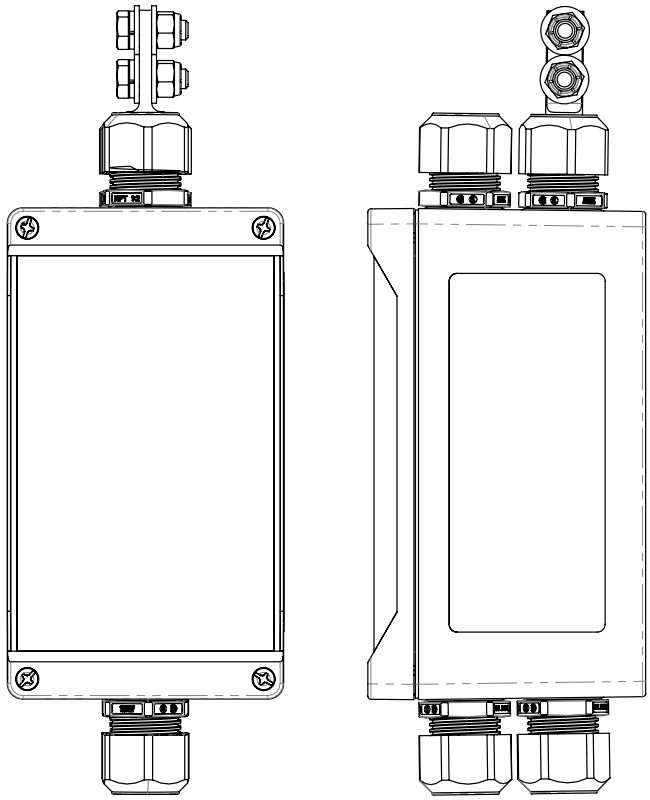
an EnerSys® company

Alpha® DPX Copper Splice Closure

±190 VDC Junction Box

User Guide ID: 7401273-J0
Effective: 11/2024



Read this document carefully.
Learn how to protect your equipment from damage and fully understand its functions.

Contents

1. Safety

Save these instructions

This document 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 document before proceeding. If there are any questions regarding the safe installation or operation of this product, contact Alpha Technologies Ltd. or the nearest Alpha® power system 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 document. Where these symbols appear, use extra care and attention.

Symbol	Type	Description
	**WARNING**	Risk of serious injury or death Equipment in operation poses a potential electrical hazard which could result in serious injury or death to personnel. This hazard may continue even when power is disconnected.
	**CAUTION**	Cautions indicate the potential for injury to personnel.
	**CAUTION**	Risk of burns A device in operation can reach temperature levels which could cause burns.
	**ATTENTION**	The use of attention indicates specific regulatory or code requirements that may affect the placement of equipment or installation procedures. Follow the prescribed procedures to avoid equipment damage or service interruption.
	**GROUNDING**	This symbol indicates the location or terminal intended for the connection to protective earth. An enclosure that is not properly connected to protective earth presents an electrical hazard. Only a licensed electrician can connect AC power and protective earth to the enclosure.
	**NOTICE**	A notice provides additional information to help complete a specific task or procedure or general information about the product.

1.2 General warning and cautions

WARNING

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

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

WARNING

This system is designed to be installed in a restricted access location that is inaccessible to the general public.

Ce système est conçu pour être installé dans un endroit à accès restreint inaccessible au grand public.

WARNING

This equipment is not suitable for use in locations where children are likely to be present.

Cet équipement ne convient pas pour une utilisation dans des lieux ou des enfants sont susceptibles d'être présents.

1.3 Mechanical safety

- Power supplies can reach extreme temperatures under load.
- Use caution around sheet metal components and sharp edges.

1.4 Electrical safety

WARNING

Hazardous voltages are present at the input and output of power equipment.

The DC output from the EnShield™ technology enabled converter module is a hazardous voltage. Do not touch the output connections when under power. Ensure that power has been removed from the outputs before working on them.

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 Occupational Health and Safety Association (OSHA®) approved insulated hand tools. Do not rest tools on top of batteries.

WARNING

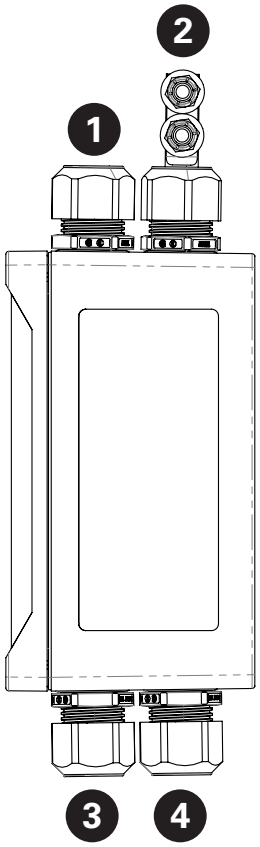
Lethal voltages are present within the power device. Always assume that an electrical connection or conductor is energized. Check the circuit with a voltmeter with respect to the grounded portion of the enclosure (both AC and DC) before performing any installation or removal procedure.

- Do not work alone under hazardous conditions.
- A licensed electrician is required to install permanently wired equipment. Input voltages can range from ±145 to ±200VDC. 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.

2. Overview

The DPX ±190VDC copper splice closure serves as a junction box to handle the incoming EnShield™ technology enabled channel power pairs and provides an outgoing connection to the DPX downconverter.

The Class 4 rated module has a built-in surge suppressor that is monitored by the system controller and provides primary protection for the DPX downconverter against lightning strikes and other overvoltage conditions.



1. IP68/Type 6P rated output gland (Factory installed)
2. Ground connection
3. Optional secondary IP68/Type 6P rated input gland (Factory or field installed)
4. IP68/Type 6P rated input gland (Factory installed)

Figure 1: DPX ±190VDC copper splice closure

NOTICE

EnShield™ technology is EnerSys' proprietary methodology in how we deliver fault managed power from the power source equipment to the powered device adhering to the UL1400-1 standards for Class 4 power system.

2.1 Simplified wiring diagram

The following figure shows a simplified wiring diagram with the Alpha® DPX power source 10-channel enclosure, DPX ±190VDC copper splice closure, DPX 1500W downconverter, and DPX 48VDC load disconnect box.

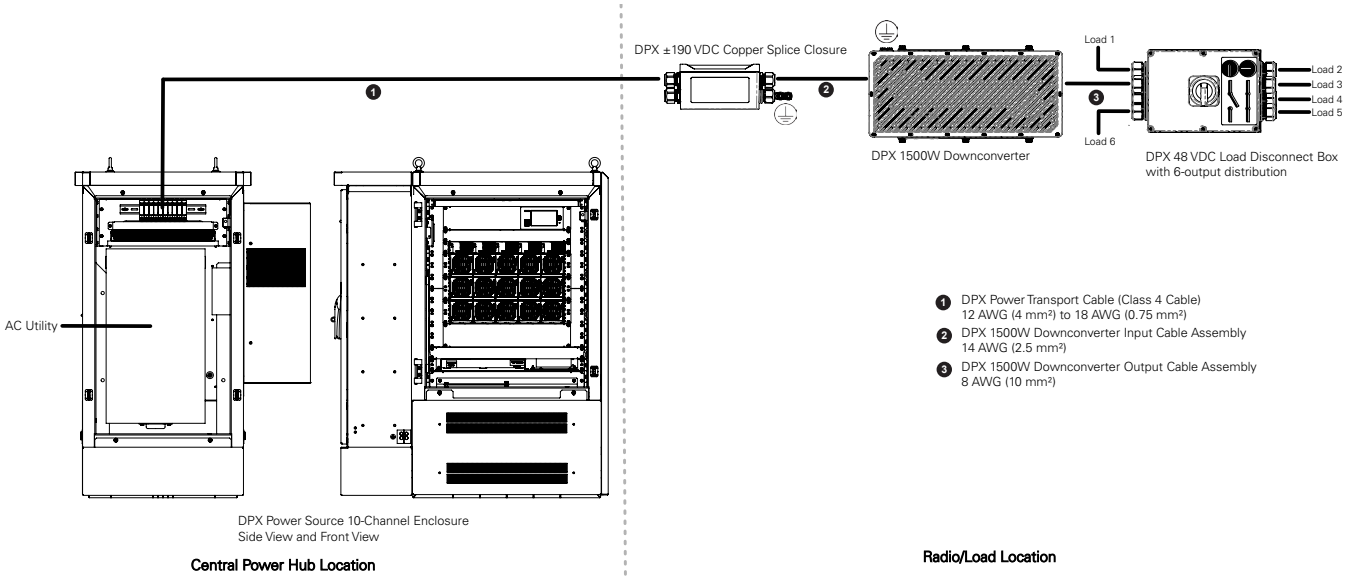


Figure 2: Simplified wiring diagram

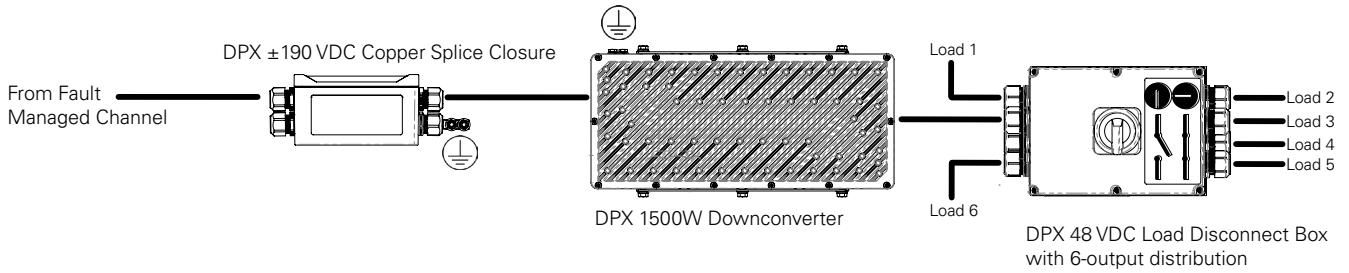


Figure 3: DPX ±190 VDC copper splice closure to DPX 1500 W downconverter to DPX 48 VDC load disconnect box wiring diagram

NOTICE

The DPX power source enclosure output terminals and the DPX downconverter input terminals are part of the fault managed power section.

WARNING

The DPX power source enclosure and DPX downconverter must only be installed with a DPX power transport cable that has been tested and certified for use with the DPX distributed power transport system. Failure to do so may result in system malfunction and could potentially cause an unsafe condition. Consult the Alpha Technologies Ltd. team for help with the proper selection of cable best suited for your application and to meet safety requirements as per Alliance for Telecommunications Industry Solutions (ATIS®) TR 0600040, Underwriters Laboratories Outline of Investigation 1400-1, and UL 1400-2.

2.3 Part numbers

The product, options, and accessories can be ordered by using the part numbers in the following table.

Table A: Part numbers, options, and accessories

Description	Part number
Module	
DPX ±190VDC copper splice closure	7401273-001
Transport cables	
DPX copper splice closure to DPX downconverter 6.6 ft (2 m) input cable assembly; 16 AWG (1.5 mm²)	8701390-001
DPX copper splice closure to DPX downconverter 25 ft (7.6 m) input cable assembly; 16 AWG (1.5 mm²)	8701390-002
DPX copper splice closure to DPX downconverter 30.5 ft (9.3 m) input cable assembly; 16 AWG (1.5 mm²)	8701390-004
DPX copper splice closure to DPX downconverter 50 ft (15.2 m) input cable assembly; 16 AWG (1.5 mm²)	8701390-003
Other	
Field installable input gland	6500141

3. Specifications

3.1 Alpha® DPX ±190VDC copper splice closure

Table B: Alpha® DPX ±190VDC copper splice closure specifications

Electrical	
Input voltage	±145 to ±190 VDC
Output voltage	±145 to ±190 VDC
Maximum current	8 A
Features	
Protection	1 x 10 kA DC surge suppression
Mechanical	
Dimensions H × W × D	6.3 × 3.5 × 3.6 in. (160 × 90 × 90.5 mm)
Net Weight	2 lb (0.91 kg)
Mounting	Pole
	Wall
	Vault or handhole
Connections	**Input:** Up to 4 pairs × 12 to 18 AWG (4 to 0.75 mm²) cable
	Output (power): 1 connection; 1 pair × 14 AWG (2.5 mm²) cable
	Output (alarm): 1 connection; 1 pair × 14 AWG (2.5 mm²) cable
	Ground: 1 connection; 1 × 6 AWG (16 mm²) ground wire crimped to a ¼ × ⅝ inch 2 hole cable lug
Environmental	
Temperature	**Operating:** –31 to 115°F (–35 to 46°C) plus solar loading
	Storage: –40 to 176°F (–40 to 80°C)
Relative humidity	5% to 95% non-condensing
Elevation	Up to 9,842 ft (3,000 m)
Enclosure rating	IP68
	Type 6P
Regulatory compliance	
Safety	CAN/CSA-C22.2 No. 62368-1 3rd Edition
	UL 62368-1 3rd Edition
	CE Mark (EN 62368-1)
	ATIS TR 0600040
	UL 1400-1

ATTENTION

Only use accessories (such as grommets or fittings) with the proper IP68/Type 6P rating or better during field installation.

4. Features

The DPX copper splice closure is part of the DPX distributed power transport system product family specifically engineered to be compliant with Alliance for Telecommunications Industry Solutions (ATIS®) fault managed power distribution technology.

The module serves as a junction box to handle the incoming fault managed channel and provide connection to the DPX downconverter.

The module has a built-in surge suppressor that is monitored by the Cordex® HP system controller and provides primary protection for the DPX downconverter against lightning strikes and other overvoltage conditions.

- Serves as a junction box for one in-bound fault managed channel.
- IP68/Type 6P rated enclosure provides maximum flexibility for various installation options (pole, wall, vault, or handhole).
- Built-in surge protection offers primary protection for each fault managed channel.
- Remote surge protection device (SPD) status reporting via the Cordex® HP system controller.

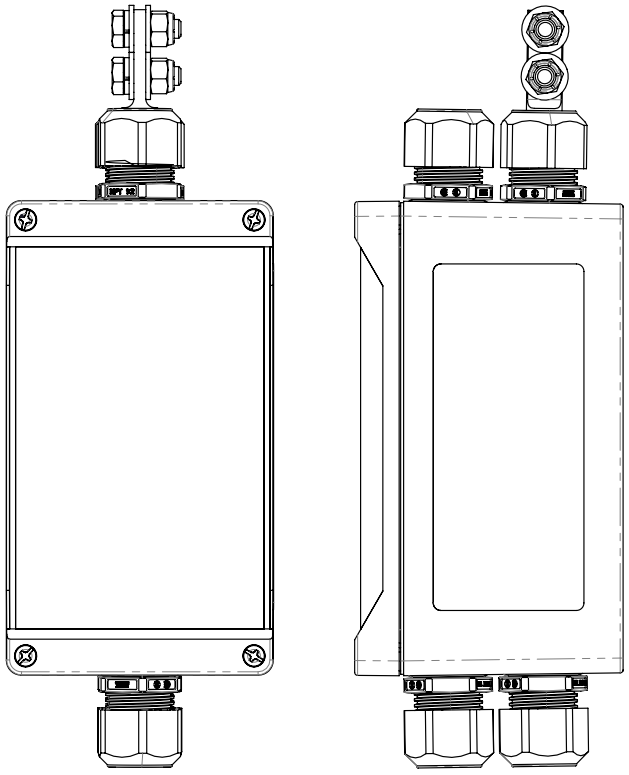


Figure 5: DPX ±190 VDC copper splice closure with optional dual input

NOTICE

The DPX ±190VDC copper splice closure is shipped with a single input gland. A second input gland can be field installed for dual input operation.

5. Inspection

5.1 Packaging materials

Alpha Technologies Ltd. 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 we strive to follow quality and environmental objectives from product supply and development through to the packaging for our products.

Rectifier and battery modules are shipped on individual pallets and are packaged according to the manufacturer's guidelines.

Almost all packaging material is from sustainable resources and or is recyclable.

5.2 Returns for service

NOTICE

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

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.

5.3 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 us for advice on the impact of any damage.

5.4 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.

5.5 Miscellaneous small parts

Review the packing slip and bill of materials to determine the part number of the configuration kits included with your system. Review the bill of materials to verify that all the small parts are included. Contact us if you have any questions before you proceed.

6. Installation

Only qualified personnel should install and connect the power components.

6.1 Safety precautions

Refer to the Safety section near the beginning of this document.

6.2 Installation tools

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

- Cable cutters
- Cutters and wire strippers 14 to 22 AWG (2.5 to 0.34 mm²)
- Various hand tools including:
  - Combination wrenches.
  - Ratchet and socket set.
  - Various screwdrivers.
  - Electricians knife.

6.3 Site selection

Consider the following before selecting a mounting site:

- The DPX ±190VDC copper splice closure is designed for pole or wall mounting and can also be placed in a vault or handhole.
- Avoid areas that could 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.

NOTICE

For more information, refer to the technical drawings at the end of this document.

6.4 Port connections

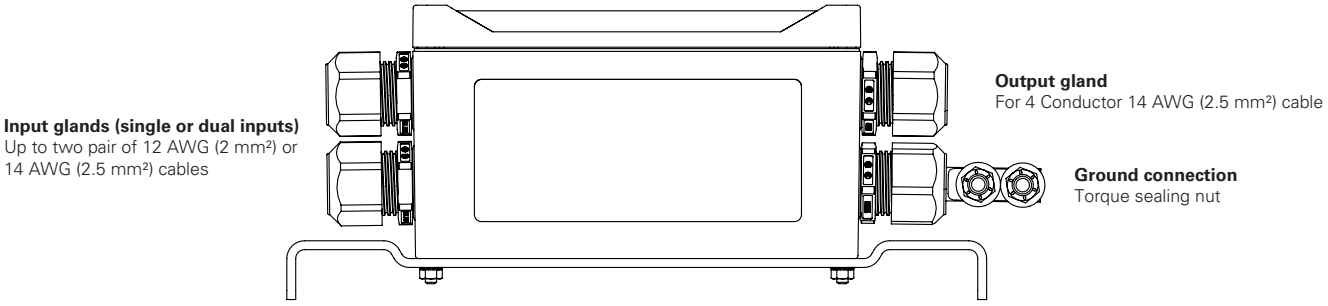


Figure 6: Port connections

6.4.1 Input port connections

Circuit designation	Terminal block color
+190V	Blue
–190V	Black

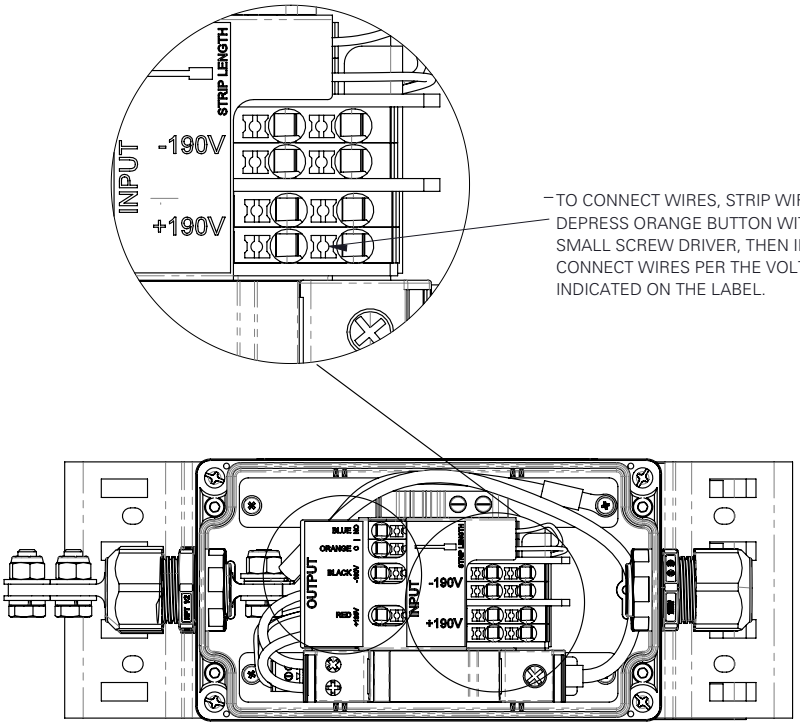


Figure 7: Input port connections

6.4.2 Output port connections

Terminal block color	Circuit designation	Cable wire color
Blue	+190V	Red
Black	–190V	Black
Black	C	Orange
Blue	NO	Blue

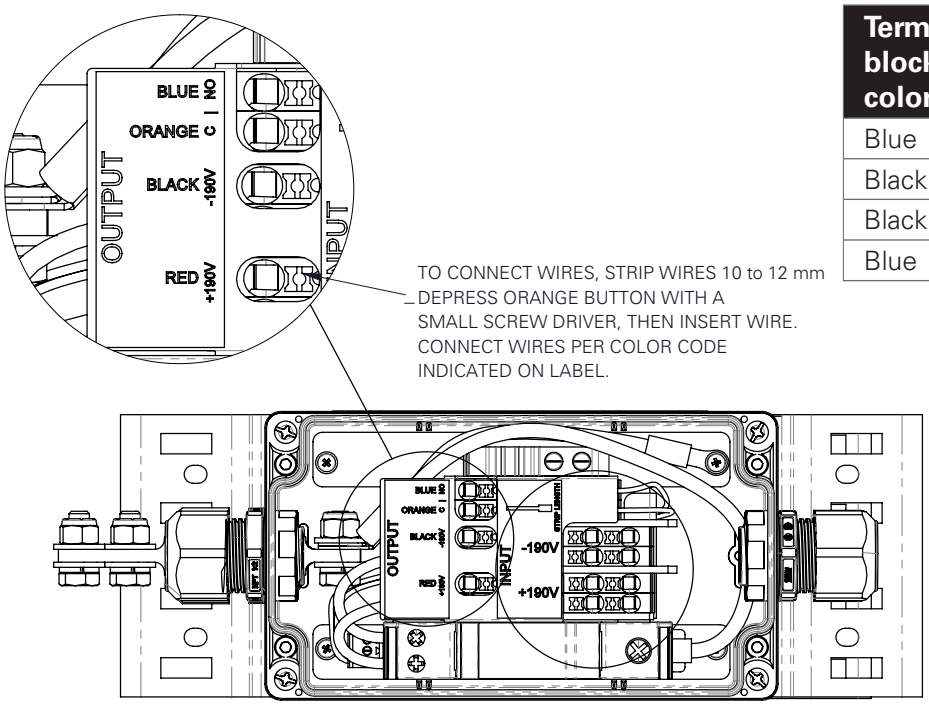


Figure 8: Output port connections

6.5 Mounting instructions

6.5.1 Mounting the module to a metal or concrete pole

Tools and materials required

- 3 mm long shaft hex key for screws that attach the module to the mounting bracket.
- Two pole mount straps that fit the pole. Straps must be stainless or galvanized.
- C001 BAND-IT® tool or equivalent.
- C206 ¾ inch stainless steel BAND-IT® band or equivalent.
- C256 ¾ inch stainless steel BAND-IT® buckles or equivalent.

Procedure

1. Secure the mounting bracket to the pole with the straps.
2. Secure the module to the mounting bracket with the supplied bolts.

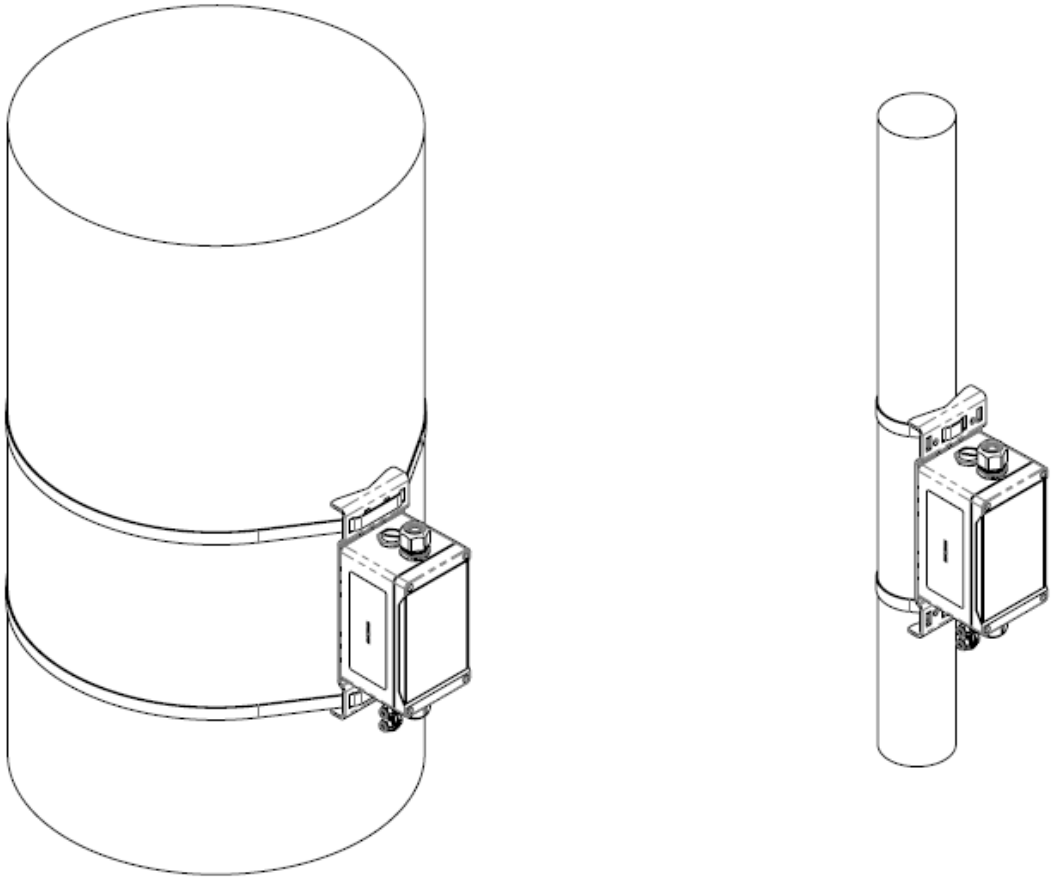


Figure 9: Mounting the DPX ±190 VDC copper splice closure to a metal or concrete pole

6.5.2 Mounting the module to a wall

Tools and materials required

- 3 mm long shaft hex key for screws that attach the module to the mounting bracket.
- Four #10 × 1-¼ inch lag screws (not provided).
- Four #10 diameter flat washers (not provided).
- Drill with ⅛ inch bit for drilling pilot holes (not provided).

Procedure

1. Using the mounting bracket as a template, drill four pilot holes into the wall to accept #10 screws. Install the mounting bracket on the copper splice closure such that the flat surface sits against the wall.
2. Secure the mounting bracket to the wall with the four bolts and washers.
3. If the wall structure is not strong enough to support the weight of the unit reinforce the wall structure with ½ inch (13 mm) plywood of a suitable grade for the application environment.
4. Secure the module to the mounting bracket with the supplied bolts.

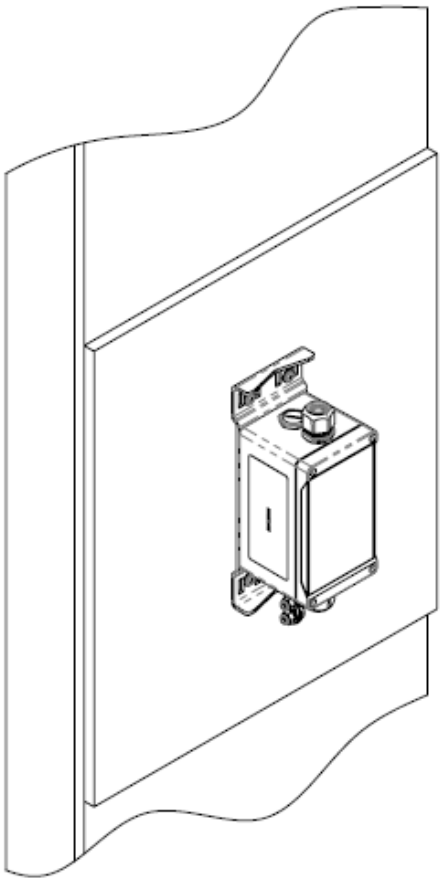


Figure 10: Mounting the DPX ±190 VDC copper splice closure to a wall

6.5.3 Cabling

ATTENTION

Before connecting or disconnecting the cables, ensure the input is powered off.

WARNING

The DPX power source enclosure and DPX downconverter must only be installed with a DPX power transport cable that has been tested and certified for use with the DPX distributed power transport system. Failure to do so may result in system malfunction and could potentially cause an unsafe condition. Consult the Alpha Technologies Ltd. team for help with the proper selection of cable best suited for your application and to meet safety requirements as per Alliance for Telecommunications Industry Solutions (ATIS®) TR 0600040, Underwriters Laboratories Outline of Investigation 1400-1, and UL 1400-2.

7. Maintenance

Although very little maintenance is required with DPX distributed power transport systems, routine checks and adjustments are recommended to ensure optimum system performance. Qualified service personnel should perform the repairs.

The following table lists a few maintenance procedures for this product. 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.

ATTENTION

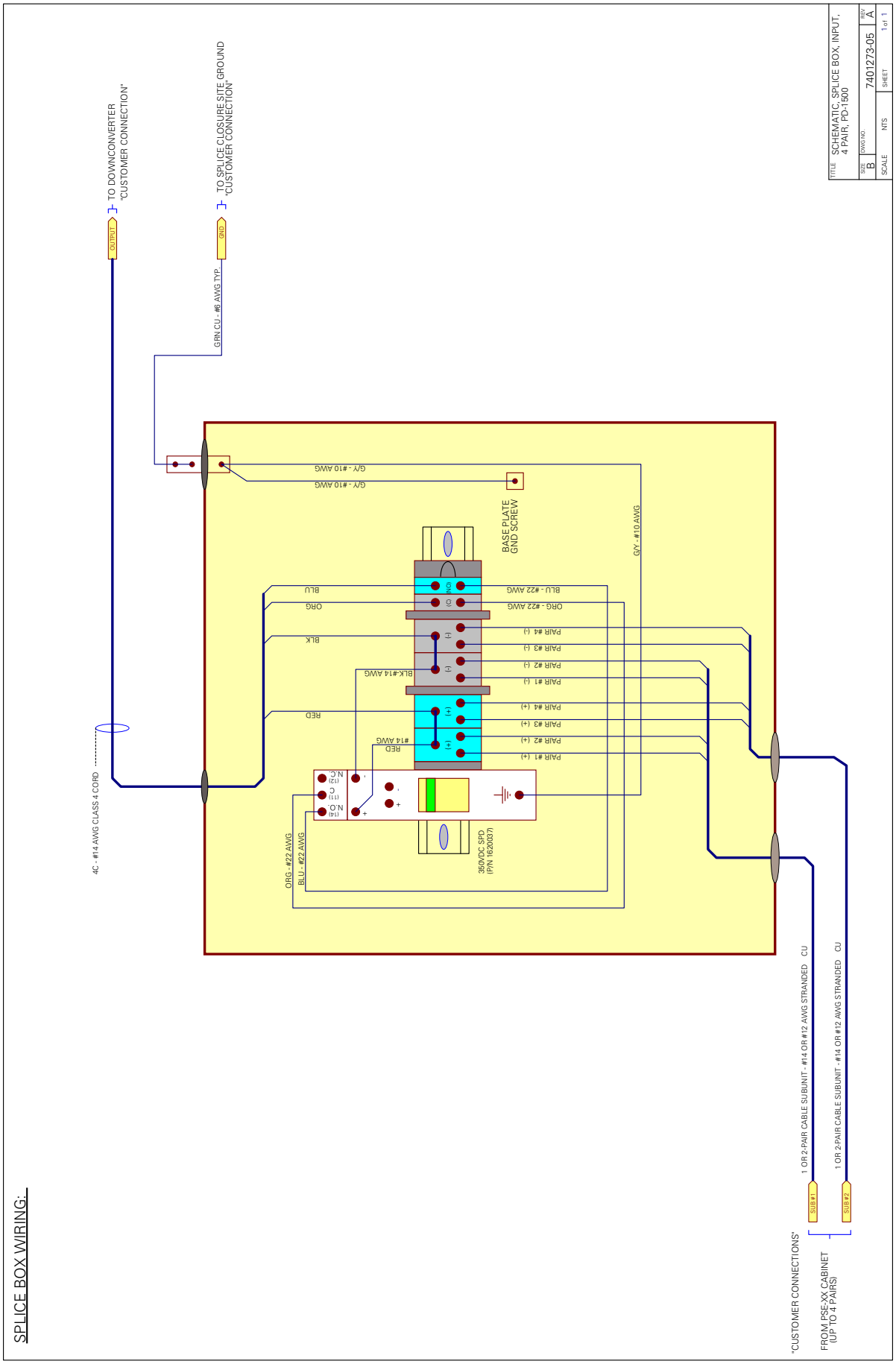
Circuit cards, including semiconductor devices, can be damaged by static electricity. Always wear a grounded wrist strap when handling or installing circuit cards.

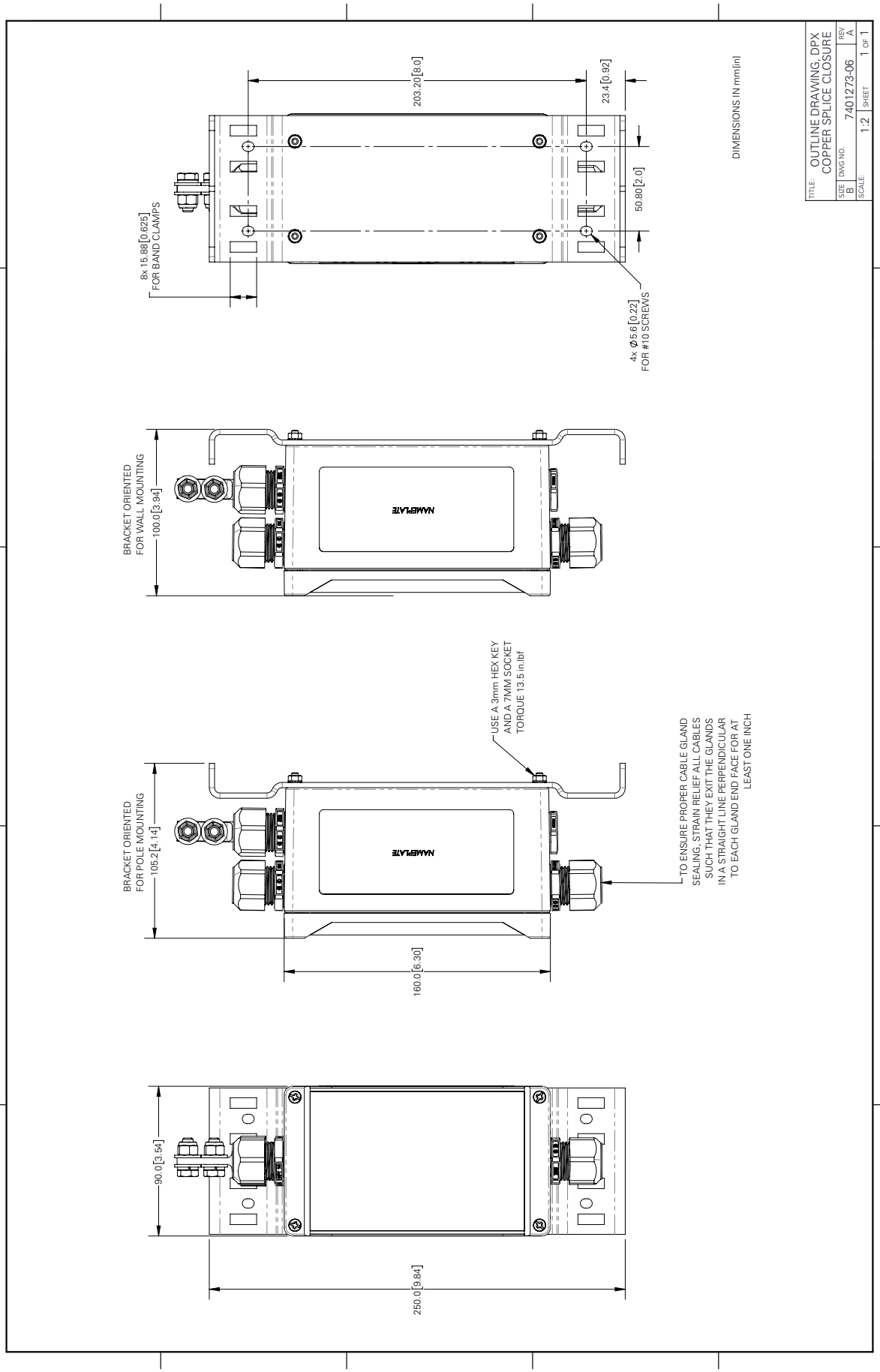
ATTENTION

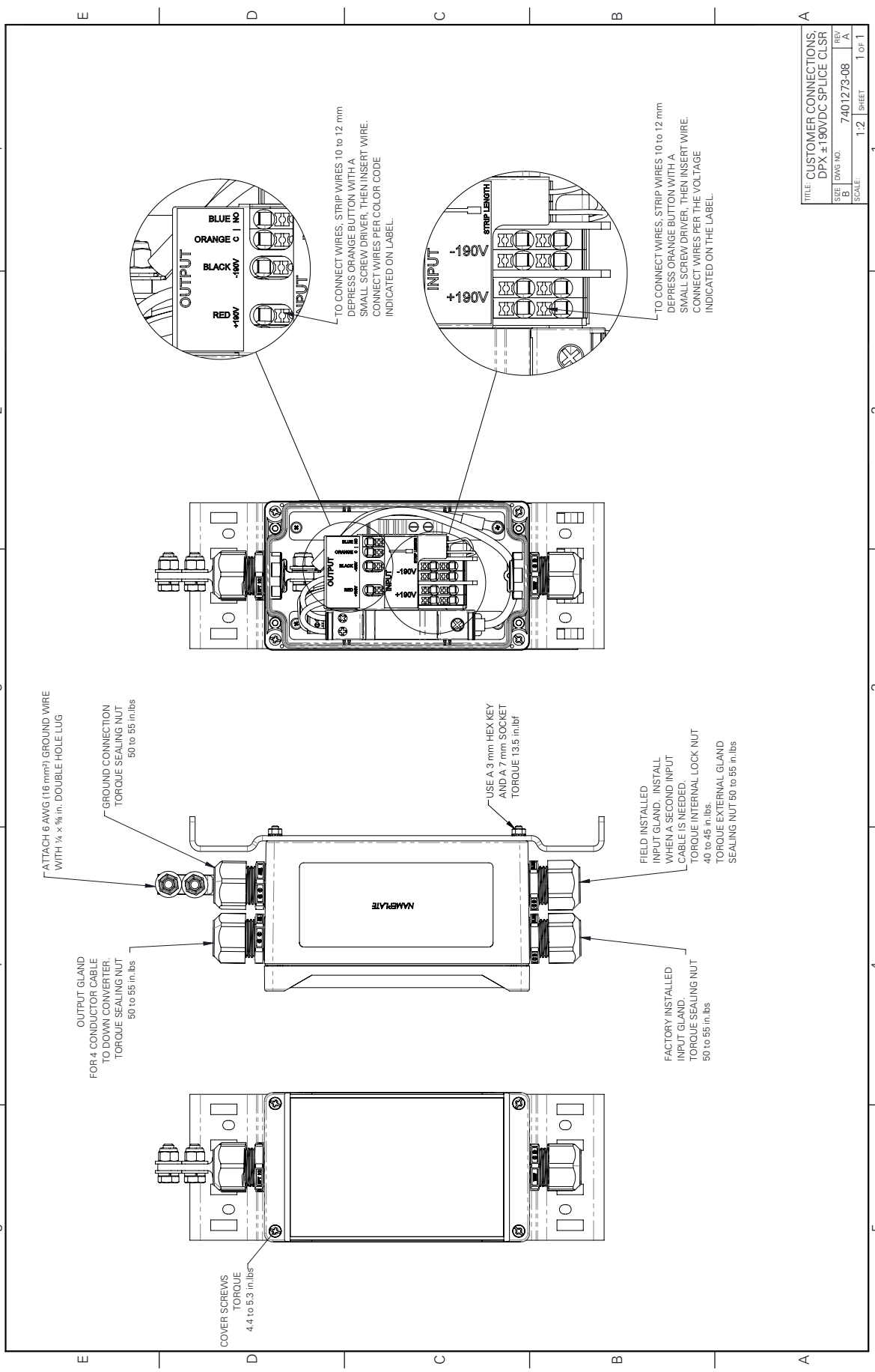
Ensure redundant modules or batteries are used to eliminate the threat of service interruptions while performing maintenance on the system's alarms and control settings.

Table C: Sample maintenance log

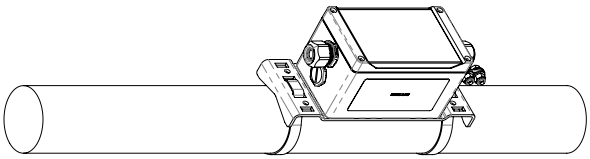
Procedure	Date completed
Inspect all system connections. Re-torque if necessary.	
Verify alarm and control settings.	
Verify module mode operation.	

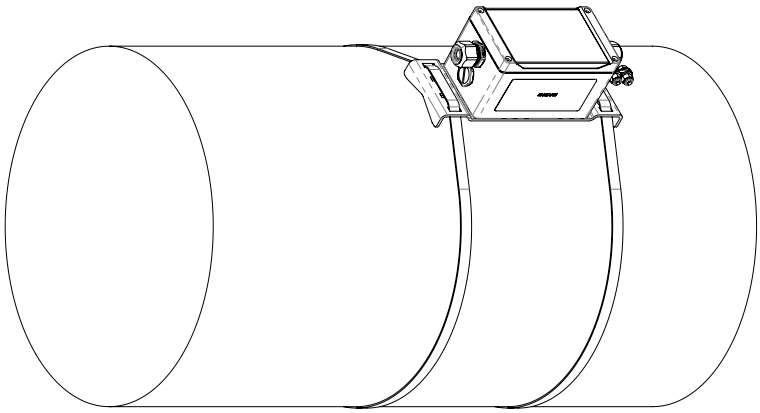

SPLICE BOX WIRING:
TITLE SCHEMATIC, SPLICE BOX, INPUT, 4 PAIR, PD-1500
SIZE B
DWG NO 7401273-05
REV A
SCALE NTS
SHEET 1 of 1
TO DOWNCONVERTER "CUSTOMER CONNECTION"
TO SPLICE CLOSURE SITE GROUND "CUSTOMER CONNECTION"
OUTPUT
GND
GRN CU - #6 AWG TYP.
4C - #14 AWG CLASS 4 CORD
G/Y - #10 AWG
G/Y - #10 AWG
BASE PLATE GND SCREW
G/Y - #10 AWG
BLU
ORG
BLK
RED
BLK-#14 AWG
#14 AWG
RED
BLU - #22 AWG
ORG - #22 AWG
PAIR #4 (-)
PAIR #3 (-)
PAIR #2 (-)
PAIR #1 (-)
PAIR #4 (+)
PAIR #3 (+)
PAIR #2 (+)
PAIR #1 (+)
N.O (14)
C (11)
N.C (12)
350VDC SPD (P/N 1620037)
1 OR 2-PAIR CABLE SUBUNIT - #14 OR #12 AWG STRANDED CU
1 OR 2-PAIR CABLE SUBUNIT - #14 OR #12 AWG STRANDED CU
SUB #1
SUB #2
"CUSTOMER CONNECTIONS"
FROM PSE-XX CABINET (UP TO 4 PAIRS)


TITLE: OUTLINE DRAWING, DPX COPPER SPLICE CLOSURE
SIZE B
DWG NO. 7401273-06
REV A
SCALE: 1:2
SHEET 1 OF 1
DIMENSIONS IN mm[in]
203.20[8.0]
23.4[0.92]
50.80[2.0]
8x 15.88[0.625] FOR BAND CLAMPS
4x Ø5.6[0.22] FOR #10 SCREWS
BRACKET ORIENTED FOR WALL MOUNTING
100.0[3.94]
NAMEPLATE
USE A 3mm HEX KEY AND A 7MM SOCKET TORQUE 13.5 in.lbf
BRACKET ORIENTED FOR POLE MOUNTING
105.2[4.14]
TO ENSURE PROPER CABLE GLAND SEALING, STRAIN RELIEF ALL CABLES SUCH THAT THEY EXIT THE GLANDS IN A STRAIGHT LINE PERPENDICULAR TO EACH GLAND END FACE FOR AT LEAST ONE INCH
160.0[6.30]
90.0[3.54]
250.0[9.84]

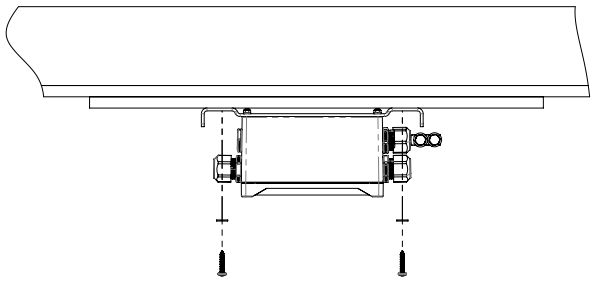

TITLE: CUSTOMER CONNECTIONS, DPX ±190VDC SPLICE CLSR
SIZE B
DWG NO. 7401273-08
REV. A
SCALE: 1:2
SHEET 1 OF 1
OUTPUT
BLUE NO
ORANGE C
BLACK -190V
RED +190V
INPUT
TO CONNECT WIRES, STRIP WIRES 10 to 12 mm
DEPRESS ORANGE BUTTON WITH A
SMALL SCREW DRIVER, THEN INSERT WIRE.
CONNECT WIRES PER COLOR CODE
INDICATED ON LABEL.
INPUT
STRIP LENGTH
-190V
+190V
TO CONNECT WIRES, STRIP WIRES 10 to 12 mm
DEPRESS ORANGE BUTTON WITH A
SMALL SCREW DRIVER, THEN INSERT WIRE.
CONNECT WIRES PER THE VOLTAGE
INDICATED ON THE LABEL.
ATTACH 6 AWG (16 mm²) GROUND WIRE
WITH ¼ × ¾ in. DOUBLE HOLE LUG
GROUND CONNECTION
TORQUE SEALING NUT
50 to 55 in.lbs
USE A 3 mm HEX KEY
AND A 7 mm SOCKET
TORQUE 13.5 in.lbf
FIELD INSTALLED
INPUT GLAND. INSTALL
WHEN A SECOND INPUT
CABLE IS NEEDED.
TORQUE INTERNAL LOCK NUT
40 to 45 in.lbs.
TORQUE EXTERNAL GLAND
SEALING NUT 50 to 55 in.lbs
OUTPUT GLAND
FOR 4 CONDUCTOR CABLE
TO DOWN CONVERTER.
TORQUE SEALING NUT
50 to 55 in.lbs
FACTORY INSTALLED
INPUT GLAND.
TORQUE SEALING NUT
50 to 55 in.lbs
NAMEPLATE
COVER SCREWS
TORQUE
4.4 to 5.3 in.lbs

TITLE: MANUAL DRAWINGS			REV A
SIZE B	DWG NO 7401273-MANUAL DRAWINGS		SHEET 1 OF 3
SCALE: 1:5			

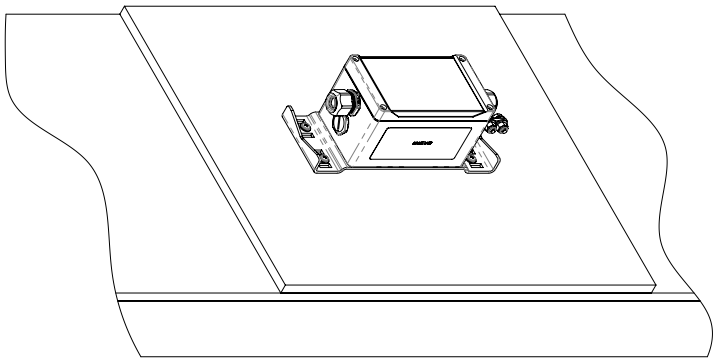




TITLE:	Manual Drawings		REV A
SIZE B	DWG NO.	7401273-manual drawings	SHEET 2 OF 3
SCALE:	1:5		



TITLE: Manual Drawings			REV A
SIZE B	DWG NO. 7401273-manual drawings		SHEET 3 OF 3
SCALE: 1:5			



Alpha Technologies Ltd. | 7700 Riverfront Gate, Burnaby, BC V5J 5M4 Canada
Toll Free North America: +1 800-667-8743 | Outside North America +1 604-436-5547 | Technical Support +1 888-462-7487
For more information visit our website at: www.enersys.com

7401273-J0 REV A (11/2024)