



| an EnerSys® company

SE48-1616, SE48-2216

Outdoor Traffic Enclosure

Technical Guide: 9400030-J0

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SE48-1616, SE48-2216


Outdoor Traffic Enclosure

 **NOTE:**

Photographs contained in this manual are for illustrative purposes only. These photographs may not match your installation.

 **NOTE:**

Operator is cautioned to review the drawings and illustrations contained in this manual before proceeding. If there are questions regarding the safe operation of this powering system, contact Alpha Technologies or your nearest Alpha representative.

 **NOTE:**

Alpha shall not be held liable for any damage or injury involving its enclosures, power supplies, generators, batteries, or other hardware if used or operated in any manner or subject to any condition inconsistent with its intended purpose, or if installed or operated in an unapproved manner, or improperly maintained.

For technical support, contact Alpha Technologies:

Canada and USA: **1-888-462-7487**

International: **+1-604-436-5547**

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1. Safety

SAVE THESE INSTRUCTIONS: This manual contains important safety instructions that must be followed during the installation, servicing, and maintenance of the product. Keep it in a safe place. Review the drawings and illustrations contained in this manual before proceeding. If there are any questions regarding the safe installation or operation of this product, contact Alpha Technologies or the nearest Alpha representative.

1.1 Safety Symbols

To reduce the risk of injury or death, and to ensure the continued safe operation of this product, the following symbols have been placed throughout this manual. Where these symbols appear, use extra care and attention.

The use of **ATTENTION** indicates specific regulatory/code requirements that may affect the placement of equipment and /or installation procedures.



NOTE:

A NOTE provides additional information to help complete a specific task or procedure. Notes are designated with a checkmark, the word NOTE, and a rule beneath which the information appears



CAUTION!

CAUTION indicates safety information intended to PREVENT DAMAGE to material or equipment. Cautions are designated with a yellow warning triangle, the word CAUTION, and a rule beneath which the information appears.



WARNING!

WARNING presents safety information to PREVENT INJURY OR DEATH to personnel. Warnings are indicated by a shock hazard icon, the word WARNING, and a rule beneath which the information appears.



HOT!

The use of HOT presents safety information to PREVENT BURNS to the technician or user.

1.2 General Warning and Cautions



WARNING!

You must read and understand the following warnings before installing the enclosure and its component. Failure to do so could result in personal injury or death.

- Read and follow all instructions included in this manual.
- Only trained personnel are qualified to install or replace this equipment and its components.
- Use proper lifting techniques whenever handling equipment, parts, or batteries.

1.3 Electrical Safety



WARNING!

Hazardous voltages and/or energy levels can be present at the input of power systems. The DC output from rectifiers and batteries, though not dangerous in voltage, has a high short-circuit current capacity that may cause severe burns and electrical arcing.

Before working with any live battery or power system, follow these precautions:

- a. Remove all metallic jewelry, such as watches, rings, metal rimmed glasses, or necklaces.
- b. Wear safety glasses with side shields at all times during the installation.
- c. Use OSHA approved insulated hand tools. Do not rest tools on top of batteries.



WARNING!

Lethal voltages are present within the power system. Always assume that an electrical connection or conductor is energized. Check the circuit with a voltmeter with respect to the grounded portion of the enclosure (both AC and DC) before performing any installation or removal procedure.

- Do not work alone under hazardous conditions.
- A licensed electrician is required to install permanently wired equipment. Input voltages can range up to 240 Vac. Ensure that the utility power is disconnected and locked out before performing any installation or removal procedure.
- Ensure that no liquids or wet clothes come into contact with internal components.
- Hazardous electrically live parts inside this unit are energized from the batteries even when the AC input power is disconnected.
- The enclosure which contains the DC or AC power system along with customer installed radios must remain locked at all times, except when authorized service personnel are present.
- Always assume electrical connections or conductors are live. Turn off all circuit breakers and double-check with a voltmeter before performing installation or maintenance.
- Place a warning label on the utility panel to warn emergency personnel that a reserve battery source is present which will power the loads in a power outage condition or if the AC disconnect breaker is turned off.
- At high ambient temperature conditions, the internal temperature can be hot so use caution when touching the equipment.

1.4 Battery Safety

- Never transport an enclosure with batteries installed. Batteries must ONLY be installed after the enclosure has been securely set in place at its permanent installation location. Transporting the unit with batteries installed may cause a short circuit, fire, explosion, and/or damage to the battery pack, enclosure and installed equipment.
- Servicing and connection of batteries must be performed by, or under the direct supervision of, personnel knowledgeable of batteries and the required safety precautions.
- Batteries contain or emit chemicals known to cause cancer and birth defects or other reproductive harm. Battery post terminals and related accessories contain lead and lead compounds. Wash your hands after handling batteries.



WARNING!

Follow battery manufacturer's safety recommendations when working around battery systems. Do not smoke or introduce an open flame when batteries (especially vented batteries) are charging. When charging, batteries vent hydrogen gas, which can explode.

- Batteries are hazardous to the environment and should be disposed at a recycling facility. Consult the battery manufacturer for recommended local authorized recyclers.

2. Introduction

2.1 Product Overview

The SE48-1616 and SE48-2216 (hereafter referred to as SE48) is a 6 cubic foot NEMA 3R rated enclosure designed to protect in outdoor environments.

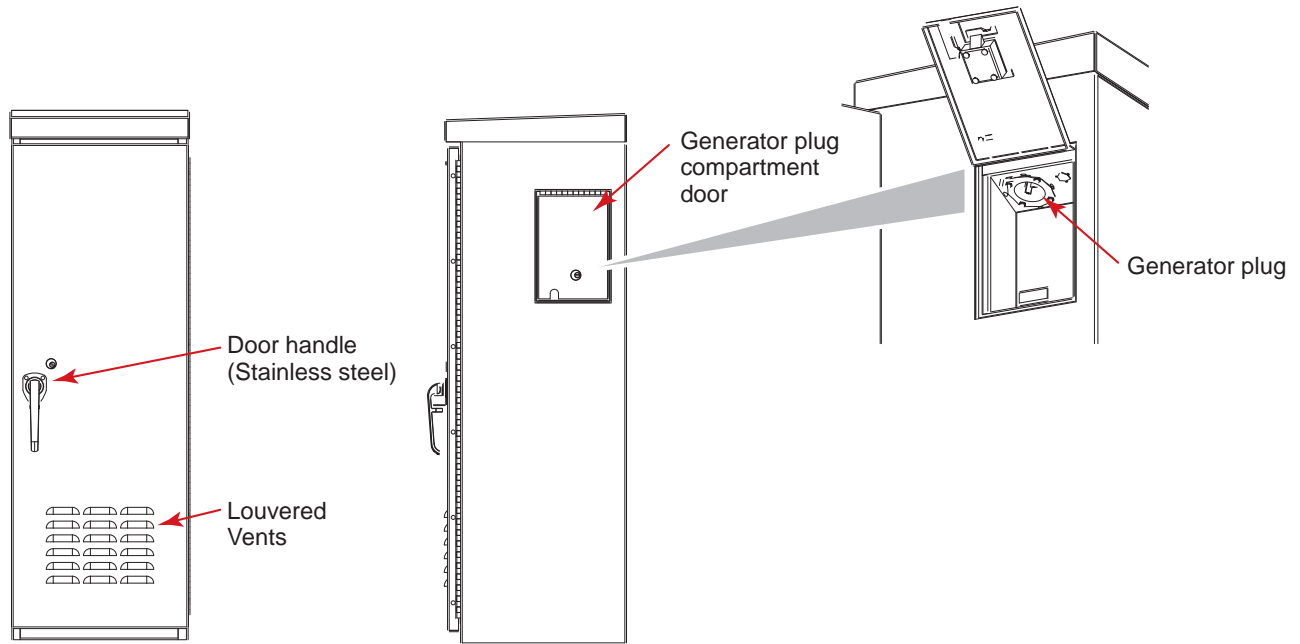


Figure 1 — Alpha SE48 Front and Side View

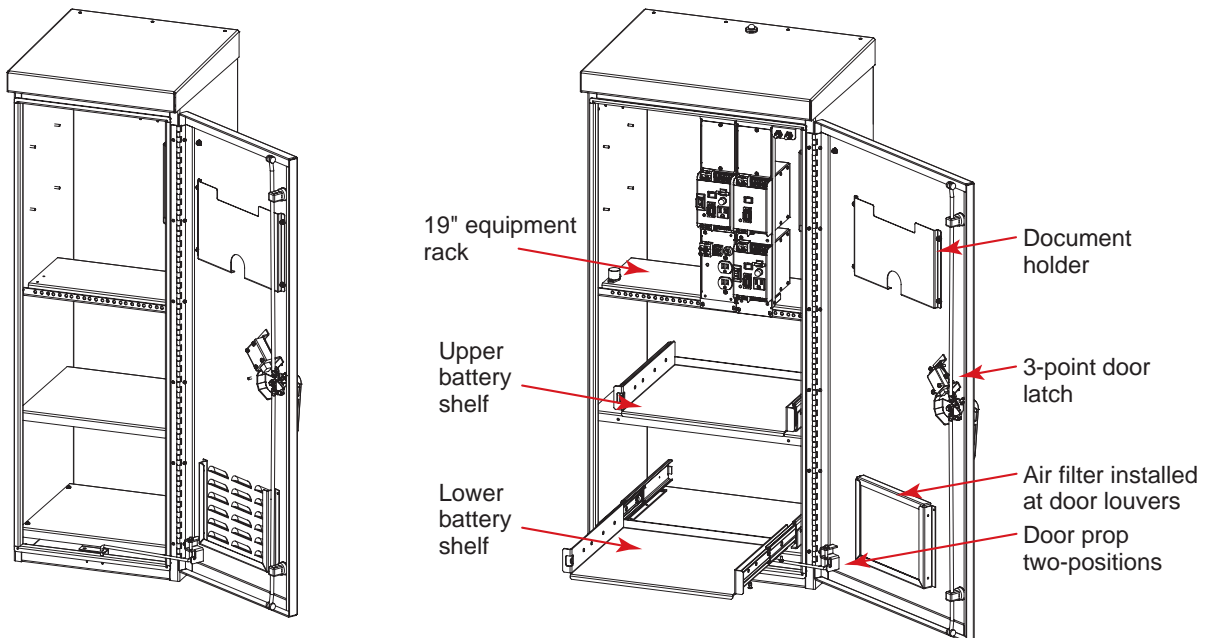


Figure 2 — Alpha SE48 Interior View

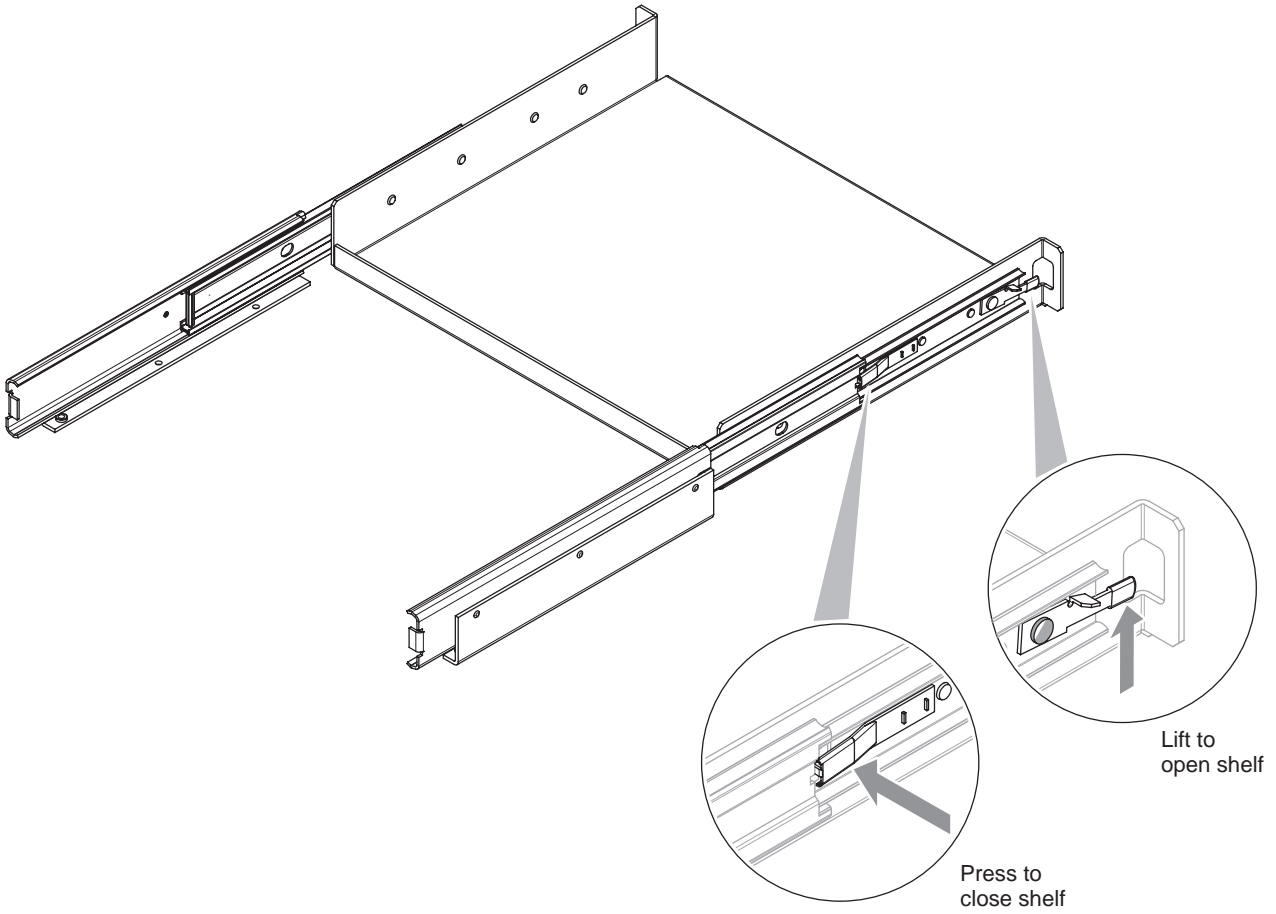


Figure 3 — Slide-out Battery Shelf Detail

3. Specifications

Table A — Specifications - SE48	
Electrical	
DC Fan:	48Vdc, 100CFM or better. Thermostat controlled.
Internal Fluorescent Lamp:	120Vac, 9W (optional)
On Battery Lamp:	48Vdc LED (optional)
Generator Plug:	NEMA L5-30P (optional)
Manual Transfer Switch:	250V, 40A (optional)
Mechanical	
Enclosure type:	Outdoor NEMA 3R
Dimensions (H x W x D):	SE48-1616: (footprint) 1220mm x 419mm x 419mm (48in x 16.5in x 16.5in) SE48-2216: (footprint) 1220mm x 559mm x 419mm (48in x 22in x 16.5in)
Weight (empty):	SE48-1616: 34kg (75lbs) SE48-2216: 38kg (84lbs)
Mounting:	Side/Base/Pedestal/Pole
Construction:	1/8" thick 5052-H32 aluminum
Finish:	Bare aluminum finish (optional: gray)
Equipment rack:	Horizontal 19" rack mount rails, EIA spacing, 8 RU wide (SE48-1616), 11 RU (SE48-2216)
Battery shelves:	Two battery shelves: <ul style="list-style-type: none"> • Fixed weld-on upper battery shelf • Removable lower battery shelf for accessing service wire and mounting holes • Battery Slide Out Tray (option on SE48-2216)
Ventilation:	<ul style="list-style-type: none"> • Louvered vents at door and vent slots at top front • Air inlet filter install at door louvers, fixed in all three dimensions • Air filter size: 9.75" (W) x 8.0" (H) x 0.875" (thick) • Air filter type: re-usable and washable • Bug screen inside vent slots at top
Door:	<ul style="list-style-type: none"> • Latch: 3-point latch with #2 Corbin slam latch integrated with the handle • Handle: stainless steel, traffic light industry standard • Prop: 1/4" bare aluminum rod, two positions. Holes located in tab mounted at the front of bottom pan providing 90° and 150° door holding positions • Hinge: stainless steel piano hinge, reverse swaged, 1.5" (W), 0.075" (thick), 0.188" Dia. pin, 0.500" knuckles • Document holder on inside door
HVAC	
Cooling:	Thermostat-controlled filtered 48VDC fan, 100CFM or better; thermostat turns fan on at 49°C (120°F) and turns fan off at 32°C (90°F).
Environmental	
Operating temperature:	-40 to 46°C (-40 to 115°F)
Storage temperature:	-40 to 85°C (-40 to 185°F)
Compliance	
NEMA rating:	3R
CSA:	C22.2 No. 94.1-07 Enclosures for Electrical Equipment, Non-Environmental Considerations C22.2 No. 94.2-07 Enclosures for Electrical Equipment, Environmental Considerations
UL	UL 50 – Enclosures for Electrical Equipment, Non-Environmental Considerations UL 50 E – Enclosures for Electrical Equipment, Environmental Considerations

4. Features

4.1 AC and DC Power Options

The following power options are available with the SE48:

- FXM 650
- FXM 1100/2000

4.2 Ordering Guide

Refer to ordering guide for a complete list of part numbers for the different mounting options and accessories.

4.3 Related Documents

FXM UPS Operator's Manual (Doc# 017-230-B0)

Universal Automatic Transfer Switch/Universal Generator Transfer Switch Installation Manual (Doc# 020-165-B0)

Local electrical codes (e.g. National Electrical Code, or NFPA 70 in the United States, Canadian Electrical Code or CSA C22.1 in Canada)

5. Site Evaluation and Pre-Installation

5.1 Site Selection

Consider the following before selecting a mounting site:

- Avoid areas that may be subjected to hot air exhaust from nearby equipment or buildings.
- Find out if your intended area is subjected to architectural controls or environmental restrictions.
- Avoid areas that are prone to flooding

The SE48 outdoor power enclosure has been designed for the following mounting options:

- Side mount to an existing enclosure
- Stand alone on a concrete pad
- Stand alone on pedestal kit
- Pole mount to either a wooden or steel/concrete pole
- Refer to ordering guide for a complete list of part numbers for the different mounting option accessories.

5.2 Tools Required

Various insulated tools are essential for the installation. Use this list as a guide:

- Electric drill with hammer action, 1/2" capacity
- Various crimping tools and dies to match lugs used in installation
- Load bank of sufficient capacity
- Digital voltmeter equipped with test leads
- Cable cutters
- Torque wrench: 1/4" drive, 0 - 150 in-lb.
- Torque wrench: 3/8" drive, 0 - 100 ft-lb.
- Various insulated hand tools including:
 - Combination wrenches - Ratchet and socket set
 - Various screwdrivers
 - Electricians knife
- Battery safety spill kit required for wet cells only:
 - Protective clothing
 - Face shields
 - Gloves
 - Baking soda
 - Eye wash equipment
- Cutters and wire strippers (#14 to #22 AWG) [2.5 to 0.34 mm²].








6. Inspection

6.1 Packing Materials

Alpha is committed to providing products and services that meet our customers' needs and expectations in a sustainable manner, while complying with all relevant regulatory requirements. As such Alpha strives to follow our quality and environmental objectives from product supply and development through to the packaging for our products.

Rectifiers and batteries are shipped on individual pallets and are packaged according to the manufacturer's guidelines.

Almost all of Alpha's packaging material is from sustainable resources and/or is recyclable. See the following table for the material and its environmental codes.

 PAP/PCB	 PET	 PE-LD	 PS	 FE	 ALU	 NW
Cardboard	Polyethylene Terephthalate	Low Density Polyethylene	Polystyrene	Steel	Aluminum	Wood
Packing boxes Caps	Flexible film Packaging	Bubble wrap Shrink wrap Plastic bags	Foam	Strapping on pallets	Strapping on pallets	Pallets Lumber

6.1.1 Returns for Service

Save the original shipping container. If the product needs to be returned for service, it should be packaged in its original shipping container. If the original container is unavailable, make sure that the product is packed with at least three inches of shock-absorbing material to prevent shipping damage.

Alpha Technologies is not responsible for damage caused by improper packaging of returned products.

6.2 Check for Damage

Before unpacking the product, note any damage to the shipping container. Unpack the product and inspect the exterior for damage. If any damage is observed, contact the carrier immediately.

Continue the inspection for any internal damage. In the unlikely event of internal damage, inform the carrier and contact Alpha Technologies for advice on the impact of any damage.

6.3 General Receipt of Shipment

The inventory included with your shipment depends on the options you have ordered. The options are clearly marked on the shipping container labels and bill of materials.

Call Alpha Technologies if you have any questions before you proceed: 1 888 462-7487.

7. Installation

Only qualified personnel should install and connect the power components within the Alpha power system.

7.1 Safety Precautions

Refer to the Safety section near the front of this manual.

7.2 Mounting the SE48

The SE48 can be mounted in one of the four following ways:

1. Side Mount to an existing enclosure such as a traffic light cabinet. Mounting holes must be drilled on site and mounted with six sets of 1/4"-20 18-8 stainless steel hex head bolts and nuts assembly (supplied).
2. Stand-alone using 4 x 1" knock outs for base mount to concrete pad with 3/4" screw anchors (not supplied). See Figure 4 for mounting pad hole patterns.
3. Stand-alone using 4 x 1/2" knock outs for mounting to optional pedestal kit with 3/8" screws (supplied in pedestal kit). See Figure 4 for mounting pad hole patterns.
4. Pole mount to either a wooden or steel/concrete pole, using the optional pole mount kit. Holes must be drilled on site and the mounting kit attached with the supplied hardware.

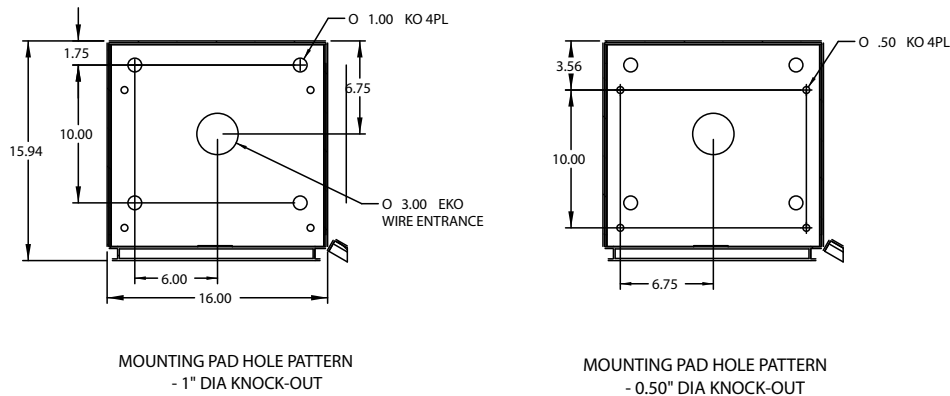


Figure 4 — Mounting Pad Hole Patterns

NOTE:

To get access to the mounting pad holes, remove the lower battery shelf by undoing four screws on the shelf.

7.2.1 Mounting the Enclosure to a Pole

If you are mounting the enclosure to a wood, steel/concrete pole, requires two optional pole mount strap kits. Install these to the rear panel of the enclosure according to the following instructions.

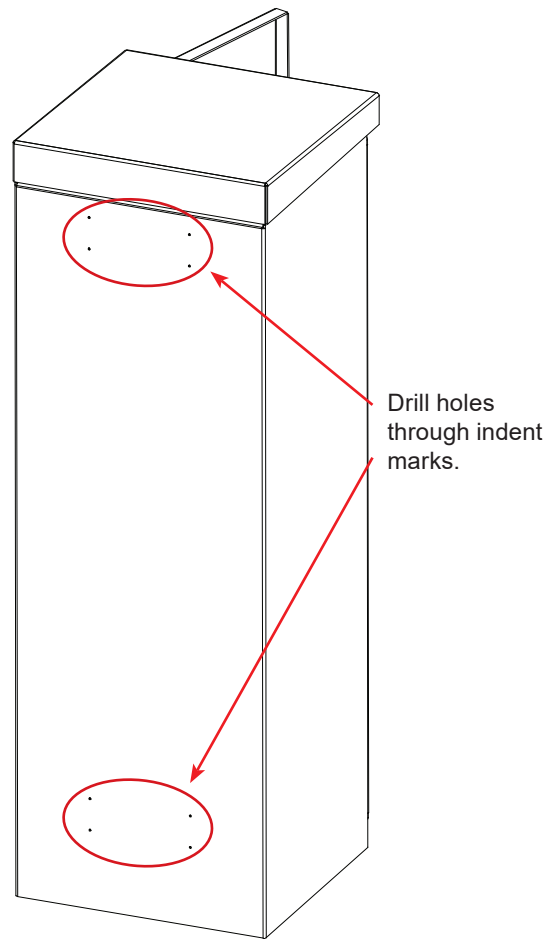
Installing the pole mount strap kit

Pole mount strap kit includes:

- Two pole mount straps
- Eight sets of 1/4-20 x 3/4" S/S carriage bolts
- 1/4" S/S flat washers and 1/4" S/S locknuts
- One 3/8-16 x 1" cap screw

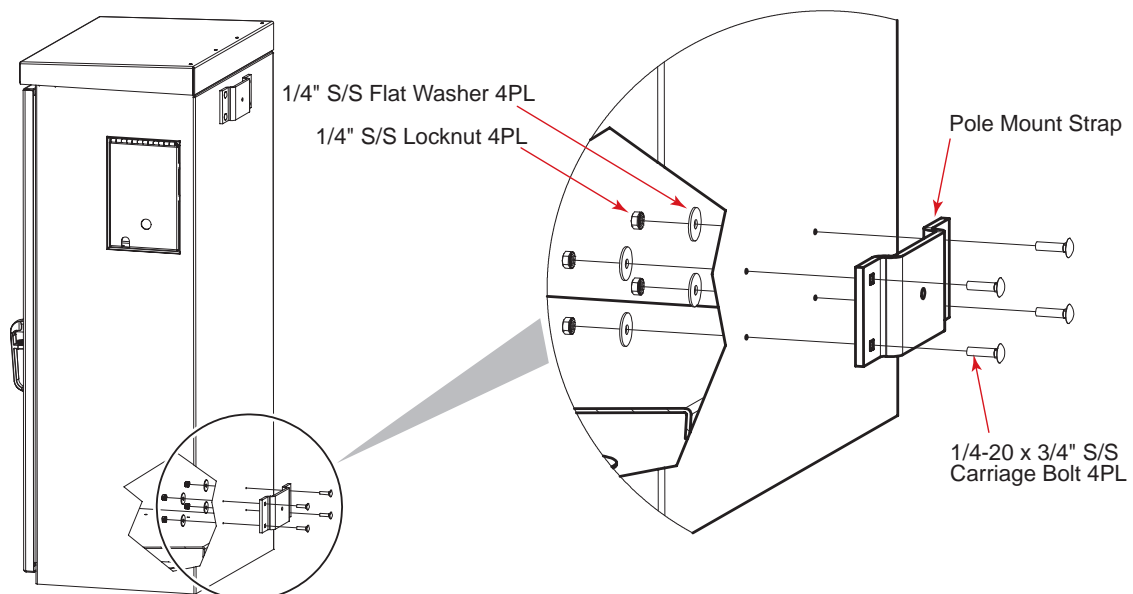
To install the strap kit:

1. Drill through the eight indent marks using a 9/32" drill bit.



Note: These are not knockouts. Do not attempt to punch them out.

2. Secure the two pole mount straps to the enclosure with the supplied carriage bolts, nuts and flat washers.



3. Install the 3/8-16 x 1" cap screw loosely into the bottom pole mount strap. Do not tighten until after the enclosure has been seated onto the pole/wall mounting brackets.

Mounting the Enclosure to a Wooden Pole

Tools required:

- Auger or drill for boring 3/4" diameter holes in the wooden pole
- Assorted sockets or wrenches

Materials required:

- Two wood pole mount brackets (provided in the kit)
- Two 5/8" diameter machine bolts (UNC threaded), SAE (Grade 5 or better), length to suit pole
- Two 5/8" diameter zinc-plated flat washers
- Two 5/8" diameter hex nuts (UNC threaded)

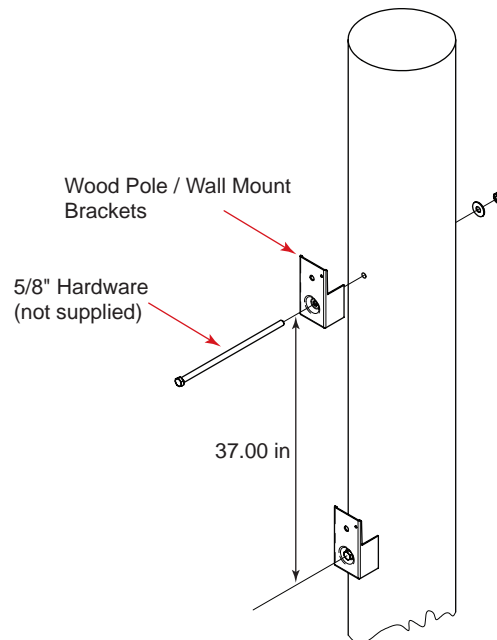


WARNING!

It is recommended to position the enclosure on the opposite side of the pole from oncoming traffic to reduce the danger of falling equipment in the event that a pole is struck by an automobile.

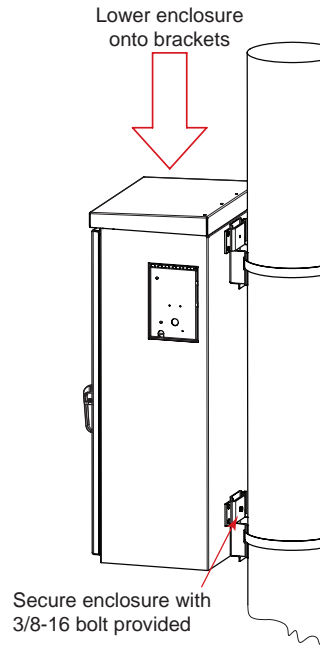
To mount enclosure to wooden pole:

1. Install the two pole mount straps on the rear panel of the enclosure. Refer to the instructions given on page 13.
2. Mark drilling locations for the upper and lower mounting brackets on the utility pole. Use a plumb line to check for plumbness. Centers should be 37.00" apart.
3. Drill two 3/4" diameter holes completely through the pole at the marked locations.
4. Secure each bracket to the pole with a 5/8" machine bolt, washer and nut (to be supplied by the installer). Do not fully tighten the bolts at this time.



5. Lower the enclosure onto the upper and lower mounting brackets.
6. Tighten the machine bolts to secure the enclosure to the pole.

7. Tighten the cap screw at the lower pole mount strap to secure the enclosure to the pole mount bracket.



Mounting the Enclosure to a Steel or Concrete Pole

Tools required:

- Assorted sockets or wrenches

Materials required:

- Two steel/concrete pole mount brackets (provided in the kit)
- Two steel bands (to be supplied by the installer, rated to support the loaded enclosure and sized for the pole diameter)

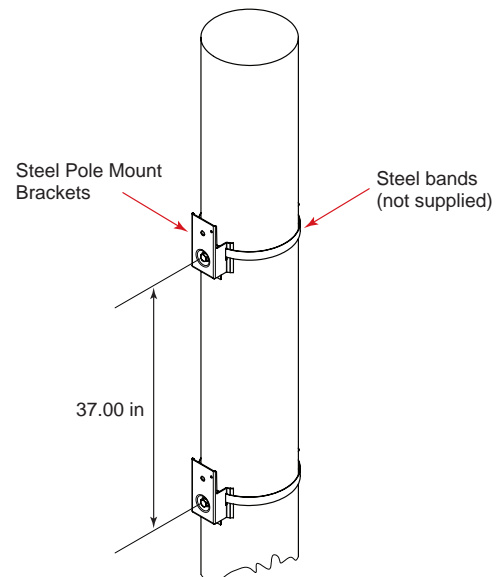


WARNING!

It is recommended to position the enclosure on the opposite side of the pole from oncoming traffic to reduce the danger of falling equipment in the event that a pole is struck by an automobile.

To mount enclosure to steel or concrete pole:

1. Install the two pole mount straps on the rear panel of the enclosure. Refer to the instructions given on page 13.
2. Mark the locations for the upper and lower mounting brackets on the utility pole. Use a plumb line to check for plumbness. Centers should be 37.00" apart.
3. Attach the mounting brackets to the pole at the marked locations using the steel bands. Do not fully tighten the steel bands at this time.
4. Lower the enclosure onto the upper and lower mounting brackets.
5. Tighten the machine bolts to secure the enclosure to the pole.
6. Tighten the cap screw at the lower pole mount strap to secure the enclosure to the pole mount bracket.



8. Wiring

Only qualified personnel should install and connect the power components within the Alpha power system. For the battery installation, refer primarily to the manufacturer's manual.

The SE48 with Generator Plug compartment option, when ordered with UATS/UGTS Accessory Shelf, should have the generator transfer switch pre-wired. Refer to the wiring of the UATS/UGTS Manual Transfer Plate in the Installation chapter of the UATS/UGTS Installation Manual if necessary. See Related Documents on page 9.

The SE48, regardless of which Generator Plug option is chosen, is ready for wiring once the UPS and/or the UATS/UGTS Accessory Shelf is installed. Refer to the UPS and the UATS/UGTS manuals for wiring details. See Related Documents on page 9.

8.1 Grounding the Enclosure



WARNING!

An enclosure that is not properly grounded presents an electrical hazard.

A proper grounding system that meets or exceeds the specifications of the equipment must be designed and installed prior to or in conjunction with the construction of the mounting pad. The ground system must be bonded to the enclosure to ensure a "common" or "single-point" ground. Refer to local building codes.

1. Locate the enclosure master ground bar at the left front of the enclosure.

NOTE: Chassis ground is connected to the enclosure frame and is terminated at the master ground bar within the enclosure.

1. Remove a suitable knockout for the external site ground wire connection. The knockouts are located on the sides, bottom and rear of the enclosure.
2. Route the wire into the enclosure using the appropriate conduit and fittings.
3. Connect the site ground wire to an open position of the enclosure SE48. The master ground bar accepts lugs with either 1/4" holes on 5/8" centers or 3/8" holes on 1" centers.

If you have the factory installed UATS/UGTS Accessory Shelf, you can also install additional accessories. Although you can customize the placement of accessories in the UATS/UGTS Accessory Shelf, Alpha recommends the preferred factory-installed configurations described in the UATS/UGTS Installation Manual.

8.2 Wiring the SE48 Components

8.2.1 Thermostat controlled 48 VDC Fan

1. Connect the black (common) wire of the DC fan to the center (common) terminal of the connector.
2. Connect the red (positive) wire to the left terminal.
3. Plug the connector into dry contact C6 on the Alpha FXM UPS.

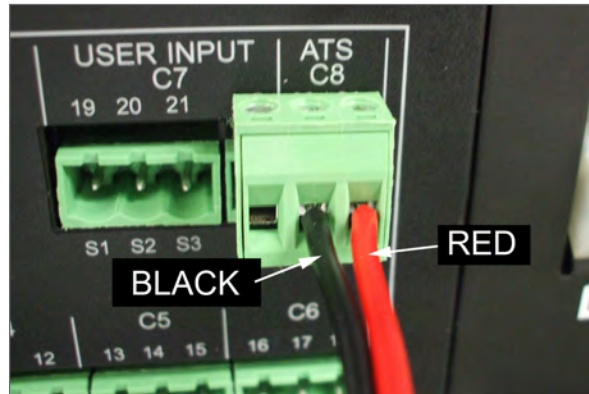


NOTE:

If you have a 24Vdc FXM system which require a 24 Vdc fan, please contact Technical Support.

9.2.1 On Battery Lamp (48 VDC) (optional on some models)

This optional lamp turns on when the UPS is operating in the battery backup mode (inverter mode). Connect the lamp wiring to dry contact C8 on the Alpha FXM UPS as shown below.



CAUTION!

The dry contact C8 can only be used for Alpha specified accessories

9.2.2 Door Ajar Switch (optional on some models)

The switch closes when the door is opened. It is used to trigger one of the user programmable inputs of the Alpha FXM UPS (typically C7 is used) and program the input as an Intrusion Alarm. See the Alpha FXM UPS Operator's Manual for details

9.2.3 Internal Lamp with Light Switch (120VAC) (optional on some models)

Connect to the terminal block marked "Lamp" in the Receptacle plate of the UATS/UGTS Accessory Shelf. See UATS/UGTS manual for details.

9. Operation

Operation of the SE48 is determined by the final installed configuration in the end system for the intended application. Please refer to the applicable equipment product manuals listed in Related Documents on page 9.

10. Maintenance

Although very little maintenance is required with Alpha systems, routine checks and adjustments are recommended to ensure optimum system performance. Qualified service personnel should do the repairs.

The following table lists a few maintenance procedures for this system. These procedures should be performed at least once a year.



WARNING!

Use extreme care when working inside the unit while the system is energized. Do not make contact with live components or parts.

Circuit cards, including RAM chips, can be damaged by static electricity. Always wear a grounded wrist strap when handling or installing circuit cards.

Ensure redundant modules or batteries are used to eliminate the threat of service interruptions while performing maintenance on the system's alarms and control settings.

Table B — Sample maintenance log

Procedure	Date Completed
Clean ventilation openings and rinse out the enclosure filters.	
Inspect all system connections. Re-torque if necessary.	
Verify alarm/control settings.	
Verify alarm relay operation.	
Verify HVAC operation	
Check for firmware/software updates for the controller and power modules	

Table C — Replacement Parts

Parts	Part Number	Description

11. Warranty Statement and Service Information

11.1 Technical Support

In Canada and the USA, call toll free 1-888-462-7487.

Customers outside Canada and the USA, call +1-604-436-5547.

11.2 Warranty Statement

For full information details review Alpha's online Warranty Statement at www.alpha.ca/support.

11.3 Product Warranty

Alpha warrants that for a period of two (2) years from the date of shipment its products shall be free from defects under normal authorized use consistent with the product specifications and Alpha's instructions, the terms of the manual will take precedence.

The warranty provides for repairing, replacing or issuing credit (at Alpha's discretion) for any equipment manufactured by it and returned by the customer to the factory or other authorized location during the warranty period.

There are limitations to this warranty coverage. The warranty does not provide to the customer or other parties any remedies other than the above. It does not provide coverage for any loss of profits, loss of use, costs for removal or installation of defective equipment, damages or consequential damages based upon equipment failure during or after the warranty period. No other obligations are expressed or implied. Warranty also does not cover damage or equipment failure due to cause(s) external to the unit including, but not limited to, environmental conditions, water damage, power surges or any other external influence.

The customer is responsible for all shipping and handling charges. Where products are covered under warranty Alpha will pay the cost of shipping the repaired or replacement unit back to the customer.

11.4 Battery Warranty

Note that battery warranty terms and conditions vary by battery and by intended use. Contact your Alpha sales representative or the Technical Support team at the above number to understand your entitlements under Battery Warranty.

11.5 Warranty Claims

Any claim under this Limited Warranty must be made in writing to Alpha BEFORE sending material back. Alpha will provide Product return instructions upon approval of return request. A Service Repair Order (SRO) and / or Return Authorization (RA) number will be issued ensuring that your service needs are handled promptly and efficiently.

Claims must be made online at: www.alpha.ca.

11.6 Service Information

For a list of international service centers, refer to the Alpha website: www.alpha.ca

12. Acronyms and Definitions

AC	Alternating current
ANSI	American National Standards Institute
AWG	American Wire Gauge
BTU	British thermal unit
CAN	Controller area network
CEC	Canadian Electrical Code
CSA	Canadian Standards Association
CX	Cordex™ series; e.g., CXC for Cordex System Controller
DC	Direct current
DHCP	Dynamic Host Configuration Protocol
EIA	Electronic Industries Alliance
EMC	Electromagnetic compatibility
EMI	Electromagnetic interference
ERM	Electromagnetic Compatibility and Radio Spectrum Matters
ESD	Electrostatic Discharge
FCC	Federal Communications Commission (for the USA)
GFCI	Ground fault circuit interrupter
HVSD	High voltage shutdown
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
LED	Light emitting diode
LVD	Low voltage disconnect
MIL	One thousandth of an inch; used in expressing wire cross sectional area
MOV	Metal oxide varistor
MTBF	Mean time between failures
NC	Normally closed
NEC	National Electrical Code (for the USA)
NO	Normally open
OSHA	Occupational Safety & Health Administration
OSP	OutSide Plant
OVP	Over voltage protection
RU	Rack unit (1.75")
TCP/IP	Transmission Control Protocol / Internet Protocol
THD	Total harmonic distortion
TVSS	Transient Voltage Surge Suppressor
UL	Underwriters Laboratories
UATS	Universal Automatic Transfer Switch
VRLA	Valve regulated lead acid

13. Certification

About CSA and UL

CSA (Canadian Standards Association also known as CSA Group) was established in 1919 as an independent testing laboratory in Canada. CSA received its recognition as an NRTL (Nationally Recognized Testing Laboratory) in 1992 from OSHA (Occupational Safety and Health Administration) in the United States of America (Docket No. NRTL-2-92).

When these marks appear with the indicator “C and US” it means that the product is certified for both the US and Canadian markets, to the applicable US and Canadian standards. (1)

As part of the reciprocal, US/Canada agreement regarding testing laboratories, the Standards Council of Canada (Canada’s national accreditation body) granted Underwriters Laboratories (UL) authority to certify products for sale in Canada. (2)

Only Underwriters Laboratories may grant a licence for the use of this mark, which indicates compliance with both Canadian and US requirements. (3)



NRTLs Capabilities

NRTLs are third party organizations recognized by OSHA, US Department of Labor, under the NRTL program.

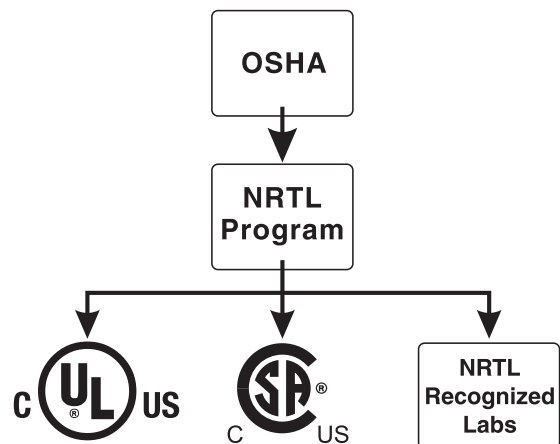
The testing and certifications are based on product safety standards developed by US based standards developing organizations and are often issued by the American National Standards Institute (ANSI). (4)

The NRTL determines that a product meets the requirements of an appropriate consensus-based product safety standard either by successfully testing the product itself, or by verifying that a contract laboratory has done so, and the NRTL certifies that the product meets the requirements of the product safety standard. (4)

Governance of NRTL

The NRTL Program is both national and international in scope with foreign labs permitted.

- (1) www.csagroup.org
- (2) www.scc.ca
- (3) www.ulc.ca
- (4) www.osha.gov



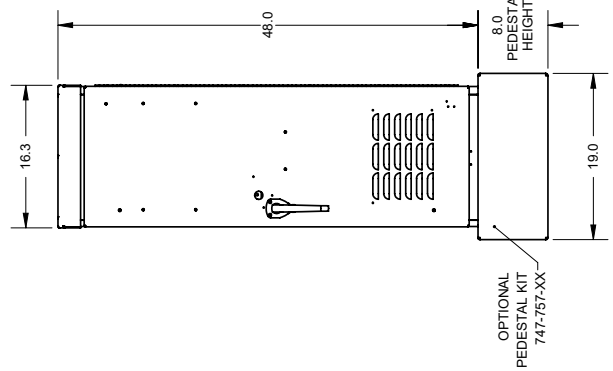
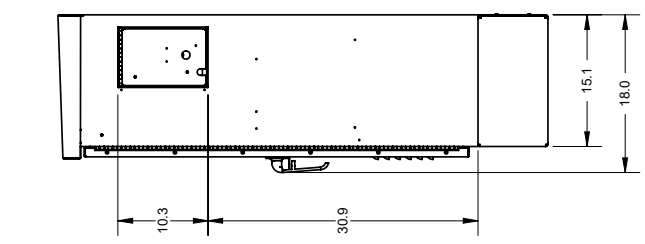
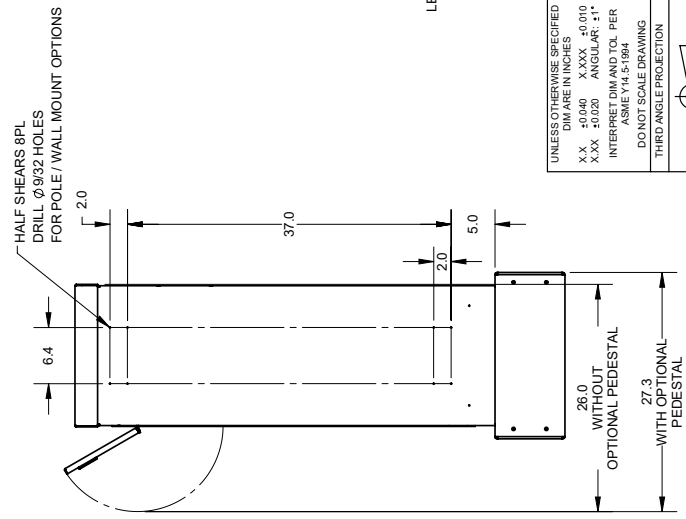
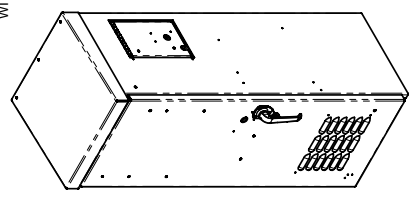
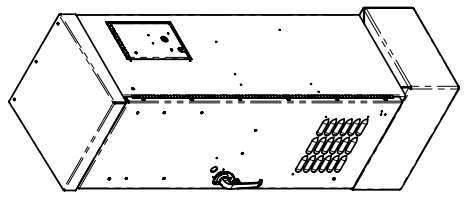
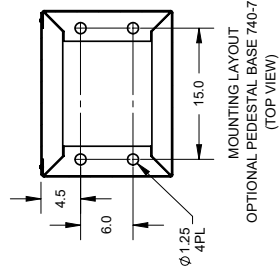
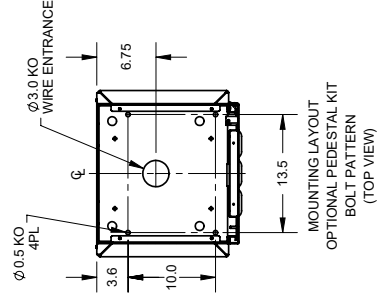
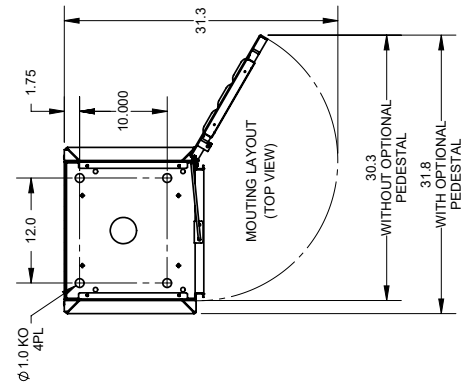
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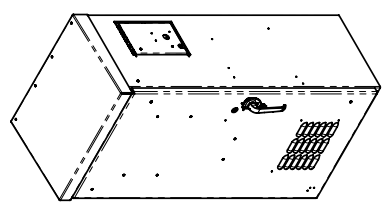
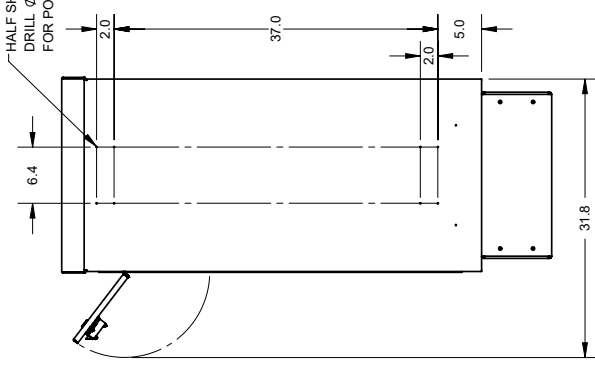
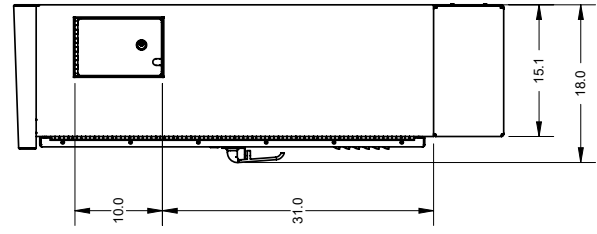
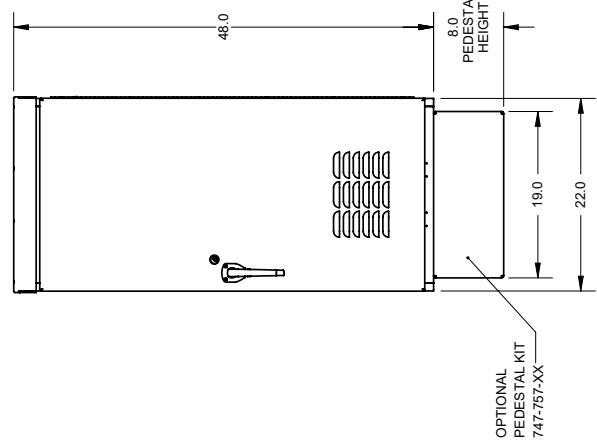
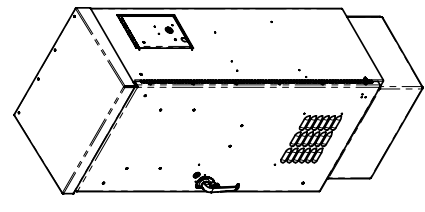
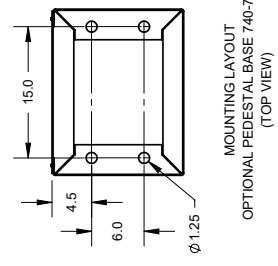
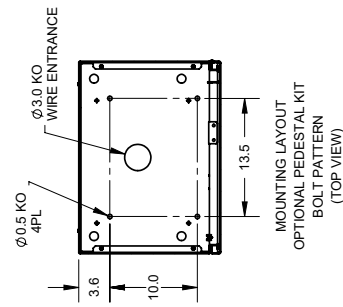
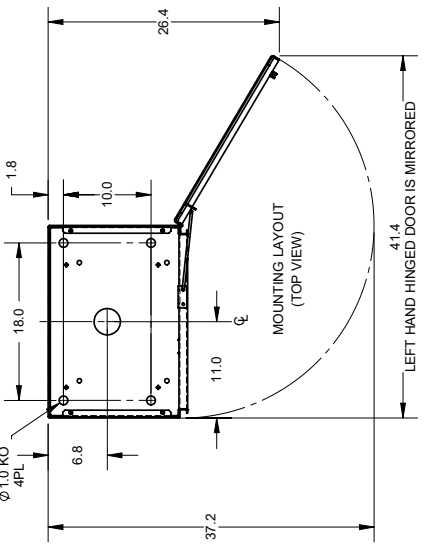


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