

# Installation, Operation, and Maintenance Manual

*tyco*

GPS PDSC Cabinet



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## GPS PDSC Cabinet

408413128 - S3702-9 (208V)

408413136 - S3702-9 (480V)

408413151 - S3703-24 (208V)

408413169 - S3703-24 (480V)

408527667 - S3704-30 (208V)

408527675 - S3704-30 (480V)



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# Table Of Contents

Section 1: General	page 1
Section 2: Introduction	page 2
Section 3: Installation and Operation	pages 3 - 4
Section 4: Steps To Be Taken Before Energizing	page 5
Section 5: Energizing Equipment	page 5
Section 6: Maintenance	page 6
Figure 1: Panelboard Conversion Instructions	page 7
Figure 2: Panelboard Configurations	page 8
Figure 3: PDSC Cabinet Bottom	page 9
Figure 4: PDSC Cabinet Top	page 10
Figure 5: S3737 Modular AC Wireway	page 11

# Section 1: General

**Warning:** Hazardous voltages in electrical equipment can cause severe personal injury or death. Unless otherwise specified, inspection and maintenance should only be performed on panelboards and equipment to which power has been turned off, disconnected and electrically isolated so that no accidental contact can be made with energized parts.

## 1.1 Successful Operation of Panelboard

The successful operation of this panelboard is dependent upon proper installation, operation, and maintenance. Neglecting fundamental installation and maintenance requirements may lead to personal injury, death, or damage to electrical equipment.

## 1.3 Definition of Qualified Personnel

For the purpose of this manual a qualified person is one who is familiar with the installation and operation of the equipment and the hazards involved. In addition, he has the following qualifications:

### 1.3.1 Requirements

Knowledgeable of the requirements of the National Electrical Code and all other applicable codes, laws, and standards.

### 1.3.2 Established Safety Practices:

Trained and authorized to test, energize, clear, ground, tag, and lockout circuits and equipment in accordance with established safety practices.

## 1.4 Suitable Ratings

Verify that the PDSC cabinet being installed has ratings suitable for the installation

# Section 2: Introduction

## 2.1 General Description

This manual contains installation, operation, and maintenance information for the GPS PDSC AC Distribution cabinet. This cabinet was specifically designed to provide AC input power to the Tyco Electronics GPS 4848/100 Galaxy Power System. The PDSC cabinet is available in three versions:

- S3702- Equipped with provisions for (9) three pole circuit breakers. This version is utilized when rectifier bays have internal circuit breakers.
- S3703- Equipped with provisions for (24) three pole circuit breakers. This version is utilized when rectifier bay has input terminal strip.
- S3704- Equipped with provisions for (30) three pole circuit breakers. This version is utilized when rectifier bay has input terminal strip.

The GPS PDSC cabinet is equipped with a U.L. Listed field convertible split bus panelboard. This panel has two configurations:

- Standard Configuration: 1200A Main Bus- Main input terminations can be connected at either the top or bottom of the cabinet.
- Split Bus Configuration: 600A Dual Main Bus- Both top and bottom panel sections rated 600A.

*Note: All panels are shipped from the factory in the standard configuration.*

## 2.2 Specifications

Electrical:	Main Lug Ampere Rating:	Standard- 1200Amp Split Bus- 600Amp
	Voltage Rating:	208V. Or 480V. 3 Phase, 3Wire with Ground. (See <b>Note 1</b> )
	Short Circuit Capacity:	65,000AIC at 240V. 25,000AIC at 480V.
	Maximum Circuit Breaker:	225 Amp
	Panelboard Material:	Silverplated Copper rated 1000A/psi current density
	U.L. File:	E6822
Mechanical:	Dimensions:	S3702 and S3703: 90"H. x 28"W. x 24"D. S3704: 96"H. x 28"W. x 24"D.
	Weight:	725 lbs.
	Cabinet Material:	12Ga.hot rolled sheet steel
	Mounting:	Cabinet is freestanding with (4) 11/16" diameter holes in bottom of enclosure for fastening to floor. (4) Leveling bolts are installed for minor adjustments in height of cabinet.

*Note 1: The panel can be converted to a 4W configuration by installing the S3878 neutral bar kit.*

## Section 3: Installation and Operation

### 3.1 Shipping and Handling

Before leaving the factory, the cabinet is given a final inspection and packed by workers experienced in the proper handling and packing of electrical equipment. Upon receiving the shipment from the freight carrier, inspect all exterior surfaces for damage and to ensure that panelboard ratings are correct for installation. If any damage is found or discrepancies are noted, report it to your supervisor immediately.

### 3.2 Proper Storage

If it necessary to store the cabinet for any length of time, store the cabinet in a clean, dry area with moderate temperature and located so that mechanical damage from work personnel in the area is not likely to happen.

### 3.3 Unpacking

Care should be exercised in unpacking the cabinet to prevent damage and loss of instruction materials and loose parts.

### 3.4 Care

Care should be taken to protect the panelboard internal parts from contamination during the installation process.

### 3.5 Installation

#### 3.5.1 General

The PDSC cabinet can be positioned anywhere in the GPS rectifier bay lineup. Contact the project engineer for exact placement of the PDSC within the lineup. Verify electrical ratings before proceeding with installation.

#### 3.5.2 Cabinet Mounting

The PDSC is supplied with four mounting holes drilled in the bottom of the cabinet for fastening to the floor, and four ½-13 leveling bolts to make minor adjustments in the height of the cabinet. See figure 3 for details. Refer to local code specifications for any zoning requirements prior to installation.

#### 3.5.3 Panelboard Configuration

The PDSC cabinet is shipped with the panelboard in the standard configuration with the main bus links installed. If a split bus configuration is required, see figure 1 for instructions on converting panelboard, and figure 2 for location of individual components.

#### 3.5.4 Main Lug Connections

The panel interior is equipped to accept (2) hypress lugs or (4) lugs when utilizing the copper “U” shaped adapter details. When fastening the hypress lugs to the main panel bus, use the (2) 3/8-16 bolts and hardware provided for each connection and torque to 30ft. /lbs.

#### 3.5.5 Load Lug Connections

When terminating the load wires in the terminal wire connector installed on the load side of the circuit breaker, refer to the manufacturer’s terminal information for torque values



specified on the faceplate of each circuit breaker.

### **3.5.6 Frame Ground**

Each PDSC is provided with frame grounding provisions located on top of the cabinet. Two sets of 3/8" diameter holes on 1" centers are pre-drilled for attachment of frame ground cable. See figure 4 for details. Refer to project engineer for size of frame ground cable.

### **3.5.7 Conductors**

Use care in stripping insulation from conductors so as to not nick or ring the conductor. For aluminum, clean all oxide from the stripped portion and apply an antioxidant compound.

### **3.5.8 Hinged Cover Wireway (S3737)**

The design of the PDSC cabinet allows for the use of the S3737 Wireway, which eliminates the need for AC conduit between the PDSC and rectifier bays. Each cabinet has provisions on both sides for attachment of the modular wireway. All cabinets are shipped with two wireway flanges for attachment of wireway. S3737 Wireway kits are ordered separately. See figure 5 for details.

### **3.5.9 Types and Temperature Ratings**

Care should be exercised to ensure that all the types and temperature ratings of conductors being installed in the panelboard are suitable for use with the terminals, which have been provided.

### **3.5.10 Debris**

Clean the cabinet of all debris, which has accumulated during the panelboard installation.

## **3.6 Operation**

### **3.6.1 Normal Operation**

Under normal operating conditions, AC power from the main AC circuit breaker (or two main circuit breakers if panel is split bus configured) is supplied to the main lug connections of the PDSC panelboard.

Input power is internally distributed to the branch circuit breakers that are mounted on the panelboard.

The load is fed from the load side of the individual branch circuit breakers.

### **3.6.2 Circuit Breaker Manual Operation**

Manual operation of the circuit breaker is controlled by the circuit breaker handle and the PUSH-TO-TRIP button. The circuit breaker has three indicated positions, two of which are shown on the cover with raised lettering to indicate ON and OFF.

### **3.6.3 Circuit Breaker Trip**

When the circuit breaker trips, the on-off toggle switch will move to the mid-trip position. This indicates an abnormal condition, and the cause of tripping should be determined. Output loading should be checked to make sure that the sum of all loads is within the power rating of the panel, and that individual loads do not exceed corresponding branch breaker rating. After tripping and making sure that all conditions are normal, the circuit breaker is reset by moving the circuit breaker handle to the extreme OFF position, then to the ON position.

### **3.6.4 Circuit Breaker Push-To-Trip Button**

The PUSH-TO-TRIP button checks the tripping function and is used to periodically exercise the operating mechanism.

## **Section 4: Steps To Be Taken Before Energizing**

### **4.1 Electrical Connections**

Tighten all electrical connections to the manufacturer's torque specifications. If such information is not provided with the equipment, consult the manufacturer.

### **4.2 Foreign Material**

Remove all foreign material from the panelboard and cabinet. Make certain that all barriers and Deadfront liner are properly installed.

### **4.3 Circuit Breakers**

Manually exercise all circuit breakers on-off toggle handles to make sure they operate freely.

### **4.4 Short Circuits and Ground Faults**

To make sure that the system is free from short circuits and ground faults, conduct an insulation resistance test phase to ground and phase to phase with the circuit breakers in both the open and closed positions. If the resistance reads less than 1 megohm while testing with the branch circuit devices in the open position, the system may be unsafe and should be investigated.

## **Section 5: Energizing Equipment**

### **5.1 Qualified Personnel**

Qualified personnel should be present when the equipment is energized for the first time. If short circuit conditions caused by damage or poor installation practices have not been detected in the procedures specified in section 4, serious personal injury and damage can occur when the power is turned on.

### **5.2 Load on the Panelboard**

There should be no load on the panelboard when it is energized. Turn off all of the downstream loads.

### **5.3 Energized in Sequence**

The equipment should be energized in sequence by starting at the source end of the system and working towards the load end. In other words, energize the main device, then the feeder devices, and then the branch-circuit devices. Turn the devices on with a firm positive motion.

## Section 6: Maintenance

### 6.1 Cabinet and Panelboard

Under normal operating conditions, the PDSC cabinet and panelboard does not require any maintenance.

### 6.2 Circuit Breaker

This information was extracted from Cutler-Hammer bulletin I.L. 29C101F. Series C molded case circuit breakers are designed to provide years of almost maintenance-free operation. The following procedure describes how to inspect and test a circuit breaker in service.

**WARNING!** Before inspecting the circuit breaker in an electrical system, make sure the circuit breaker is switched to the OFF position and there is no voltage present where work is to be performed. The voltages in energized equipment can cause injury or death.

#### 6.2.1

Remove dust, dirt, soot, grease and/or moisture from the surface of the circuit breaker using a lint free cloth, brush, or vacuum cleaner. Do not blow debris into circuit breaker. If contamination is found, look for the source and eliminate the problem.

#### 6.2.2

Switch circuit breaker to ON and OFF several times to be sure that the mechanical linkages are free and do not bind. If mechanical linkages are not free, replace circuit breaker.

#### 6.2.3

Press the PUSH-TO-TRIP button to mechanically trip the circuit breaker. Trip, reset, and switch circuit breaker ON several times. If mechanism does not reset each time the circuit breaker is tripped, replace the circuit breaker.

#### 6.2.4

Check base, cover, and operating handle for cracks, chipping, and discoloration. Circuit breakers should be replaced if cracks or severe discoloration is found.

#### 6.2.5

Check terminals and connectors for looseness or signs of overheating. Overheating will show as discoloration, melting, or blistering of conductor insulation, or as pitting or melting of conductor surfaces due to arcing. If there is no evidence of overheating or looseness, do not disturb or tighten the connections. If there is evidence of overheating, terminations should be cleaned or replaced. Before re-energizing the circuit breaker, all terminations and cable should be refurbished to the condition when originally installed.

#### 6.2.6

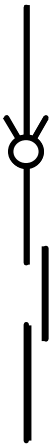
Check area where circuit breaker is installed for any safety hazards, including personal safety and fire hazards. Exposure to certain types of chemicals can cause deterioration of electrical connections.

# Figure 1: Panelboard Conversion Instructions

- 1) Turn Off all power supplying this equipment before working inside
- 2) Remove circuit breaker liner cover
- 3) Remove copper bus links marked "SPLIT BUS LINKS"
- 4) Utilizing the same bolts and mounting holes, fasten fiberglass barriers marked as "SPLIT BUS BARRIERS" in place.
- 5) Replace circuit breaker liner cover

## 1200 A. Configuration

Feed



Split Bus Links in Place

*Note: Panel may be Bottom Fed*

## Dual 600A Configuration

Feed #1

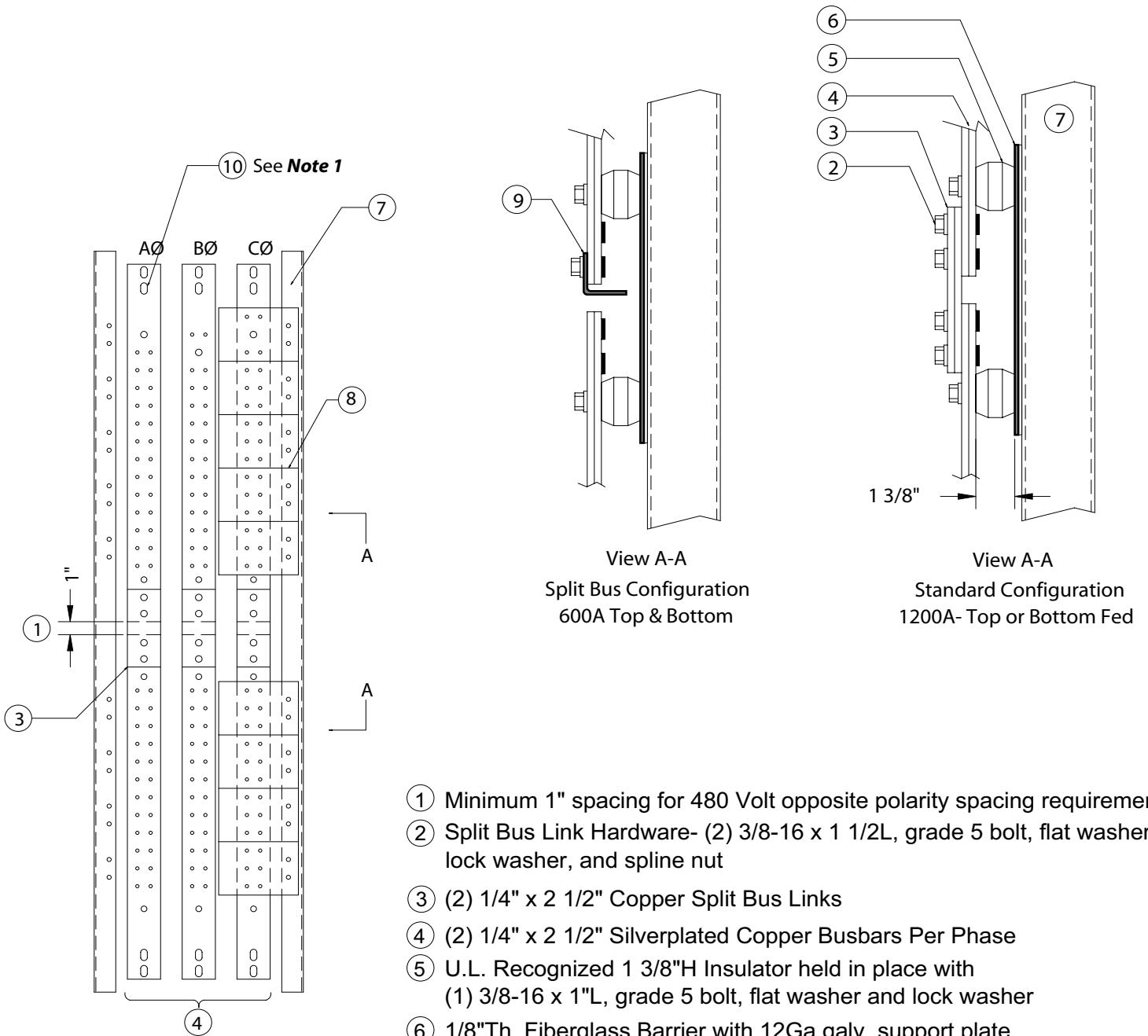


Split Bus Links Removed

Split Bus Barriers in Place

Feed #2

## Figure 2: Panelboard Configurations



Front View  
Standard Panelboard Configuration  
with Split Bus Links installed

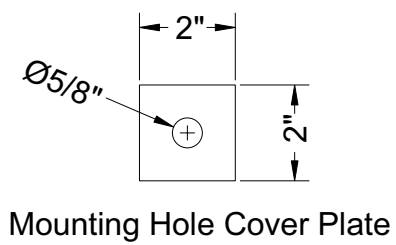
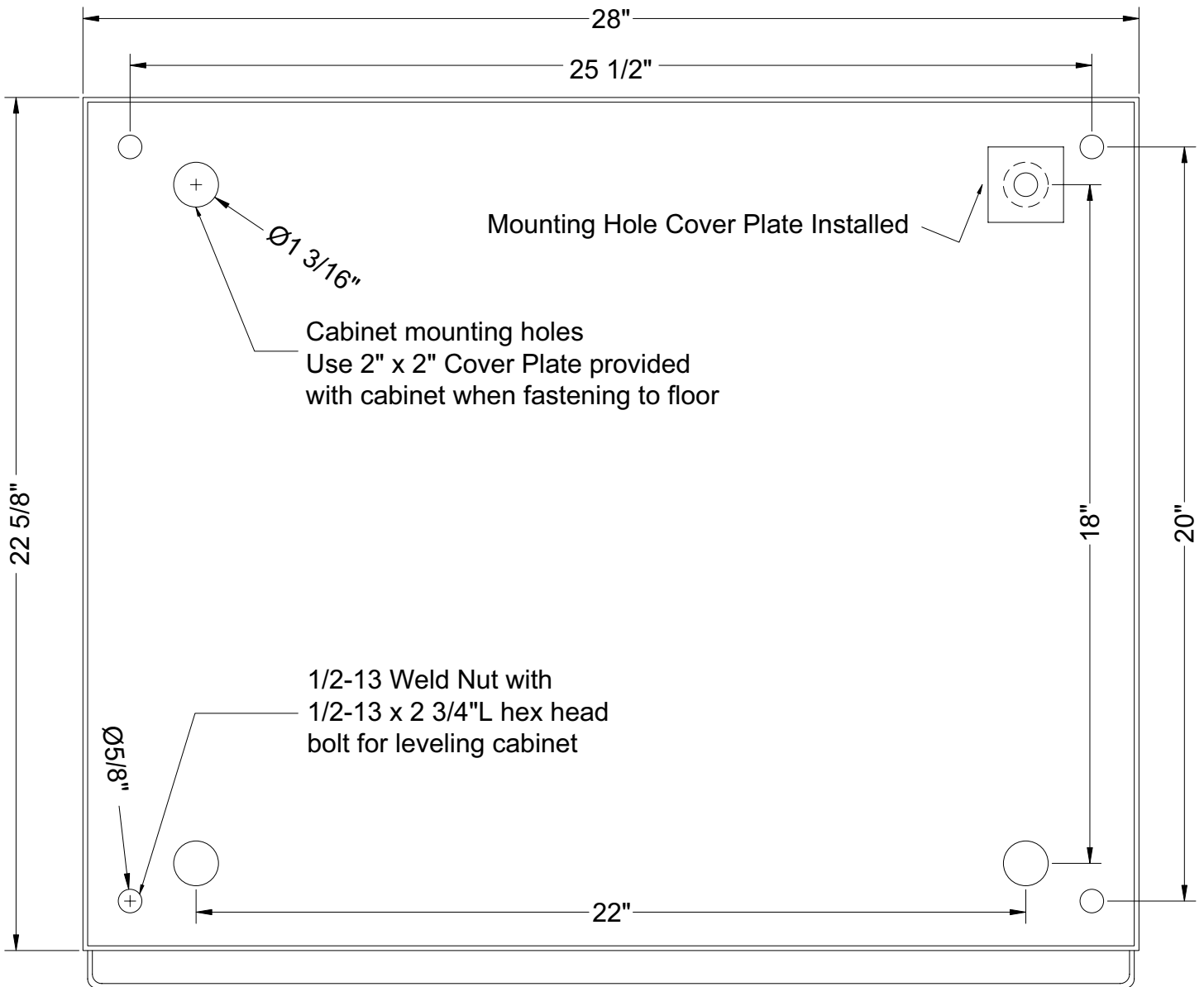
View A-A  
Split Bus Configuration  
600A Top & Bottom

View A-A  
Standard Configuration  
1200A- Top or Bottom Fed

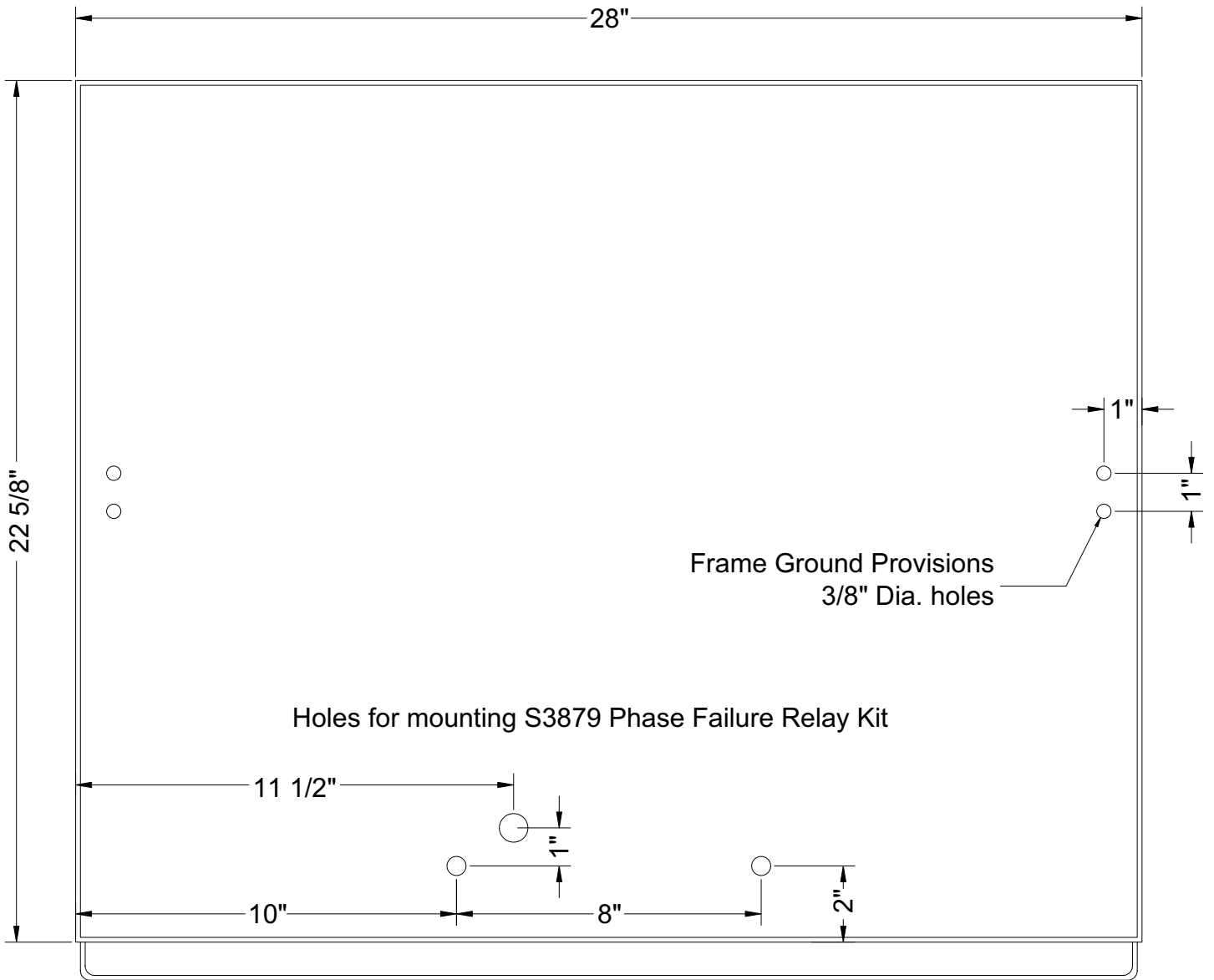
- ① Minimum 1" spacing for 480 Volt opposite polarity spacing requirements
- ② Split Bus Link Hardware- (2) 3/8-16 x 1 1/2L, grade 5 bolt, flat washer, lock washer, and spline nut
- ③ (2) 1/4" x 2 1/2" Copper Split Bus Links
- ④ (2) 1/4" x 2 1/2" Silverplated Copper Busbars Per Phase
- ⑤ U.L. Recognized 1 3/8"H Insulator held in place with (1) 3/8-16 x 1"L, grade 5 bolt, flat washer and lock washer
- ⑥ 1/8"Th. Fiberglass Barrier with 12Ga galv. support plate
- ⑦ 12Ga. Galvanized Panelboard Chasis Support Rails
- ⑧ Cutler-Hammer 3 Pole Branch Circuit Breakers
- ⑨ Fiberglass Split Bus Barrier- (3) Required
- ⑩ Busbar drilled for 1" and 1 3/4" Center To Center Lugs

**Note 1:** (3) "U" Shaped Lug Adaptor details are provided with cabinet that allows for termination of up to (4) Lugs per Phase

# Figure 3: PDSC Cabinet Bottom



**Figure 4: PDSC Cabinet Top**

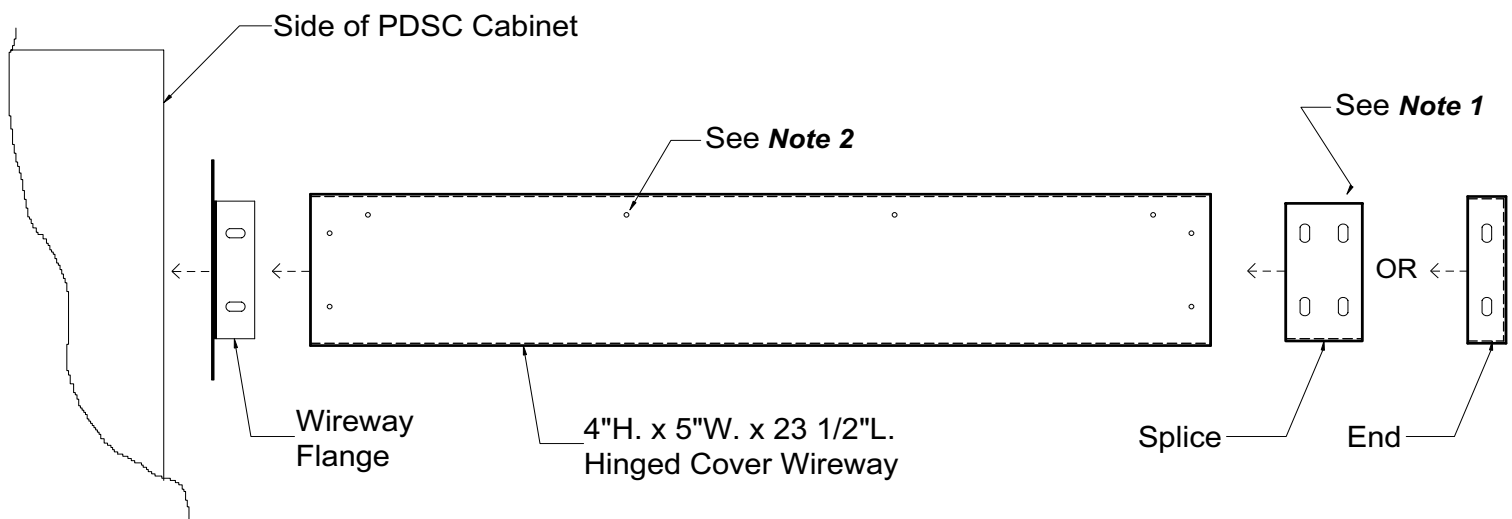


# Figure 5: S3737 Modular AC Wireway

## Installation Hardware List

Qty.	Description of Connection	Hardware
4	Wireway Flange to PDSC Cabinet	10-32 x 3/8" Screws
4	Wireway Flange to 4 x 5 Wireway	10-32 x 1/4" Screws
4	Splice Bracket to 4 x 5 Wireway	10-32 x 1/4" Screws
4	End Cap to 4 x 5 Wireway	10-32 x 1/4" Screws
3	Hinged Cover to 4 x 5 Wireway	10-32 x 1/4" Screws

See **Note 3**



**Note 1:** Screws for Wireway Flange, Splice Bracket, and End cap are fastened from the inside of the wireway out

**Note 2:** If cutout in bottom of wireway does not match cutout in top of rectifier cabinet, remove wireway cover screws, and fasten cover on opposite side of wireway.

**Note 3:** Each PDSC cabinet is supplied with (2) Wireway Flanges  
 Each S3737 Wireway Kit includes (1) Section of Wireway,  
 (1) Slice Bracket, and (1) End cap









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