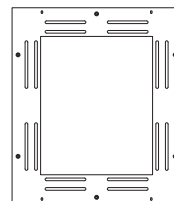
MW-10FT accepts 10" fan  
 MW-10FT-550CFM includes 10" fan  
 MW-10FT-FC includes 10" fan and fan controller (included with A/V enclosures)



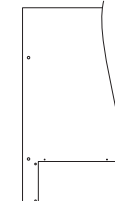
MW-6FT accepts 6" fans  
 MW-6FT-660CFM includes 6" fans



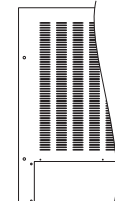
MW-4FT accepts 4-1/2" fans  
 MW-4FT-380CFM includes 4-1/2" fans  
 MW-4QFT-FC includes 4-1/2" quiet fans and fan controller



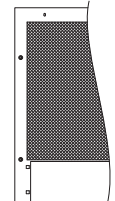
MW-LA accepts 6", 9" and 12" width cable ladder



MW-ST solid



MW-VT slot vent



MW-LVT large perf vent

## Features

- 127 addresses available on this analog addressable system
- Additional system capacity achieved via multi-point SLC modules
- 99 software zones
- NFPA 72 Compliant Smoke Sensitivity Test Built-In
- System Operates as Class A or Class B for SLC, P-Link and NACs
- 5 Amp Power Supply, Expandable to 310 amps
- 2 NACS, Regulated, Rated at 3 Amps each, expandable to 188
- 2 Input/Output (I/O) Circuits for system flexibility rated at 1 Amp each, ideal for manual release and abort
- Strobe Synchronization and System Wide Sync for Potter/AMSECO®, Gentex®, Cooper Wheelock® and System Sensor® strobes
- Dedicated Alarm, Supervisory and Trouble Relays
- 4,000 Event History Buffer
- Cabinet will house up to 18 AH batteries
- Optional two line DACT with UD-2000 that can report General, Zone or Point Information
- Built in IP Communicator
- Ethernet Port for Programming and Network Connectivity
- E-Mail System Status, Reports and Event Information
- Product includes 5 year warranty
- UUKL Listed for Smoke Control



## Description

The IPA-100 is an analog/addressable releasing fire alarm system with a total system capacity of 127 addresses. Additional capacity on the system is achieved using multi-point SLC modules. The control panel utilizes the exclusive Potter protocol that includes a complete line of sensors and modules. Each SLC may be comprised of any combination of smoke sensor, heat detectors or modules and allows for a total of 50 ohms of impedance and may use any wire compliant with the National Electrical Code (NEC).

The IPA-100 has a 5 Amp power supply with two Notification Appliance Circuits (NACs) and two Input/Output (I/O) circuits. The NACs are rated at 3 Amps each and the I/Os are rated at 1 Amp each. Each output is regulated and power limited. In addition, each output is uniquely programmable and may be configured for steady signal, strobe synchronization, constant power, door holder power, or releasing. The strobe synchronization includes Potter/AMSECO, Gentex, System Sensor and Cooper/Wheelock and with the exclusive Quadrasync each output may have a unique brand and all strobes will flash together. The I/Os are designed for inputs such as manual release stations and abort switches that will not require polling and react nearly instantaneously.

The IPA-100 is listed for releasing of fire suppression systems. The software allows cross zones, counting zones, and timers for suppression. The system is capable of multiple release outputs across multiple hazards. In addition, the PSN-1000 may be used to extend releasing capability. The NACs may be expanded using the PSN-1000 series intelligent power supplies. Each PSN-1000 adds another 10 Amps of power, 2 additional input circuits and the IPA-100 will support up to 31 power supplies. The system will synchronize the strobes system wide. In addition, the PSN-1000E has space to allow the installation of up to six loop expansion cards. The cards mount on a stacker bracket that allows access to all SLC circuit connections.

## Technical Specifications

Dimensions	16"W x 17"H x 3 7/8"D
AC Mains	3.0 Amps @ 120 VAC 50/60 HZ 2.0 Amps @ 240 VAC 50/60 HZ
Enclosure	16 gauge cold rolled steel with removable locked door with Lexan viewing window
Battery	Standby Current-130 mA Alarm Current-200 mA <ul style="list-style-type: none"> <li>• 5 Amps power for NACs, I/O, and P-Link</li> <li>• 3 Amps per NAC, regulated</li> <li>• 1 Amp per I/O circuit, regulated</li> <li>• Battery Charger range 8-55 Ah</li> <li>• Battery Charger voltage 27.3 VDC</li> <li>• P-Link maximum current of 1 Amp</li> </ul>
Temperature and Humidity Range	32° to 120° (0°C to 49°C) with a maximum humidity of 93% non-condensing.
Standards	<ul style="list-style-type: none"> <li>• NFPA 12, 12A, 13, 15, 16, 17, 17A, 70, 72, 750, and 2001</li> <li>• ANSI/UL 864 - Local (L), Remote Station (RS), Central Station (CS), Propriety (PPU), Auxiliary (AUX). Type of Service: Automatic (A), Manual (M), Water flow (WF) Sprinkler Supervisory (SS) Type of Signaling: Digital Alarm Communicator (DAC), March Time (March), Non Coded (NC), Reverse Polarity (Rev Pol), Other Technologies (OT)</li> <li>• IBC 2000, 2003, 2006, 2009, 2012</li> </ul>



## SLC Loop Accessories

The control panel may be connected with up to 127 addressable devices or modules in any combination. The SLC is not restricted by any special wire requirements and may be wired with any wire that complies with the NEC.

## SLC Loop Devices

Device	Description
PAD100-PD	Analog Photo Electric Smoke Detector is a smoke detector with a listed obscuration of 1.02 to 3.83 percent per foot.
PAD100-PHD	Combination Analog Photo Electric Smoke/Heat Detector – a smoke detector with a listed obscuration of 1.02 to 3.83 percent obscuration and a fixed temperature 135° Fahrenheit heat detector.
PAD100-HD	Analog Fixed Temperature Heat Detector that is selectable from 135° F to 185°F.
PAD100-DUCTR	Addressable Duct Smoke Detector with Form C Relay.
PAD100-DUCT	Addressable Duct Smoke Detector.
PAD100-6B	6" round base that is mounted to an electrical box and wired for connection of one of the above sensors.
PAD100-4B	4" round base that may be mounted to an electrical box and wired for connection to the above sensors.
PAD100-IB	Isolator base that interrupts a short in a SLC and prevents the short from affecting protected devices on the loop.
PAD100-RB	Addressable Relay Base that contains one relay controlled by the SLC. Relay is rated at rated at 2 amps at 30 VDC or 0.5A at 125VAC.
PAD100-SB	Addressable Sounder Base that contains an addressable sounder module that may be configured for local, group and all call.
PAD100-CD	Addressable CO gas detector.
PAD100-DD	Addressable photo electric smoke detector for use in DUCT/DUCTR enclosure.
PAD100-LFSB	Addressable Low Frequency Sounder Base that contains an addressable sounder module that may be configured for local, group and all call. The LFSB complies with the Low Frequency Signal Requirements (520 Hz)
PAD100-SPKB	Speaker base is a wall or ceiling mount speaker capable of 25 or 70.7 VRMS and is field selectable from 1/8W to 4W.

## Modules

Device	Description
PAD100-MIM	Micro Input Module provides a small foot print contact module for mounting inside an enclosure.
PAD100-PSSA	Single Action Addressable Pull Station.
PAD100-PSDA	Dual Action Addressable Pull Station.
PAD100-SIM	Single Input Module is a standard contact module with an LED that mounts into a 4" square electrical box.
PAD100-DIM	Dual Input Module is a device that can monitor two distinct inputs with a single device or in a Class A mode.
PAD100-TRTI	Two Relay Two Input module provides two form C relays that are individually controlled by the control panel. Each relay is rated for 2 amps at 30VDC or 0.5 amps at 125VAC. Also provides two contact inputs.
PAD100-NAC	Notification Appliance Circuit module is an addressable remote appliance circuit controlled by the panel.
PAD100-ZM	Zone Module is used to connect conventional 2-wire smoke detectors to the system.
PAD100-IM	Isolater Module interrupts a short on the SLC and prevents the short from affecting protected devices on the loop.
PAD100-RM	Relay Module that provides one form C relay controlled by the control panel. Relay is rated for 2 amps at 30VDC or 0.5 amps at 125VAC.
PAD100-LED	Module provides a single addressable LED that is controlled by the control panel.
PAD100-SM	Speaker Module provides switching for two audio channels.
PAD100-LEDK	Addressable LED and key switch that mounts in a single gang box.
PAD100-DRTS	DUCTR Remote Test Switch that mounts in a single gang box and optionally supervised.
PAD100-OROI	One Relay One Input Module provides one form C relay and one input. The relay is rated at 2 amps at 30VDC or 0.5 amps at 125VAC.

### SLC Features

The Potter protocol is a digital protocol with a proven design for reliability and noise immunity. The system does not require special cable or conductors for connection of the Signaling Line Circuit as long as the cable is compliant with NFPA 70 and NFPA 72. The system allows for Class A or Class B installations as well as “T-Taps”, with a max wiring distance of 10,000 Ft.

### Sensor Features

The sensors through the fire alarm control panel provide a real time status as to the condition of the system. The smoke detector sensitivity, heat detector temperature level and drift compensation are all programmable options. The system also allows for a day/night mode where the panel automatically adjusts the sensitivity depending on the time of day. To assist in the reduction of false alarms, the smoke detectors also have a maintenance warning that sends a trouble signal when a detector is dirty to the point that it can no longer maintain the programmed sensitivity.

### User Interface

The fire alarm control panel has a 2 x 16 LCD display to provide information to the system status. The keypad has navigation keys to allow manipulation of the Menu on board the panel. The panel is shipped standard with the following LEDs:

- AC Power - Green
- Alarm - Red
- Earth Fault - Amber
- Supervisory - Amber
- Silenced - Amber
- Trouble - Amber
- Pre-Release - Amber
- Release - Red

The common buttons include a Silence, Reset, Acknowledge, and Drill. All of the buttons are accessible once the locked door is opened.

### P-Link

The IPA-100 has a proprietary communication protocol that communicates through a RS-485 connection to field devices. Up to 64 devices may be connected to a single P-Link connection. The P-Link includes the communication terminals and regulated 24 VDC connection for the field devices. The field devices may be any of the following:

**RA-6075R** – 2 x 16 LCD annunciator with a key pad in a locked metal enclosure.

**RA-6500R(F)** – 4 x 40 LCD annunciator with a key pad in a locked metal enclosure. Flush mount version available.

**LED-16(F)** – 16 LED annunciator with common indicators in a locked metal enclosure. Flush mount version available.

**PSN-1000(E)** – 10 amp, remote intelligent power supply with 6 NACs, 2 Inputs and a P-Link repeater. This panel is listed in conjunction with the IPA-100 as releasing circuits.

**CA-6075** – Class A convertor that converts the SLC, NACs and P-Link connection

**UD-2000** – UL listed, Dual line telephone alarm communicator

**DRV-50** – LED driver expander, used to connect up to 50 LEDs in a graphic display

**FCB-1000** – Fire communication bridge, provides remote mounting of the Ethernet connection

**FIB-1000** – Fiber interface module, used to extend P-Link to multi-mode fiber (2 required)

**RLY-5** – Relay module, provides 5 form C relay contacts rated at 3.0 amps 24VDC/125AC

**SPG-1000** – Serial parallel gateway, allows for the connection to a serial or parallel printer

The **FIB-1000**, **FCB-1000** and the **SPG-1000** may be installed in the stacker bracket or ordered with the optional rack mount enclosure.

**MC-1000** Multi-Connect allows up to sixty-three IPA series panels to share a single reporting technology.

**IDC-6** – Initiating device circuit provides 6 programmable inputs

**AE-2** – Two card expansion cabinet

**AE-8** – Eight card expansion cabinet

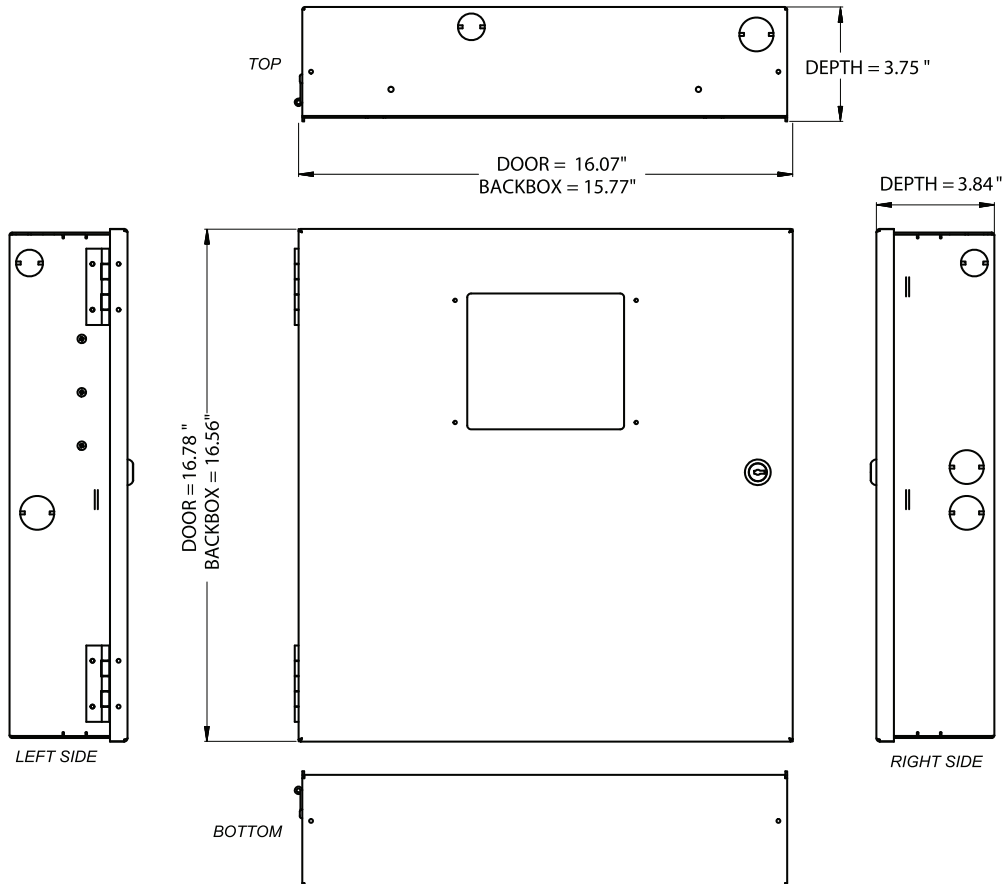
**AE-14** – Fourteen card expansion cabinet

### Ethernet/I.P. Connection

The IPA-100 is shipped standard with an Ethernet connection. This connection is the programming port and may be connected to a building Wide Area Network (WAN) or Local Area Network (LAN). Once connected to the Internet, the panel may be selectively programmed to e-mail alarm conditions, trouble conditions, supervisory conditions, test, Event History and detector status. An e-mail may be sent to the panel and the panel will e-mail the event history, detector status, configuration file or server status to an authorized E-mail account. In addition, reminders may be set to send an e-mail for service, testing or other conditions.

In addition, the Ethernet connection is UL listed as an IP communicator. The IP communicator is listed to report to the UL listed Sur-Gard III IP receiver. The IP communicator replaces the traditional less reliable alarm communicator transmitter that utilized telephone lines. The IP communicator is an active method of connection and communication to the monitoring station.

## Dimensions



DWG #593-1

## Compatible Releasing Devices

**Note:** For releasing applications please order the Potter EOLD (3005012) for circuits connected to a releasing solenoid or actuator.

Brand	Description
Skinner	73218BN4UNLVN0C112CZ 73212BN4TNLVN0C322C2
Victaulic	753-E Series
Mini Max	MX123 & MX200 w/ 8876677 & 889323
Viking	11591, 11601, 11602, 13843, & 13844
TLX	PA0036

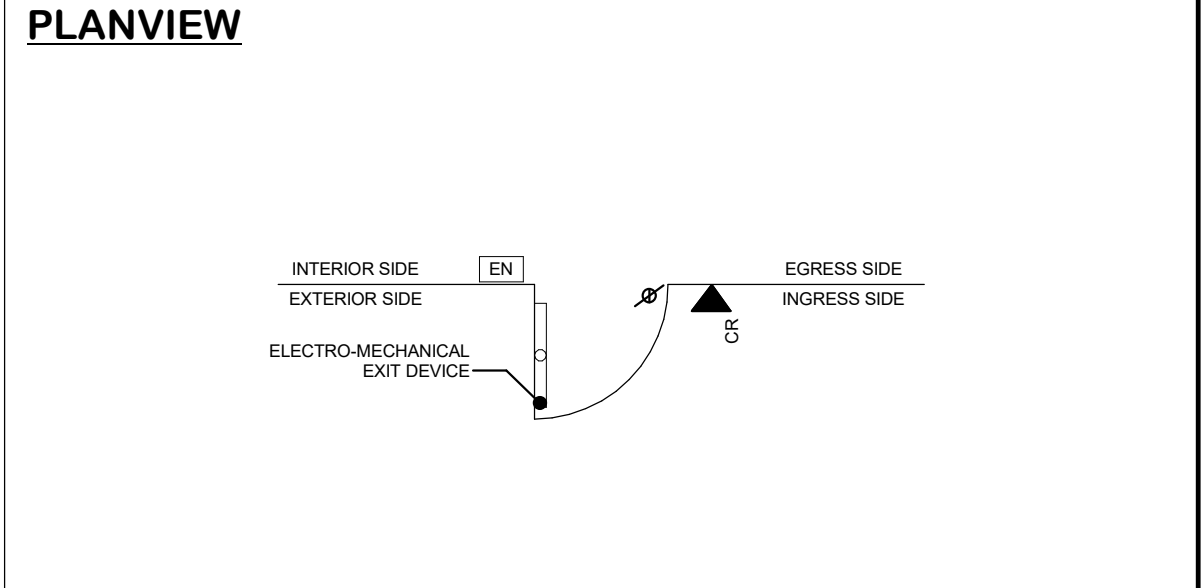
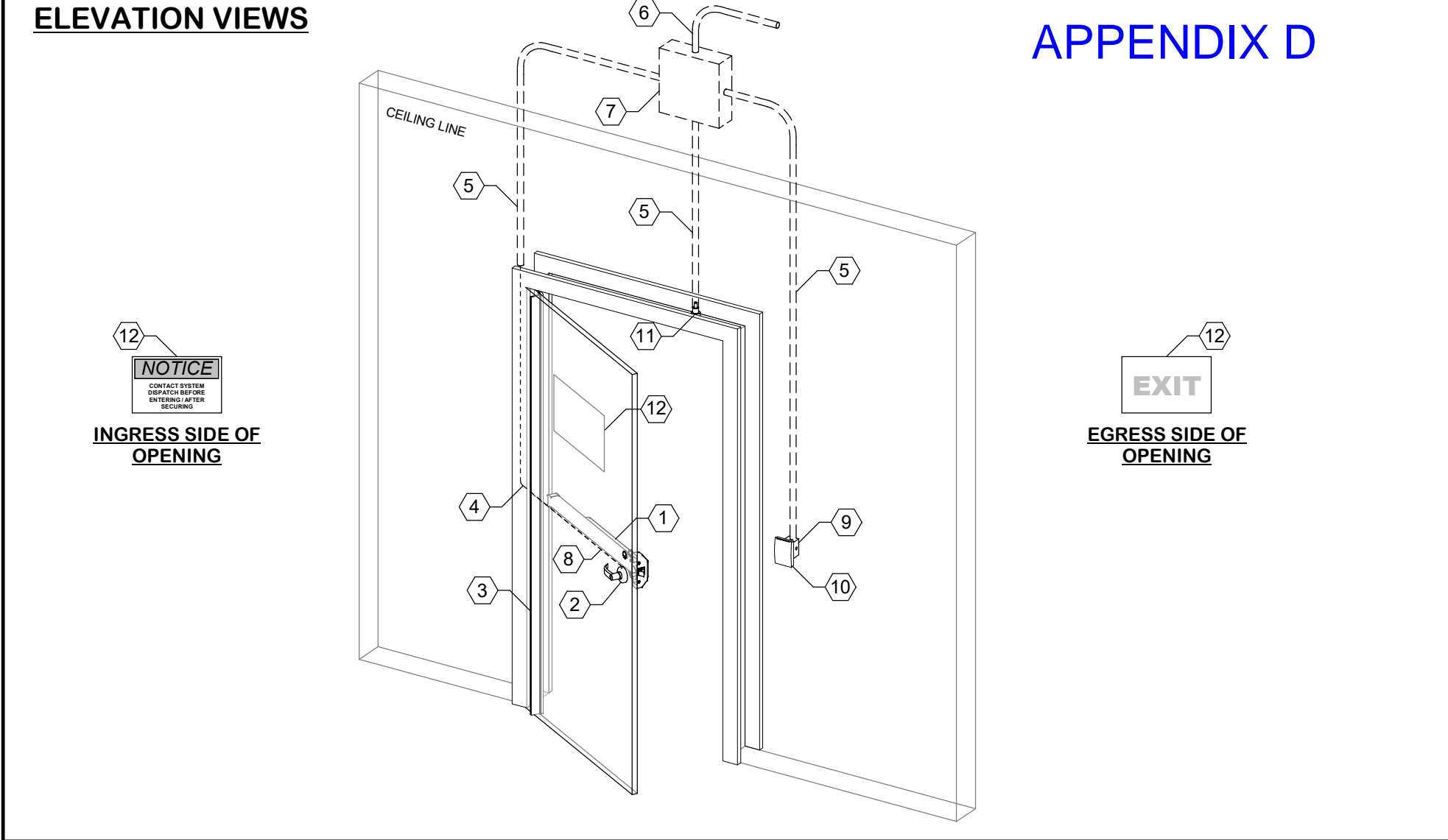
## Ordering Information

Model	Description	Stock No.
IPA-100	Fire Alarm Releasing Control Panel	3992715
	Replacement Board IPA-100	3992739

ELEVATION VIEWS

APPENDIX D

PLANVIEW



OPERATIONAL NARRATIVE	
INGRESS	PRESENTING VALID CARD CREDENTIALS TO ACCESS CONTROL READER SHUNTS DOOR POSITION SWITCH (DPS) AND UNLOCKS FAIL SECURE ELECTRIFIED TRIM, ALLOWING INGRESS. OUTSIDE TRIM OPERABLE BY KEY UNDER EMERGENCY SITUATION ONLY.  ALL ENTRY EVENTS (AUTHORIZED AND UNAUTHORIZED) ARE REPORTED TO AND RECORDED BY THE ACCESS CONTROL MANAGEMENT SYSTEM.
EGRESS	FREE MECHANICAL EGRESS AT ALL TIMES. EXIT DEVICE INTEGRATED REQUEST TO EXIT SWITCH SHUNTS THE DPS, ALLOWING UNALARMED EGRESS.
FIRE ALARM	OPENING MAY REQUIRE FIRE ALARM INTERFACE DEPENDING ON SPECIFIC APPLICATION.
POWER	POWER TO LOCKSET/EXIT DEVICE PROVIDED BY 24vDC LOW VOLTAGE POWER SUPPLY, LOCATE ON SECURE SIDE OF OPENING EITHER ABOVE ACCESSIBLE CEILING OR IN SECURED REMOTE LOCATION. AMPERAGE, LOCATION, AND EXACT CONFIGURATION DEPENDENT ON SPECIFIC APPLICATION. POWER TO DOOR CONTROLLER PROVIDED BY 12vDC POWER SUPPLY; AMPERAGE, LOCATION, AND EXACT CONFIGURATION DEPENDENT ON SPECIFIC APPLICATION. POWER TO CARD READER PROVIDED BY DOOR CONTROLLER.

KEYNOTE LEGEND	
1	ELECTROMECHANICAL RIM EXIT DEVICE WITH LESS DOGGING MECHANISM & INTEGRATED REQUEST TO EXIT & ELECTROLYNX "QC" MOLEX CONNECTORS: ED5200S.
2	ELECTRIFIED FAIL SECURE EXIT DEVICE TRIM WITH CYLINDER OVERRIDE & ELECTROLYNX "QC" MOLEX CONNECTORS: x9905 - TRIM TO MATCH REST OF FACILITY.
3	FULL MORTISE ALUMINUM CONTINUOUS GEARED HINGE "PEMKO CFMHD1" WITH "EL-CEPT" ELECTRIC POWER TRANSFER DEVICE AND FACTORY PREP AT LOCKING DEVICE HEIGHT.
4	15" "QC-12" ELECTROLYNX WIRING HARNESS WHIP CONCEALED IN 3/4" EMT CONDUIT MOUNTED IN THROAT OF DOOR FRAME.
5	3/4" EMT CONDUIT CONCEALED IN WALL ABOVE DOOR FRAME TO ACCESS CONTROL ENCLOSURE.
6	EMT CONDUIT TRUNK TO HEADEND EQUIPMENT AND CENTRALIZED POWER SUPPLY (SIZE OF CONDUIT TO BE CONFIRMED BY JEA SECURITY DEPARTMENT).
7	SURFACE MOUNTED METALLIC ENCLOSURE WITH COVER (HOFFMAN: ASE6X6X4). WHERE FINISHED CEILING EXISTS, HOFFMAN ENCLOSURE SHALL BE INSTALLED ABOVE FINISHED CEILING, IN AN ACCESSIBLE LOCATION.
8	"QC-12" ELECTROLYNX WIRING HARNESS ADEQUATELY SIZED FOR DOOR WIDTH CONCEALED IN FACTORY PREPPED DOOR PATHWAY FROM ELECTRIC POWER TRANSFER DEVICE TO LOCKING DEVICE WIRING HARNESS.
9	WALL CONCEALED SINGLE GANG JUNCTION BOX (C/W PLASTER RING FOR GYP OVER STUD WALLS).
10	WALL MOUNTED ACCESS CONTROL READER (PROXIMITY CARD READER).
11	NEW CONSTRUCTION: CONCEALED IN FRAME MOUNTED DPS (INTERLOGIX: 1076). EXISTING CONSTRUCTION: SURFACE MOUNTED DPS (GEORGE RISK: 4402).
12	SIGNAGE VERBIAGE AND APPLICATION SPECIFIC, COORDINATE WITH JEA SECURITY DEPARTMENT.

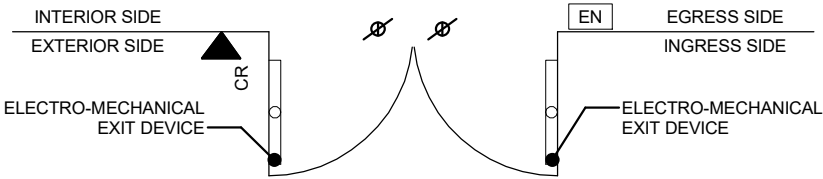
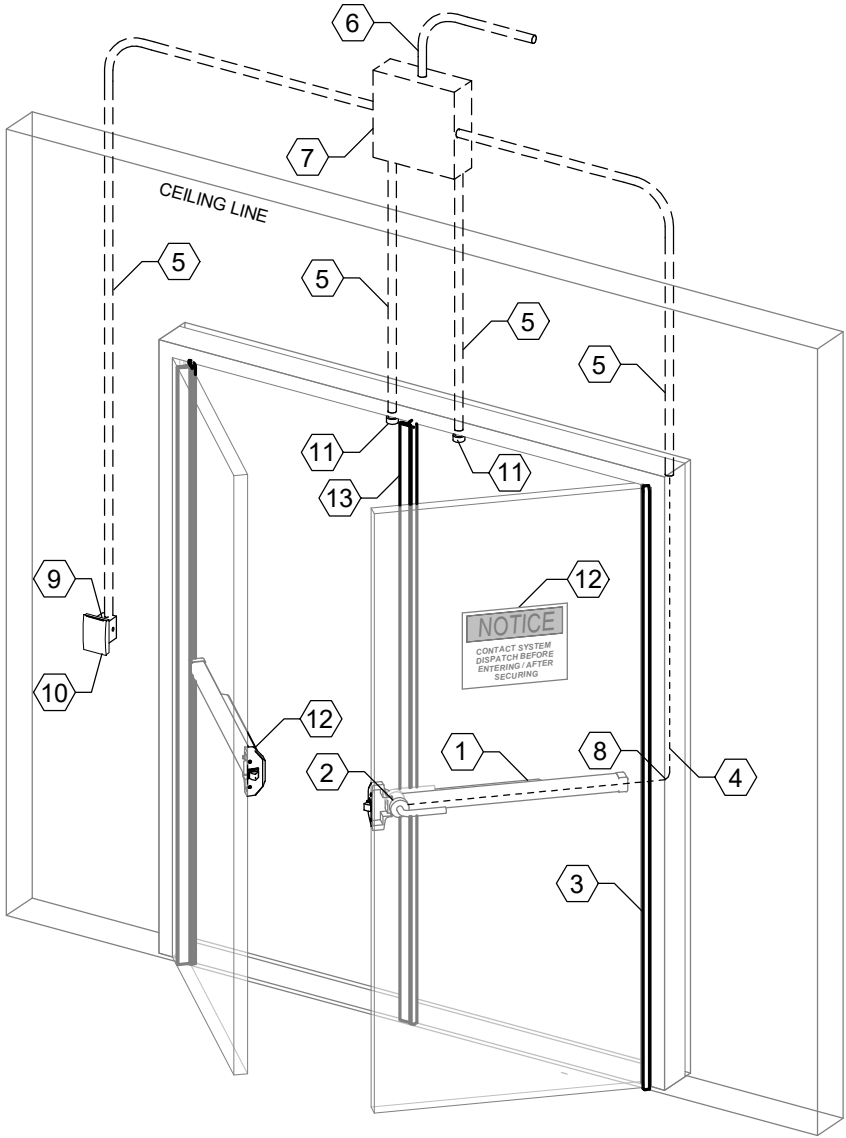
DRAWING GENERAL NOTES:	
1. ABBREVIATIONS	
1.1. EN	- HOFFMAN ENCLOSURE
1.2. DPS	- DOOR POSITION SWITCH
1.3. REX	- REQUEST TO EXIT
1.4. NTS	- NOT TO SCALE
1.5. CR	- CARD READER
1.6. EL	- ELECTRIC LOCKSET / TRIM
1.7. ED	- EXIT DEVICE
2. GENERAL NOTES	
2.1.	FOR ALL WIRING CONNECTIONS AT LOCKING DEVICE AND FRAME CONCEALED WIRING HARNESSES, MOLEX CONNECTORS TO BE USED. OTHER WIRING CONNECTIONS NOT PERMITTED.
2.2.	ALL DOOR AND FRAME PREPS FOR ELECTRIC POWER TRANSFERS AND THROUGH DOOR PATHWAY MUST BE PREPPED AT FACTORY.
2.3.	MORTISE LOCK DOORS - PROVIDE LOCKSET LESS CYLINDER, CYLINDER TYPE SHALL BE COORDINATED WITH JEA PHYSICAL SECURITY DEPARTMENT.
2.4.	EXIT DEVICE DOORS - PROVIDE EXIT DEVICE TRIM LESS CYLINDER, CYLINDER TYPE SHALL BE COORDINATED WITH JEA PHYSICAL SECURITY DEPARTMENT.
2.5.	PROVIDE CORBIN RUSSWIN DC8200 x A10 / DC8210 x A11 DOOR CLOSERS, 689 FINISH (MOUNT ON INTERIOR SIDE OF ALL EXTERIOR DOORS).
2.6.	PROVIDE ALL OTHER AUXILIARY DOOR HARDWARE BHMA CERTIFIED GRADE 1: THRESHOLDS, PERIMETER SEALS, DOOR STOPS, DOOR BOTTOMS, AND WHERE APPLICABLE, ASTRAGALS, MEETING STILE SEALS, DOOR COORDINATORS, AND FLUSH BOLTS.
2.7.	TOTAL DOOR ASSEMBLY SHALL MEET ALL APPLICABLE PROJECT BUILDING CODE REQUIREMENTS.
2.8.	JEAS STANDARD DOOR DETAIL, MODIFICATION OF MANUFACTURER PART NUMBERS AND/OR OVERALL CABLING/CONDUIT LAYOUT MAY BE REQUIRED TO ACCOMMODATE FIELD CONDITIONS AND/OR SPECIFIC APPLICATION.

NO.	DATE	REVISIONS			HSJ PROJECT NO.:	SINGLE DOOR - CARD READER IN - ED - A/C DETAIL		SHEET NO.:
					430-2001			SD-02
					DATE:	04.22.2020	LEAF QTY: SINGLE	
							LOCKING DEVICE: ELECTROMECHANICAL FAIL SECURE MORTISE LOCKSET	
							ACCESS CONTROL TYPE: CARD IN, FREE OUT	
					SCALE:	N.T.S.		

ELEVATION VIEWS

APPENDIX D

PLANVIEW



OPERATIONAL NARRATIVE



INGRESS	PRESENTING VALID CARD CREDENTIALS TO ACCESS CONTROL READER SHUNTS DOOR POSITION SWITCH (DPS) AND UNLOCKS FAIL SECURE ELECTRIFIED TRIM, ALLOWING INGRESS. OUTSIDE TRIM OPERABLE BY KEY UNDER EMERGENCY SITUATION ONLY.  ALL ENTRY EVENTS (AUTHORIZED AND UNAUTHORIZED) ARE REPORTED TO AND RECORDED BY THE ACCESS CONTROL MANAGEMENT SYSTEM.
EGRESS	FREE MECHANICAL EGRESS AT ALL TIMES. LOCKSET INTEGRATED REQUEST TO EXIT SWITCH SHUNTS THE DPS, ALLOWING UNALARMED EGRESS.
FIRE ALARM	OPENING MAY REQUIRE FIRE ALARM INTERFACE DEPENDING ON SPECIFIC APPLICATION.
POWER	POWER TO LOCKSET/EXIT DEVICE PROVIDED BY 24vDC LOW VOLTAGE POWER SUPPLY, LOCATE ON SECURE SIDE OF OPENING EITHER ABOVE ACCESSIBLE CEILING OR IN SECURED REMOTE LOCATION. AMPERAGE, LOCATION, AND EXACT CONFIGURATION DEPENDENT ON SPECIFIC APPLICATION. POWER TO DOOR CONTROLLER PROVIDED BY 12vDC POWER SUPPLY; AMPERAGE, LOCATION, AND EXACT CONFIGURATION DEPENDENT ON SPECIFIC APPLICATION. POWER TO CARD READER PROVIDED BY DOOR CONTROLLER.

KEYNOTE LEGEND

- ① ELECTROMECHANICAL RIM EXIT DEVICE WITH LESS DOGGING MECHANISM & INTEGRATED REQUEST TO EXIT & ELECTROLYNX "QC" MOLEX CONNECTORS: ED5200S.
- ② ELECTRIFIED FAIL SECURE EXIT DEVICE TRIM WITH CYLINDER OVERRIDE & ELECTROLYNX "QC" MOLEX CONNECTORS: x9905 - TRIM TO MATCH REST OF FACILITY.
- ③ FULL MORTISE ALUMINUM CONTINUOUS GEARED HINGE "PEMKO CFMHD1" WITH "EL-CEPT" ELECTRIC POWER TRANSFER DEVICE AND FACTORY PREP AT LOCKING DEVICE HEIGHT.
- ④ 15" "QC-12" ELECTROLYNX WIRING HARNESS WHIP CONCEALED IN 3/4" EMT CONDUIT MOUNTED IN THROAT OF DOOR FRAME.
- ⑤ 3/4" EMT CONDUIT CONCEALED IN WALL ABOVE DOOR FRAME TO ACCESS CONTROL ENCLOSURE.
- ⑥ EMT CONDUIT TRUNK TO HEADEND EQUIPMENT AND CENTRALIZED POWER SUPPLY, (SIZE OF CONDUIT TO BE CONFIRMED BY JEA SECURITY DEPARTMENT).
- ⑦ SURFACE MOUNTED METALLIC ENCLOSURE WITH COVER (HOFFMAN: ASE6X6X4). WHERE FINISHED CEILING EXISTS, HOFFMAN ENCLOSURE SHALL BE INSTALLED ABOVE FINISHED CEILING, IN AN ACCESSIBLE LOCATION.
- ⑧ "QC-12" ELECTROLYNX WIRING HARNESS ADEQUATELY SIZED FOR DOOR WIDTH CONCEALED IN FACTORY PREPPED DOOR PATHWAY FROM ELECTRIC POWER TRANSFER DEVICE TO LOCKING DEVICE WIRING HARNESS.
- ⑨ WALL CONCEALED SINGLE GANG JUNCTION BOX (C/W PLASTER RING FOR GYP OVER STUD WALLS).
- ⑩ WALL MOUNTED ACCESS CONTROL READER (PROXIMITY CARD READER).
- ⑪ NEW CONSTRUCTION: CONCEALED IN FRAME MOUNTED DPS (INTERLOGIX: 1076). EXISTING CONSTRUCTION: SURFACE MOUNTED DPS (GEORGE RISK: 4402).
- ⑫ SIGNAGE VERBIAGE AND APPLICATION SPECIFIC, COORDINATE WITH JEA SECURITY DEPARTMENT.
- ⑬ KEYED REMOVABLE MULLION C/W HC PREFIX: LC-HC-L980.

DRAWING GENERAL NOTES:

- 1. ABBREVIATIONS
  - 1.1. EN - HOFFMAN ENCLOSURE
  - 1.2. DPS - DOOR POSITION SWITCH
  - 1.3. REX - REQUEST TO EXIT
  - 1.4. NTS - NOT TO SCALE
  - 1.5. CR - CARD READER
  - 1.6. EL - ELECTRIC LOCKSET / TRIM
  - 1.7. ED - EXIT DEVICE
- 2. GENERAL NOTES
  - 2.1. FOR ALL WIRING CONNECTIONS AT LOCKING DEVICE AND FRAME CONCEALED WIRING HARNESSES, MOLEX CONNECTORS TO BE USED. OTHER WIRING CONNECTIONS NOT PERMITTED.
  - 2.2. ALL DOOR AND FRAME PREPS FOR ELECTRIC POWER TRANSFERS AND THROUGH DOOR PATHWAY MUST BE PREPPED AT FACTORY.
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  - 2.8. JEA STANDARD DOOR DETAIL, MODIFICATION OF MANUFACTURER PART NUMBERS AND/OR OVERALL CABLING/CONDUIT LAYOUT MAY BE REQUIRED TO ACCOMMODATE FIELD CONDITIONS AND/OR SPECIFIC APPLICATION.

NO.	DATE	REVISIONS			HSJ PROJECT NO.:	DOUBLE DOOR - CARD READER IN - ED - A/C DETAIL		SHEET NO.:  <b>SD-04</b>	
					430-2001	LEAF QTY: SINGLE			
					DATE:	04.22.2020	LOCKING DEVICE:		
							ACCESS CONTROL TYPE:		
					SCALE:	N.T.S.			





## Trove2AM2 Kit / TAM2 Backplane Access & Power Integration Solution

### Description

Altronix Trove™ enclosures and backplanes let you easily integrate Altronix power with AMAG Symmetry access controllers and accessories. Trove simplifies board layout and wire management, reduces installation time and labor costs.

### Trove2 Enclosure + TAM2 Backplane Features

- Accommodates the following AMAG Symmetry controllers with or without Altronix power/accessories:
  - M2150 2DC, M2150 4DC or M2150 AC24/4
  - M2150 2DBC, M2150 4DBC or M2150 8DBC
  - Altronix Power Supplies
  - Altronix Sub-Assemblies
- Includes Altronix Trove2 Enclosure and one (1) removable TAM2 backplane

### Agency Listings

#### UL:

UL294 - Access Control System.

#### cUL:

CAN/ULC - s319-05 - Electronic Access Control Systems.

#### CE

European Conformity.

### Features

- Simplifies board layout and wire management
- Convenient knockout configuration:
  - Single 2" diameter knockout located top center of enclosure
  - Sixteen (16) double knockouts (1" and 0.75")
- Accommodates up to four (4) 12VDC/7AH batteries
- 16 AWG powder coated steel
- Includes cam lock, tamper switch and mounting hardware

### Dimensions (H x W x D):

27.25" x 21.5" x 6.5" (692.15mm x 546.1mm x 165.1mm)

### Weights:

Product - 37.1 lbs. (16.83 kg)

Shipping - 40.85 lbs. (18.53 kg)

### TAM2 Backplane Features

- Accommodates the following AMAG Symmetry controllers with or without Altronix power/accessories:
  - M2150 2DC, M2150 4DC or M2150 AC24/4
  - M2150 2DBC, M2150 4DBC or M2150 8DBC
  - Altronix Power Supplies
  - Altronix Sub-Assemblies
- Backplane features:
  - Simplifies board layout and wire management
  - 16 AWG galvanized steel

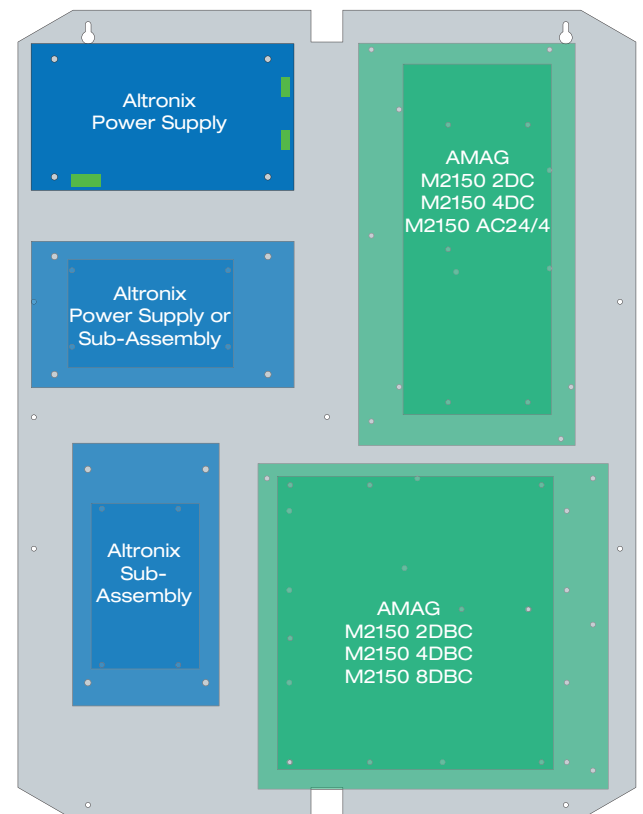
Dimensions: 25.375"H x 19.375"W x 0.3125"D  
(644.5mm x 492.1mm x 8mm)

Weights: Product - 8.0 lbs. (3.63 kg)  
Shipping - 10.0 lbs. (4.53 kg)



Trove2AM2

\* Boards not included





Trove2AM2

Access & Power Integration Solution

