



NetSure™ -48 VDC

# GMT Distribution Fuse Panel Assembly

Installation and User Manual

Specification Number: 545700

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### **Technical Support Site**

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit <https://www.vertiv.com/en-us/support/> for additional assistance.

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## Admonishments Used in this Document



**DANGER!** Warns of a hazard the reader **will** be exposed to that will **likely** result in death or serious injury if not avoided. (ANSI, OSHA)



**WARNING!** Warns of a potential hazard the reader **may** be exposed to that **could** result in death or serious injury if not avoided. This admonition is not used for situations that pose a risk only to equipment, software, data, or service. (ANSI)



**CAUTION!** Warns of a potential hazard the reader **may** be exposed to that **could** result in minor or moderate injury if not avoided. (ANSI, OSHA) This admonition is not used for situations that pose a risk only to equipment, data, or service, even if such use appears to be permitted in some of the applicable standards. (OSHA)



**ALERT!** Alerts the reader to an action that **must be avoided** in order to protect equipment, software, data, or service. (ISO)



**ALERT!** Alerts the reader to an action that **must be performed** in order to prevent equipment damage, software corruption, data loss, or service interruption. (ISO)



**FIRE SAFETY!** Informs the reader of fire safety information, reminders, precautions, or policies, or of the locations of fire-fighting and fire-safety equipment. (ISO)



**SAFETY!** Informs the reader of general safety information, reminders, precautions, or policies not related to a particular source of hazard or to fire safety. (ISO, ANSI, OSHA)

# **Important Safety Instructions**

## **Safety Admonishments Definitions**

Definitions of the safety admonishments used in this document are listed under “Admonishments Used in this Document” on page iv.

## **Safety and Regulatory Statements**

Refer to Section 4154 (provided with your customer documentation) for Safety and Regulatory Statements.

## **Déclarations de Sécurité et de Réglementation**

Reportez-vous à la Section 4154 (fourni avec les documents de votre client) pour les déclarations de sécurité et de réglementation.

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# 1 Description

Spec. No. 545700 is a -48VDC GMT Distribution Fuse Panel Assembly, which accepts up to twenty (20) separately ordered GMT fuses. The assembly may be connected for single load distribution or dual (A and B side) load distribution. The assembly is designed for mounting in a 19" or 23" relay rack. This assembly is designed for use in -48VDC systems.

An external fuse alarm circuit card is provided. The alarm card provides resistive battery and Form-C relay contacts for connection to external alarm circuits.



**WARNING!** WHEN THIS PANEL IS USED IN NON-FACTORY INTEGRATED SYSTEMS, EXTERNAL BRANCH CIRCUIT PROTECTION IS REQUIRED FOR ALL INPUT FEEDS.

## 2 Specifications

### 2.1 Electrical

- Input/Output Voltage: Nominal -48VDC.
- Current: 40A per side, 80A total.
- Fuse Alarm Circuit: One set of Form-C relay contacts changes state if one or more distribution fuses open. Resistive battery is provided to an alarm terminal if one or more distribution fuses open.

### 2.2 Environmental

- Operating Temperature Range: -40°C to +65°C (-40°F to +149°F).
- Storage Temperature Range: -40°C to +85°C (-40°F to +185°F).
- Humidity: Capable of operating in an ambient relative humidity range of 0% to 95%, non-condensing.
- Altitude: Will operate at any elevation between sea level and 10,000 ft.
- Safety Compliance:
  - This assembly is UL Recognized for use in DC Power Distribution Centers for Communications Equipment.
  - This assembly meets the requirements of CAN/CSA 22.2, No. 60950-00 and is tested and Certified by UL ("c UR") for use in Telephone, Electronic Data Processing or Information Processing Equipment.

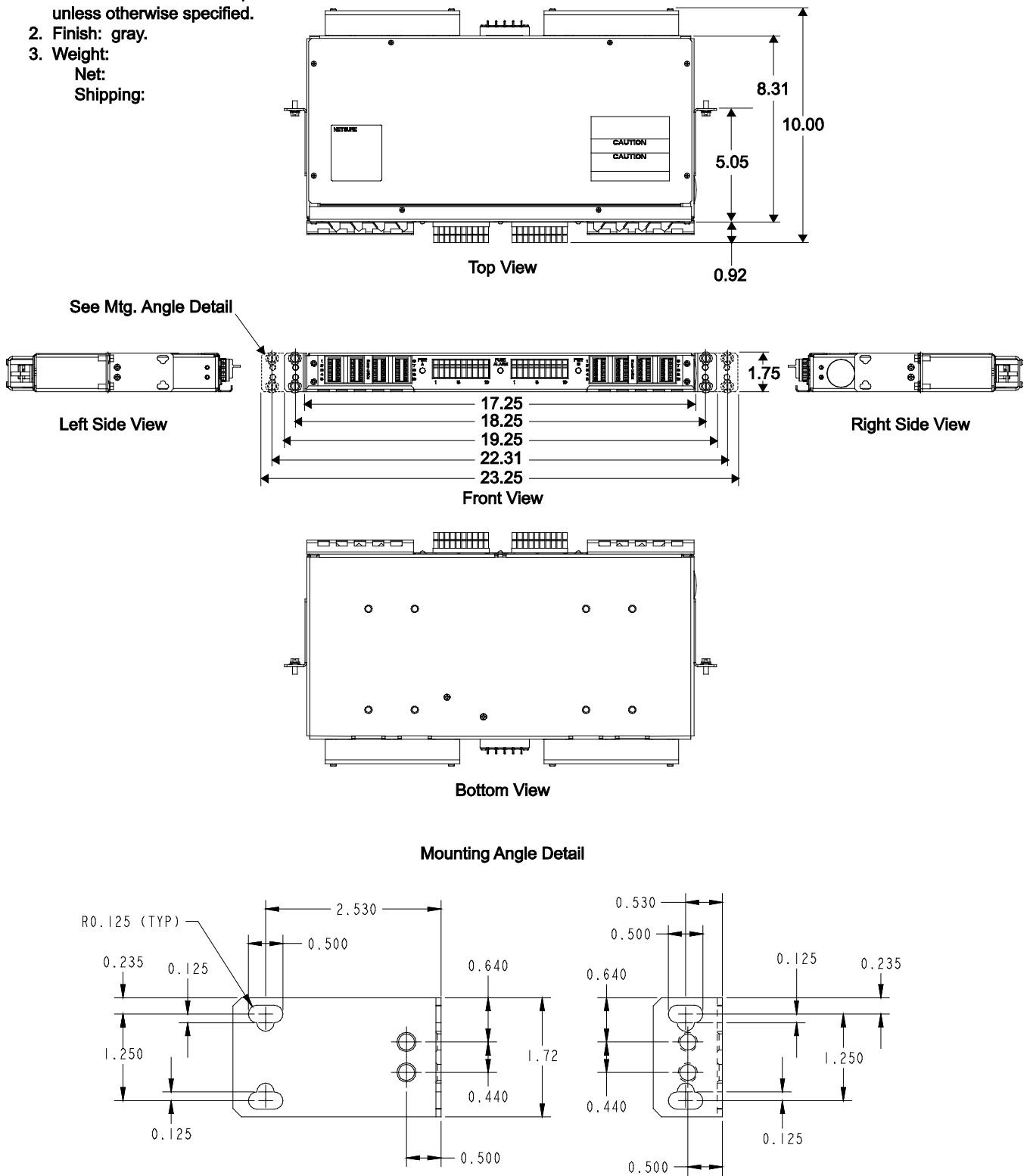
### 2.3 Dimensions

- See **Figure 2.1**.

Figure 2.1 Dimensions

**Notes:**

1. Dimensions are in inches, unless otherwise specified.
2. Finish: gray.
3. Weight:  
Net:  
Shipping:





## 2.4 GMT Distribution Fuses

- Order distribution fuses as required from **Table 2.1**. Note that dummy fuses and fuse safety covers are factory provided for each distribution position.



**CAUTION!** At +40°C and +65°C ambient, a fuse with a rating of greater than 10 amperes SHALL HAVE an empty mounting position between it and any other fuse.



**NOTE!** Load should not exceed 80% of device rating, except 10 and 15 amp fuses, for which load should not exceed 70% of device rating.

**Table 2.1 GMT Distribution Fuses**

Ampere Rating	Part Number	Fuse Color
1/4	248610200	Violet
1/2	248610300	Red
3/4	248610500	Brown
1-1/3	248610700	White
2	248610800	Orange
3	248610900	Blue
5	248611000	Green
7-1/2	248611300	Black-White
10	248611200	Red-White
15	248611500	Red-Blue
Safety Fuse Cover	102774	---
Dummy Fuse	248872600	---

## 3 Installation

### 3.1 Mounting

Mount the assembly into a 19" or 23" relay rack.

For 23" relay rack mounting, the reversible mounting angles must be re-positioned for 23" mounting. Torque hardware securing the mounting angles to the assembly to 9.6 in-lbs.

Use the supplied hardware to secure the assembly to the relay rack. Use a supplied grounding washer at each mounting location. Torque to 70 in-lbs.

### 3.2 Electrical Connections

To access the assembly's input terminations, remove the two protective covers from the rear of the assembly. After all wiring connections have been made and checked, reinstall the two protective covers.

#### **Wiring Considerations**

All wiring and grounding should follow the current edition of the National Electrical Code and applicable local codes.

#### **Equipment Grounding Connection (Frame Ground)**

The assembly is grounded to the relay rack by using grounding washers (supplied) with the relay rack mounting hardware, as previously described.

## **-48V DC Input Connections**



**DANGER!** To avoid injury, it is recommended that DC power be disconnected from the input leads before connecting them to the GMT Distribution Fuse Panel Assembly.



**WARNING!** Check for correct polarity before making connections.



**WARNING!** WHEN THIS PANEL IS USED IN NON-FACTORY INTEGRATED SYSTEMS, EXTERNAL BRANCH CIRCUIT PROTECTION IS REQUIRED FOR ALL INPUT FEEDS.

### **Recommended Input External Branch Circuit Protection, Wire Sizes, and Lugs**

A single input or dual inputs can be connected to the assembly. Input leads are connected to busbars located on the rear of the assembly. In dual inputs applications, input leads may be connected instead to busbars located inside the assembly. These busbars provide 10-32 threaded studs on 5/8" centers for installation of input leads terminated in two-hole lugs. Factory provides lug-mounting hardware.

- All lugs for customer connections must be ordered separately.
- DC input cable size varies depending on power requirements, therefore no specific information is provided for cable size. Refer to **Table 3.1** for recommended cable sizes and lugs at rated maximum assembly load and other various loads. Note that loads typically should not exceed 80% of capacity; therefore, input cables have been sized for an overcurrent protection device rated at 125% of the expected load.
- Lugs should be crimped to the specifications given in the manufacturer's instructions furnished with the crimp tool or lugs.

**Table 3.1 Recommended Input External Branch Circuit Protection, Wire Sizes, and Lug**

External Overcurrent Protection Device Rating	Ambient Operating Temperature <sup>(1)</sup>	Loop Length (Ft) 1.0 Voltage Drop <sup>(2)</sup>	Recm 90°C Wire Size (AWG) <sup>(1)</sup>	Recommended Crimp Lug <sup>(3)</sup>
100A (single input)	40°C	59.8	2	--
80A (single input)	40°C	47.4	4	--
60A (single input)	40°C	39.4	6	245346500
50A (dual inputs)	40°C	29.7	8	245346600
40A (dual inputs)	40°C	37.2	8	245346600
20A (dual inputs)	40°C	29.4	12	245390100

<sup>1</sup> Wire sizes are based on recommendations of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC). Table 310-16 for copper wire rated at 90°C conductor temperature operating in ambient temperatures of 40°C was used. For other operating ambient temperatures, refer to the NEC. For operation in countries where the NEC is not recognized, follow applicable codes.

<sup>2</sup> Recommended wire sizes are sufficient to restrict maximum voltage drop to 1.0 volt at rated full load output current of the shelf for the loop lengths shown in this column. Loop length is the sum of the lengths of the positive and negative leads.

<sup>3</sup> Two-hole lug, #10 bolt clearance hole, 5/8" centers. Lugs should be crimped per lug manufacturer's specifications.

### **Side A and Side B Load Distribution Configuration - Dual Inputs**

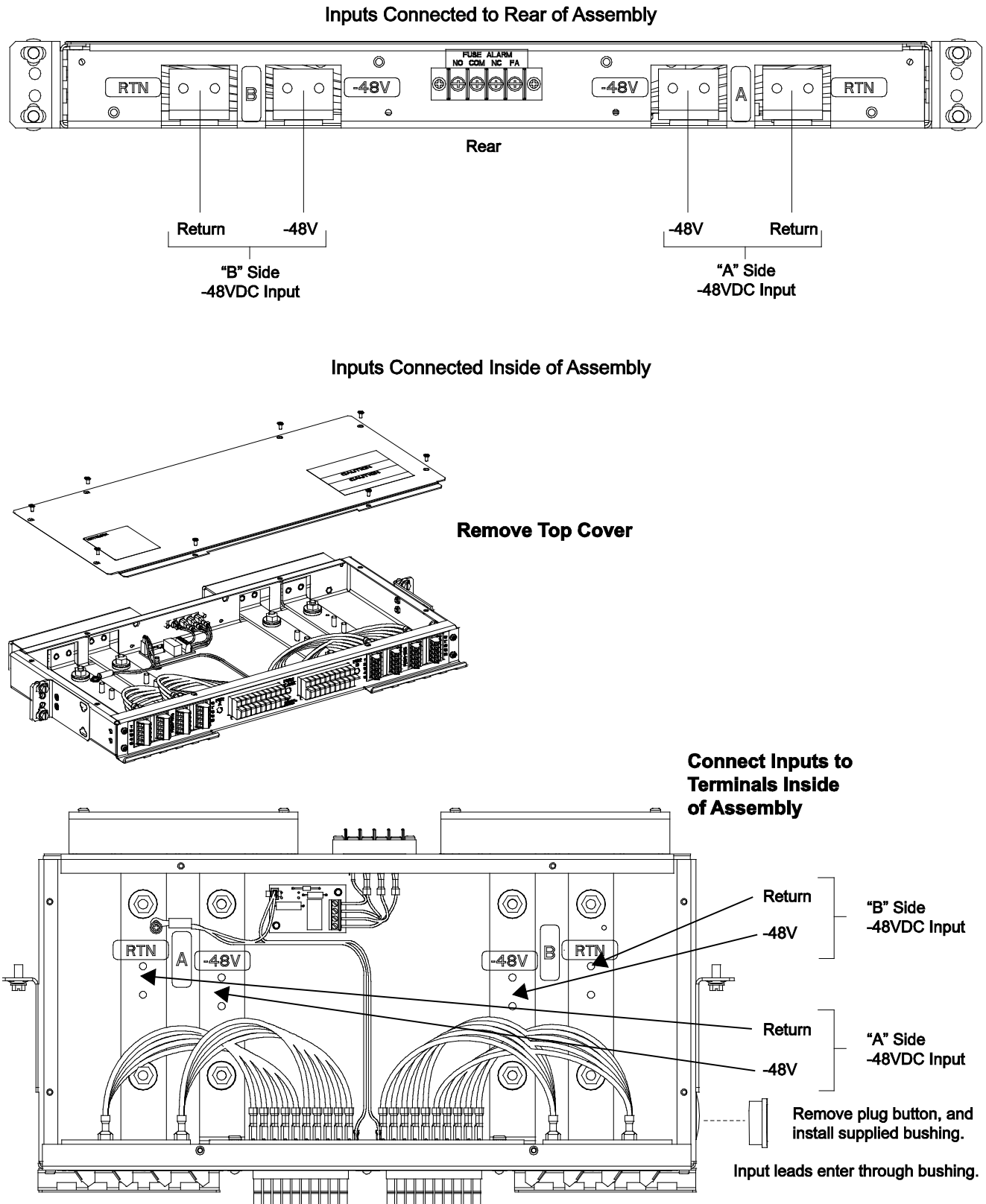
Two sets of 10-32 x 1/2" threaded studs on 5/8" centers are provided on the rear of the assembly for connection of Side A and Side B input leads terminated in two-hole lugs. KEPS nuts are factory supplied to secure the leads to the studs. Recommended torque is 23 in-lbs. Refer to **Figure 3.1**.

1. Connect the positive (+) Side A input lead to the terminal labeled RTN (A).
2. Connect the positive (+) Side B input lead to the terminal labeled RTN (B).
3. Connect the negative (-) Side A input lead to the terminal labeled -48V (A).
4. Connect the negative (-) Side B input lead to the terminal labeled -48V (B).

An alternative method is to connect the input leads to terminations inside the assembly. Two sets of 10-32 x 1/2" threaded studs on 5/8" centers are provided inside the assembly for connection of Side A and Side B input leads terminated in two-hole lugs. KEPS nuts are factory supplied to secure the leads to the studs. Recommended torque is 23 in-lbs. Refer to **Figure 3.1**.

1. Remove the top cover from the assembly.
2. Remove the plug button from the right side of the assembly. Install the supplied bushing in place of the plug button. Run input leads through bushing.
3. Connect the positive (+) Side A input lead to the terminal labeled RTN (A) in **Figure 3.1**.
4. Connect the positive (+) Side B input lead to the terminal labeled RTN (B) in **Figure 3.1**.
5. Connect the negative (-) Side A input lead to the terminal labeled -48V (A) in **Figure 3.1**.
6. Connect the negative (-) Side B input lead to the terminal labeled -48V (B) in **Figure 3.1**.
7. Replace the top cover.

Figure 3.1 DC Input Connections - Dual Input Configuration

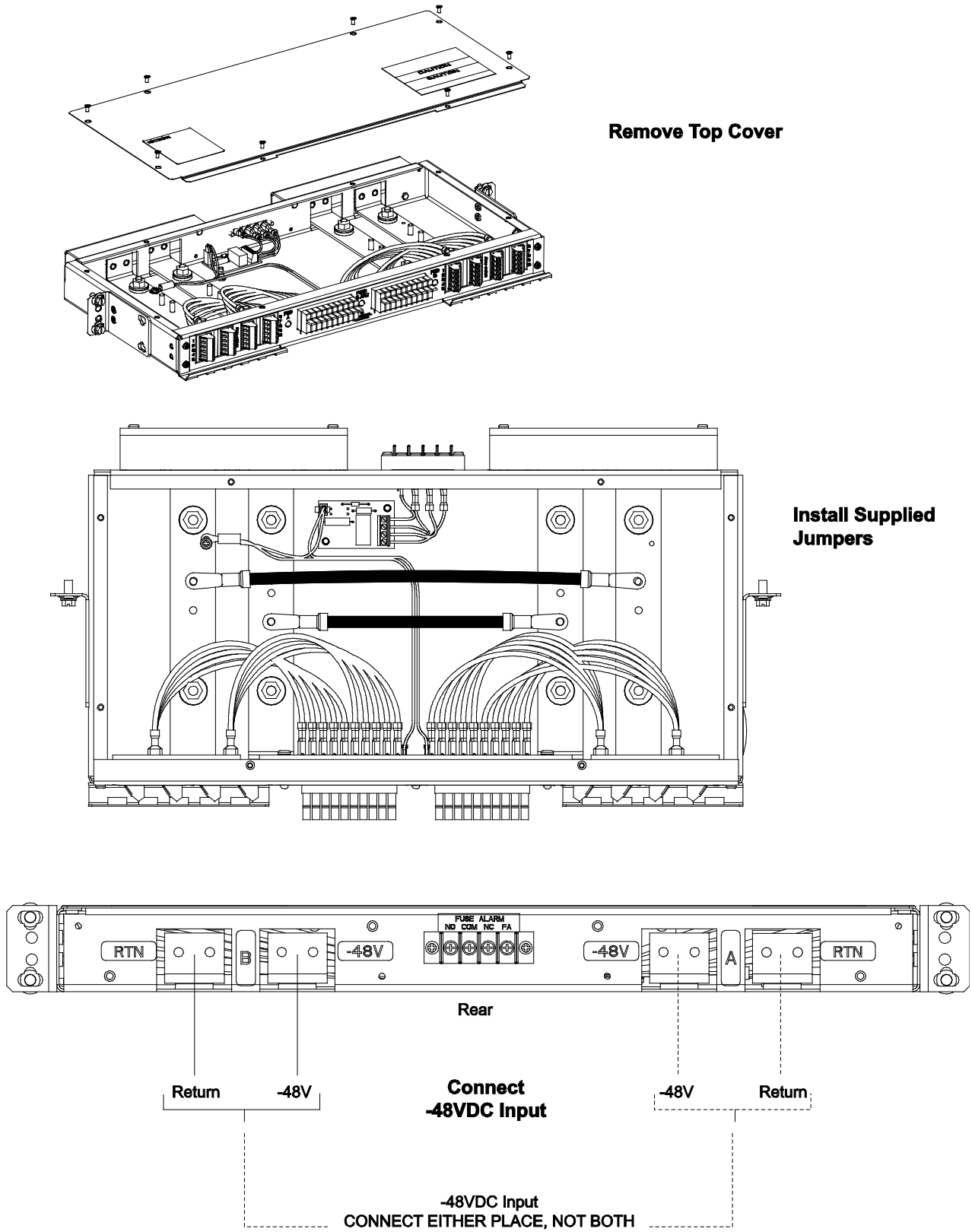


### **Single Load Distribution Configuration - Single Input**

Two sets of 10-32 x 1/2" threaded studs on 5/8" centers are provided on the rear of the assembly for connection of input leads terminated in two-hole lugs. **CONNECT TO ONLY ONE SET OF THREADED STUDS.** Jumpers (8 AWG) are factory furnished to tie the two inputs together for a single load distribution configuration and **MUST** be connected by the installer before connecting input leads. KEPS nuts are factory supplied to secure the customer input leads and also the supplied jumpers. Recommended torque is 23 in-lbs for these connections. Refer to **Figure 3.2**.

1. Remove the top cover from the assembly.
2. Connect the shorter supplied jumper between the inner two busbars as shown in **Figure 3.2**.
3. Connect the longer supplied jumper between the outer two busbars as shown in **Figure 3.2**.
4. Connect the input leads to one set of threaded studs located on the rear of the assembly.
  - a) Connect the positive (+) input lead to a terminal labeled RTN.
  - b) Connect the negative (-) input lead to a terminal labeled -48V.
5. Replace the top cover.

Figure 3.2 DC Input Connections - Single Input Configuration



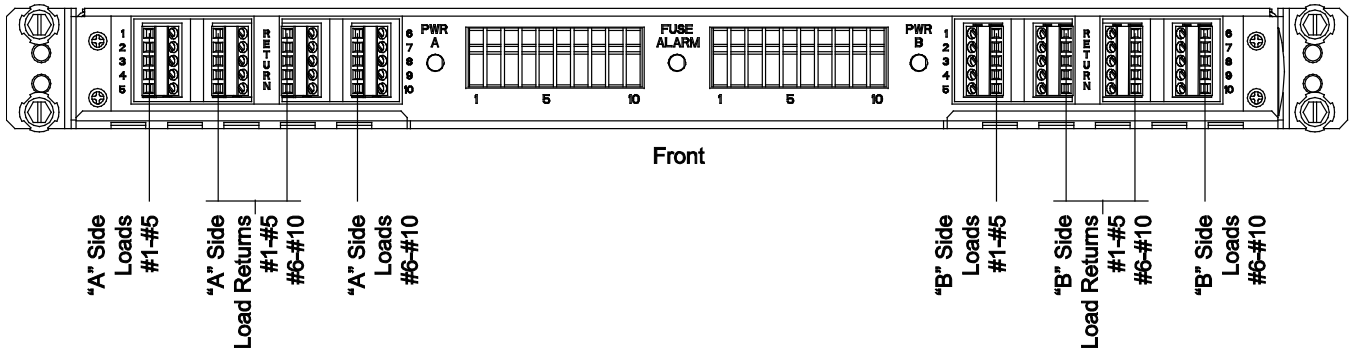
### -48V DC Load Connections



**WARNING!** Check for correct polarity before making connections.

Load and Load Return connections are made to the terminal blocks located on the front of the assembly. These terminal blocks provide screw compression type terminals, which accept a wire size in the range of 26 to 14 AWG. Refer to **Figure 3.3**. Recommended torque is 5.0 in-lbs.

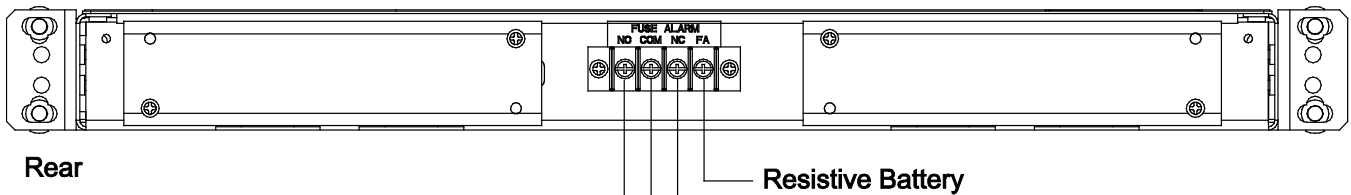
Figure 3.3 -48V DC Load Connections



### External Fuse Alarm Connections

A Fuse Alarm terminal block is located on the rear of the assembly. If any GMT distribution fuse opens, resistive battery is provided at terminal FA of the terminal block. Also, relay contacts open between terminals NO and COM and close between terminals NC and COM of the terminal block. Refer to **Figure 3.4**. Recommended torque is 9 in-lbs.

Figure 3.4 Fuse Alarm Connections



**Notes:**

- Relay shown in deenergized state.
- Relay energizes during alarm condition.

- NO (Normally Open Contact)
- COM (Common)
- NC (Normally Close Contact)

The terminal block accepts #6 ring or spade lugs.  
Recommended Torque: 0.5 to 0.6 Nm.

## 3.3 Initial Startup

### **Procedure**

1. Install distribution fuses. Use only Bussmann GMT type of the rating required for your application.
2. If your installation requires dummy fuses in all unused fuse positions, install the dummy fuses (factory provided).
3. Ensure that fuse safety covers are installed on each fuse, as shown in **Figure 5.1**.
4. Apply input power to the assembly. Note that there may be one or two inputs depending on configuration.
5. Verify that PWR A and PWR B indicators located on the front of the assembly are illuminated.
6. Verify that the Fuse Alarm indicator located on the front of the assembly is extinguished. Verify that the external fuse alarm circuit is not active (if connected). If indicator or external alarm is active, refer to the *Troubleshooting and Repair* section.
7. To verify operation of the fuse alarm circuit:
  - a) Remove a distribution fuse, and replace with a known open fuse. Verify the Fuse Alarm indicator located on the front of the assembly illuminates and the external fuse alarm circuit activates (if connected).
  - b) Remove the open fuse and install the good fuse. Verify the Fuse Alarm indicator located on the front of the assembly extinguishes and the external fuse alarm circuit retires (if connected).



## 4 Operation

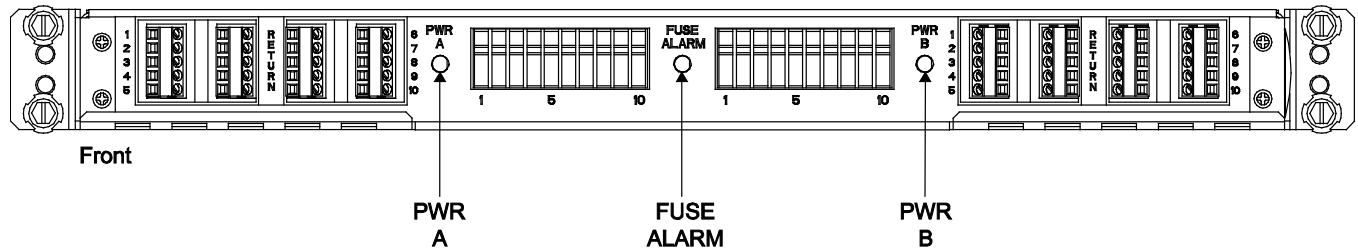
### 4.1 Indicators

Refer to **Figure 4.1** for indicator locations.

PWR A and PWR B Indicators: When illuminated (green), indicates power is supplied to the A and B sides, respectively.

FUSE ALARM: When illuminated (red), a GMT distribution fuse is open.

**Figure 4.1** Indicators Locations



## 5 Troubleshooting and Repair

Other than the distribution fuses, the assembly contains no user-replaceable parts. No attempt should be made to repair the assembly. If repair is required, contact Vertiv.

If the local Fuse Alarm indicator illuminates and external fuse alarm circuits activate (if connected), check for an open distribution fuse. An open fuse will provide an indicator that is visible through the front of the fuse safety cover. Refer to *Fuse Replacement* in this section for a replacement procedure.

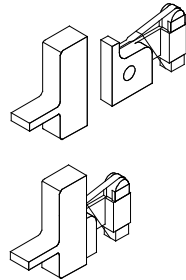


**NOTE!** Loss of DC input power to the assembly will prohibit the local alarm indicators and external fuse alarm circuits from activating.

### 5.1 Fuse Replacement

If replacement of a distribution fuse becomes necessary, replace only with Bussmann GMT type of the correct rating. Ensure a safety cover is installed on the replacement fuse, as shown in **Figure 5.1**.

**Figure 5.1 Safety Fuse Cover, P/N 102774 (Bussmann GMT-Y)**



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