Te43p Outdoor Auxiliary Enclosure

Installation & Operation Manual

with DC Heat Exchanger
Part # 0570011-J0
Effective: 05/2013

member of The Group™

Your Power Solutions Partner

Te43p Outdoor Auxiliary Enclosure

Equipment number: 0570011-J0

The following documents and drawings are included in this manual to provide the necessary information required for routine operation and fault diagnosis of the system:

CSA/NRTL Equivalence	048-554-10
Schematic	7400061-05
Outline Drawing	057-104-06
Cust Connect, Interface Kit, Power to Batt, with Cable	747-602-08
Cust Connect, Interface Kit, Batt to Batt, with Cable	747-603-08
Cust Connect, Interface Kit, Power to Batt without Cable	747-607-08
Cust Connect, Interface Kit, Nokia Bridge	747-595-08
Cust Assy, Kit, 9” Top Extension	747-531-F0
Cust Assy, Kit, Plinth w/ Mounting Hardware	747-592-F0
Cust Assy, Kit, 4x Cable Boot for Top Extension	747-627-F0

Important Safety Instructions

Save These Instructions

This section contains important instructions that must be followed during the installation and maintenance of the equipment and batteries. Read all of the instructions before installing or operating the equipment, and save this manual for future reference.

All electrical connections must be performed by licensed electricians only. Installation of the power supply and batteries must be performed by, or under the direct supervision of, service personnel knowledgeable of the required electrical and battery safety procedures.

If instructions in this manual conflict with the local electrical codes, follow the local codes.

The following safety symbols are found throughout this manual. Carefully read all information and abide by the instructions:

DANGEROUS VOLTAGE
This symbol indicates a dangerous voltage
exists in this area of the product.

GAS HAZARD
This symbol indicates a gas hazard
exists in the area of vented batteries.

NO MATCHES OR OPEN FLAMES
This symbol indicates a fire or explosive hazard
exists in the area of the product.

The following warning levels are used in conjunction with the symbols:

DANGER: You WILL be KILLED or SERIOUSLY INJURED if instructions are not followed closely.

WARNING: You CAN be KILLED or SERIOUSLY INJURED if instructions are not followed closely.

CAUTION: You CAN be INJURED or equipment can be DAMAGED if instructions are not followed closely.

Mechanical safety

Keep hands and tools clear of fans. Fans are thermostatically controlled and switch on automatically.

Power supplies can reach extreme temperatures under load.

Use caution around sheet metal components and sharp edges.

Electrical safety

WARNING: Hazardous voltages are 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:

- Remove all metallic jewelry, such as watches, rings, metal rimmed glasses, or necklaces.
- Wear safety glasses with side shields at all times during the installation.
- Use OSHA approved insulated hand tools.

DANGER: 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.

Battery safety

Servicing and connection of batteries must be performed by, or under the direct supervision of, personnel knowledgeable of batteries and the required safety precautions.

Always wear eye protection, rubber gloves, and a protective vest when working near batteries. Remove all metallic objects from your hands and neck.

Use OSHA approved insulated hand tools. Do not rest tools on top of batteries.

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.

WARNING: 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.

Post installation weather proofing

After installing the conduits and removing any knockouts to accommodate conduit locations, ensure that any gaps between the conduit fittings and the shroud are sealed. Apply a weatherproof caulking to gaps to prevent wind driven rain from reaching the electrical equipment.

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1 Introduction

1.1 Scope of manual

- This instruction manual covers features, installation, startup, and maintenance of the Alpha Tempest Te43p Outdoor Power Enclosure with DC heat exchanger.
- Enclosure specifications and drawings are included in this manual.
- Operation instructions for the system controller and related modules are provided in separate component manuals.
- Separate manuals are provided for batteries and other accessory equipment, such as HVAC.
- Images contained in this document are for illustrative purposes only and may not exactly match your unit.

1.2 Product overview

The Te43p Outdoor Power Enclosure is designed to be used in conjunction with other Alpha enclosures (Te4x) or other stand-alone equipment.

A Te43p system typically includes:

- Zone 4 seismic enclosure design
- Mates with Alpha outdoor enclosures Te4x
- Front access, side-to-side inter-bay mating
- Alarm interface
- External utility panel with 12-position AC load center

Figure 1 - Tempest Te43p Outdoor Power Enclosure

1.3 Recommended pre-installation training

1.3.1 Cordex controller operation

Go to http://www.alpha.ca/web2/services-and-support/training-programs

1.3.2 Enclosure installation

Courses are available on an “as needed” basis. Contact the factory for details.

Free emergency technical support:
North America 1-888-462-7487; Outside North America +604-436-5547

2 Specifications

Electrical

Input Voltage:	120/240Vac, 60Hz single phase 120Vac for auxiliary equipment 208-240Vac for rectifiers
AC Distribution Panel:	Main breaker 22 KAIC rated
Output Voltage:	48Vdc system
Output Power:	7.2kW (4x Cordex 48V rectifiers; Alpha #010-580-20)
Supplied Feeder Breakers (integrated at AC distribution panel):	
Per rectifier shelf:	2 AC feeds (2 rectifiers each feed) 2-pole, 30A (208-240Vac single phase)
GFCI & Heater Mat Receptacles:	1 Pole, 15A, 120Vac

Mechanical

Dimensions (footprint):	2134mm H x 762mm W x 762mm D (84" H x 30" W x 30" D)
Dimensions (enclosure):	2134mm H x 1003mm W x 1016mm D (84" H x 39.5" W x 40" D)
Weight	340 kg (750 lb.), no batteries, no rectifiers
Mounting:	Pad or platform
Cooling:	150W/°C (83W/°F) DC heat exchanger
Enclosure:	Aluminum, 5052-H32
Internal Rack:	19"/23", 45RU

Environmental

Operating Temperature:	-40 to +46°C (-40 to 115°F)
Storage Temperature:	-40 to +85°C (-40 to +185°F)
Humidity:	0 to 95% non-condensing
Elevation:	3600m, see Operating Temperature (12,000 feet)
Weather Tightness:	NEMA Type 3R

Regulatory Approvals

Enclosure Ratings:	CSA/UL Type 3R
Product Safety:	CSA/UL 60950

The above information is valid at the time of publication. Consult factory for up-to-date ordering information. Specifications are subject to change without notice.

3 Features

3.1 Equipment compartment

The power enclosure is equipped with alarm wiring, a GFCI outlet, heater mat outlet, and a master ground bar.

Four rails are installed in the enclosure. The rails are adjustable to a width of 19" or 23" (standard) and are also adjustable front-to-back.

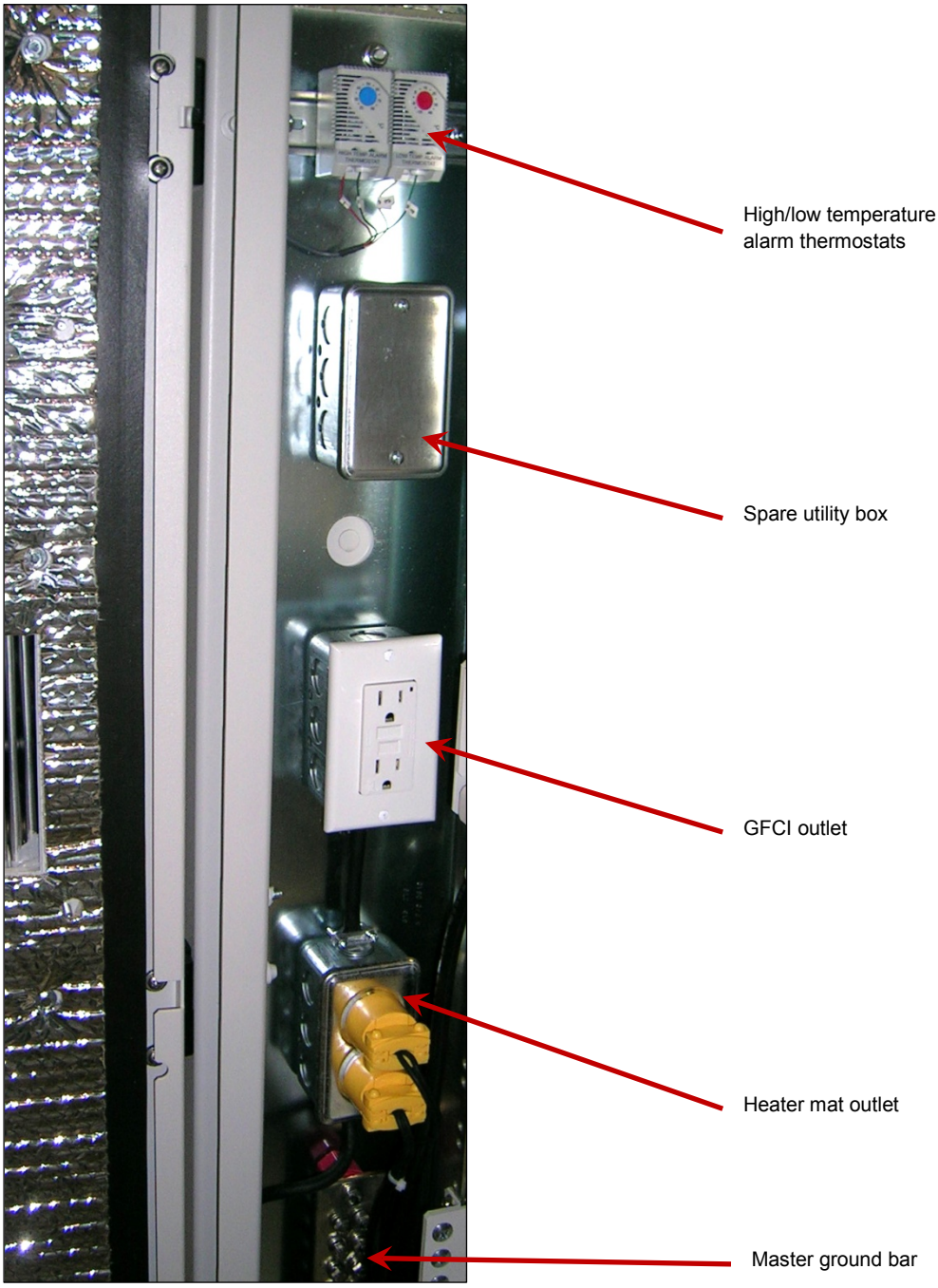


Figure 2 - Miscellaneous compartment features


12-position AC load center
Ground bar
DC generator breaker
AC service entrance
DC generator entrance

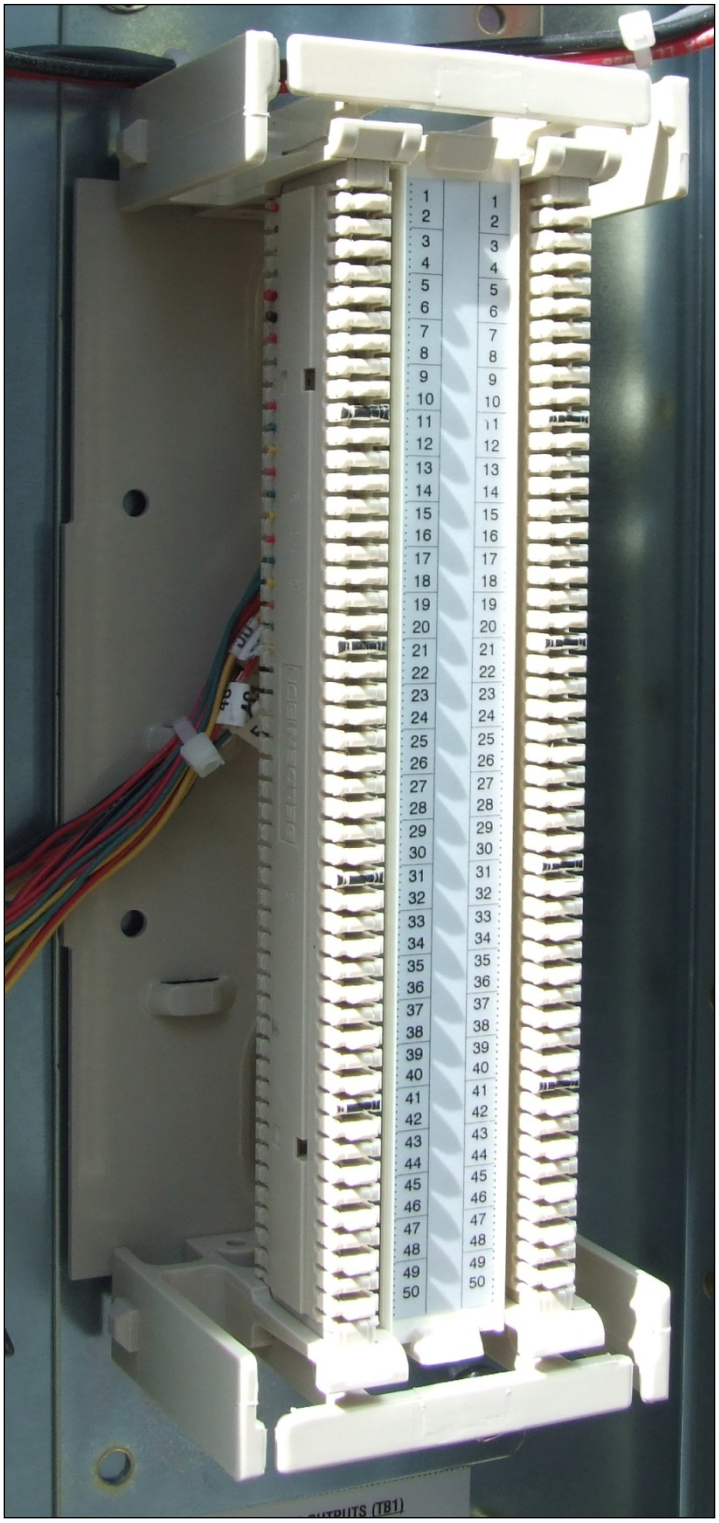


Figure 4 - Alarm “Bix” block

3.2 Heating, ventilating, and air conditioning (HVAC)

A heat exchanger package is mounted on the front door of the enclosure. It provides cooling for the batteries and customer equipment. Refer to the HVAC manual supplied with the unit for operation and maintenance details.

Battery heater mats are provided to keep the batteries warm in cooler environments.

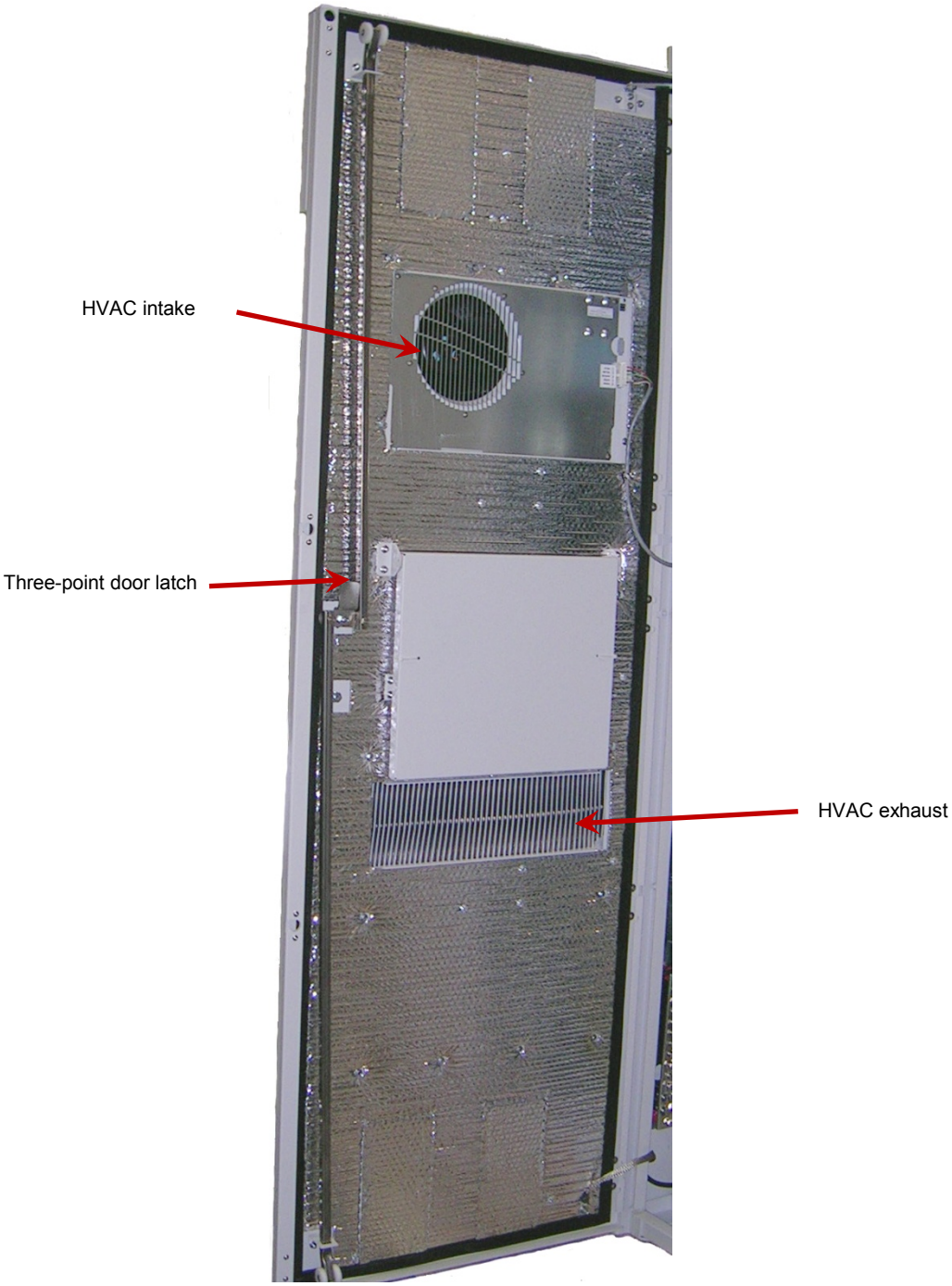


Figure 5 - Enclosure features

3.3 Security

The front door can be padlocked:

Figure 6 - Front door handle security

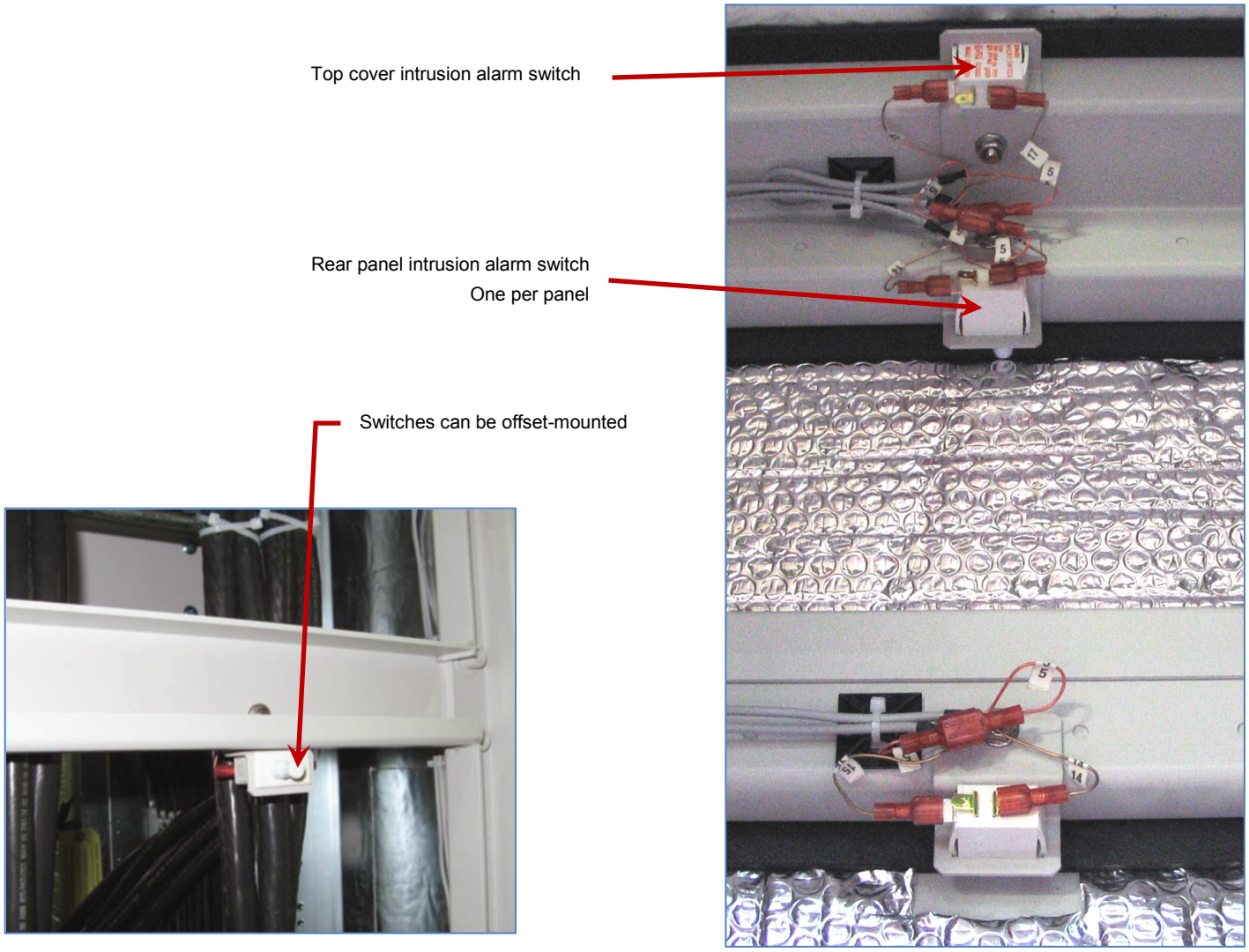
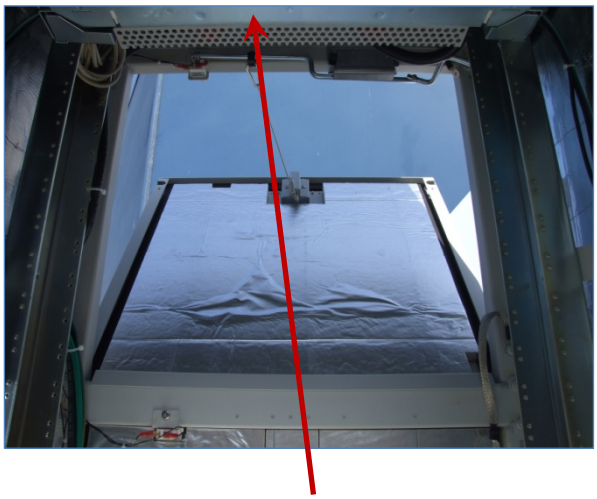


Figure 7 - Top cover and rear panel intrusion alarm switch

3.4 Rear access panels

There are four removable rear access panels, one top 8" panel and three 24" panels below. The 24" panel directly below the 8" top panel is a slam latch panel. The top 8" panel uses internal wing-studs that must be removed to lift off the panel. The two bottom panel can simply be lifted off once the slam latch panel has been removed.

Push on knob to release rear slam latch panel.



Unclip cord and lift panel off

Figure 8 - Slam latch panel release

When installing the rear panels, first install the lower panel, then the next one up, then the top 8" panel, and finally the top 24" slam latch rear panel.

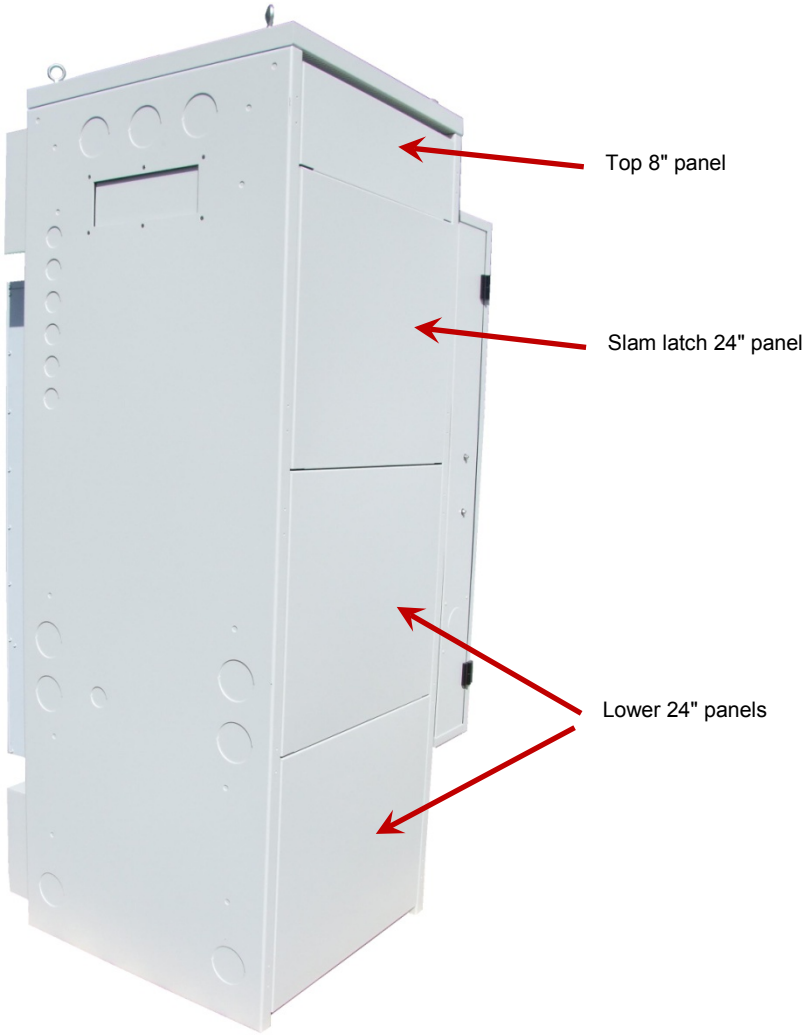
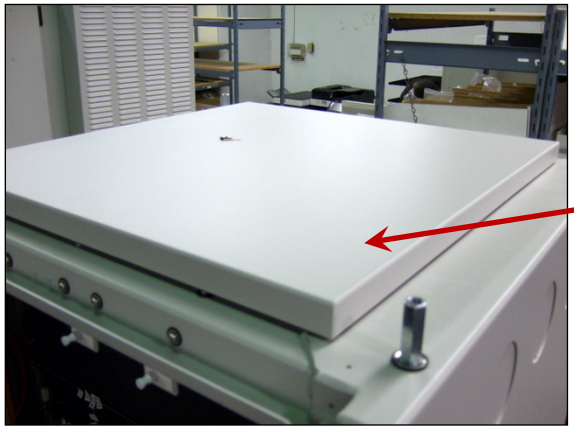


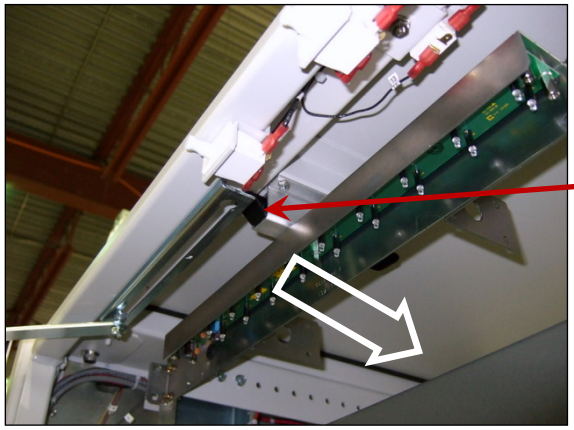
Figure 9 - Rear panels

3.5 Removable solar shield and hatch plate

Remove eyebolts.



Remove solar shield exposing hatch plate.



To release hatch plate, pull the latch ring toward the rear of the enclosure in the direction shown by the large arrow.

To re-install:

- Ensure the inner hatch plate gasket is centered on the left and right side flanges along the top of the enclosure.
- Then ensure the slam latch on the hatch plate is fully engaged.
- Re-install the solar shield by re-installing the eyebolts.

4 Transportation and storage

4.1 Packaging

The enclosure and components are shrink wrapped and shipped on individual pallets. The enclosures and components must not be stacked on top of each other.

The pallet is approximately 0.15 m H x 1.22 m W x 1.22 m D (6" H x 48" W x 60" D). The overall height including the pallet and enclosure is approximately 2.3 m (91").

Batteries are shipped on a separate pallet and packaged according to the manufacturer's guidelines. Packaging assemblies and methods have been tested to International Safe Transit Association standards.

4.2 Storage

The weight of the enclosure is written in the specifications. The equipment pallet can be moved using a forklift.

4.3 Site Considerations

The site should be ready for the enclosure installation before the enclosure arrives. A lift truck or crane is required to lift and position the enclosure and its components. Make sure that there are no potential obstructions in the transport path. Use safe lifting practices.

4.4 Inspection

Before unpacking the equipment, perform a visual inspection and note any damage. Unpack the equipment and inspect the exterior for damage. Continue the inspection for potential internal damage. Contact the carrier immediately if internal damage is detected. Then contact Alpha Technologies for advice on the consequence of any damage.

Verify that you have all the required parts before proceeding with the installation.

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

5 Installation

5.1 Pre-installation considerations

The information in this section is intended to be used as a guideline only. There may be site-specific requirements and other factors that could require different procedures. For example, your jurisdictional codes and construction covenants may require different procedures than those in this manual.

5.1.1 Site selection

The Te43p has been designed as an outdoor power system enclosure. The most common mounting structures are:

- An at-grade concrete slab.
- A steel platform.
- An existing structure, such as a rooftop.

The mounting structure must be strong enough to support a fully equipped enclosure. Existing structures may need to be reinforced. The mounting site must be built in accordance with local building practices and codes.

Consider the following before selecting a mounting site:

- The Alpha Te43p enclosure is designed for front, rear, and if necessary top access. Only front access is required for maintenance.
- 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.

5.1.2 Enclosure support

The empty enclosure weighs approximately 750 lb and has a base area of 6.25 ft². The supporting structure must have a loading capacity capable of supporting this weight (120 lb/ ft²) plus the additional weight of all the equipment installed inside the enclosure.

5.1.3 Base layout dimensions

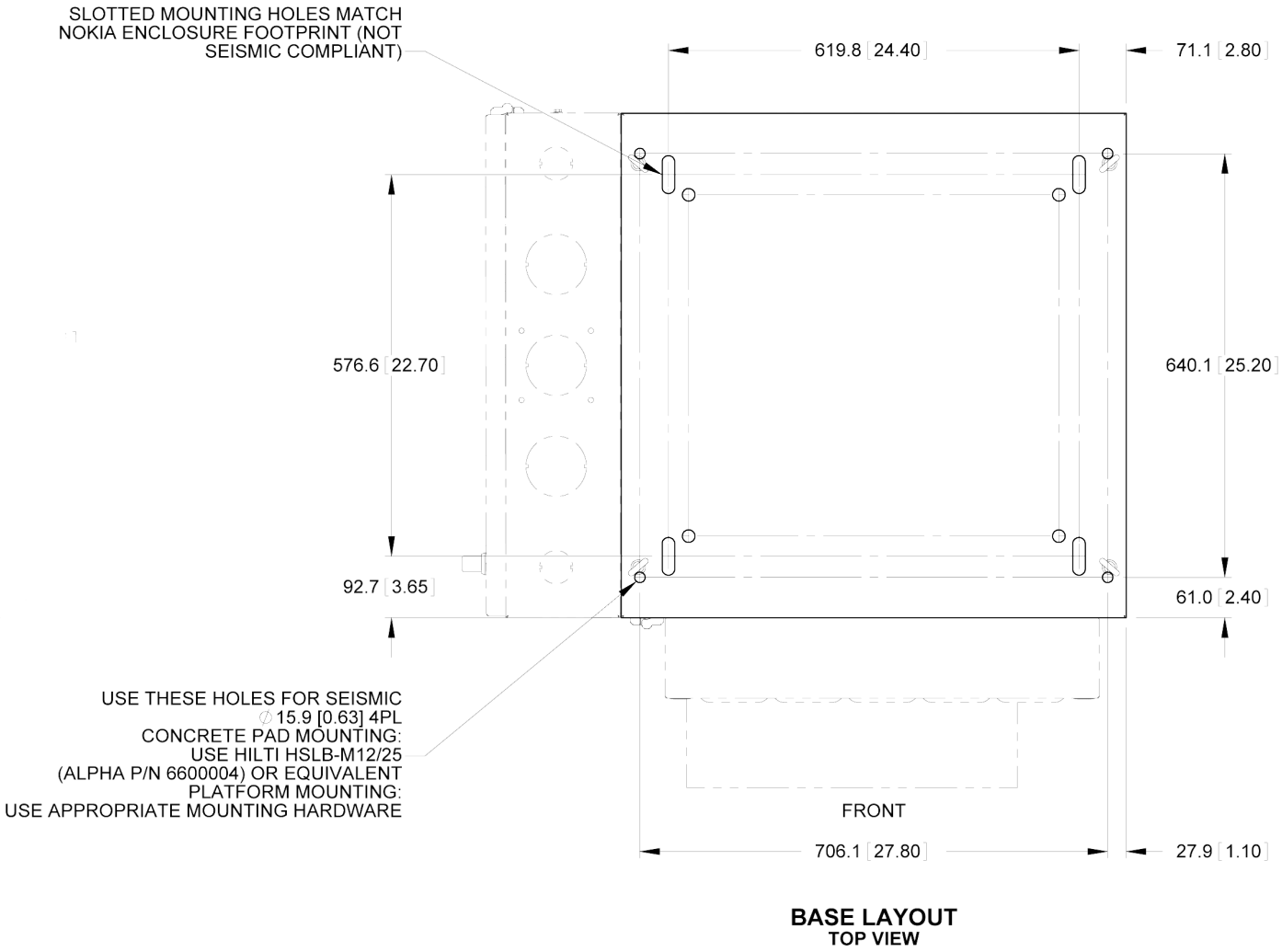


Figure 10 - Base layout drawing and mounting hole location for Te43p

5.1.4 Concrete slab

Cast-in-place or pre-cast concrete slabs can be used.

Place the enclosure on the concrete slab. Use the enclosed Hilti HSL heavy-duty expansion anchor bolts or approved equivalents to secure the enclosure. Follow the specific recommendations from the fastener manufacturer to ensure that the securing device achieves its full structural capacity. Take into account the embedment depth and clear edge distances. Refer to the following figure.

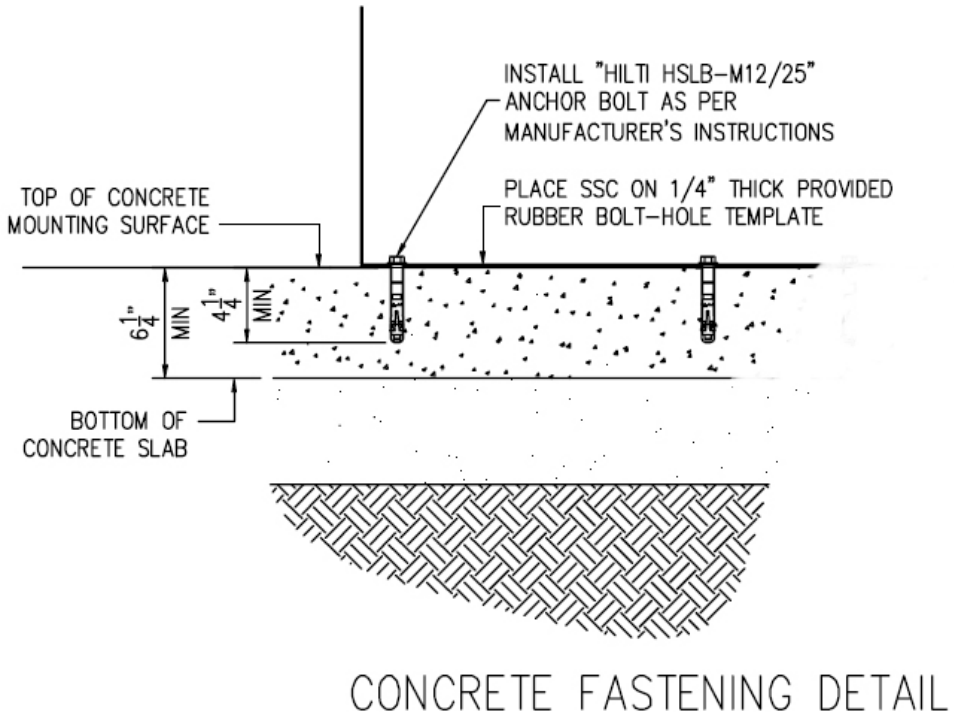


Figure 11 - Concrete anchor bolt fastening detail

Alternate mounting systems that are not provided directly with the enclosure must be reviewed by a registered professional engineer that is qualified to practice within the jurisdiction where the enclosure is being installed.

An alternate mounting system could for example use a chemical anchoring system such as Hilti's HY150 for concrete or HY20 for masonry along with suitable threaded rods and inserts from the manufacturer. Follow the manufacturer's recommendations to determine the spacing and placement of the threaded rods.

The supporting structure must be designed to support a fully equipped enclosure. The concrete slab and any existing structures must be properly reinforced to support the floor loading. The mounting site must be designed and installed in accordance with local building practices and codes.

5.1.5 Steel platform

Use 1.27 cm (½") diameter A325 structural bolts in conjunction with a backing plate/clasp to grip the underside of the grating. Once the enclosure is in place, secure the bolts on the inside using appropriate washers and bolts. See the following figure:

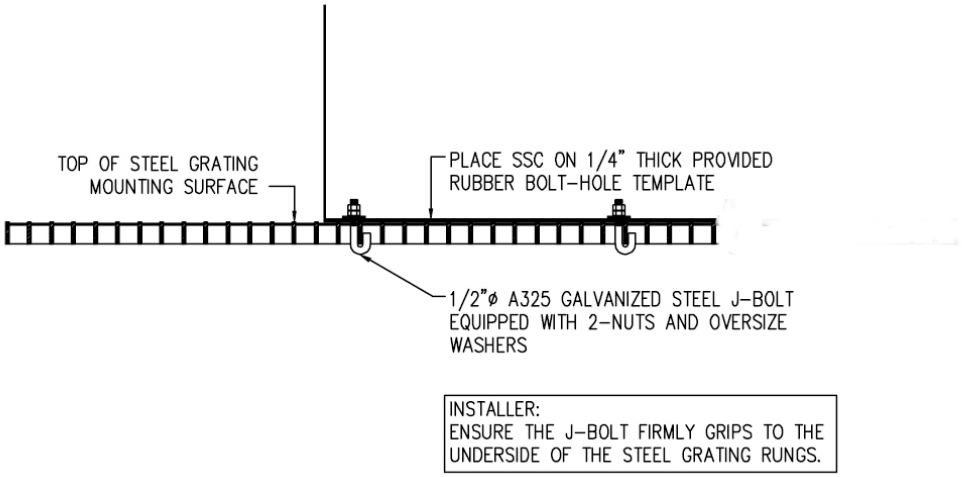


Figure 12 - Installation on steel platform

CAUTION: Installation on a wood base is not recommended. The compressive strength of the base material would not be able to maintain the load during a Type 4 seismic event.

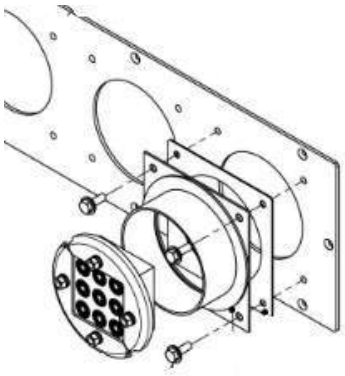
5.2 Installation component requirements

Concrete and metal grating mounting hardware is not supplied with the enclosure.

AC electrical conduit, cable and fittings are not supplied with the enclosure.

External DC conduit, cable and fittings are not supplied with the enclosure.

A cable entry port fitting is available as an option:

Roxtec seal port 9 way assembly including boot, mounting collar and hardware	Alpha part number: 037-193-20-000
Can be used for cable entry into the Te43p enclosure wherever there are 3") knockouts.	
See  www.roxtec.com for additional information	

For multiple enclosure installations an interface kit is required.

Power to battery: 747-602-20

Battery to battery: 747-603-20

Power to battery without cables: 747-607-20.

5.3 Installation tools and equipment

5.3.1 Tools Required

Insulated tools are essential for DC power system installation. Use this list as a guide:

- Electric drill with hammer action
- Digital voltmeter equipped with test leads
- Lap top computer with Internet Explorer 8 for communication with the Cordex controller (not required for initial installation and test)
- Various crimping tools and dies, to match lugs used in installation
- Torque wrench: ¼" drive, 0-150 in-lb for battery post connections
- Torque wrench: 3/8" drive, 0-100 ft-lb for system connections
- Insulating canvases as required (2' x 2', 1' x 1', 3' x 3', etc.)
- Insulated hand tools:

  -Combination wrenches -Ratchet and socket set

  -Various screwdrivers -Electricians knife

  -Fine tipped slot screwdrivers (“tweaker”) -Cable cutters
- Cutters and wire strippers (#14 to #22 AWG) [2.5 – 34 mm^2].

Figure 13 - Example of an insulated tool kit

5.3.2 Lifting equipment requirements

- Hoist or crane capable of lifting 1814 kg (4000 lb)
- The forklift should have a rated lifting capacity of 1814 kg (4000 lb) with a minimum fork length of 36”
- Four wire-rope slings at least 1.22 m (4') long with a capacity of 907 kg (2000 lb) each.
- Four clevises.
- Minimum 1.59 cm (5/8”) diameter rope to use as a tagline to guide the enclosure while lifting.

5.4 Enclosure installation

NOTE: *The rubber installation mat, shipped inside the enclosure, can be used as a template to determine mounting bolt hole locations on the mounting surface.*

5.4.1 Enclosure preparation

NOTE: *If the batteries are on a separate pallet, do not install them until after the enclosure has been secured and the ground wires and other cable entries are connected. It is easier to route the cables when the batteries are not installed.*

Remove the protective covering from the system. The door is designed to be locked with a padlock and is secured with tie-wraps for shipping. Cut the tie-wraps and open the doors. The inside of the enclosure contains the installation hardware.

Inspect the packing slip to verify that you have received all the equipment that you ordered.

- All documentation is packed inside the equipment compartment.
- Inspect all moving parts, hardware, connectors, and other equipment.
- Report any damage to the shipper and Alpha Technologies.
- Remove and properly dispose of all packaging.
- Remove the rear panels to access the rear mounting bolts.
- Remove the four bolts that secure the enclosure to the pallet. These bolts are accessible from the inside of the enclosure and are located in the corners of the enclosure. The enclosure is now ready for lifting.

5.4.2 Lifting preparation

WARNING: Follow all local safety practices and guidelines while lifting the enclosure. All personnel involved with lifting and placing the enclosure must wear head, eye protection, gloves when required. Only properly trained and certified personnel should operate the crane. Only properly trained and certified personnel should operate the forklift.

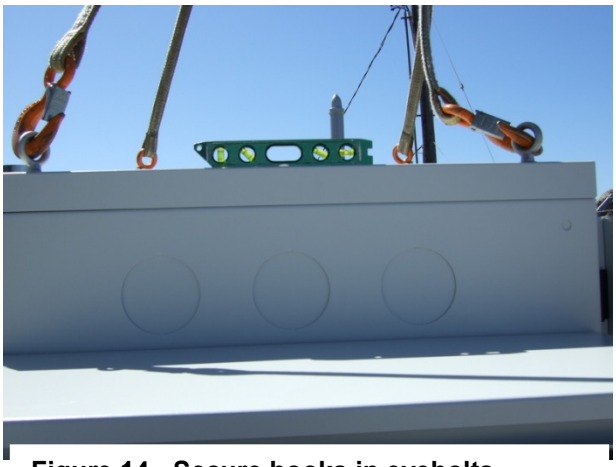


Figure 14 - Secure hooks in eyebolts

Make sure that the lifting eyes are securely fastened before lifting. Ensure that the clevises are correctly installed and that the enclosure is approximately level when it is lifted. This will simplify the enclosure placement.

Close and latch the enclosure front door. The rear panels do not need to be installed.

Place the enclosed rubber mat onto the slab or platform. Orient the mat so that the mounting holes line up. If the rubber mat is ribbed, the ribs should be against the concrete.

5.4.3 Mounting the enclosure

Concrete slab

Use the tagline to guide the enclosure as it is lifted. As the enclosure is lowered, align the mounting bolts and drop the enclosure into place.

CAUTION: Follow all local safety practices and guidelines while lifting the enclosure. As the enclosure is lowered, ensure that it remains as level as possible and lines up with the anchoring bolt locations. Ensure the rubber mat is in the proper position. Open the door and proceed with leveling the enclosure and securing it into place.

Steel platform

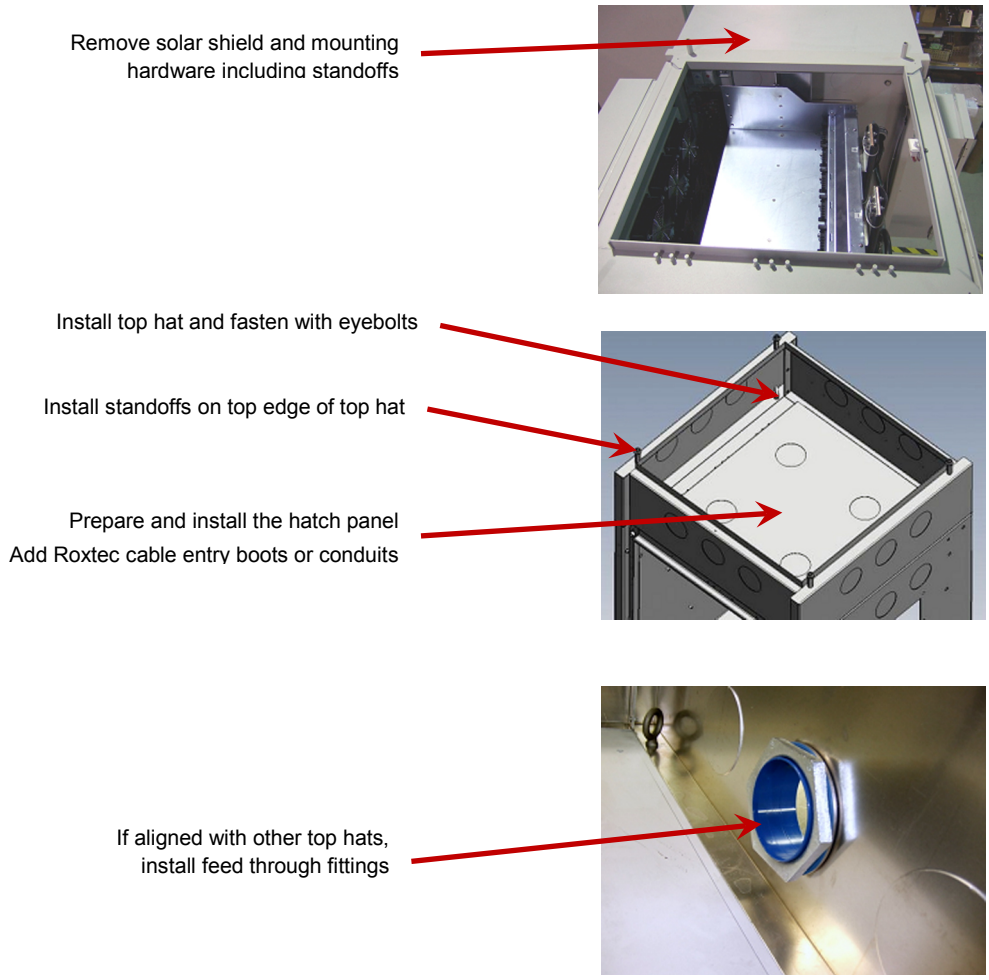
If the steel platform is located at ground level, the procedures are the same as those for the concrete slab.

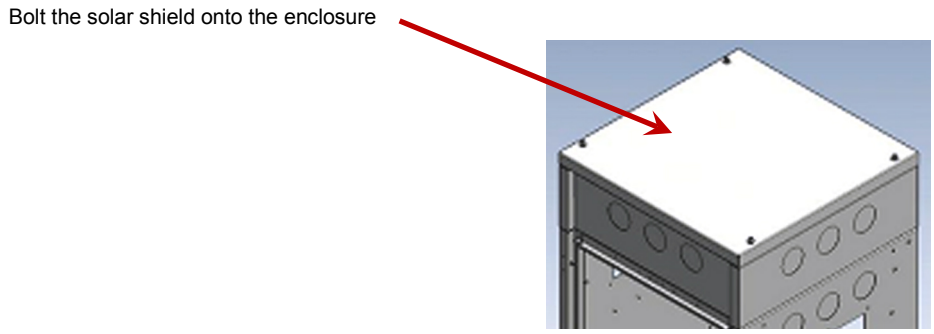
Roof mounting

CAUTION: The mounting platform must be installed before the enclosure can be installed. All grounding must be in place before the installation. Place the enclosure onto the roof using either a freight elevator with access to the roof, or a crane or hoist on the roof. Do not remove the enclosure from its pallet until it is on the roof and is ready to be placed.

5.4.4 Top hat installation

A top hat is an optional structure. See enclosed drawings for the top hat kit assembly. Install the top hat kit before installing adjacent enclosures.





5.4.5 Enclosure compartment integrity

The Te43p enclosure compartment is cooled by a heat exchanger.

Use gaskets, boots, and other sealing materials to minimize air exchange between enclosures. These seals will reduce the heat exchanger loading.

Similarly use gaskets, boots, and other sealing materials to prevent water from entering the enclosures. See the enclosed drawings for more details.

5.5 Grounding

DANGER: 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.

Examples of grounds:

New builds – a buried ground ring with a bare, solid conductor going to ground rods.

Rooftop – a connection to the building’s steel structure, water pipes, etc.

Refer to local codes and practices for proper acceptable grounding arrangements. Only a licensed electrician should install the grounding system. Use a dedicated ground rod for the AC panel.

CAUTION: Do not route AC and DC wiring in the same conduit.

5.5.1 Site ground wire entry

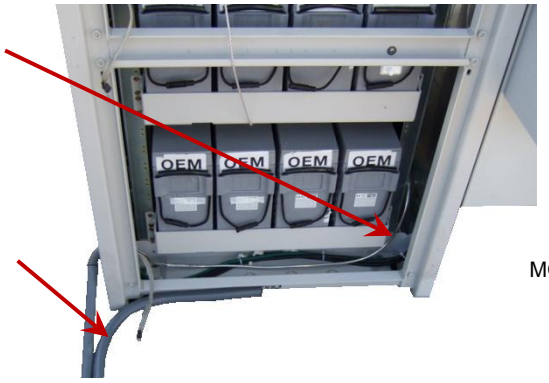
External ground studs are located at the bottom front and rear of the enclosure. Use these to make the site ground wire connections. Terminate either the front or rear connection to the external ground ring with an exothermic connection. A minimum of #2 AWG solid wire is required.

5.5.2 Master ground bus (MGB)

The master (main) ground bus is located at the lower left front corner of the enclosure. Terminate the MGB to the external ground ring with an exothermic connection. A minimum of #2 AWG solid wire is required.

Ground wire that connects the site ground to the master ground bar

External chassis ground connected to site ground. There are two connection points, one at the front of the enclosure, and one at the rear. Only one connection is required with an exothermic connection.



MGB

Figure 15 - Enclosure ground connections

5.5.3 Enclosure chassis ground

The enclosure chassis ground is pre-installed at the factory. It is connected to the enclosure frame and equipment racks and is terminated to the MGB inside the enclosure.

6 System startup

After completing the enclosure installation and the power system wiring, perform the following startup and test procedure:

6.1 Connecting the batteries

WARNING: Ensure battery breakers are off.

1. Check and verify the polarity of all the batteries.
2. Open all the DC breakers and temporarily remove all the DC fuses. The breakers must be closed and the fuses reinstalled after the testing is complete.
3. Unplug all rectifiers except one.
4. Switch on the AC breakers to apply power to the rectifier shelf.
5. The controller will perform a short self-test as it boots up.
6. Alarm conditions will likely be present and will probably not clear because there is no DC load on the rectifiers since all the loads are disconnected.
7. The system voltage will be visible on the controller display.
8. With the battery breakers off and the batteries disconnected, measure the voltage difference between the power system and the battery string. The voltage difference should be less than 3 V. If the voltage difference is greater than 3 V, check the cable connections and the conditions of the batteries. Correct the problems and then proceed. If you are unable to correct the problem, switch off the AC input power and contact Alpha Technologies.
9. Measure the battery voltage at the battery terminals and ensure that the polarity is correct. Connect the first string of batteries by switching on the corresponding breaker. Repeat this step for the remaining string of batteries.
10. Plug in the remaining rectifiers one at a time.
11. All the alarms should clear and the audible alarm will switch off provided the batteries are slightly discharged.
12. Switch on the all the remaining breakers.
13. Apply the DC loads by switching on the DC powered equipment.

6.2 Test and commissioning overview

6.2.1 System

All power system components undergo thorough factory testing. All levels and alarms are set to values according to the information given in the component manuals, unless custom levels are specified. Check the operation of all features and alarms and ensure that the power system levels are set in accordance with the specific requirements of your system. See the component manuals for more details.

6.2.2 Environmental/intrusion

Check the operation of all enclosure features, such as the high/low temperature alarms and the intrusion alarm.

Check the operation of the heat exchanger fans by turning on the heat exchanger breaker.

6.3 Battery

After the batteries have been installed, the batteries must be “initially charged” to eliminate plate sulfation. Follow the guidelines in the battery manual. Record the initial charge readings, which are: specific gravity, cell voltage, charge current, and temperature. Battery warranty may be void if the batteries are not initially charged following the manufacturer's guidelines and proper records maintained.

Some VRLA batteries do not require initial charging if they are placed on charge within 3-6 months of manufacture. Check the battery manufacturer’s manual.

After the equalization period, reduce the battery voltage to the recommended float level.

Once the batteries have been initially charged, perform a short duration high rate discharge test on the batteries to verify that the cable connections are good and that there are no open or failed cells. Monitor the cell voltages during this process:

1. Discharge for 15 minutes at the C/8 rate.
2. Record cell voltages every 5 minutes.
3. Check for overheating connections.

6.4 Documentation

Complete all the required commissioning documentation such as:

- Battery reports
- DC wiring lists
- AC distribution tables
- Floor plans
- Fill out tag wire identification strips
- Identify circuit breakers

6.5 Final cleanup

Vacuum clean all metal filings and other debris from inside and around the enclosure.

Ensure that:

- All cables and conduit are neatly secured.
- Access panels are installed correctly.
- All connections are tight.
- All breakers are on and the system is running without any alarms.
- Enclosure is locked and secure.

7 Maintenance

The equipment requires regular maintenance. The maintenance should be done by qualified service personnel only.

WARNING: HIGH VOLTAGE AND SHOCK HAZARD.

Use extreme care when working inside the enclosure/shelf while the system is energized. Do not make contact with live components or parts. Static electricity may damage circuit boards, including RAM chips. Always wear a grounded wrist strap when handling or installing circuit boards.

7.1 General maintenance schedule

Description	Interval
Clean ventilation openings	1-6 months
Inspect all cable connections, re-torque if necessary	1 year
Verify alarm/control settings	1 year
Verify alarm relay operation	1 year
Clean heat exchanger bug screens	2-6 months

7.2 Heat exchanger

7.2.1 Heat exchanger bug screens

Clean the bug screens periodically with water, compressed air, or a brush.

7.2.2 High temperature alarms and heat exchanger failures

The heat exchanger is not always thoroughly tested at the factory. If the heat exchanger fails to switch on when it should, refer to the heat exchanger manual.

If the heat exchanger appears to be working properly but the **Hi-Temp** alarm is on, check that the enclosure's Hi-Temp alarm thermostat is correctly set.

8 HVAC default settings

8.1 Heat exchanger

The heat exchanger is DC powered and has no programmable settings. The internal loop fan is on continuously. It rotates at 700rpm from -40°C to 20°C (-40°F to 68°F), and then ramps up linearly to 2300rpm at 50°C (122°F).

The heat exchanger external loop fan is off below 18°C (64°F). It turns on at 20°C (68°F) and ramps up linearly to 2300rpm at 50°C (122°F).

In both cases, fan control is released above 50°C and the fans rotate as fast as they can based on the available voltage.

Refer to the heat exchanger manual for further operation and maintenance details.

8.2 Temperature alarms

Compartment thermostat	Setting
High temperature alarm (blue)	50°C (122°F)
Low temperature alarm (red)	-5°C (23°F)

9 Warranty

Alpha Technologies Ltd. warrants all equipment manufactured by it to be free from defects in parts and labor, for a period of two years from the date of shipment from the factory. 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.

Visit http://www.alpha.ca for full warranty information.

9.1 Battery Warranty

Note that battery warranty terms and conditions vary by battery and by intended use. The most common battery warranty provided by Alpha is a two year full replacement warranty with a pro-rated warranty for the following three years. Pro rated warranty provides a credit applicable toward the purchase of new batteries from Alpha. The credit is calculated as the purchase price multiplied by the percentage of the battery life that was not available (in months). Battery warranty coverage is lost where the battery charge is not maintained for 6 months. Contact your Alpha sales representative or the Technical Support team at the above number to understand your entitlements under Battery Warranty.

10 Acronyms

The following acronyms are used in this manual:

Acronym	Definition
AC	Alternating current
AWG	American wire gauge
BTU	British thermal unit
CSA	Canadian Standards Association
CX	Cordex™ series; e.g., CXC for Cordex System Controller
DC	Direct current
GFCI	Ground fault circuit interrupter
HVAC	Heating, ventilating, and air conditioning
MGB	Master ground bus
NEMA	National Electrical Manufacturers Association
RU	Rack unit (1.75”)
UL	Underwriters Laboratories
VRLA	Valve regulated lead acid

CSA/NRTL — MARKS — BACKGROUND

What are the CSA and NRTL?

CSA (Canadian Standards Association also known as CSA International) 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). This was expanded and renewed in 1997, 1999, and 2001. The specific notifications were posted on OSHA's official website as follows:

Federal Register #: 59:40602 - 40609 [08/09/1994]
Federal Register #: 64:60240 - 60241 [11/04/1999]
Federal Register #: 66:35271 - 35278 [07/03/2001]

C US NRTL/C

The product on which either of these marks appear has been certified by CSA as meeting applicable Canada/US standards.

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

Alpha rectifier and power system products, bearing the aforementioned CSA marks, are certified to CSA C22.2 No. 950 and UL 1950, or CSA/UL 60950.

Alpha UPS products, bearing the aforementioned CSA marks, are certified to CSA C22.2 No. 107.3 and UL 1778.

c UL US

The product on which this mark appears has been certified by UL as meeting applicable Canada/US standards.

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)

What are NRTLs and what do they do?

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)

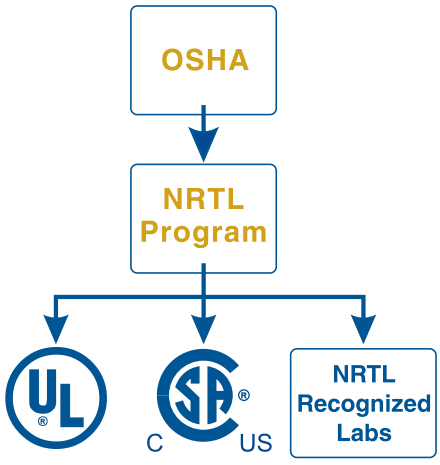
The NRTL determines that a product meets the requirements of an appropriate consensus-based product safety standard either by successfully testing the product itself, or by verifying that a contract laboratory has done so, and the NRTL certifies that the product meets the requirements of the product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

When was the NRTL started and who governs it?

In 1983, in a suit brought on by an independent testing laboratory, OSHA was court ordered to remove specific references to UL (Underwriters Laboratories) and FMRC (Factory Mutual Research Corporation) from its regulations.

In 1988, OSHA revised its regulations to remove those references and the NRTL program was established.

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



References:
Information in this document has been developed from the official websites of the respective organizations.
(1) www.csa-international.org
(2) www.scc.ca
(3) www.ulc.ca
(4) www.osha.gov

AC POWER DISTRIBUTION WIRING:

REVISION					
LTR	DESCRIPTION	DRW	DATE	CHK	APP
B	LOAD BREAKER CHANGES (REF. ECO #4367)	M.E.	12/10	J.K.	M.E.
C	CHANGE GROUND WIRING FROM ENCL. MGB TO UTILITY PANEL MGB	H.K.	13/04	M.E.	M.E.

AC POWER INPUT CONNECTION

120/240 VAC, 60Hz
SINGLE PHASE
3 WIRE + GND
(CUSTOMER CONNECTION)

LINE 1 — BLK - #2 AWG TYP.
LINE 2 — RED - #2 AWG TYP.
NEU — WHT - #2 AWG TYP.
GND — GRN - #2 AWG TYP.

TRANSIENT VOLTAGE SURGE SUPPRESSOR
40kA, 120/240V

LINE 1 — BLK - #14 AWG
LINE 2 — BLK - #14 AWG
NEU — WHT - #14 AWG
GND

AC LOADCENTRE, 12 POS, 125 AMP, MAIN BREAKER, 120/240V, 1 PHASE

WHT - #2 AWG
RED - #2 AWG
BLK - #2 AWG
L2 L1
CB1 2P/100A
OFF ON *MAIN BREAKER DISCONNECT*
L1 L2
CB2 #1 #2 CB5 'GEN' 2P/100A — BLK - #2 AWG
#3 #4 — RED - #2 AWG
CB3
2P/30A #5 #6 CB6 1P/15A
#7 #8 *NOT USED*
CB4
2P/30A #9 #10 *NOT USED*
#11 #12 *NOT USED*
WHT - #2 AWG
GRN - #2 AWG
GRN /YEL - #14 AWG
NEUTRAL BUS BAR
EQUIPMENT GROUND BAR
7
GRN - #2 AWG
GRN - #2 AWG
GRN - #10 AWG
GRN - #10 AWG
GRN - #18 AWG

PIN & SLEEVE GENERATOR INLET RECEPTACLE
100 AMP, 120/240V, 1 PHASE
1 2 3 G

BLK - #14 AWG
WHT - #14 AWG
GRN - #14 AWG

CONVENIENCE 120 VAC GFCI DUPLEX RECEPTACLE
BLK
WHT
GFCI
LINE TERMINALS
'WHT' NEU
HOT
TEST
RESET
GRN
YEL
LOAD TERMINALS
GND
GRN
WHT
BLK
GRN
BONDING SCREW
15A/125V
'UTILITY BOX'

HEATER MAT 120 VAC DUPLEX RECEPTACLE
BLK
WHT
STD
NEU
HOT
GRN
YEL
GND
GRN
BONDING SCREW
15A/125V
'UTILITY BOX'

BLK - #14 AWG
WHT - #14 AWG
GRN - #14 AWG
BLK - #10 AWG
BLK - #10 AWG
GRN - #10 AWG
BLK - #10 AWG
BLK - #10 AWG
GRN - #10 AWG
P/N 8700060

LINE 1 / LINE 2 / GND — **TO RECTIFIER SHELF MDL 1 & 2 TERMINAL BLOCK** (REFER TO SHEET 2)

LINE 1 / LINE 2 / GND — **TO RECTIFIER SHELF MDL 3 & 4 TERMINAL BLOCK** (REFER TO SHEET 2)

GRN - #6 AWG FLEX — **TO ENCLOSURE MASTER GROUND BAR** (REFER TO SHEET 4)

GRN - #18 AWG — GND — **FROM HEAT EXCHANGER GND CONNECTION** (REFER TO SHEET 2)

NOTES:

1.) USE 14/3 SJ FLEXIBLE CORD FOR AC POWER WIRING UNLESS OTHERWISE INDICATED (CABLE P/N 856-007-10).

ALPHA TECHNOLOGIES™

DESIGN	J.K.	2011/02		CHECKED	M.E.	2011/05
DRAWN	J.K	2011/02		APPROVED	J.K.	2011/05

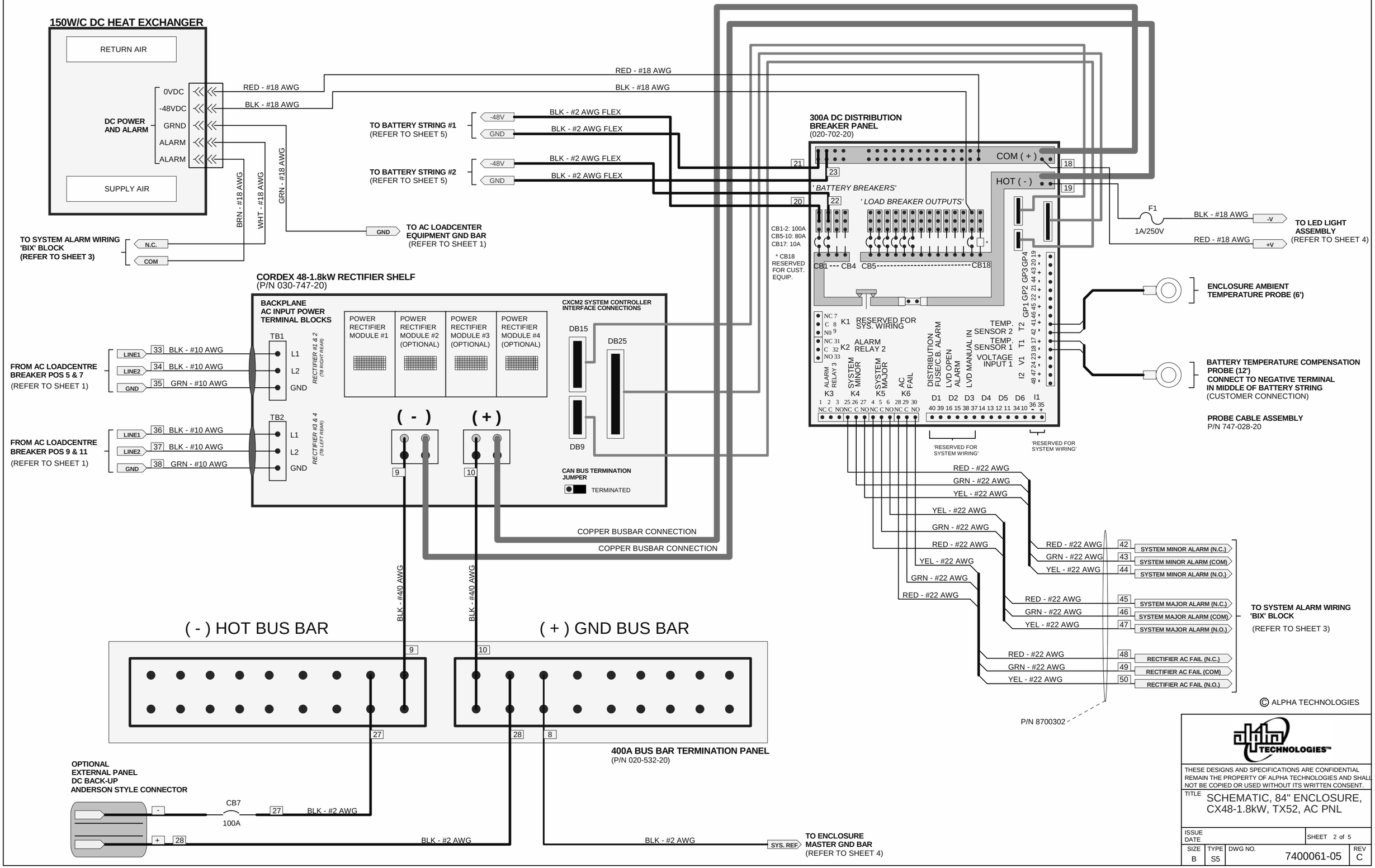
TITLE: SCHEMATIC, 84" ENCLOSURE, CX48-1.8kW, TX52, AC PNL

ISSUE DATE

SHEET 1 of 5

SIZE	TYPE	DWG NO.	REV
B	S5	7400061-05	C

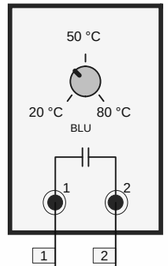
RECTIFIER SHELF, DC BREAKER DISTRIBUTION & HEAT EXCHANGER WIRING:



TITLE	SCHEMATIC, 84" ENCLOSURE, CX48-1.8kW, TX52, AC PNL		
ISSUE DATE		SHEET	2 of 5
SIZE	TYPE	DWG NO.	REV
B	S5	7400061-05	C

ENCLOSURE INTRUSION, TEMPERATURE, HEAT EXCHANGER & SYSTEM CONTROLLER ALARM WIRING:

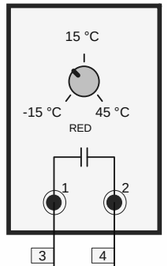
ENCLOSURE HIGH TEMPERATURE ALARM THERMOSTAT



FACTORY DEFAULT SETTINGS:

HIGH TEMP = 50 °C (122 °F)
LOW TEMP = - 5 °C (23 °F)

ENCLOSURE LOW TEMPERATURE ALARM THERMOSTAT



P/N 8700302

RED - #22 AWG
BLK - #22 AWG
YEL - #22 AWG
GRN - #22 AWG

RED - #22 AWG
BLK - #22 AWG

P/N 8700057

SYSTEM ALARM WIRING 'BIX' BLOCK

TB1

POS #		
1	RED - #22 AWG	1
2	BLK - #22 AWG	2
3	YEL - #22 AWG	3
4	GRN - #22 AWG	4
5	RED - #22 AWG	5
6	BLK - #22 AWG	6
7	RED - #22 AWG	42
8	GRN - #22 AWG	43
9	YEL - #22 AWG	44
10	RED - #22 AWG	45
11	GRN - #22 AWG	46
12	YEL - #22 AWG	47
13	RED - #22 AWG	48
14	GRN - #22 AWG	49
15	YEL - #22 AWG	50
16	WHT - #18 AWG	
17	BRN - #18 AWG	
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
44		
45		
46		
47		
48		
49		
50		

FROM CXCM2 CONTROLLER I/O TERMINAL BLOCK (REFER TO SHEET 2)
- SYSTEM MINOR ALARM (N.C.)
- SYSTEM MINOR ALARM (COM)
- SYSTEM MINOR ALARM (N.O.)

FROM CXCM2 CONTROLLER I/O TERMINAL BLOCK (REFER TO SHEET 2)
- SYSTEM MAJOR ALARM (N.C.)
- SYSTEM MAJOR ALARM (COM)
- SYSTEM MAJOR ALARM (N.O.)

FROM CXCM2 CONTROLLER I/O TERMINAL BLOCK (REFER TO SHEET 2)
- RECTIFIER AC FAIL ALARM (N.C.)
- RECTIFIER AC FAIL ALARM (COM)
- RECTIFIER AC FAIL ALARM (N.O.)

FROM HEAT EXCHANGER ALARM OUTPUT (REFER TO SHEET 2)
- HEAT EXCH FAIL ALARM (N.C.)
- HEAT EXCH FAIL ALARM (COM)

ALARM OUTPUT SIGNALS

1	N.O.	'ENCLOSURE HIGH TEMP ALARM'
2	COM	
3	N.O.	'ENCLOSURE LOW TEMP ALARM'
4	COM	
5	N.C.	'ENCLOSURE INTRUSION ALARM'
6	COM	
7	N.C.	'SYSTEM MINOR ALARM'
8	COM	
9	N.O.	
10	N.C.	'SYSTEM MAJOR ALARM'
11	COM	
12	N.O.	
13	N.C.	'RECTIFIER AC FAIL ALARM'
14	COM	
15	N.O.	
16	N.C.	'HEAT EXCHANGER FAIL ALARM'
17	COM	

'CUSTOMER CONNECTIONS'

24" X 30" (BOTTOM) REAR PANEL INTRUSION ALARM SWITCH

24" X 30" (MID) REAR PANEL INTRUSION ALARM SWITCH

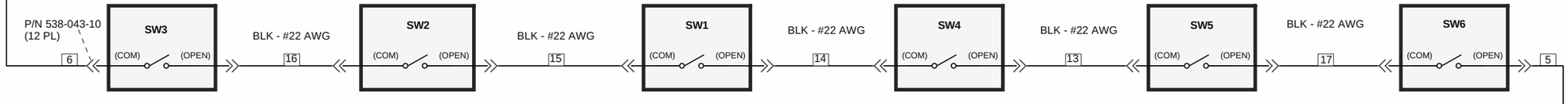
24" X 30" (UPPER) REAR PANEL INTRUSION ALARM SWITCH

8" X 30" (UPPER) REAR PANEL INTRUSION ALARM SWITCH

SOLAR SHIELD INTRUSION ALARM SWITCH

FRONT DOOR INTRUSION ALARM SWITCH

P/N 538-043-10 (12 PL)

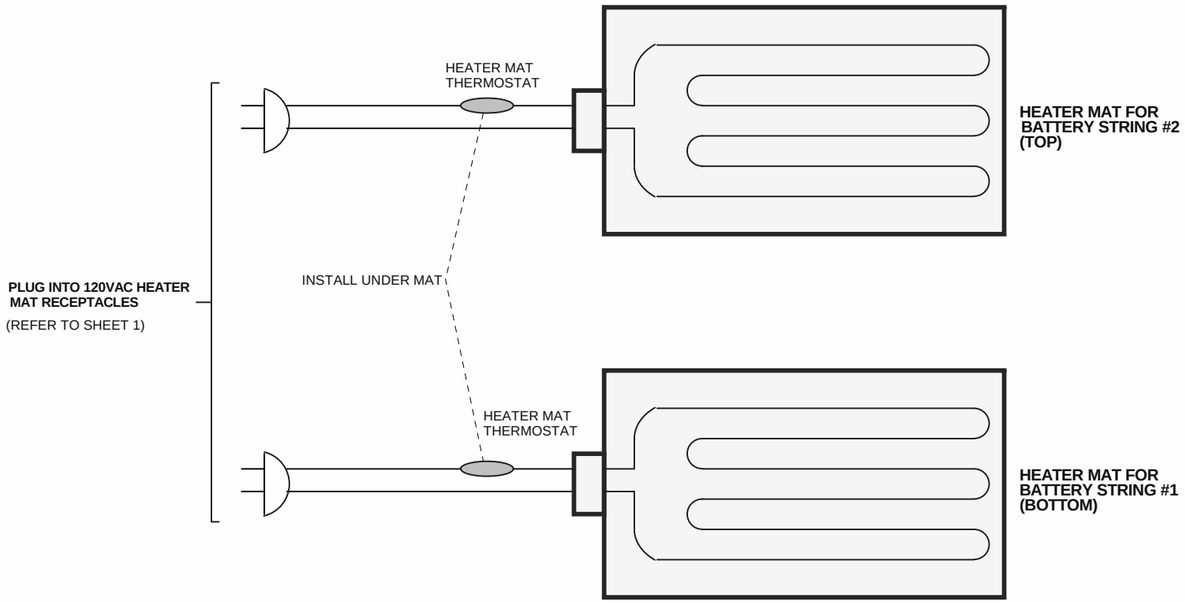


RED - #22 AWG
RED - #22 AWG

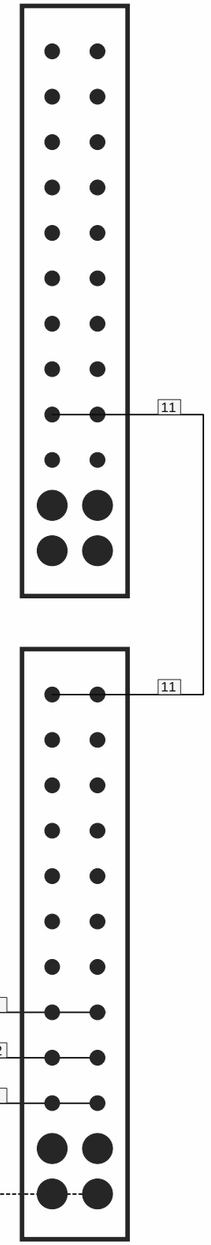
ALPHA TECHNOLOGIES™

TITLE	SCHEMATIC, 84" ENCLOSURE, CX48-1.8kW, TX52, AC PNL		
ISSUE DATE		SHEET	3 of 5
SIZE	TYPE	DWG NO.	REV
B	S5	7400061-05	C

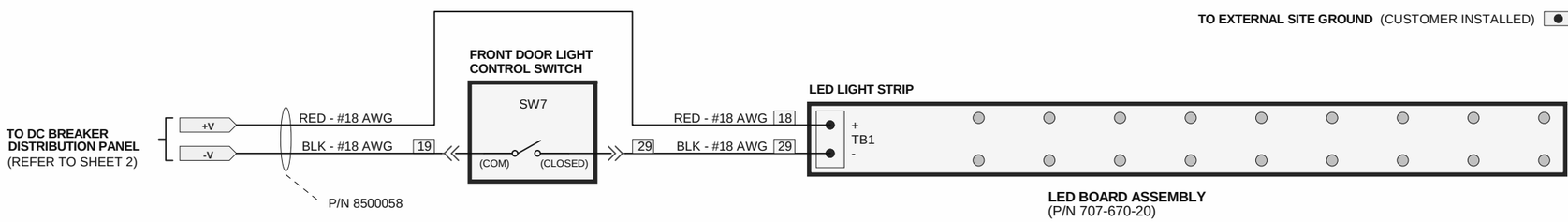
LED LIGHT FIXTURE & BATTERY HEATER MAT WIRING:



ENCLOSURE MASTER GROUND BAR TERMINATIONS:

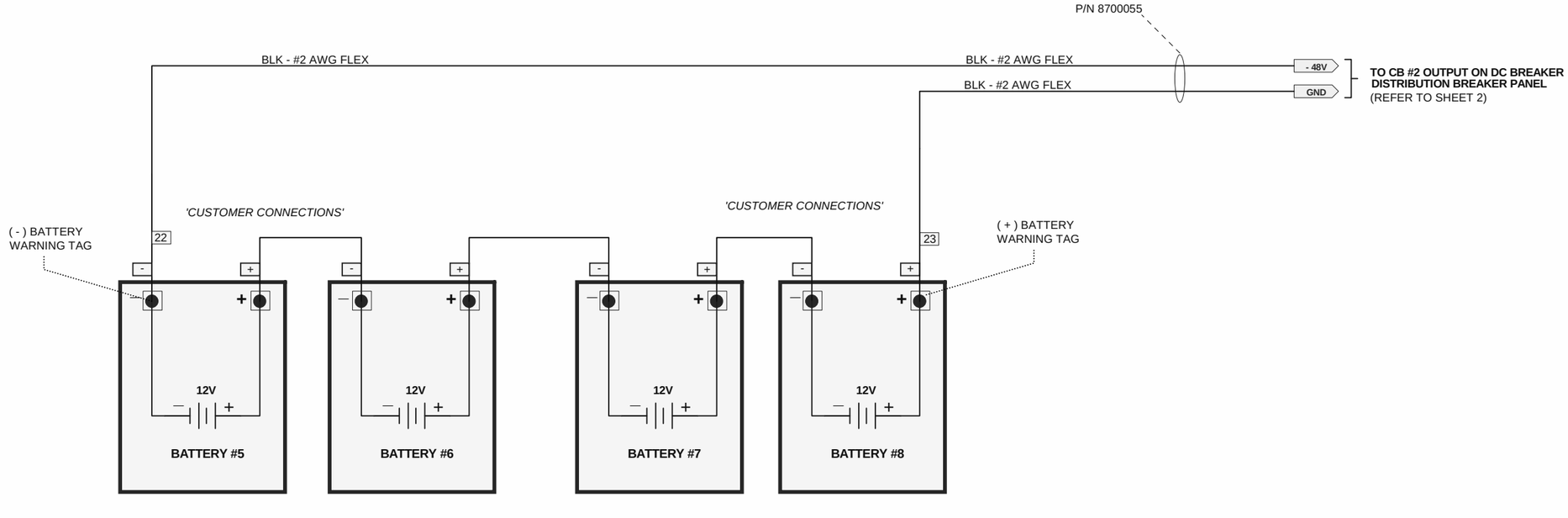


UTILITY PANEL MASTER GROUND BAR TERMINATIONS:

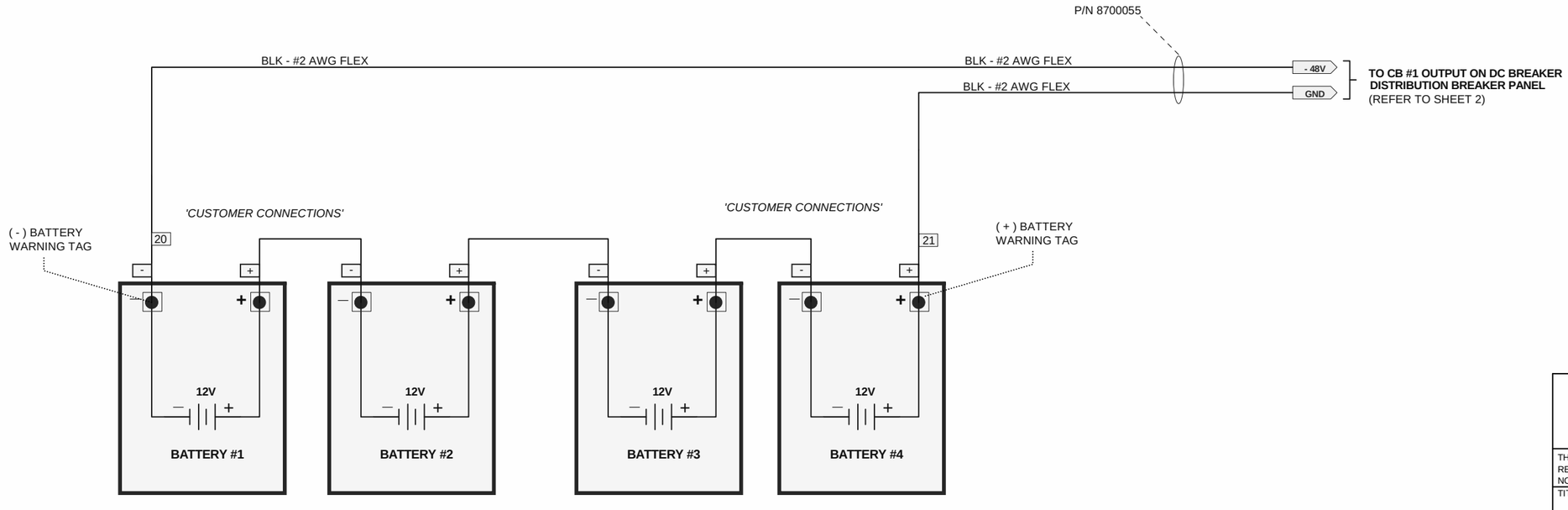


TITLE	SCHEMATIC, 84" ENCLOSURE, CX48-1.8kW, TX52, AC PNL
ISSUE DATE	SHEET 4 of 5
SIZE B / TYPE S5 / DWG NO. 7400061-05 / REV C	

SYSTEM -48V BATTERY STRING CABLING:



BATTERY STRING #2 (TOP)

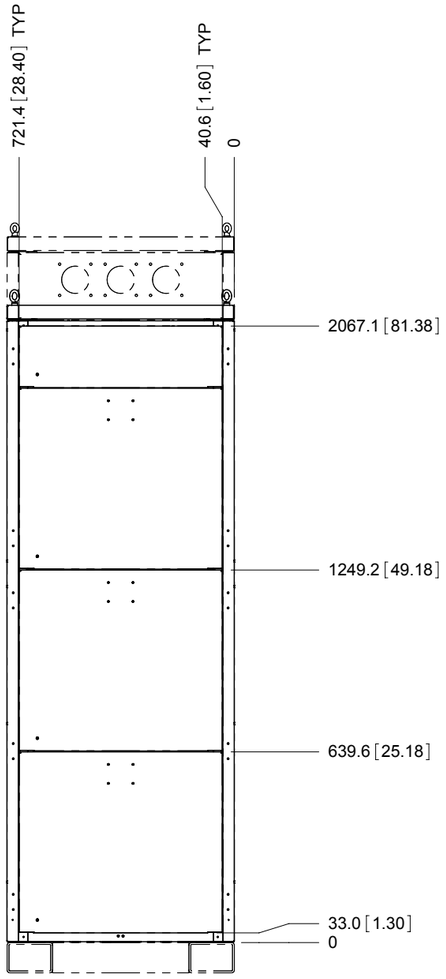


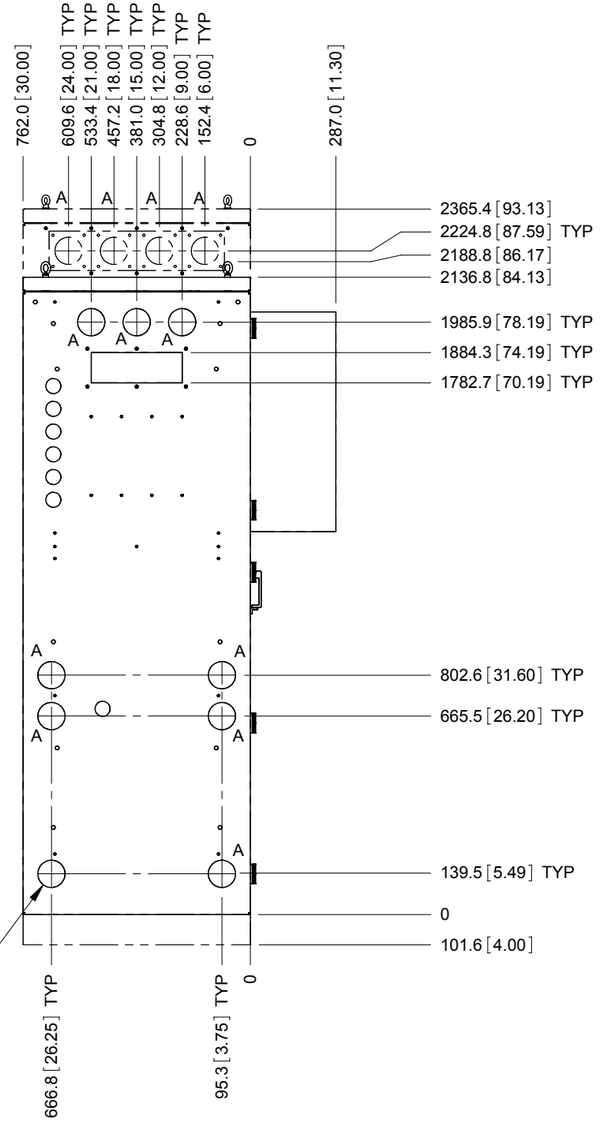
BATTERY STRING #1 (BOTTOM)

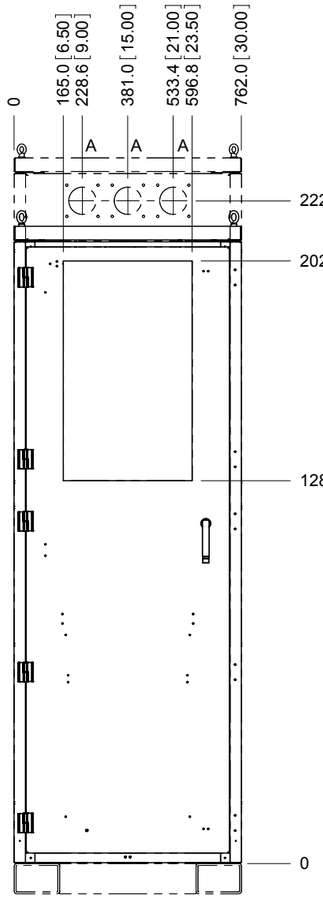
ALPHA TECHNOLOGIES™

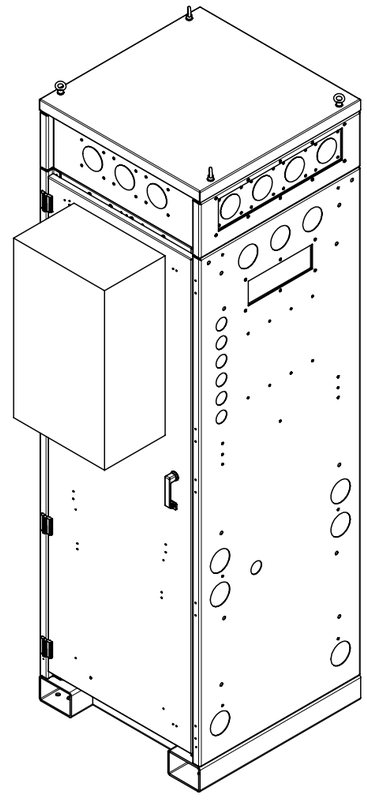
TITLE	SCHEMATIC, 84" ENCLOSURE, CX48-1.8kW, TX52, AC PNL
ISSUE DATE	
SHEET	5 of 5
SIZE	B
TYPE	S5
DWG NO.	7400061-05
REV	C

REVISIONS					
LTR	DESCRIPTION	DWN	DATE	CHKD	APPD
P/B	ADDED TE43P OUTLINE	RP	10/04	DX	JK









ITEM
QTY

	NAME	DATE
DESIGN	RP	2009/09
DRAWN	KL	2009/09
CHECKED	RP	2009/09
APPROVED	JK	2009/09

ALPHA TECHNOLOGIES™

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

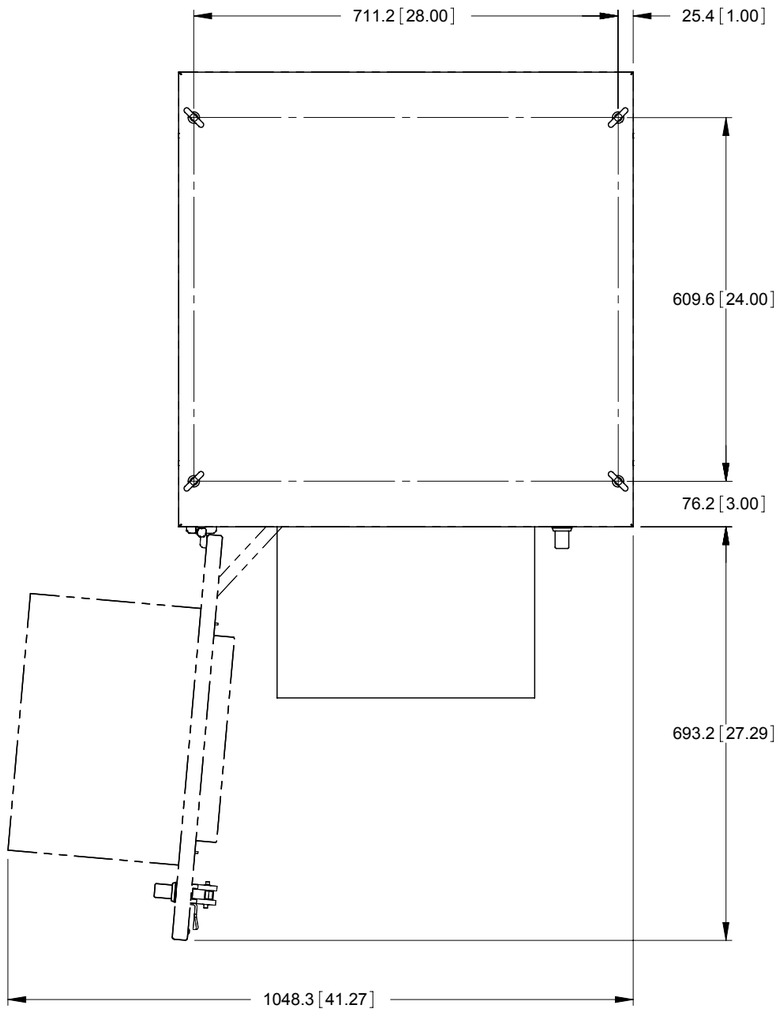
SCALE: NTS

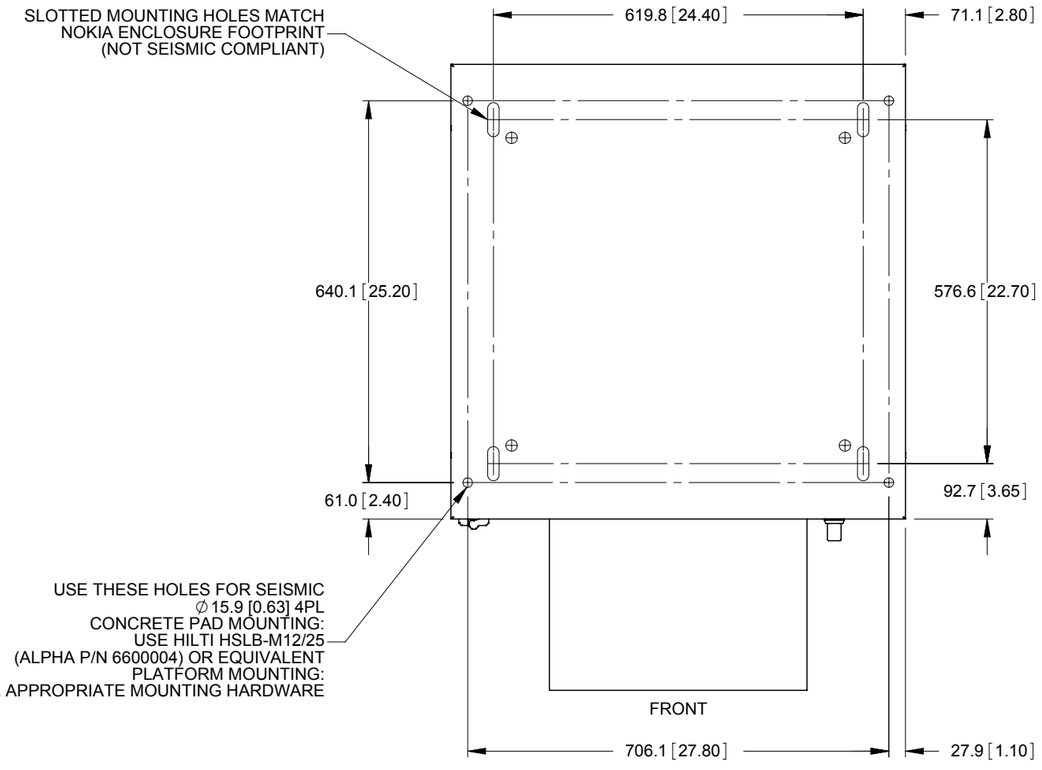
TITLE: OUTLINE DRAWING, Te43
84" POWER SYSTEM AUX
ENCLOUSURE

ISSUE DATE

SHEET 1 OF 4

SIZE	TYPE	DWG NO.	REV
B	D2	057-104-06	P/B





BASE LAYOUT
TOP VIEW

ALPHA TECHNOLOGIES™

UNITS: mm [in]		
X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5°	

SCALE: NTS

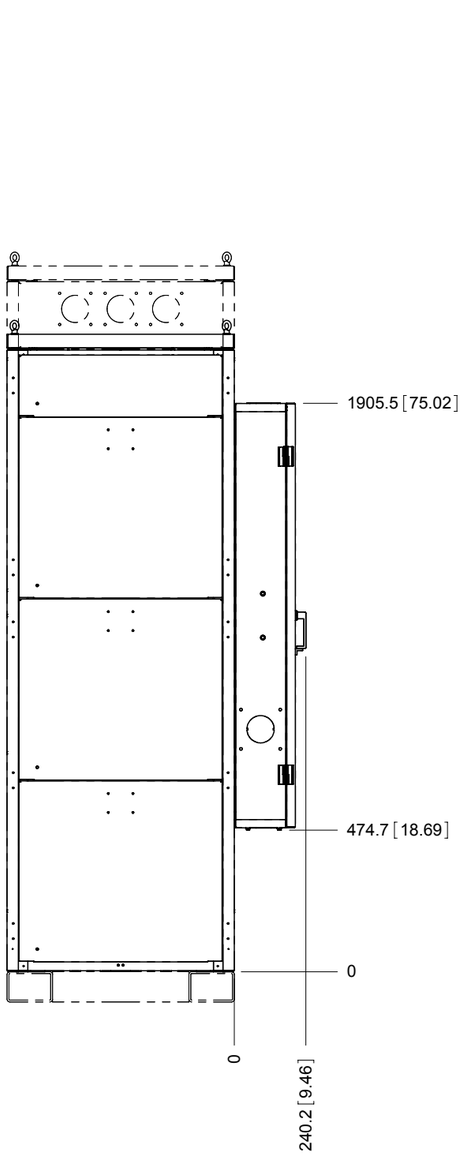
TITLE: OUTLINE DRAWING, Te43
84" POWER SYSTEM AUX
ENCLOUSURE

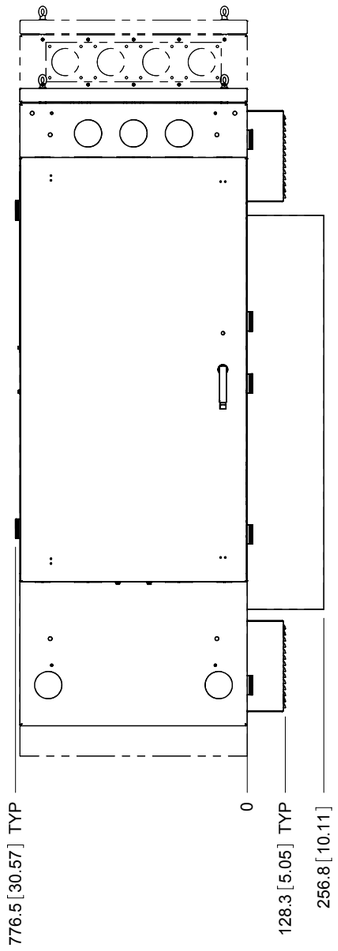
ISSUE DATE

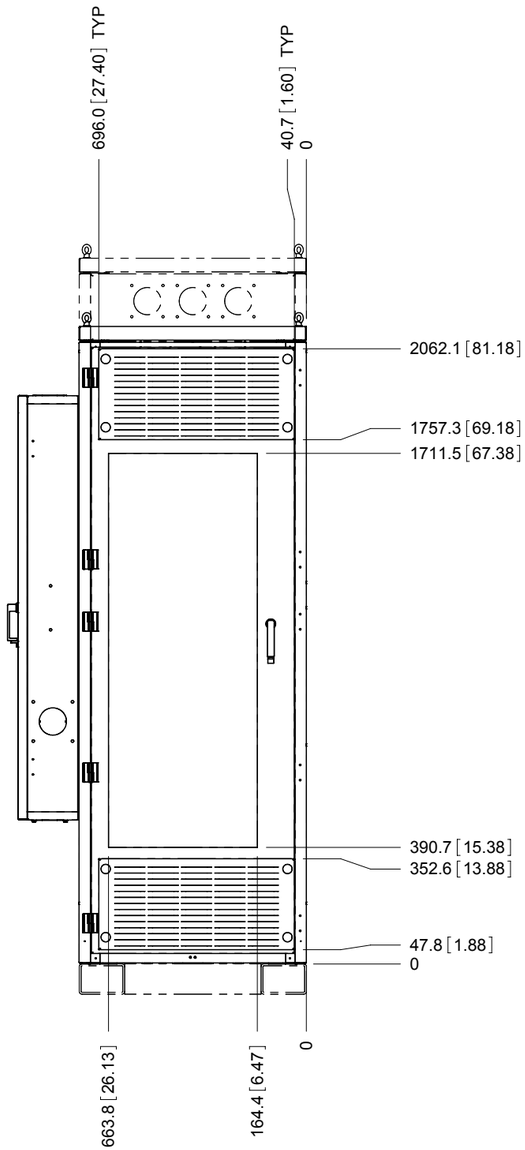
SHEET 2 OF 4

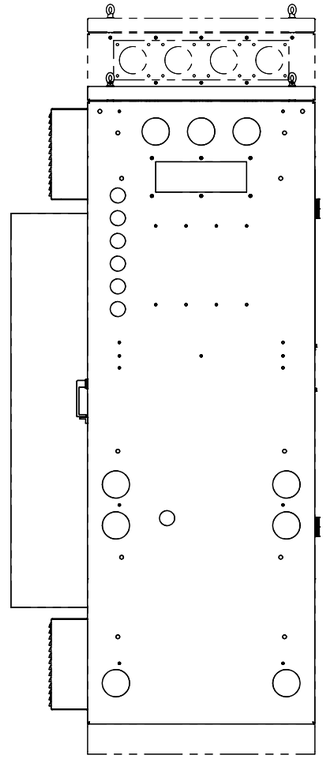
SIZE	TYPE	DWG NO.	REV
B	D2	057-104-06	P/B

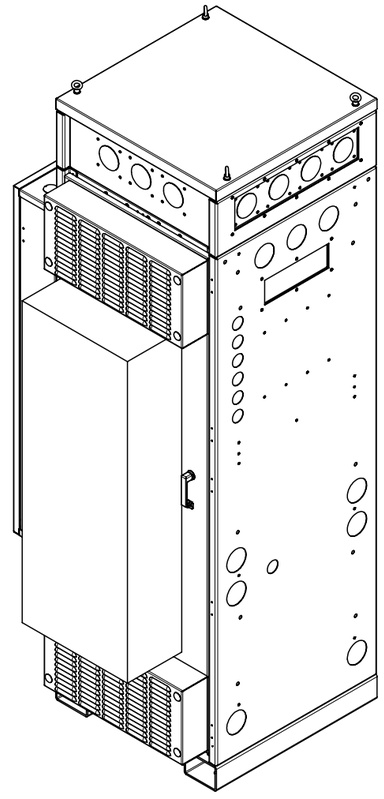
TE43P











ALPHA TECHNOLOGIES™

UNITS: mm [in]

X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5°	

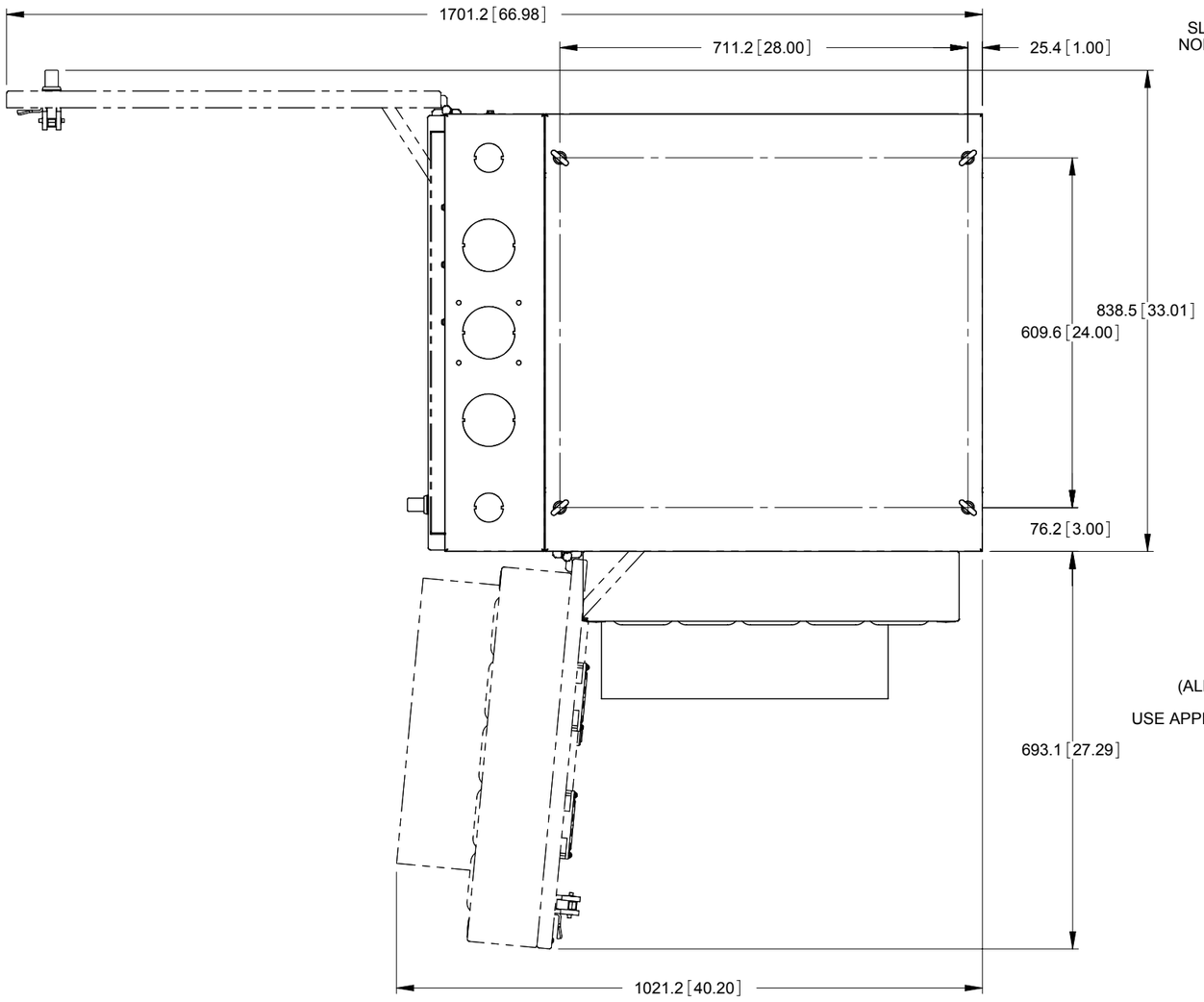
SCALE: NTS

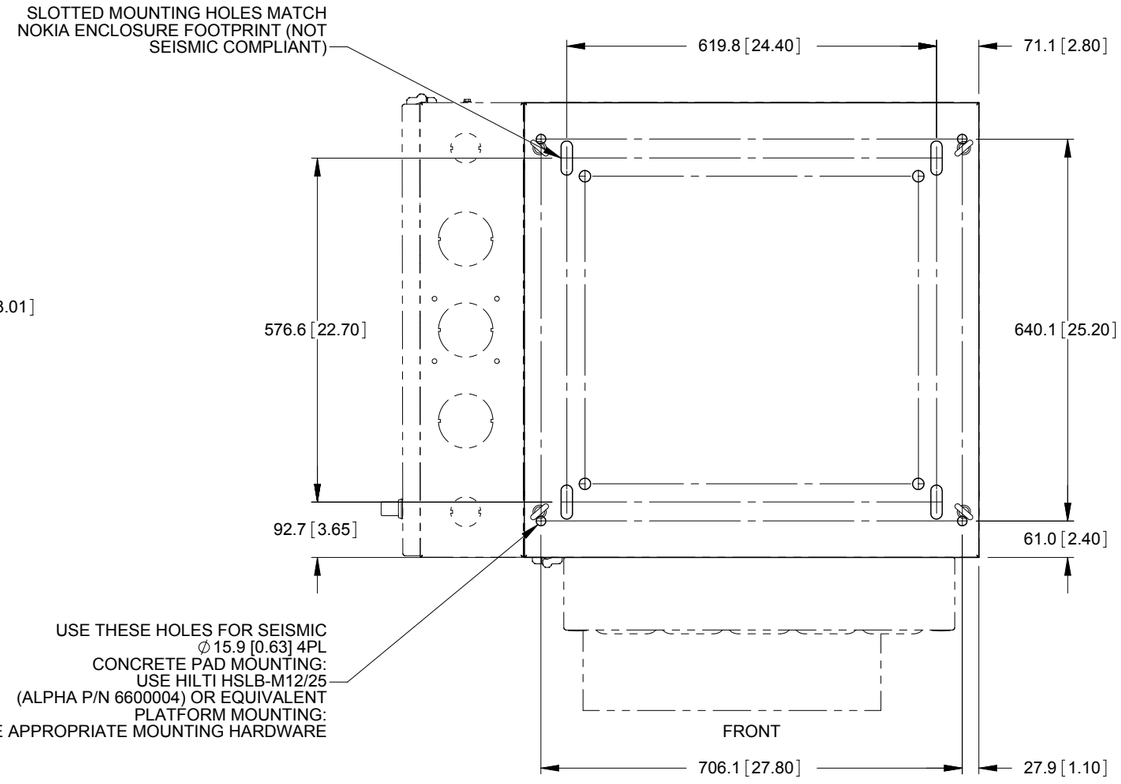
TITLE: OUTLINE DRAWING, Te43 84" POWER SYSTEM AUX ENCLOUSURE

ISSUE DATE

SHEET 3 OF 4

SIZE	TYPE	DWG NO.	REV
B	D2	057-104-06	P/B





BASE LAYOUT
TOP VIEW

UNITS: mm [in]		
X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5°	

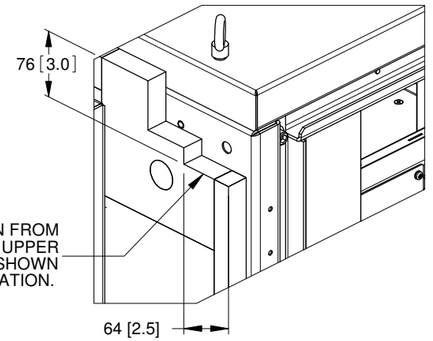
SCALE: NTS

TITLE: OUTLINE DRAWING, Te43
84" POWER SYSTEM AUX
ENCLOUSURE

ISSUE DATE			SHEET 4 OF 4
SIZE B	TYPE D2	DWG NO. 057-104-06	REV P/B

REVISIONS					
LTR	DESCRIPTION	DWN	DATE	CHKD	APPD
P/B	ADD NOTE	KL	10/01	ME	JK

POWER AND BATTERY ENCLOSURE SETUP & PREPARATION:



CUT AWAY A SMALL SECTION FROM INNER WALL INSULATION IN THE UPPER CORNERS OF BOTH ENCLOSURES AS SHOWN FOR 3/8" HARDWARE INSTALLATION.

INSULATION CUT DETAIL

DETAIL A - INSIDE VIEW

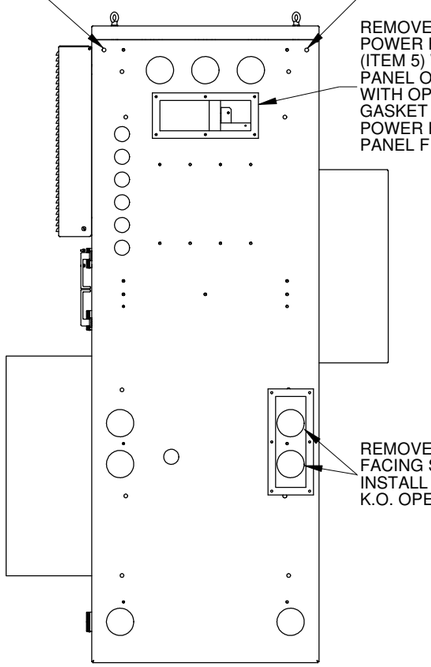
SIDE KNOCKOUT REMOVAL, PANEL CHANGE & GASKET INSTALLATION:

P/B

NOTE: ONLY REMOVE KNOCK OUTS ON FACING SIDES OF BOTH ENCLOSURES

REMOVE TOP CORNER KNOCKOUTS ON FACING SIDES OF BOTH ENCLOSURES (2 PER SIDE) TO ACCEPT BOLTING HARDWARE

REMOVE EXISTING TOP ACCESS BLANK PANEL ON POWER ENCLOSURE. INSTALL REPLACEMENT PANEL (ITEM 5) WITH 4 MOUNTING SCREWS (ITEM 17). MOUNT PANEL ON INSIDE POSITIONED TOWARDS THE FRONT WITH OPENING FOR CABLES AT REAR. INSTALL SEALING GASKET (ITEM 6) AROUND TOP ACCESS OPENING ON POWER ENCLOSURE SIDE ONLY. REMOVE TOP ACCESS PANEL FROM FACING SIDE OF BATTERY ENCLOSURE.

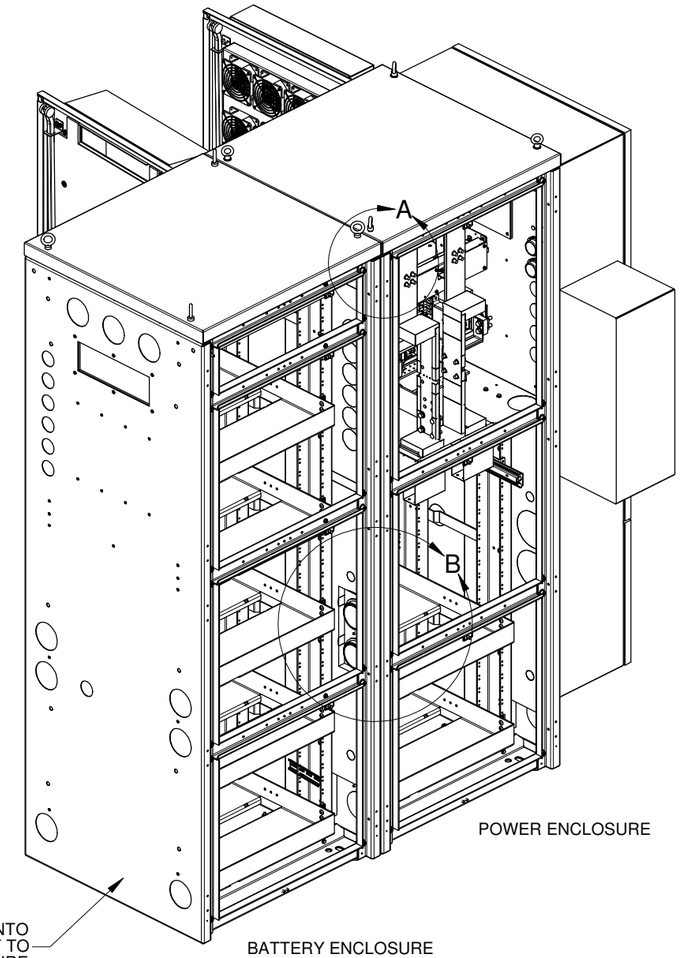


REMOVE SIDE ACCESS CABLE KNOCKOUTS ON FACING SIDES OF BOTH ENCLOSURES. INSTALL SEALING GASKET (ITEM 6) AROUND K.O. OPENINGS ON POWER ENCLOSURE SIDE ONLY.

RIGHT SIDE VIEW
POWER ENCLOSURE SHOWN

KNOCK OUTS REQUIRED TO BE REMOVED MAY BE LOCATED ON THE LEFT SIDE PANEL DEPENDING ON THE ENCLOSURE CONFIGURATION

P/B



MOVE BATTERY ENCLOSURE INTO POSITION LINING UP NEXT TO POWER ENCLOSURE

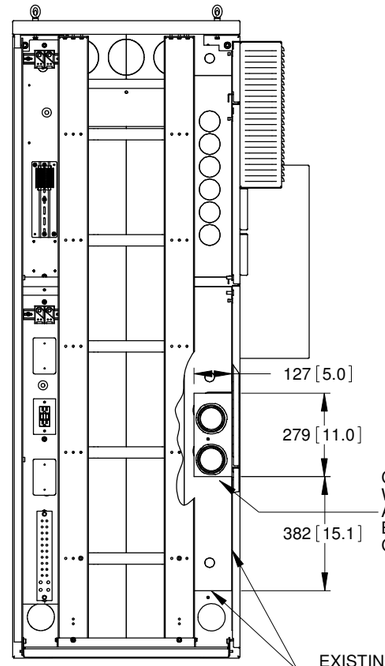
POWER ENCLOSURE

BATTERY ENCLOSURE

(MAY BE LOCATED ON THE OTHER SIDE OF POWER ENCLOSURE DEPENDING ON CONFIGURATION)

P/B

REAR VIEW



CUT AWAY A SMALL SECTION OF INNER WALL INSULATION IN AREA OF SIDE ACCESS CABLE KNOCKOUTS ON BOTH ENCLOSURES AS SHOWN FOR CHASE NIPPLE INSTALLATION.

EXISTING CUT LINES

INSULATION CUT DETAIL

DETAIL B - INSIDE VIEW

ITEM
QTY

ALPHA TECHNOLOGIES™

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTERFACE, w/ CBL SET, PWR TO BATT, Te4x

	NAME	DATE
DESIGN	ME	2009/04
DRAWN	SDW	2009/05
CHECKED	JK	2009/06
APPROVED	ME	2009/06

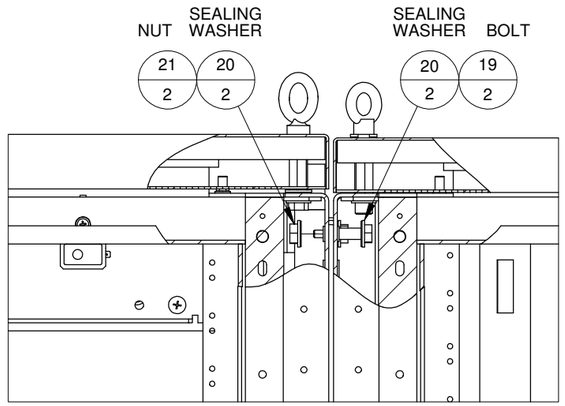
ISSUE DATE

SHEET 1 OF 5

SIZE B | TYPE D2 | DWG NO. 747-602-08 | REV P/B

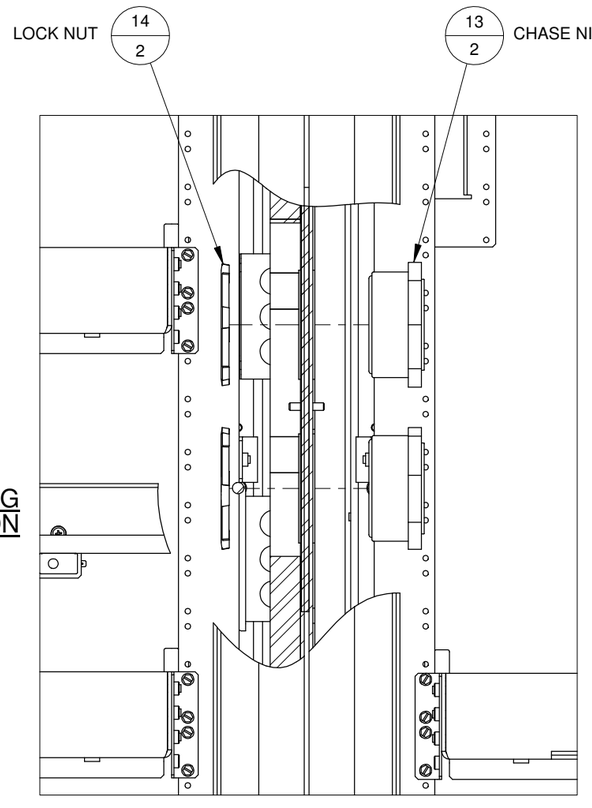
JOINING OF POWER & BATTERY ENCLOSURES:

3/8" BOLT INSTALLATION



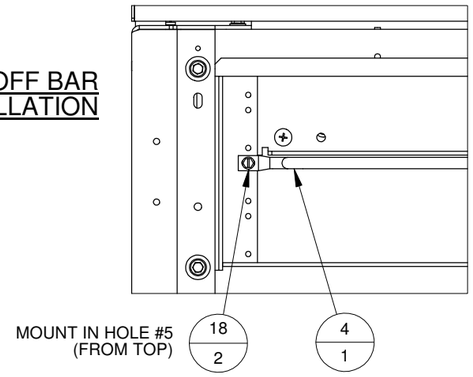
DETAIL A

CHASE NIPPLE FITTING INSTALLATION

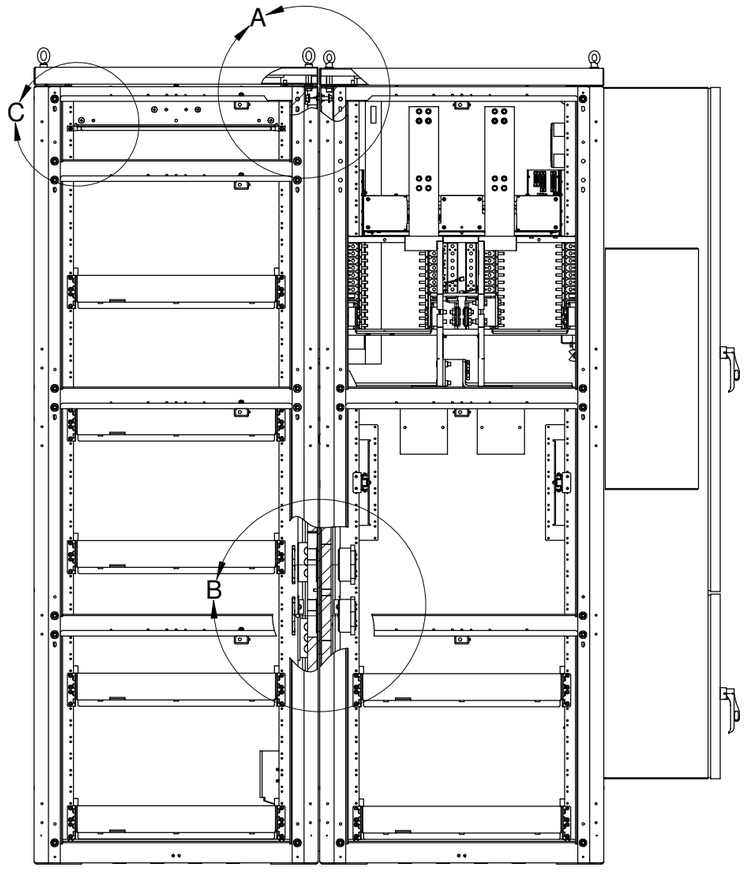


DETAIL B

CABLE TIE-OFF BAR INSTALLATION



DETAIL C



REAR VIEW - PANELS REMOVED

UNITS: mm [in]		
X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5°	

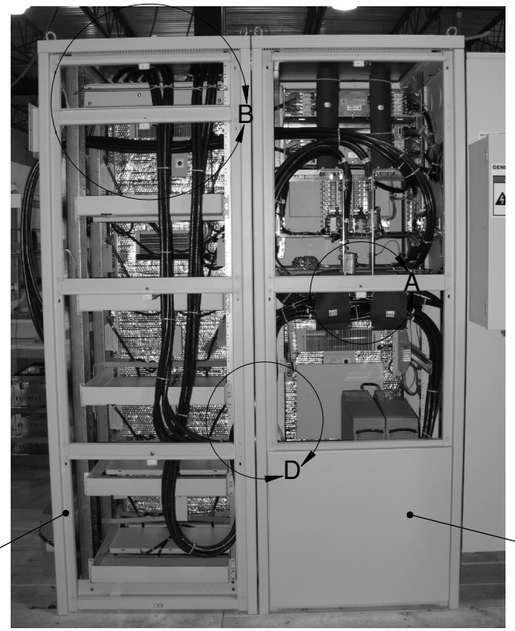
SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTERFACE, w/ CBL SET, PWR TO BATT, Te4x

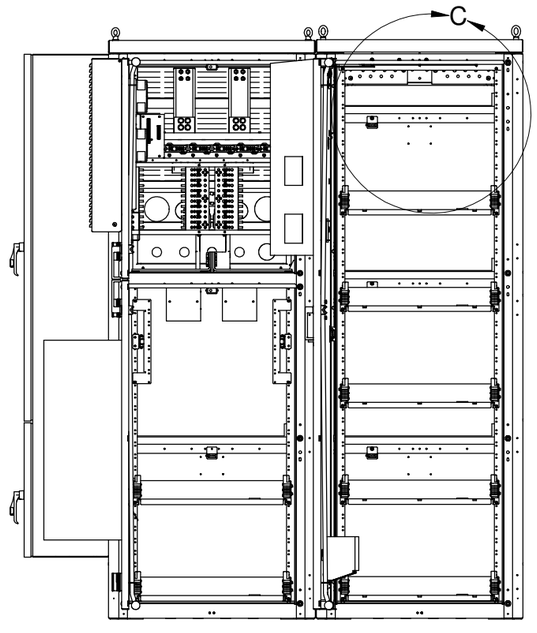
ISSUE DATE			SHEET 2 OF 5
SIZE B	TYPE D2	DWG NO. 747-602-08	REV P/B

POWER ENCLOSURE (Te41) TO BATTERY ENCLOSURE (Te40) INTERFACE CABLE ROUTING & CONNECTIONS:

ROUTE INTERFACE CABLES FROM POWER ENCLOSURE THROUGH CHASE NIPPLE FITTINGS INTO BATTERY ENCLOSURE AND UP TO THE BATTERY CHARGE TERMINATION PANEL.



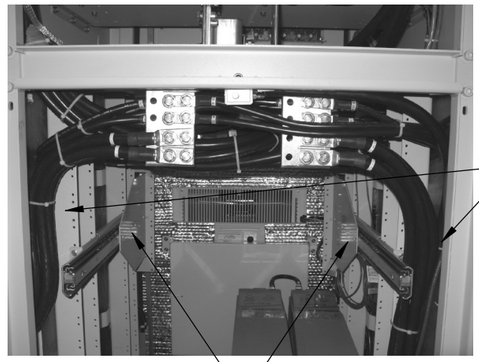
REAR VIEW



FRONT VIEW

REAR SYSTEM OUTPUT BUS BAR INSULATING COVERS (+24V SYSTEM SHOWN)

TEMPORARILY REMOVE INSULATING COVERS ON SYSTEM BUS BARS TO MAKE INTERFACE CABLE CONNECTIONS. RE-INSTALL COVERS ONCE CABLE CONNECTIONS ARE COMPLETED.



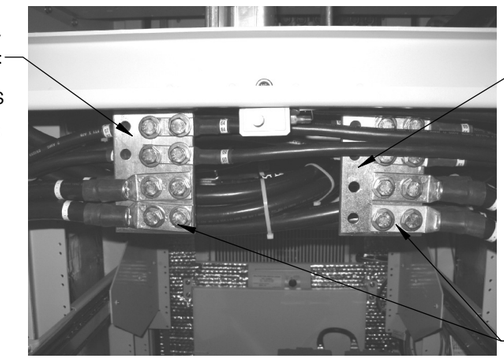
KEEP ALL INTERFACE CABLES AWAY FROM REAR SECTION OF EQUIPMENT SLIDES. USE CABLE TIES PROVIDED TO ATTACH INTERFACE CABLES TO SIDES OF EQUIPMENT RACK CHANNELS AS NECESSARY.

CUSTOMER EQUIPMENT SLIDES

REAR SYSTEM OUTPUT BUS BAR CABLE ROUTING PATH

OBSERVE PROPER BUS POLARITY ON THIS SIDE:

- FOR +24V SYSTEMS
- FOR -48V SYSTEMS



OBSERVE PROPER BUS POLARITY ON THIS SIDE:

- FOR +24V SYSTEMS
- FOR -48V SYSTEMS

CONNECT INTERFACE CABLE LUGS BACK TO BACK ONTO SYSTEM OUTPUT BUS BARS USING 3/8" HARDWARE SUPPLIED IN KIT.

REAR SYSTEM OUTPUT BUS BAR LUG CONNECTIONS

DETAIL A - POWER ENCLOSURE SYSTEM OUTPUT BUS BAR CABLING & CONNECTIONS

ALPHA TECHNOLOGIES™

UNITS: mm [in]		
X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5°	

SCALE: NTS

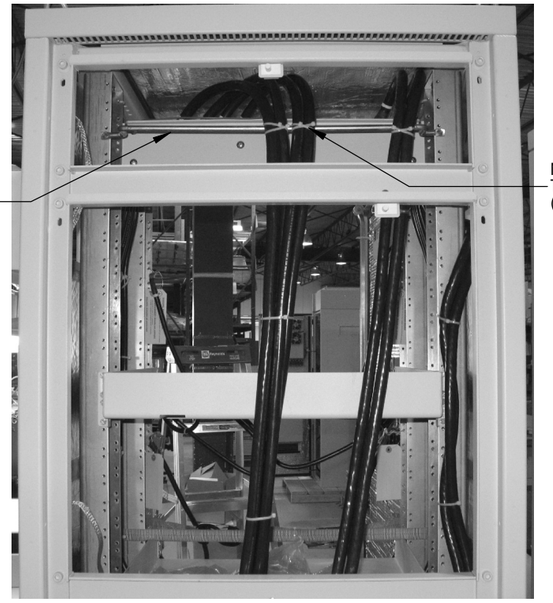
TITLE: CUSTOMER CONNECTION, KIT, INTERFACE, w/ CBL SET, PWR TO BATT, Te4x

ISSUE DATE

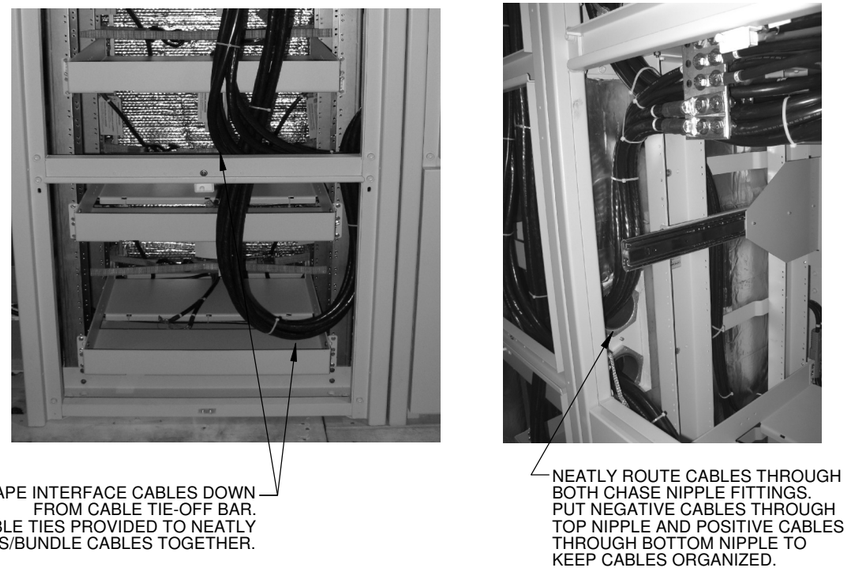
SHEET 3 OF 5

SIZE	TYPE	DWG NO.	REV
B	D2	747-602-08	P/B

POWER ENCLOSURE (Te41) TO BATTERY ENCLOSURE (Te40) INTERFACE CABLE ROUTING & CONNECTIONS CONT'D:

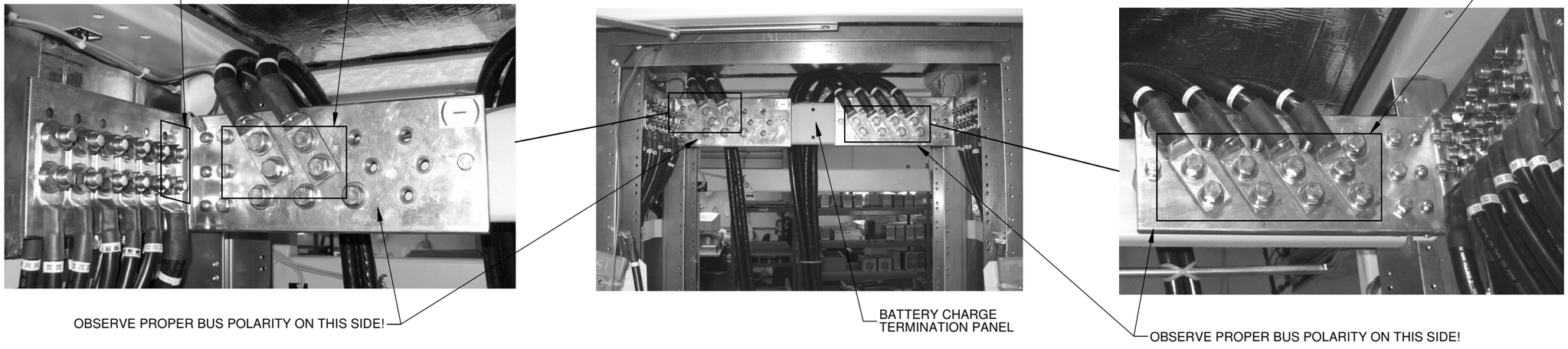


DETAIL B - REAR BATTERY CHARGE TERMINATION PANEL CABLE ROUTING



DETAIL D - REAR CABLE ROUTING BETWEEN ENCLOSURES

CONNECT INTERFACE CABLES TO THEIR RESPECTIVE (+) AND (-) BUS BARS ON CHARGE TERMINATION PANEL USING 3/8" HARDWARE SUPPLIED AS SHOWN. ENSURE CORRECT POLARITY IS OBSERVED WHEN MAKING CONNECTIONS. USE A MULTIMETER TO CHECK ALL TERMINATIONS BEFORE CONNECTING BATTERIES AND APPLYING POWER TO THE SYSTEM.



DETAIL C - FRONT BATTERY CHARGE TERMINATION PANEL CONNECTIONS

(+24V SYSTEM SHOWN)

UNITS: mm [in]		
X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5°	

SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTERFACE, w/ CBL SET, PWR TO BATT, Te4x

ISSUE DATE

SIZE	TYPE	DWG NO.	REV
B	D2	747-602-08	P/B

AIR CONDITIONER & AC LOADCENTER AC POWER CONNECTIONS:

Te40 AIR CONDITIONER UTILITY BOX WIRING

CONNECT A SEPARATE POWER CABLE TO THE EXISTING AIR CONDITIONER AC WIRING INSIDE UTILITY BOX AND ROUTE IT THROUGH BOTH ENCLOSURES INTO THE Te41 UPPER COMPARTMENT TO THE INTERNAL AC LOADCENTER.

Te40 AIR CONDITIONER AC POWER CONNECTION TO Te41

Te41 UPPER COMPARTMENT INTERNAL AC LOADCENTER WIRING
(ONLY INCLUDED FOR ENCLOSURES NOT EQUIPPED WITH AN EXTERNAL LOADCENTER)

CONNECT THE POWER CABLE COMING FROM Te40 AIR CONDITIONER AC POWER CONNECTION UTILITY BOX TO A 15A 120VAC RATED 1 POLE FEEDER BREAKER INSTALLED IN LOADCENTER.

FOR ENCLOSURES WITH AN EXTERNAL LOADCENTER, CONNECT THE POWER CABLE DIRECTLY TO A 15A 120VAC RATED 1 POLE FEEDER BREAKER INSTALLED IN LOADCENTER.

Te41 AC LOADCENTER AIR CONDITIONER AC POWER CONNECTION FROM Te40

ALPHA TECHNOLOGIES™

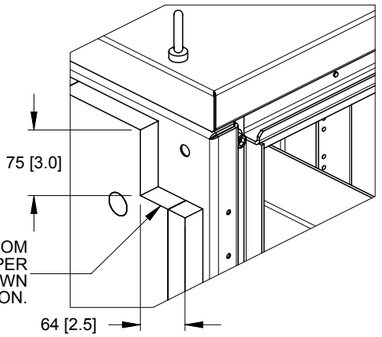
UNITS: mm [in]			SCALE: NTS
X [X.X]	±1	[±0.040]	
X.X [X.XX]	±0.5	[±0.020]	
X.XX [X.XXX]	±0.05	[±0.002]	
ANGULAR:	±0.5˚		

TITLE: CUSTOMER CONNECTION, KIT, INTERFACE, w/ CBL SET, PWR TO BATT, Te4x

ISSUE DATE			SHEET 5 OF 5
SIZE B	TYPE D2	DWG NO. 747-602-08	REV P/B

REVISIONS					
LTR	DESCRIPTION	DWN	DATE	CHKD	APPD

ENCLOSURE SETUP & PREPARATION:

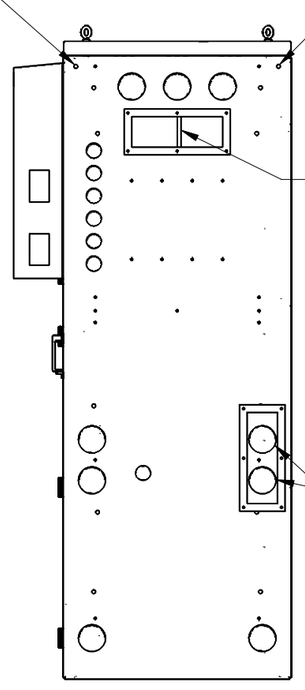


INSULATION CUT DETAIL

DETAIL A - INSIDE VIEW

SIDE KNOCKOUT REMOVAL, PANEL CHANGE & GASKET INSTALLATION:

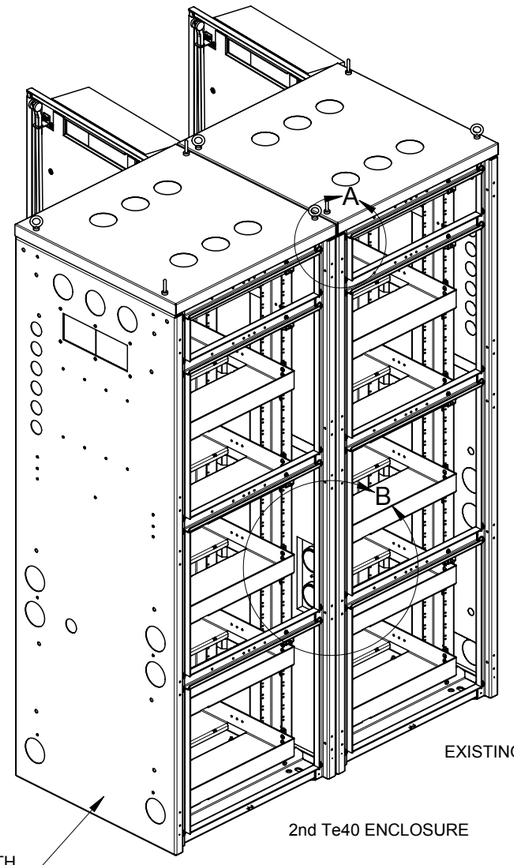
REMOVE TOP CORNER KNOCKOUTS ON FACING SIDES OF BOTH ENCLOSURES (2 PER SIDE) TO ACCEPT BOLTING HARDWARE



REMOVE THE TOP ACCESS BLANK PANEL ON EXISTING BATTERY ENCLOSURE. INSTALL REPLACEMENT PANEL (ITEM 5) WITH 4 MOUNTING SCREWS (ITEM 17). MOUNT PANEL ON INSIDE POSITIONED TOWARDS THE FRONT WITH OPENING FOR CABLES AT REAR. INSTALL SEALING GASKET (ITEM 6) AROUND TOP ACCESS OPENING ON SIDE OF EXISTING BATTERY ENCLOSURE. REMOVE TOP ACCESS PANEL FROM LEFT SIDE OF 2nd BATTERY ENCLOSURE.

REMOVE SIDE ACCESS CABLE KNOCKOUTS ON FACING SIDES OF BOTH ENCLOSURES. INSTALL SEALING GASKET (ITEM 6) AROUND K.O. OPENINGS ON SIDE OF EXISTING BATTERY ENCLOSURE.

RIGHT SIDE VIEW
EXISTING BATTERY ENCLOSURE SHOWN

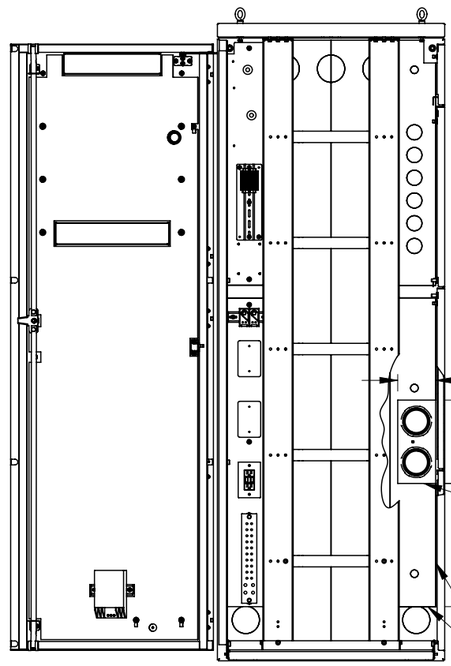


ALIGN 2nd Te40 BATTERY ENCLOSURE WITH INSTALLED Te40 BATTERY ENCLOSURE

2nd Te40 ENCLOSURE

EXISTING Te40 ENCLOSURE

REAR VIEW



INSULATION CUT DETAIL

DETAIL B - INSIDE VIEW

ITEM
QTY

ARGUS®

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTRFC, w/ CBL SET, BATT TO BATT, Te4x

	NAME	DATE
DESIGN	JK	2009/05
DRAWN	SDW	2009/05
CHECKED	JK	2009/06
APPROVED	ME	2009/06

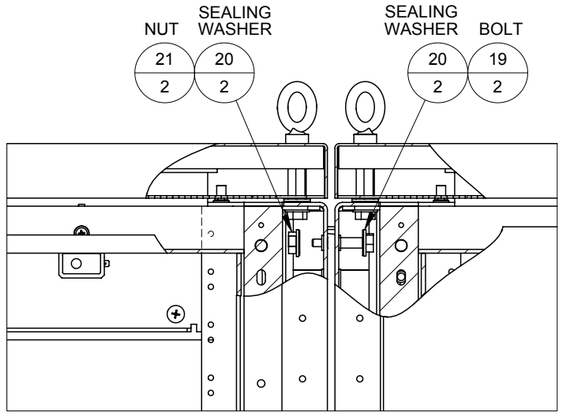
ISSUE DATE

SHEET 1 OF 7

SIZE B | TYPE D2 | DWG NO. 747-603-08 | REV P/A

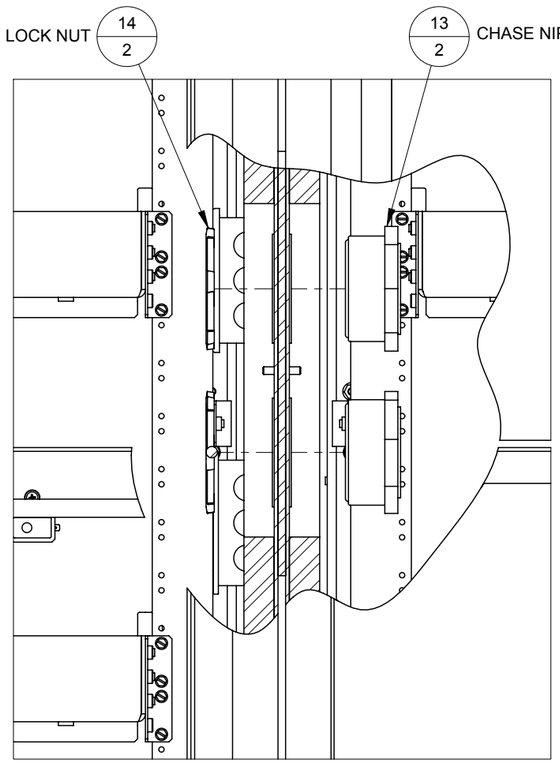
JOINING OF BATTERY & BATTERY ENCLOSURES:

3/8" BOLT INSTALLATION



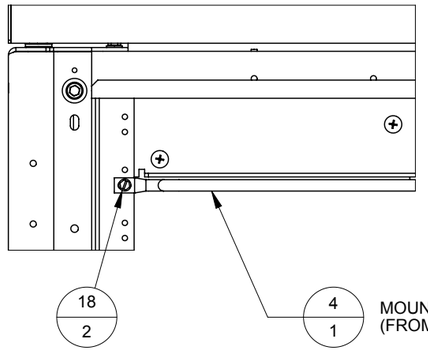
DETAIL A

CHASE NIPPLE FITTING INSTALLATION

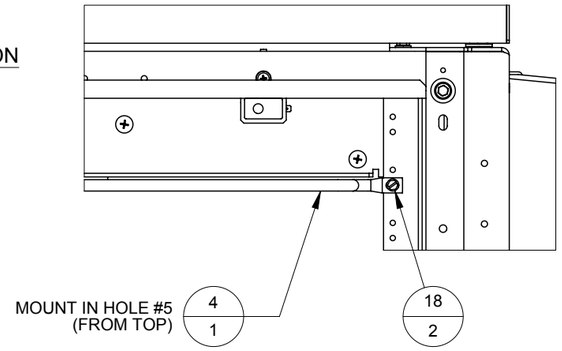


DETAIL B

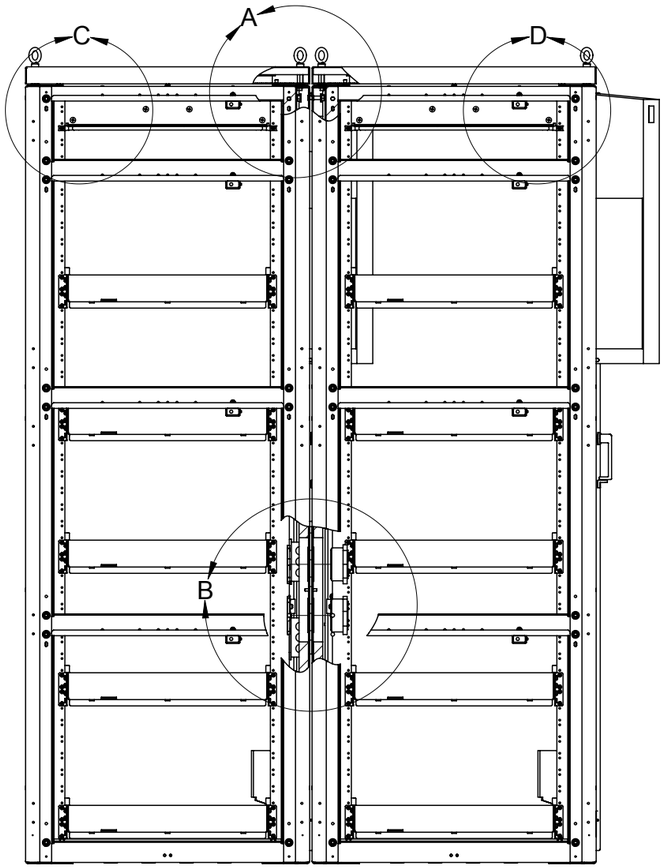
CABLE TIE-OFF BAR INSTALLATION



DETAIL C



DETAIL D



REAR VIEW - PANELS REMOVED

ARGUS®

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTRFC, w/ CBL SET, BATT TO BATT, Te4x

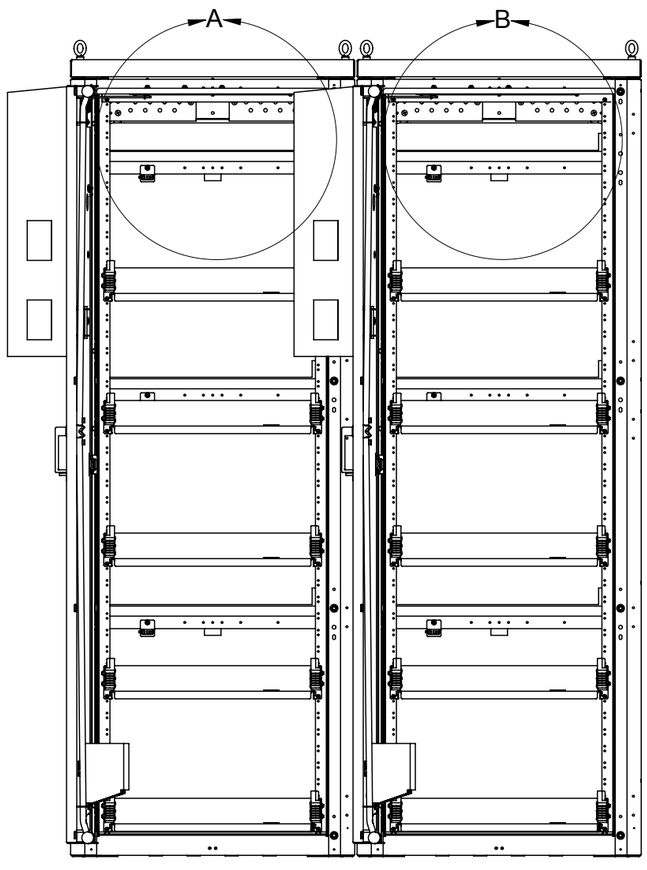
ISSUE DATE

SHEET 2 OF 7

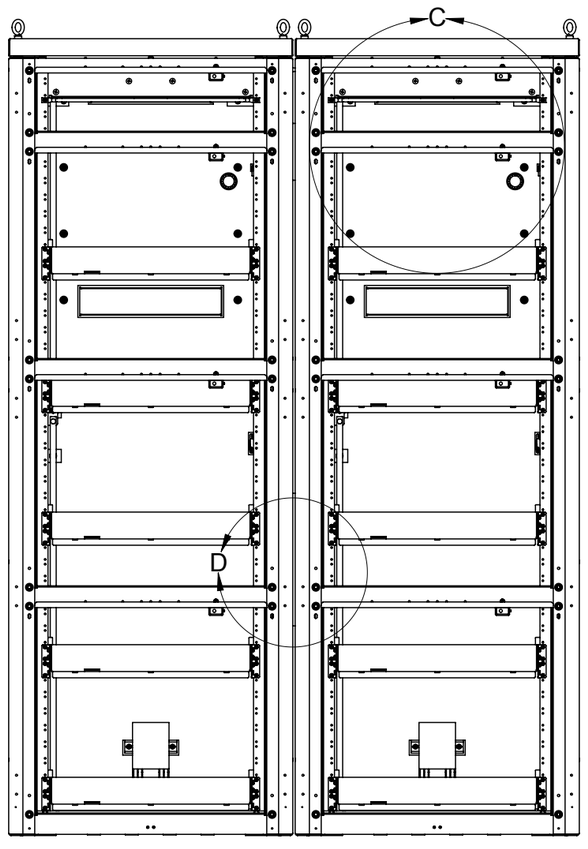
SIZE	TYPE	DWG NO.	REV
B	D2	747-603-08	P/A

BATTERY ENCLOSURE (Te40) TO BATTERY ENCLOSURE (Te40)
INTERFACE CABLE ROUTING & CONNECTIONS:

* SEE NEXT SHEETS FOR FURTHER DETAILS.



FRONT VIEW



REAR VIEW

ARGUS®

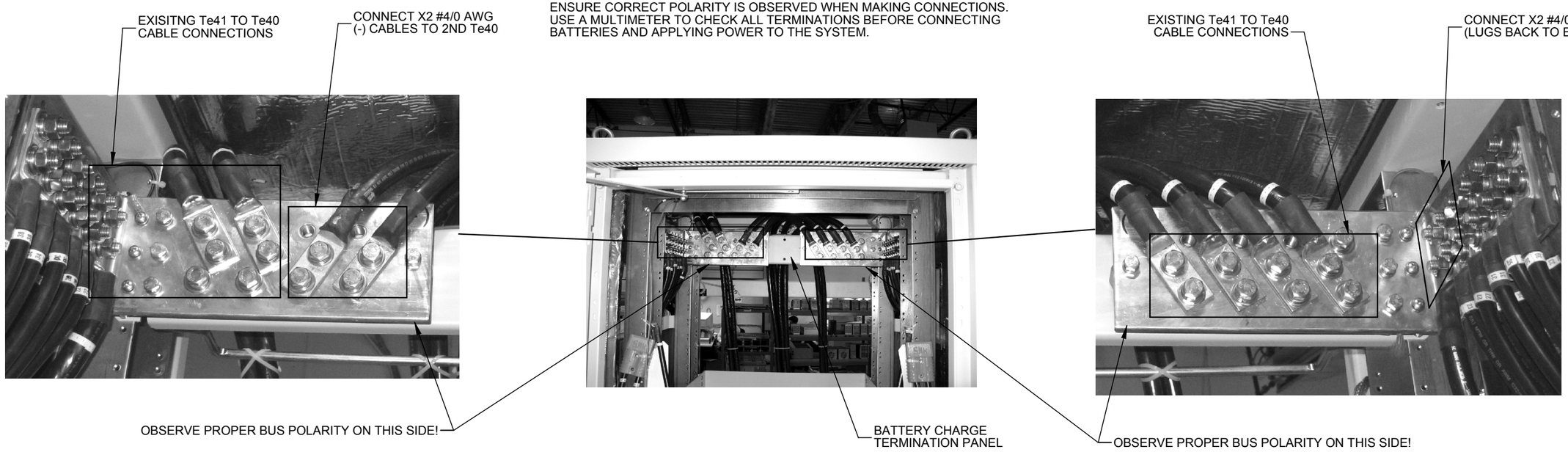
UNITS: mm [in]			SCALE: NTS
X [X.X]	±1	[±0.040]	
X.X [X.XX]	±0.5	[±0.020]	
X.XX [X.XXX]	±0.05	[±0.002]	
ANGULAR:	±0.5°		

TITLE: CUSTOMER CONNECTION, KIT, INTRFC, w/ CBL SET, BATT TO BATT, Te4x

ISSUE DATE			SHEET 3 OF 7
SIZE B	TYPE D2	DWG NO. 747-603-08	REV P/A

BATTERY ENCLOSURE (Te40) TO BATTERY ENCLOSURE (Te40) INTERFACE CABLE ROUTING & CONNECTIONS CONT'D:

CONNECT INTERFACE CABLES TO THEIR RESPECTIVE (+) AND (-) BUS BARS ON CHARGE TERMINATION PANEL USING 3/8" HARDWARE SUPPLIED AS SHOWN. ENSURE CORRECT POLARITY IS OBSERVED WHEN MAKING CONNECTIONS. USE A MULTIMETER TO CHECK ALL TERMINATIONS BEFORE CONNECTING BATTERIES AND APPLYING POWER TO THE SYSTEM.



DETAIL B - FRONT BATTERY CHARGE TERMINATION PANEL CONNECTIONS ON EXISTING Te40 ENCLOSURE

(+24V SYSTEM SHOWN)

ARGUS®

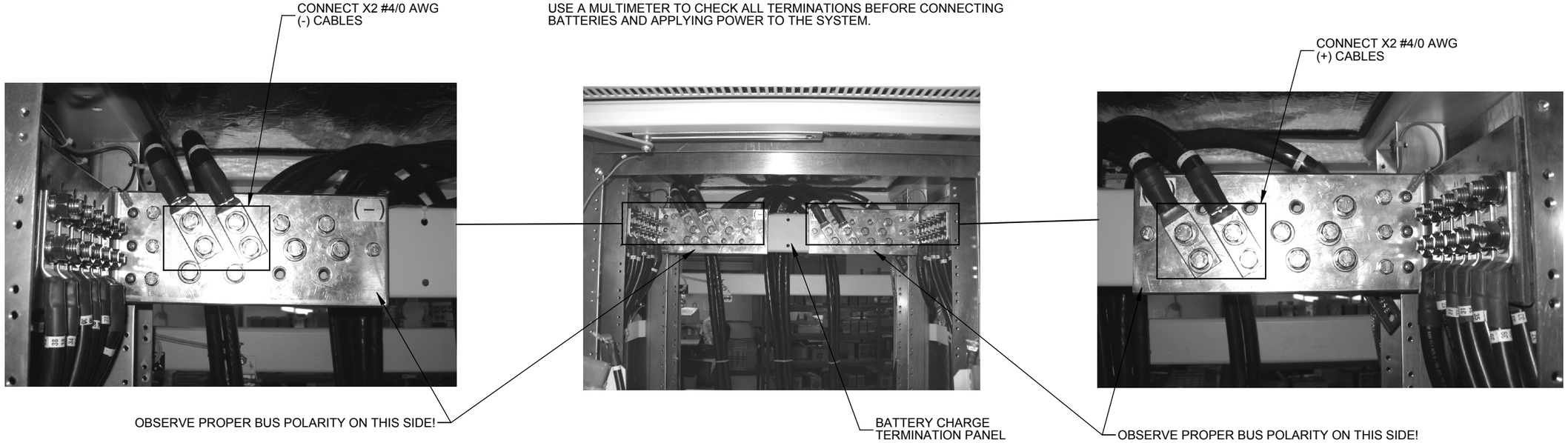
UNITS: mm [in]			SCALE: NTS
X [X.X]	±1	[±0.040]	
X.X [X.XX]	±0.5	[±0.020]	
X.XX [X.XXX]	±0.05	[±0.002]	
ANGULAR:	±0.5°		

TITLE: CUSTOMER CONNECTION, KIT, INTRFC, w/ CBL SET, BATT TO BATT, Te4x

ISSUE DATE			SHEET 4 OF 7
SIZE B	TYPE D2	DWG NO. 747-603-08	REV P/A

BATTERY ENCLOSURE (Te40) TO BATTERY ENCLOSURE (Te40) INTERFACE CABLE ROUTING & CONNECTIONS CONT'D:

CONNECT INTERFACE CABLES TO THEIR RESPECTIVE (+) AND (-) BUS BARS ON CHARGE TERMINATION PANEL USING 3/8" HARDWARE SUPPLIED AS SHOWN. ENSURE CORRECT POLARITY IS OBSERVED WHEN MAKING CONNECTIONS. USE A MULTIMETER TO CHECK ALL TERMINATIONS BEFORE CONNECTING BATTERIES AND APPLYING POWER TO THE SYSTEM.



DETAIL A - FRONT BATTERY CHARGE TERMINATION PANEL CONNECTIONS ON 2nd Te40 ENCLOSURE

(+24V SYSTEM SHOWN)

ARGUS®

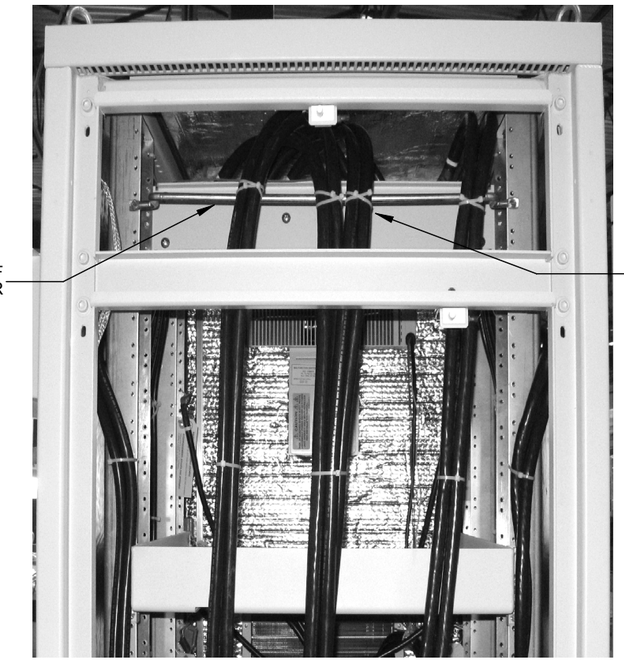
UNITS: mm [in]		
X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5°	

SCALE: NTS

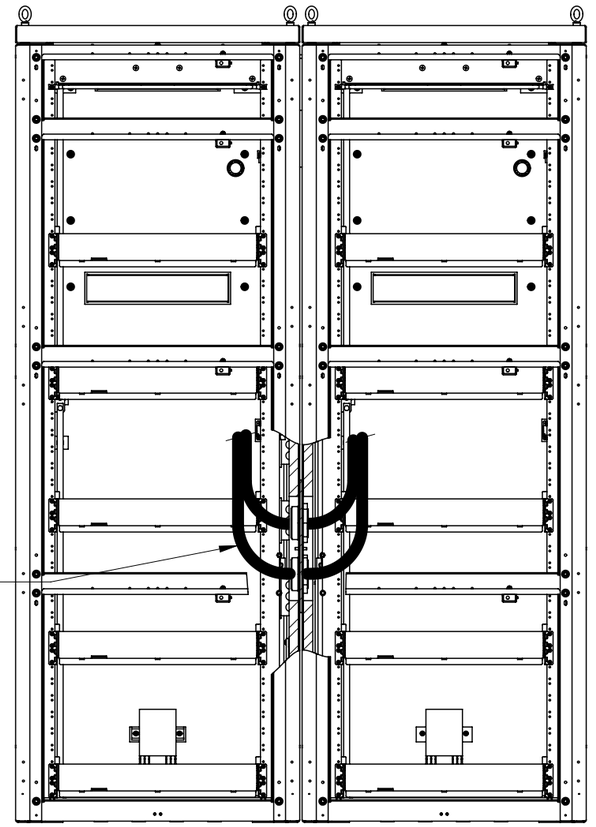
TITLE: CUSTOMER CONNECTION, KIT, INTRFC, w/ CBL SET, BATT TO BATT, Te4x

ISSUE DATE			SHEET 5 OF 7
SIZE B	TYPE D2	DWG NO. 747-603-08	REV P/A

BATTERY ENCLOSURE (Te40) TO BATTERY ENCLOSURE (Te40) INTERFACE CABLE ROUTING & CONNECTIONS CONT'D:



DETAIL C - REAR BATTERY CHARGE TERMINATION PANEL CABLE ROUTING (TYP.)



DETAIL D - REAR BATTERY INTERFACE CABLE ROUTING

ARGUS®

UNITS: mm [in]		
X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5˚	

SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTRFC, w/ CBL SET, BATT TO BATT, Te4x

ISSUE DATE

SIZE	TYPE	DWG NO.	REV
B	D2	747-603-08	P/A

AIR CONDITIONER AC POWER CONNECTION:

Te40 AIR CONDITIONER AC POWER WIRING

Te40 AIR CONDITIONER UTILITY BOX WIRING

CONNECT A SEPARATE POWER CABLE TO THE EXISTING AIR CONDITIONER AC WIRING INSIDE THE UTILITY BOX AND ROUTE IT OUT THROUGH THE ENCLOSURE(S) TO A SEPARATE AC POWER SUPPLY FEED.

NOTE:

THE AIR CONDITIONER UNIT MUST BE SUPPLIED FROM A SEPARATE AC SOURCE PROTECTED BY A 15A 120VAC RATED 1 POLE CIRCUIT BREAKER AHEAD OF IT.

THIS CONNECTION CAN ALSO BE MADE TO THE OPTIONAL EXTERNAL AC LOADCENTER ON THE Te41 POWER ENCLOSURE IF INSTALLED.

ARGUS®

UNITS: mm [in]		
X [X.X]	±1	[±0.040]
X.X [X.XX]	±0.5	[±0.020]
X.XX [X.XXX]	±0.05	[±0.002]
ANGULAR:	±0.5°	

SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTRFC, w/ CBL SET, BATT TO BATT, Te4x

ISSUE DATE

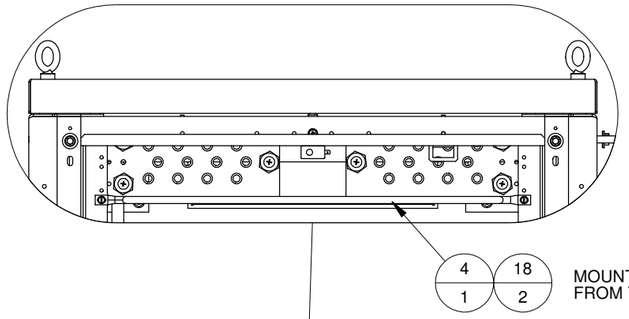
SHEET 7 OF 7

SIZE	TYPE	DWG NO.	REV
B	D2	747-603-08	P/A

REVISIONS					
LTR	DESCRIPTION	DWN	DATE	CHKD	APPD
A	ADD TE21 INSTALLATION	KL	10/04	ME	JK

POWER AND BATTERY ENCLOSURE SETUP & PREPARATION

PREPARATION OF BATTERY ENCLOSURE Te40: SIDE KNOCKOUT REMOVAL, PANEL CHANGE, INSULATION CUTOUT & TIE-OFF BAR INSTALLATION

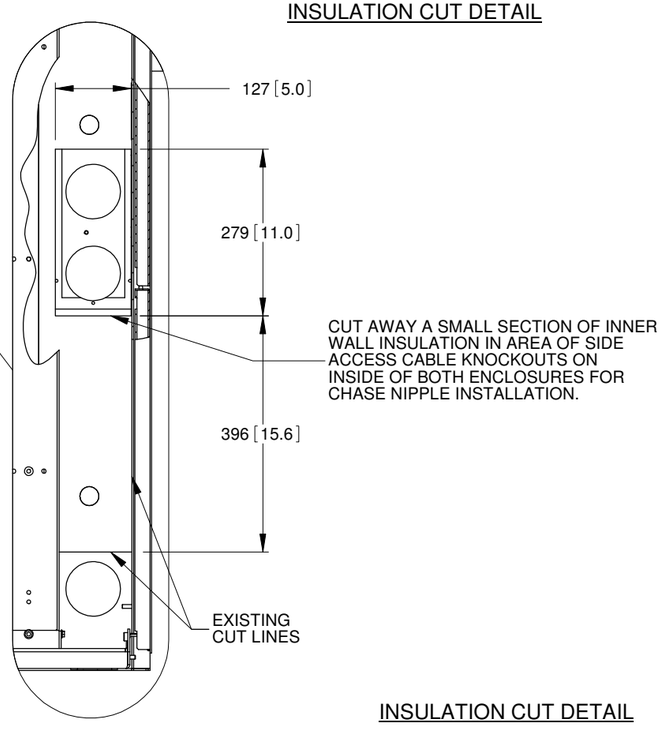


BATTERY ENCLOSURE

REAR VIEW - PANELS REMOVED

KO REQUIRE TO BE REMOVED MAY BE LOCATED ON THE OTHER SIDE DEPENDING ON THE ENCLOSURE CONFIGURATION

INSULATION CUT DETAIL

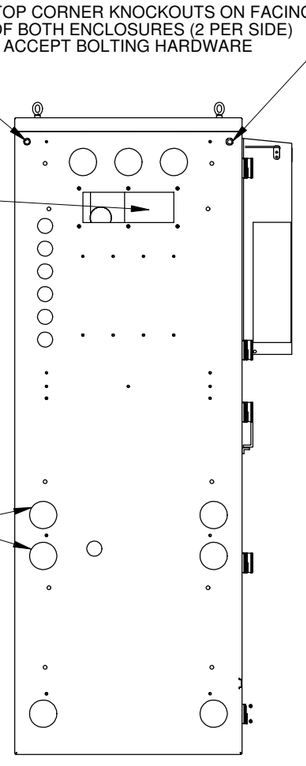


INSULATION CUT DETAIL

REMOVE TOP CORNER KNOCKOUTS ON FACING SIDES OF BOTH ENCLOSURES (2 PER SIDE) TO ACCEPT BOLTING HARDWARE

REMOVE EXISTING TOP ACCESS BLANK PANEL ON BATTERY ENCLOSURE. INSTALL REPLACEMENT PANEL (ITEM 5) WITH 4 MOUNTING SCREWS (ITEM 17). MOUNT PANEL ON INSIDE POSITIONED TOWARDS THE FRONT WITH OPENING FOR CABLES AT REAR.

NOTE: ONLY REMOVE KNOCK OUTS ON FACING SIDE OF BATTERY ENCLOSURE



REMOVE SIDE ACCESS CABLE KNOCKOUTS ON FACING SIDE OF BATTERY ENCLOSURE ONLY.

ITEM
QTY

	NAME	DATE
DESIGN	JK	2009/05
DRAWN	SDW	2009/05
CHECKED	JK	2009/06
APPROVED	ME	2009/06

ALPHA TECHNOLOGIES™

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTERFACE, w/o CBL SET, PWR TO BATT, Te4x

ISSUE DATE

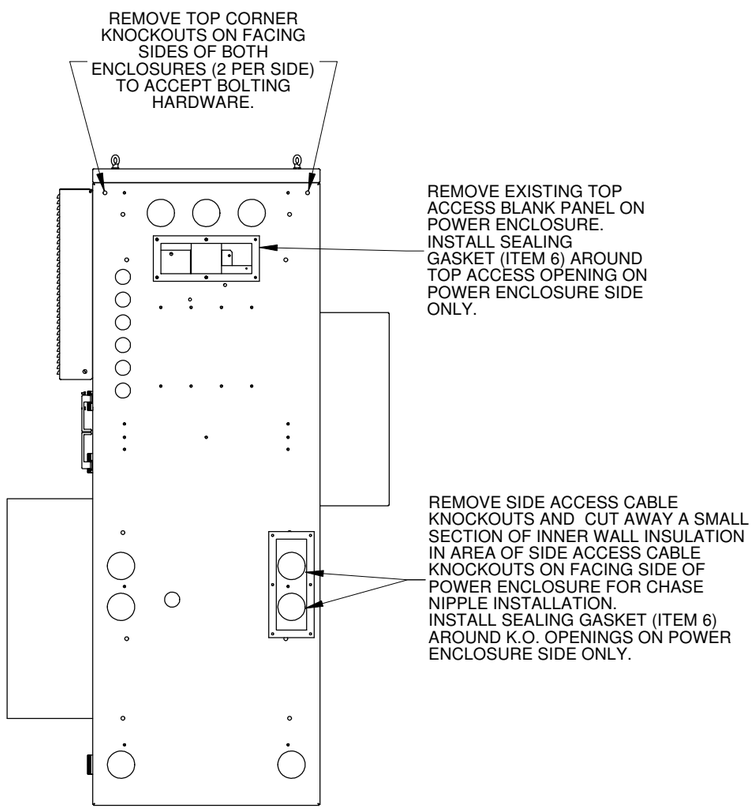
SHEET 1 OF 3

SIZE	TYPE	DWG NO.	REV
B	D2	747-607-08	A

POWER AND BATTERY ENCLOSURE SETUP & PREPARATION

PREPARATION OF POWER ENCLOSURE Te41: GASKET INSTALLATION, KNOCK OUT REMOVAL

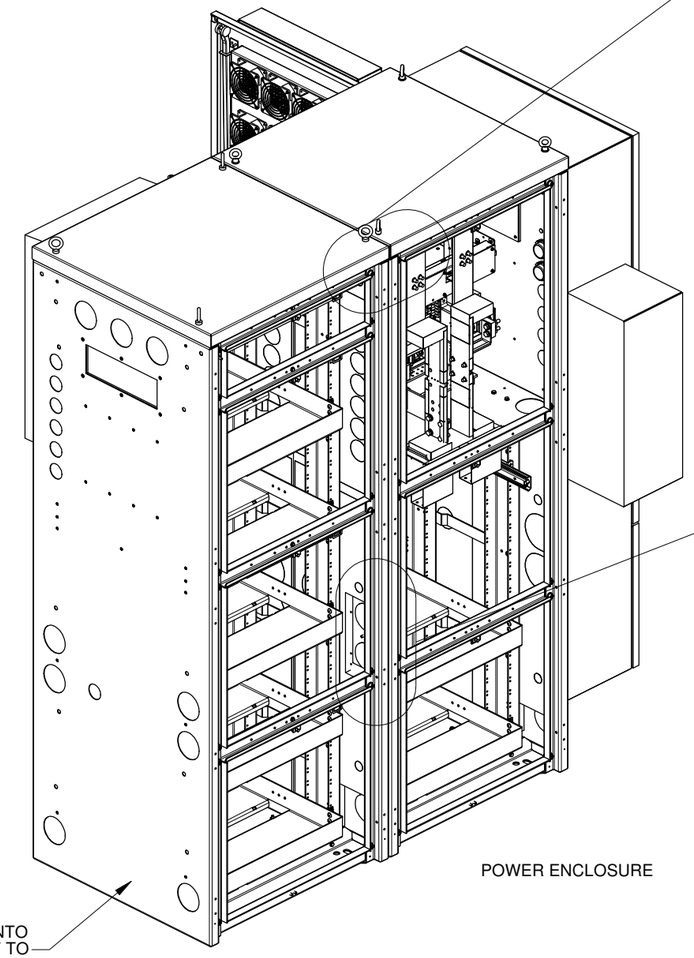
NOTE: ONLY REMOVE KNOCK OUTS ON FACING SIDE OF POWER ENCLOSURE



RIGHT SIDE VIEW
POWER ENCLOSURE SHOWN

KNOCK OUTS REQUIRED TO BE REMOVED MAY BE LOCATED ON THE LEFT SIDE PANEL DEPENDING ON THE ENCLOSURE CONFIGURATION

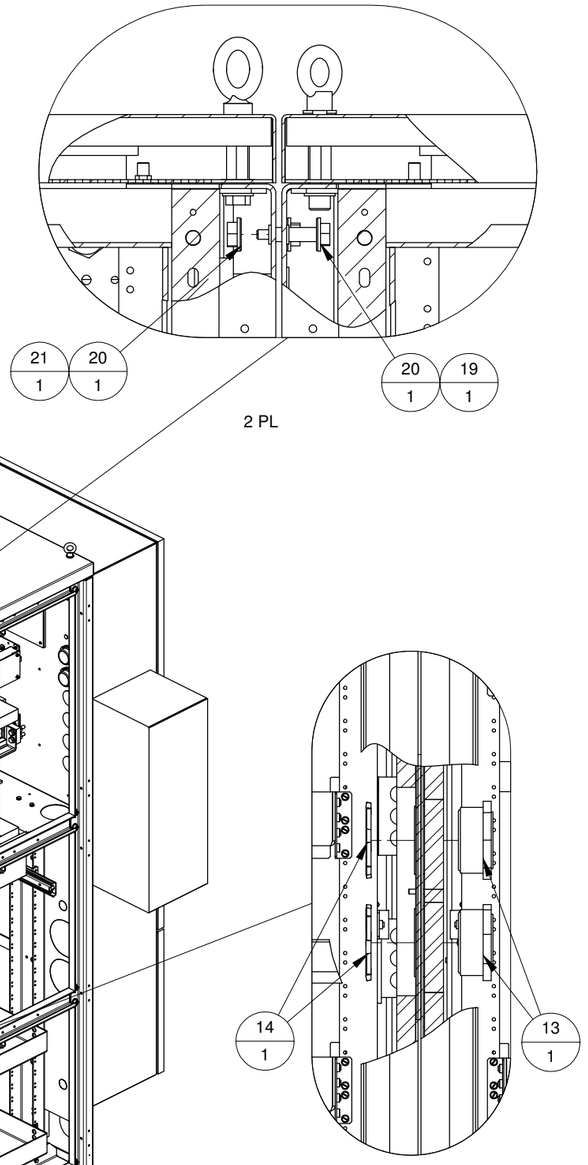
JOINING OF POWER (Te41) & BATTERY (Te40) ENCLOSURES:



BATTERY ENCLOSURE

(MAY BE LOCATED ON THE OTHER SIDE OF POWER ENCLOSURE DEPENDING ON CONFIGURATION)

REAR VIEW



POWER ENCLOSURE

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

TITLE: CUSTOMER CONNECTION, KIT, INTERFACE, w/o CBL SET, PWR TO BATT, Te4x

ISSUE DATE

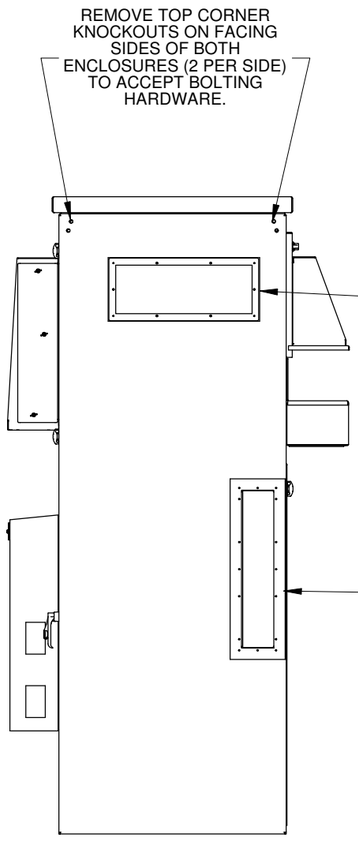
SHEET 2 OF 3

SIZE	TYPE	DWG NO.	REV
B	D2	747-607-08	A

POWER AND BATTERY ENCLOSURE SETUP & PREPARATION

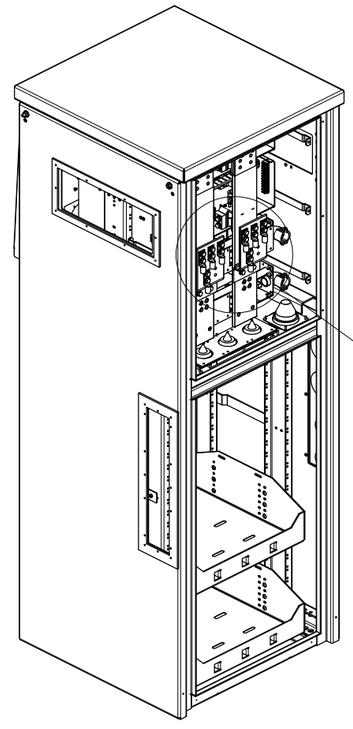
PREPARATION OF POWER ENCLOSURE Te21: GASKET INSTALLATION, KNOCK OUT & PANEL REMOVAL

NOTE: ONLY REMOVE KNOCK OUTS & PANEL ON FACING SIDE OF POWER ENCLOSURE



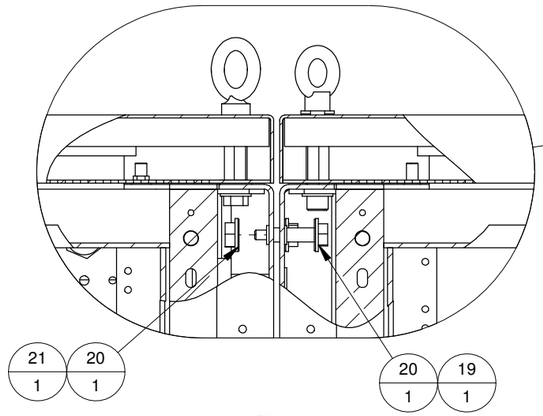
RIGHT SIDE VIEW
POWER ENCLOSURE SHOWN

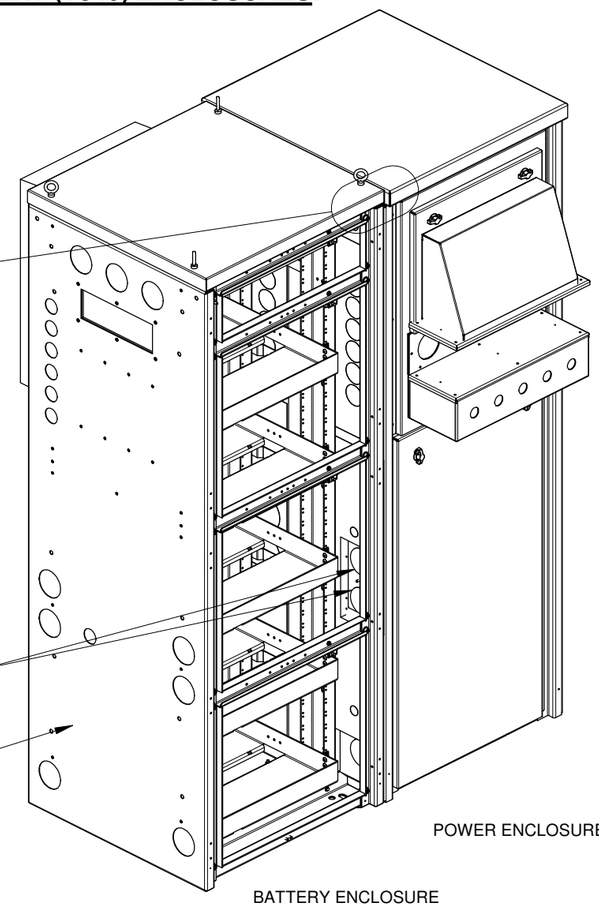
KNOCK OUTS REQUIRED TO BE REMOVED MAY BE LOCATED ON THE LEFT SIDE PANEL DEPENDING ON THE ENCLOSURE CONFIGURATION

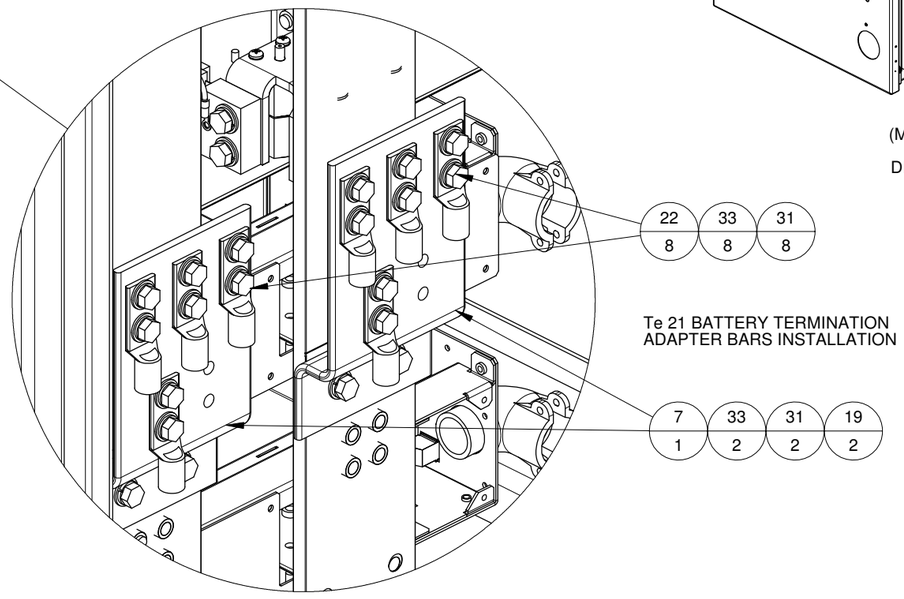


REAR PANEL REMOVED

JOINING OF POWER (Te21) & BATTERY (Te40) ENCLOSURES:







Te 21 BATTERY TERMINATION ADAPTER BARS INSTALLATION

REAR VIEW

TECHNOLOGIES™

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

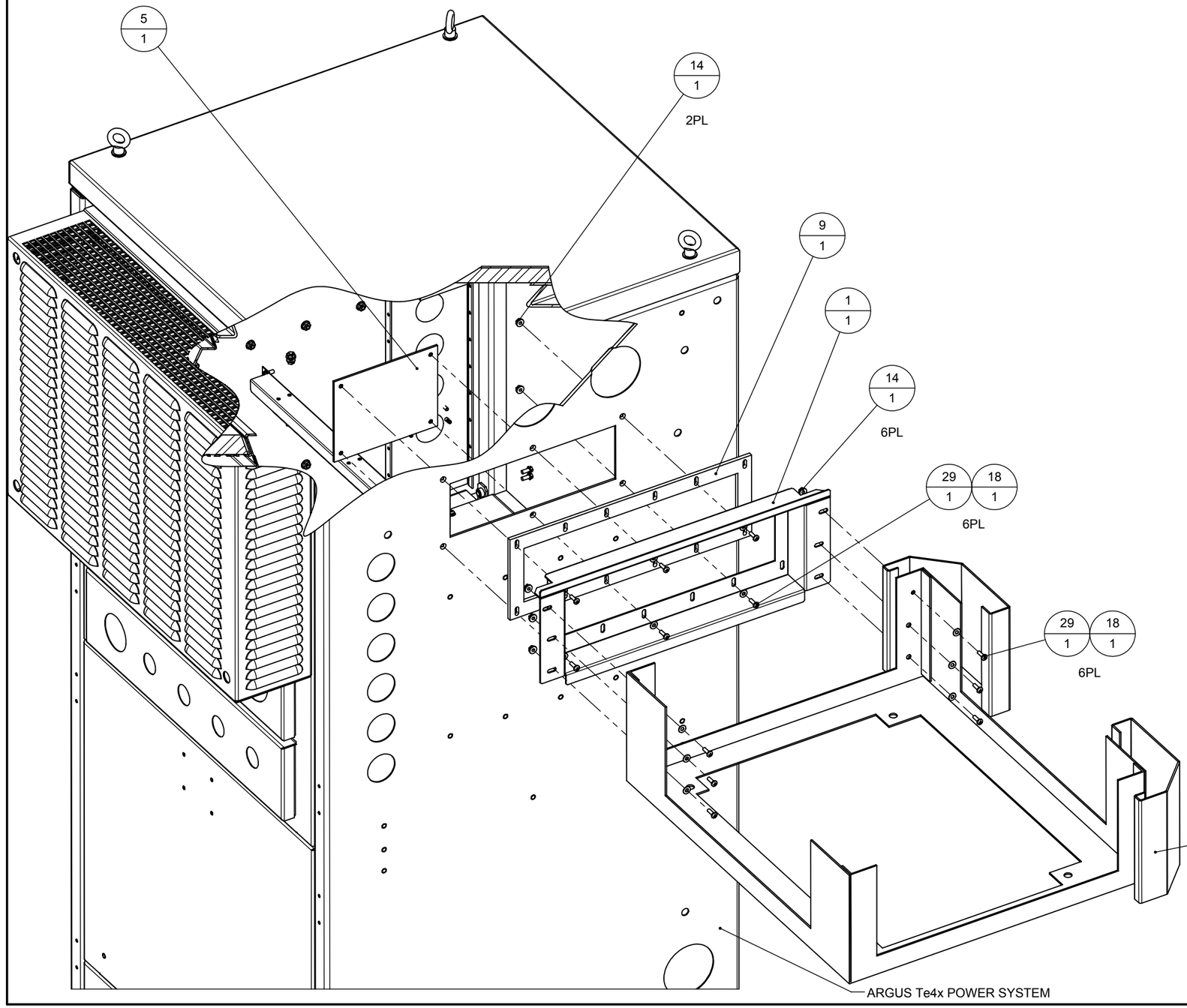
TITLE: CUSTOMER CONNECTION, KIT, INTERFACE, w/o CBL SET, PWR TO BATT, Te4x

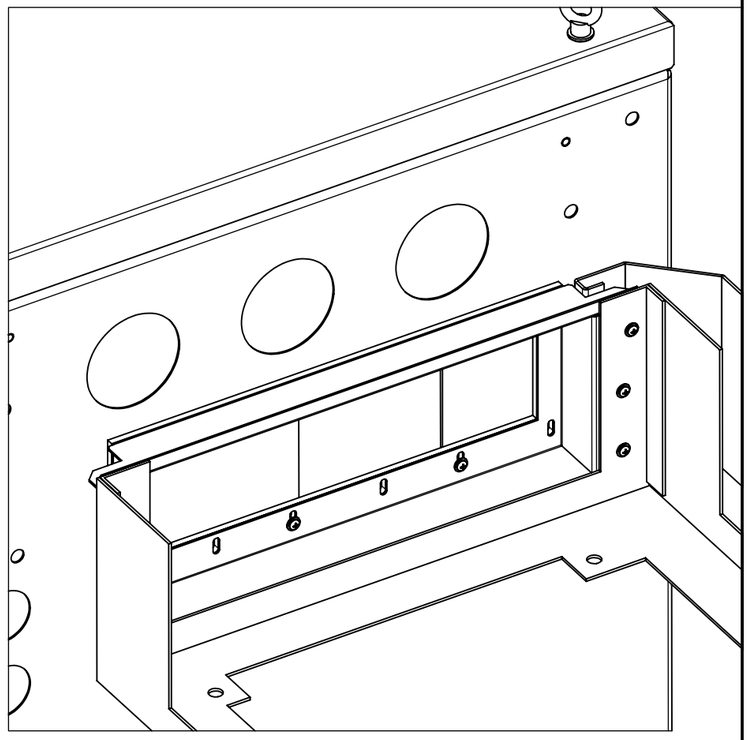
ISSUE DATE

SHEET 3 OF 3

SIZE	TYPE	DWG NO.	REV
B	D2	747-607-08	A

REVISIONS					
LTR	DESCRIPTION	DWN	DATE	CHKD	APPD





ITEM
QTY

ARGUS®

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

TITLE: KIT, BRIDGE INTERFACE, NOKIA, Te4x

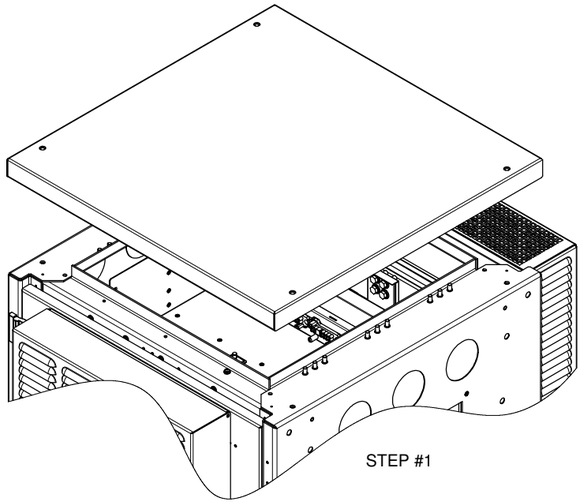
	NAME	DATE
DESIGN	RP	2009/05
DRAWN	KL	2009/05
CHECKED	RP	2009/05
APPROVED	JK	2009/05

ISSUE DATE

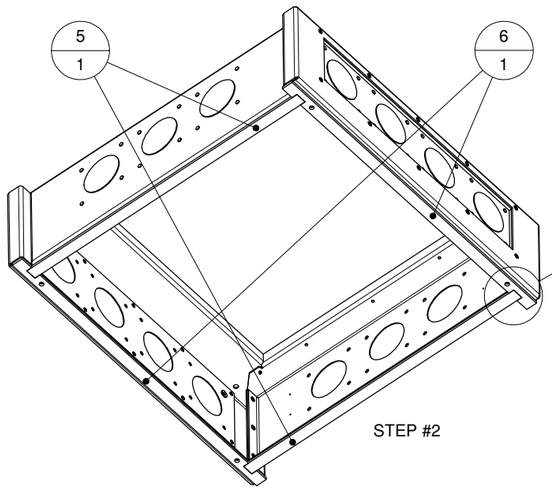
SHEET 1 OF 1

SIZE	TYPE	DWG NO.	REV
B	D2	747-595-08	P/A

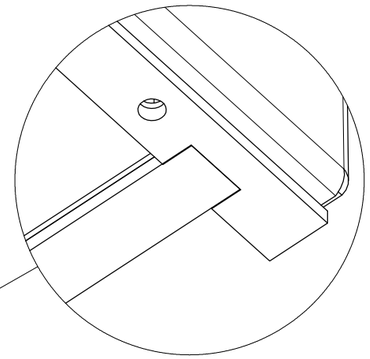
REVISIONS					
LTR	DESCRIPTION	DWN	DATE	CHKD	APPD
P/B	REDESIGNED	KL	09/06	RP	JK
P/C	ADD 5, 6, UPDATE 1, 2	KL	09/09	RP	JK



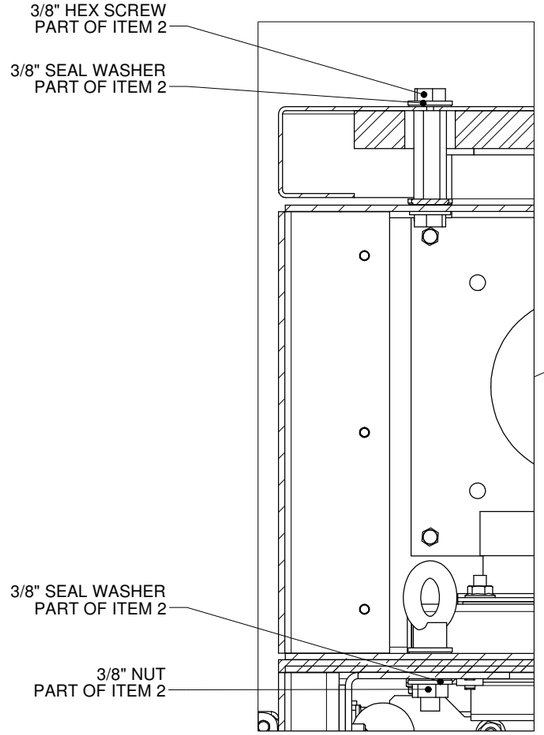
STEP #1



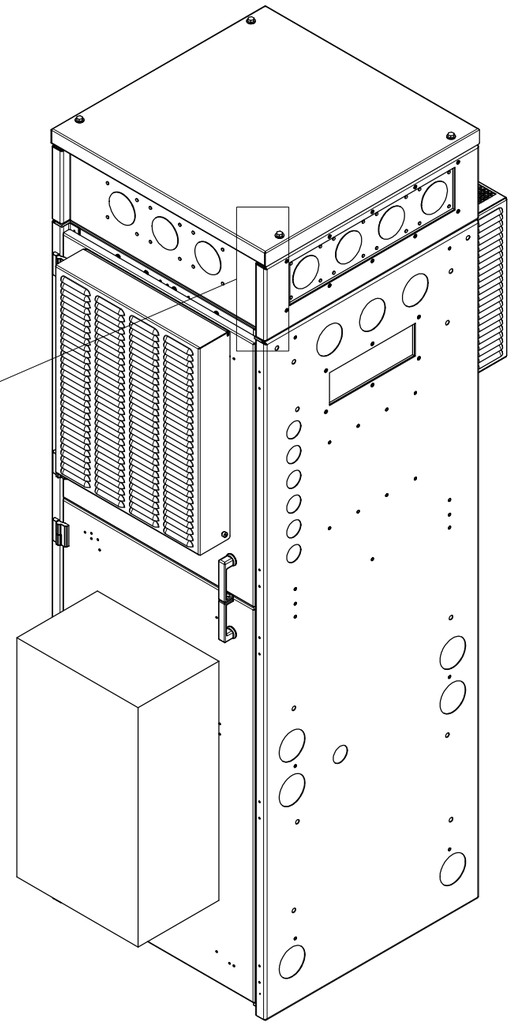
STEP #2



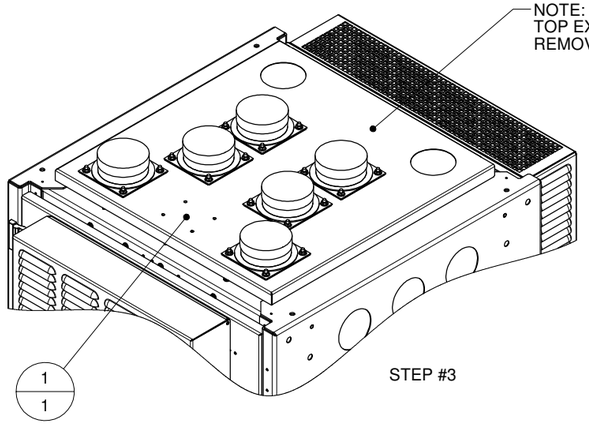
GASKETS (ITEM 5 & 6) MUST INTERLOCK WHEN ADHERE TO THE BOTTOM OF TOP EXTENSION AS SHOWN AT 4 PLACES



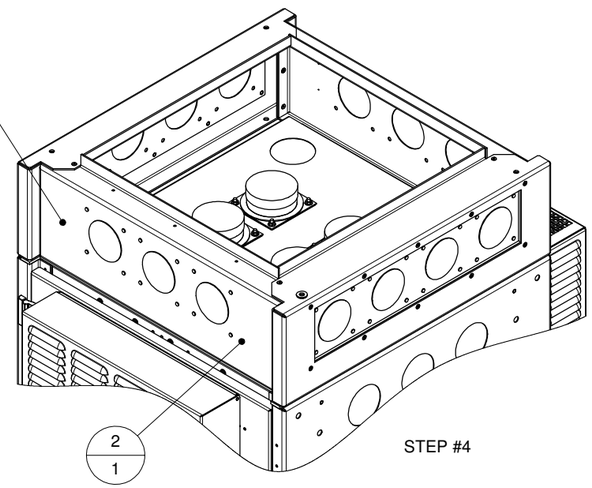
4 PL



STEP #5



STEP #3



STEP #4

ITEM
QTY

ARGUS®

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

TITLE: DWG, ASSY SEQUENCE, TOP EXTENSION, 9", ENCLR

	NAME	DATE
DESIGN	RP	2009/05
DRAWN	RP	2009/05
CHECKED	SY	2009/05
APPROVED	JK	2009/05

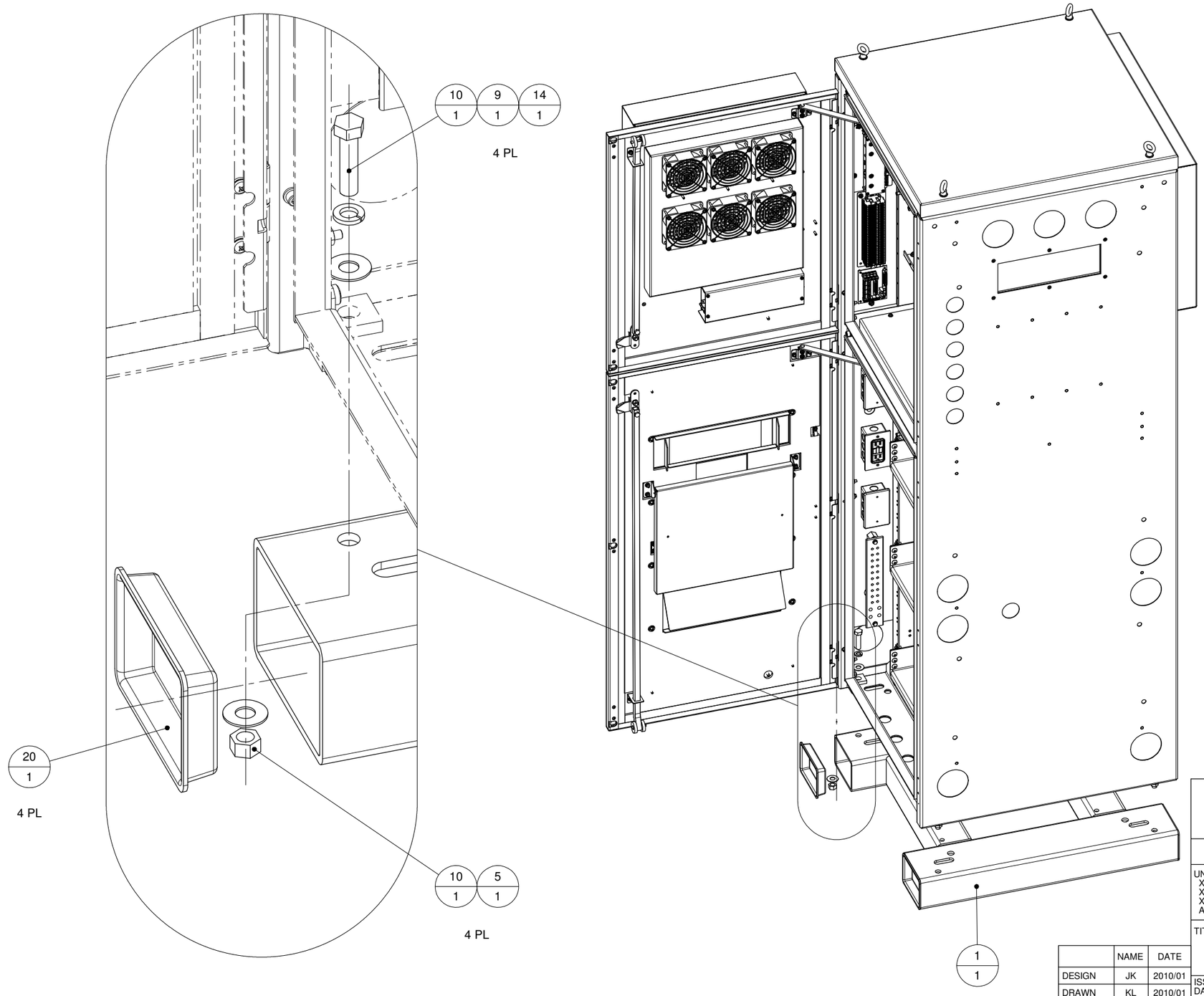
ISSUE DATE

SHEET 1 OF 1

SIZE B | TYPE D2 | DWG NO. 747-531-F0 | REV P/C

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	615-311-R8	ASSY, PLINTH, 30"X30", STL, EXT GRAY	1
5	634-092-10	Nut,1/2"-13,Hex,3/4" AF,7/16" Thk,SSt	4
9	633-159-10	WASHER, LOCK, HELICAL SPRING, 1/2" BOLT, SST	4
10	633-615-10	WASHER, FLAT, 1/2", 1.25" OD, 0.084"THK, SST	8
14	631-170-10	SCREW, CAP, 1/2-13X2", HEXHEAD, SST	4
20	570-026-10	PLUG, PLINTH END, 6"X4", PLASTIC	4

REVISIONS					
LTR	DESCRIPTION	DWN	DATE	CHKD	APPD



ITEM
QTY

	NAME	DATE
DESIGN	JK	2010/01
DRAWN	KL	2010/01
CHECKED	RP	2010/01
APPROVED	JK	2010/01

ALPHA TECHNOLOGIES™

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

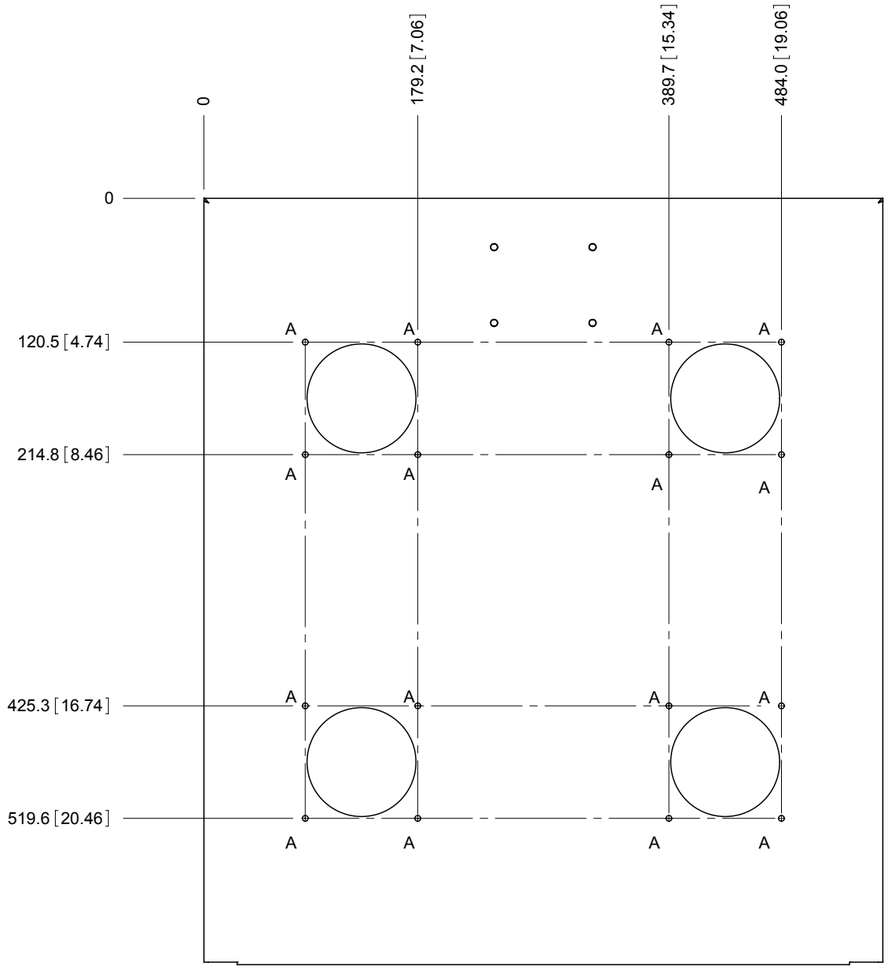
TITLE: KIT, PLINTH, W/ MOUNTING HARDWARE, 4"H X 30" W X 30"D

ISSUE DATE

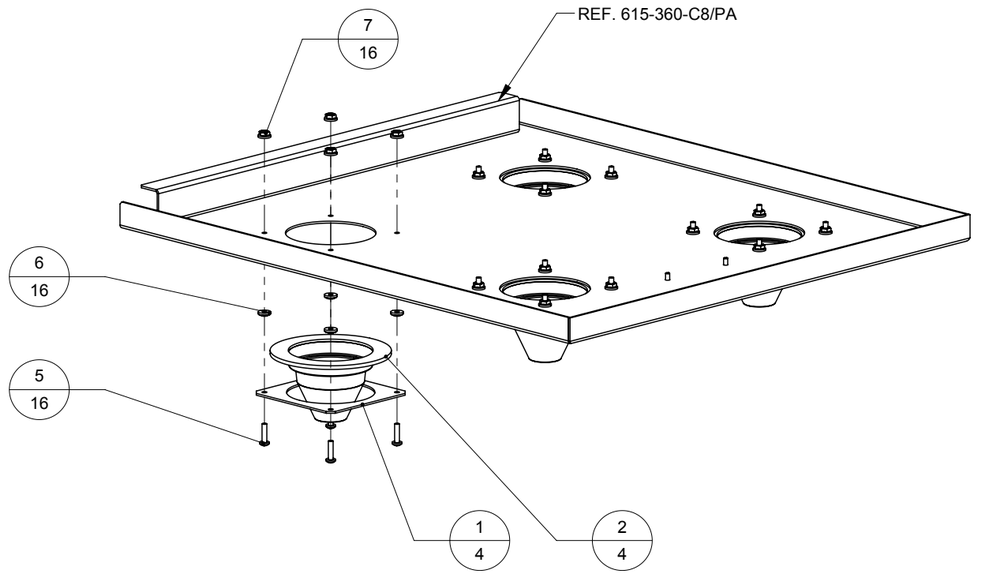
SHEET 1 OF 1

SIZE B | TYPE D2 | DWG NO. 747-592-F0 | REV A

REVISIONS					
LTR	DESCRIPTION	DWN	DATE	CHKD	APPD



HOLES LOCATION



A	Ø4.9 [0.19]	16
LTR	DESCRIPTION	QTY

FINISHED HOLE LEGEND

ARGUS®

UNITS: mm [in]
X [X.X] ±1 [±0.040]
X.X [X.XX] ±0.5 [±0.020]
X.XX [X.XXX] ±0.05 [±0.002]
ANGULAR: ±0.5°

SCALE: NTS

TITLE: KIT,4X CABLE BOOT,TOP EXT,TE4X

	NAME	DATE
DESIGN	DX	2009/06
DRAWN	DX	2009/06
CHECKED	RP	2009/06
APPROVED	JK	2009/06

ISSUE DATE

SHEET 1 OF 1

SIZE	TYPE	DWG NO.	REV
B	D2	747-627-F0	P/A

Alpha Technologies Ltd.
7700 Riverfront Gate
Burnaby, BC V5J 5M4
Canada
Tel: +1 604 436 5900
Fax: +1 604 436 1233
Toll Free: +1 800 667 8743

Alpha Energy
1628 W Williams Drive
Phoenix, AZ 85027
United States
Tel: +1 602 997 1007
Fax: +1 623 249 7833

Alpha Technologies Europe Ltd.
Twyford House Thorley
Bishop's Stortford
Hertfordshire, CM22 7PA
United Kingdom
Tel: +44 1279 501110
Fax: +44 1279 659870

Alpha Technologies
Unit 504, 5/F,
Fourseas Building
No 208-212 Nathan Road
Kowloon, Hong Kong
Tel: +852 2736 8663
Fax: +852 2199 7988

Alpha Technologies Inc.
3767 Alpha Way
Bellingham, WA 98226
United States
Tel: +1 360 647 2360
Fax: +1 360 671 4936

Alpha Technologies GmbH
Hansastrasse 8
D-91126
Schwabach, Germany
Tel: +49 9122 79889 0
Fax: +49 9122 79889 21

Alphatec Ltd.
339 St. Andrews St.
Suite 101 Andrea Chambers
P.O. Box 56468
3307 Limassol, Cyprus
Tel: +357 25 375 675
Fax: +357 25 359 595

Alpha Innovations Brasil
Rua Manuel Augusto
de Alvarenga, 155
São Paulo, SP - Brasil
Tel: +55 11 2476 0150
Fax: +55 11 2476 0150

Alpha Industrial Power Inc.
1075 Satellite Blvd NW,
Suite 400
Suwanee, GA 30024
United States
Tel: +1 678 475 3995
Fax: +1 678 584 9259

Technologies Argus First de Mexico
Anatole France Num. 17
Colonia Polanco
11560, México D.F.
Tel: +52 55 5280 6990

Alpha TEK ooo
Khokhlovskiy Pereulok 16
Stroenie 1, Office 403
Moscow, 109028
Russia
Tel: +7 495 916 1854
Fax: +7 495 916 1349

Alphatec Baltic
S. Konarskio Street 49-201
Vilnius, LT-03123
Lithuania
Tel: +370 5 210 5291
Fax: +370 5 210 5292

Visit us at www.alpha.ca

Power

048-690-10 (03/2010)