

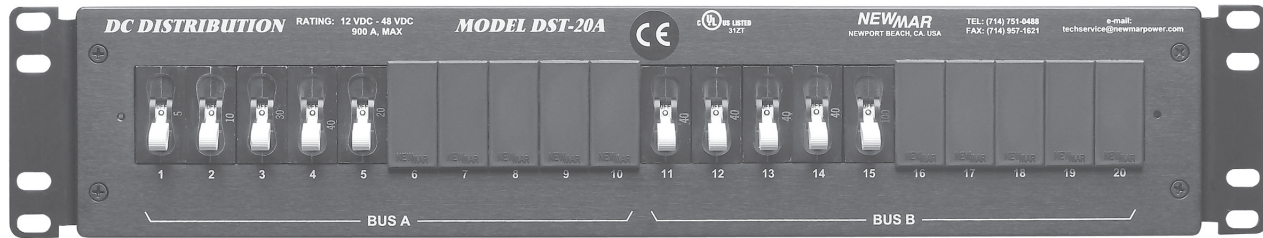
# Rackmount Distribution Panel



Models:  
DST-20A  
DST-10



## INSTALLATION/OPERATION INSTRUCTIONS



Model DST-20A pictured  
with 10 optional  
breakers installed

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M-DST-20A  
As Of January 2008

## D) OVERVIEW

The DST is a high density Rackmount Secondary Distribution Panel designed to accommodate virtually any communication site power distribution requirement.

The panel accommodates up to 10 or 20 circuit breakers, depending on model, within a compact housing occupying only 2 RU of rack space. The plug-in breakers only require front access for quick, easy installation during initial system configuration, as well as future system expansion.

**Model DST-20A** features dual isolated A and B buses, each rated at 450 amps, which accept up to 10 breakers each and enable redundant power, dual voltage and/or dual ground reference configurations. The A and B inputs can also be paralleled to make a single 900 amp bus (see INSTALLATION OPTION section). Model DST-10 has a single 450 amp bus which accepts up to 10 breakers.

The plug-in circuit breakers feature compression power contacts which insert securely into sockets recessed in the panel. Breaker alarm contacts which are part of the plug-in assembly feed an output connector at the rear of the panel for optional remote tripped breaker alarm/indication. A "mid-trip" function of the breaker moves the toggle to a 90 degree position when an over-current situation is encountered, providing quick visual identification of a failed circuit. It distinguishes between an over-current trip and intentional shut-off, allowing the technician to turn off individual loads without unnecessarily activating the alarm.

Input/output wiring is via rear access bus bars that accept single or double hole lugs. There is no internal power wiring or terminals, eliminating multiple points of failure. Input/output buses are secured to the load breaker sockets via nickel-plated copper bus bars.

Mounting brackets are provided to adapt the panel for 19" or 23" racks. Snap-in hole covers are provided for unused breaker ports and a clear protective toggle guard is provided to prevent accidental breaker switching and for convenient placement of identification labels.

The panel is shipped standard without breakers. These are sold separately and are plugged into the unit during installation. Refer to the Circuit breaker Specifications and Ordering Guide section at the end of this manual for available values.

Warranty period for the panel is two years, parts and labor.

For questions or comments on Newmar Distribution Panels, please call 800-854-3006 or e-mail sales@newmarpower.com.

## II) IMPORTANT SAFETY INFORMATION

1) This equipment shall be installed in a Restricted Access Location in accordance with Articles 110-16, 110-17 and 110-18 of the National Electrical Code, ANSI/NFPA 70.

2) Never restrict air flow through the vents of the DST panel.

3) Reliable Earthing (Grounding) of rackmounted equipment shall be maintained.

4) The power connections shall be made with copper conductors. Refer to NEC for proper dc wire gauge.

5) For use with Carling Technologies, C-Series circuit breakers, special purpose, single pole, rated 80V dc, 5-100 amps, Airpax LML series, or Circuit Breaker Industries D frame series orientated so that the ON position is in the UP position. (Suitable breakers are available from NEWMAR.)

## III) MATERIALS LIST

Prior to installation, carefully go over the following list to verify all necessary items have been provided. Note: Some items are provided in the hardware accessory package; others are taped to the main DST assembly or installed. For any missing items please contact the factory at US Headquarters. (Contact information may be found on the bottom of any page of this manual.)

### Hardware/parts provided with both models

- (1 ea.) Rackmount Distribution Panel Assembly
- (2 ea.) Mounting Brackets for 19" rack (stamped 13918C)
- (2 ea.) Mounting Brackets for 23" rack (stamped 13917D)
- (6 ea.) 6-32 X 5/16" Phillips Screws (for mounting bracket installation)
- (1 ea.) Molex-to-Molex Connector Assembly (four wires installed)
- (19 ea./DST-20A, 9 ea./DST-10) Open Circuit Position Covers (factory installed)
- (1 ea.) Clear Protective Toggle Guard
- (2 ea.) Toggle Guard Mounting Screws, 6-32 x 1 3/8"
- (2 ea.) Toggle Guard Nylon Stand-Offs
- (2 ea.) Flat Washers, # 6 (for toggle guard assembly)
- (8 ea.) Lock Washers, # 6 (2 ea. for toggle guard assembly; 6 ea. for mounting bracket installation)
- (1 ea.) Circuit Identification Label Set (25 ea., blank)
- (1 ea.) Circuit Breaker Extraction Tool
- (2 ea.) Circuit Breaker Extraction Screws, 6-32 x 3/8"
- (1 ea.) Installation/Operation Manual

### Additional hardware provided with model DST-20A

- (4 ea.) Bolts, Hex-Head, 1/4" - 20 x 1"
- (4 ea.) Flat Washers, 1/4"
- (40 ea.) Bolts, Hex-Head, 1/4" - 20 x 3/4"
- (4 ea.) Nuts, Hex, 1/4" - 20
- (44 ea.) Lock Washers, 1/4"

### Additional hardware provided with model DST-10

- (2 ea.) Bolts, Hex-Head, 1/4" - 20 x 1"
- (2 ea.) Flat Washers, 1/4"
- (20 ea.) Bolts, Hex-Head, 1/4" - 20 x 3/4"
- (2 ea.) Nuts, Hex, 1/4" - 20
- (22 ea.) Lock Washers, 1/4"



## IV) PANEL INSTALLATION

### A) Panel Mounting

Two sets of mounting brackets are provided (select pair required for either 19" or 23" rack), and six 6-32 x 5/16" pan head phillips screws with six # 6 lock washers are provided for attaching the brackets to the assembly. Two sets of tapped attachment holes in the assembly sides facilitate either flush or 6" forward mounting.

### B) Input Wiring

**Note:** Model DST-10 has only a single 450 amp bus (BUS A). All references in this manual to dual bus applications apply to model DST-20A only.

Hot input is wired to the heavy duty input bus bar(s) at the rear panel. These are the vertically oriented bus bars on either side labeled "BUS A" and "BUS B". The DST may be used with either positive or negative ground applications. Each bus is rated at 450 amps and in model DST-20A, they are electrically isolated, permitting redundant power, dual voltage and/or dual ground reference configurations in the same unit. (The dual buses of model DST-20A may also be paralleled to make a single 900 amp bus; refer to the OPTIONS section of this manual.)

Wiring should be terminated with ring lugs to ensure a safe installation. Two holes are provided to accommodate double hole lugs. Both holes will accept either 1/4" or 5/16" hardware and the rear hole is elongated to enable adjustment for center-to-center hole spacing between 3/4" and 1". Use the 1/4" - 20 x 1" hex head bolts, and 1/4" lock washers, flat washers and hex nuts which have been provided for securing the lugs, or obtain and install 5/16" hardware. (Note: The input bus bars are isolated from the case with a nylon spacer which allows a certain degree of "play". If a small amount of bus bar shifting is noted when wiring, this is normal.)

Recommended torque for all 1/4 inch hardware is 50 inch-pounds.

### C) Output/Load Wiring

(Refer to N.E.C. or local codes for any questions regarding proper d.c. wire gauges and color codes.)

Twenty output bus bars are provided with model DST-20A; ten are provided with model DST-10. Use of any of the outputs requires installation of a plug-in breaker at that position. Outputs 1-10 are fed by BUS A only; outputs 11-20 are fed by BUS B only (unless buses are paralleled).

Wires are attached to the numbered output bus bars using the provided 1/4 - 20 x 3/4" hex head bolts and 1/4" lock washers. Center-to-center spacing for double hole lugs is 5/8".

## V) CIRCUIT BREAKER AND SUMMARY ALARM INSTALLATION

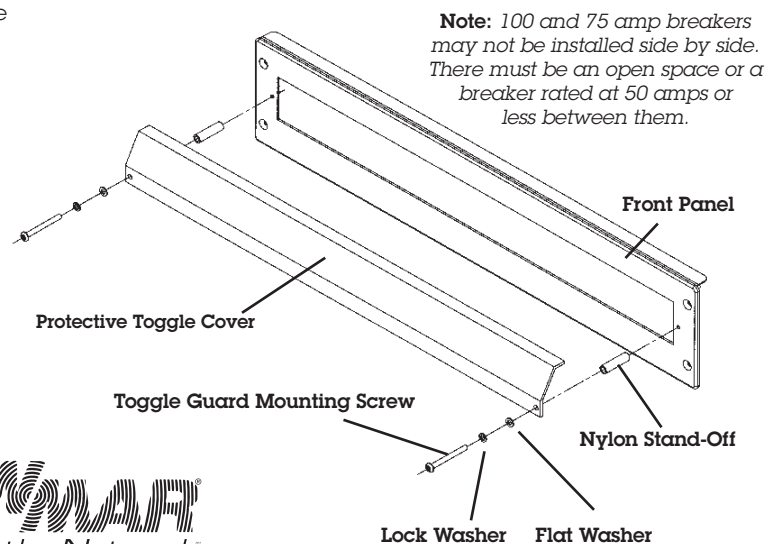
### A) Breaker Installation

The DST accepts only specially designed plug-in "mid-trip" circuit breakers with auxiliary contacts which are available from NEWMAR. (The mid-trip function is explained later). Refer to the Circuit Breaker Ordering Guide at the end of this manual for available values.

**Note:** It is recommended that only breakers obtained from NEWMAR should be used with this panel to assure proper fit and operation. When selecting the breaker use the following guideline: Where loads will be in continuous operation for three hours or more, then the breaker value should be at least 120% of normal load current.

- 1) Remove the front panel of the assembly (held in place with four flat-head phillips screws).
- 2) Install each circuit breaker by lining up the push-in studs of the breakers with the internal mating sockets and pushing firmly into place. When pressed into place, the two top auxiliary contact terminals in the middle of the breaker will press against the mating clips. (The bottom auxiliary contact is unused in this installation.)
- 3) Align the front panel into position over the breakers and onto the assembly. Knock out any plastic open position covers, as necessary. It may be necessary to nudge breakers individually up or down to achieve proper alignment.
- 4) Replace the front panel mounting screws.
- 5) Re-install plastic covers over any unused breaker positions.
- 6) Remove the plastic film from the clear protective breaker toggle guard and install as shown in FIGURE 1. Apply the provided labels to the guard for circuit identification, if desired.

**FIGURE 1: Toggle Guard Installation**



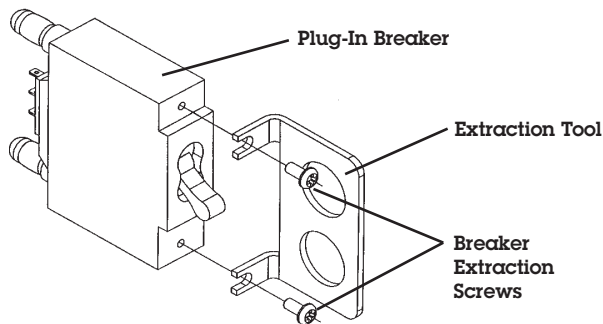
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## B) Breaker Removal

The front panel must be removed in order to remove any breaker. It is not necessary to remove the toggle guard in order to remove the front panel.

A special extraction tool (with screws) has been provided to facilitate breaker removal without putting unnecessary lateral stress on the internal sockets and mating clips. Screw the breaker extraction screws part way in, then use the tool to pull the breaker firmly out (as shown in FIGURE 2).

**FIGURE 2: Circuit Breaker Extraction**



## C) Remote Summary Alarm Wiring

A connector at the rear of the panel enables optional installation of a remote summary alarm to indicate when any breaker has been over-current tripped. Separate contacts are provided for each bus to activate Bus A and Bus B alarms independently, if desired (Bus A only for model DST-10). The alarm contacts are configured Normally Open (N.O.) and close when a breaker is tripped (not when shut off manually—see Circuit Breaker Function section). Diagrams on each side of the connector (labeled "BREAKER STATUS") in the center of the rear panel illustrate the contactor positions when any breaker in the bus is in a TRIPPED state.

A 35" four wire connector harness is provided for remote alarm indication (two wires for each bus). It is terminated with Molex connectors at both ends for compatible connection with NEWMAR's PFM-400. For applications in which a summary alarm is to be installed in a system that does not contain a PFM, simply clip off one of the connectors.

### C1) Summary Alarm Wiring with PFM-400

Plug one end of the harness into the keyed connector on the rear of the DST which is labeled BREAKER STATUS. Note: The harness is reversible, therefore it does not matter which end is plugged in. Plug the other end into an unused STATUS CONTACT INPUT connector on the rear of the PFM. (Typically the #5/#6 connector will be used when Power Modules are connected to the PFM, but the summary alarm will function the same in either the #1/#2 or #3/#4 connector positions, as well.)

If all STATUS CONTACT positions are occupied (i.e., five or six Power Modules are in the system), and a summary alarm from the DST is required, this may be accomplished through parallel wiring of the status wires. Please contact the factory for information on how to perform this modification.

**Note:** Although the breaker status contacts in the DST operate in a Normally Open configuration, the summary alarm contacts within the PFM are Form C; that is, the connector labeled OUTPUT SUMMARY ALARM on the rear of the PFM may be wired in either Normally Open or Normally Closed configuration.

When wired to the PFM in this fashion any tripped breaker within the DST will result in illumination of the CHECK SYSTEM light on the front of PFM, as well as activation of the PFM summary alarm contacts. For additional information on PFM operation, refer to the manual provided with that product. Note: The PFM is rated to 400 amps maximum.

### C2) Alarm Wiring Without PFM

Cut one of the Molex connectors off of the provided connector assembly (functionally, it does not matter which connector is removed) to create a wiring "pigtail", and plug the other end into the keyed BREAKER STATUS connector on the rear of the DST. Use parallel splices and 18 AWG wire or larger for wiring from the pigtail to the alarm.

The alarm must be configured as Normally Open (N.O.). Wire the alarm for Bus A across the yellow and blue wires (may also be yellow and purple).

Model DST-20A only: Wire the alarm for Bus B across the orange and brown wires. If a single alarm is required for both buses, connect the pigtail wires in parallel to the alarm as follows:  
Yellow-to-Orange  
Blue-to-Brown (or Purple-to-Brown)

**Caution:** Status contact wiring cannot be paralleled in applications where the A and B buses are of different voltages or have a different ground reference.

Power through the alarm contacts must not exceed the following:  
1 amp @ 125 VAC  
5 amps @ 30 VDC

## VI) CIRCUIT BREAKER FUNCTION

The plug-in circuit breaker functions as an on/off load switch and provides over-current protection specified by its amperage rating. However, the special mid-trip feature enables the technician to distinguish between a condition where the breaker has been tripped by over-current and where it has been intentionally shut off.



When the circuit breaker is manually shut off, the alarm contacts within the DST will remain in the "OPEN" position, to avoid setting off alarms unnecessarily when load disconnect is intentional. When the breaker is over-current tripped, the toggle will rest at a 90 degree position (for easy identification of the tripped circuit), and the alarm contacts will be in the "CLOSED" position. To reset, (after the overload condition has been corrected) simply switch the breaker off and back on again.

## VII) INSTALLATION OPTION - Single 900 Amp Bus (For model DST-20A only)

If the installation requires, the 450 amp A and B input buses may be paralleled to constitute a single 900 amp bus. This may be accomplished by:

Running separate 450 amp cables to each of the buses from a single power source or power source tie point, or

Running a single 900 amp cable to the A bus and a second 450 amp cable from the A bus to the B bus (or vice versa).

Refer to the Typical Wiring Diagrams on page 9. See Single Bus Installation.

**Note:** The maximum total breaker current rating for positions 1-10 (BUS A) and positions 11-20 (BUS B) remains at 450 amps each, even when the two buses are wired in parallel.

## VIII) SPECIFICATIONS

### Electrical:

#### **Nominal Input/Output:**

48, 24 or 12 VDC; positive or negative ground

#### **Total Circuit Capacity:**

DST-20A: 20 breakers

DST-10: 10 breakers

#### **Total Current Capacity:**

DST-20A: 900 amps (dual 450 amp buses)

DST-10: 450 amps (one 450 amp bus)

#### **Maximum Circuits per Bus:** 10

### Environmental:

**Temperature Rating:** Up to 50° C ambient

### Alarm/Indicator:

Tripped Breaker Contacts via **Rear Panel Connector**; Normally Open (N.O.) configuration.

**Note:** Separate contacts are provided for each bus on model DST-20A. A and B status contact wiring cannot be paralleled in applications where the buses are at different voltages or ground reference.

#### **Maximum power through the alarm contacts:**

1 amp @ 125 VAC

5 amps @ 30 VDC

### Mechanical:

**Bus Bars:** Nickel-plated copper; accept single or double hole lugs

**Front Panel:** Anodized aluminum

**Cover and Rear Panel:** Vinyl-laminated aluminum

**Dimensions:** 3.5" H x 17" W x 11.75" D; Occupies 2 RU \*19" and 23" rack mounting brackets provided

#### **Weight (without breakers):**

DST-20A: 12 lbs. DST-10: 9 lbs.

### Compliances

**UL Listed:** Listing # 31ZT

**UL 1801 First Edition:** Subject Standard for Power Distribution Center for Telecommunications Equipment

**C22.2 No. 225-M90:** Canadian Standards for Telecommunication Equipment Carries the CE Mark

**Warranty:** Two Years

## IX) CIRCUIT BREAKER SPECIFICATIONS AND ORDERING GUIDE

Current Ratings: See list below (breaker value stamped beside toggle)

**Voltage Rating:** 80 VDC max.

**Type:** Magnetic-Hydraulic Plug-in with Auxiliary Contacts (Normally Open) and Mid-Trip Function

**UL Listed Telecom Breaker**

**CSA Certified**

**10,000 Amp Interrupt Capacity**

To order additional or replacement breakers for the DST refer to the following NEWMAR model or Carlingswitch part numbers:

Rating	NEWMAR Model
5 amp	PBA-5
10 amp	PBA-10
15 amp	PBA-15
25 amp	PBA-25
30 amp	PBA-30
40 amp	PBA-40
50 amp	PBA-50
75 amp	PBA-75
100 amp	PBA-100

**Note:** Other circuit breaker values are available on a special order basis. Typical lead time is 10 weeks.

## X) DST ACCESSORIES

### **Ground Bus Bar Assembly**

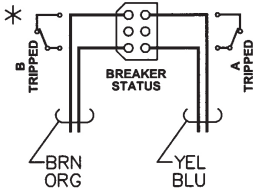
\* 800 amps: Model BBA-800

### **Rear Terminal Cover Assembly**

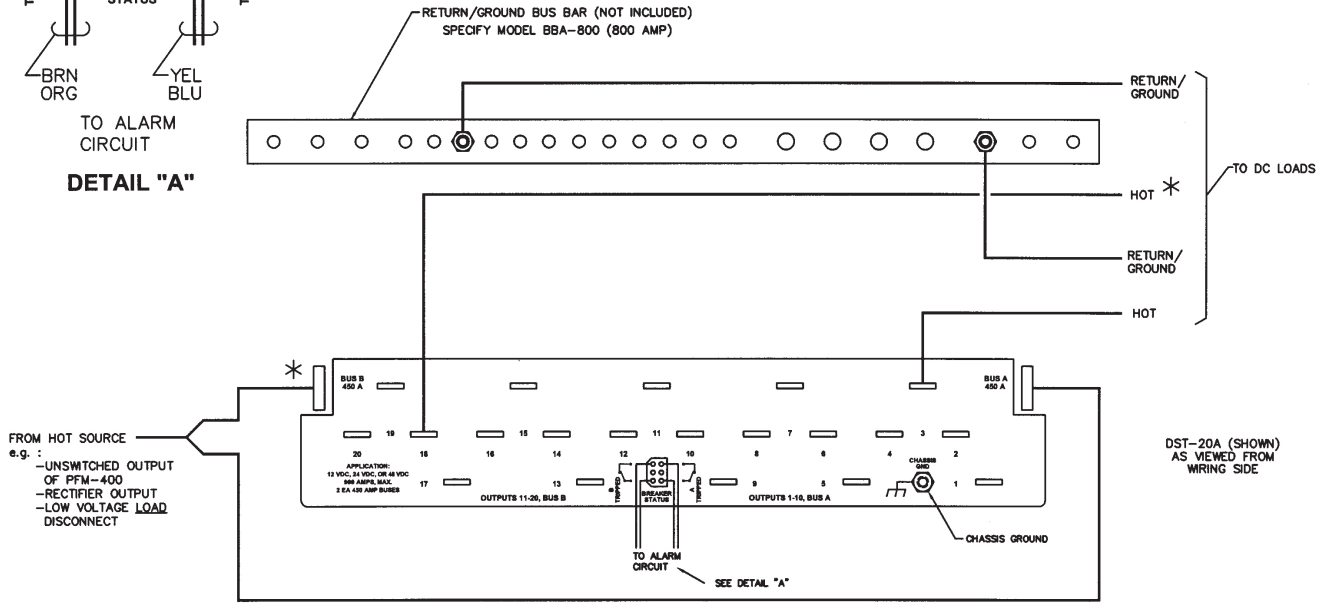
\* Specify Model RC-DST

  
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# XI) TYPICAL WIRING DIAGRAMS



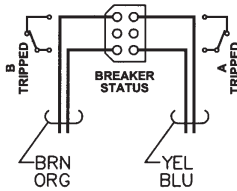
**DETAIL "A"**



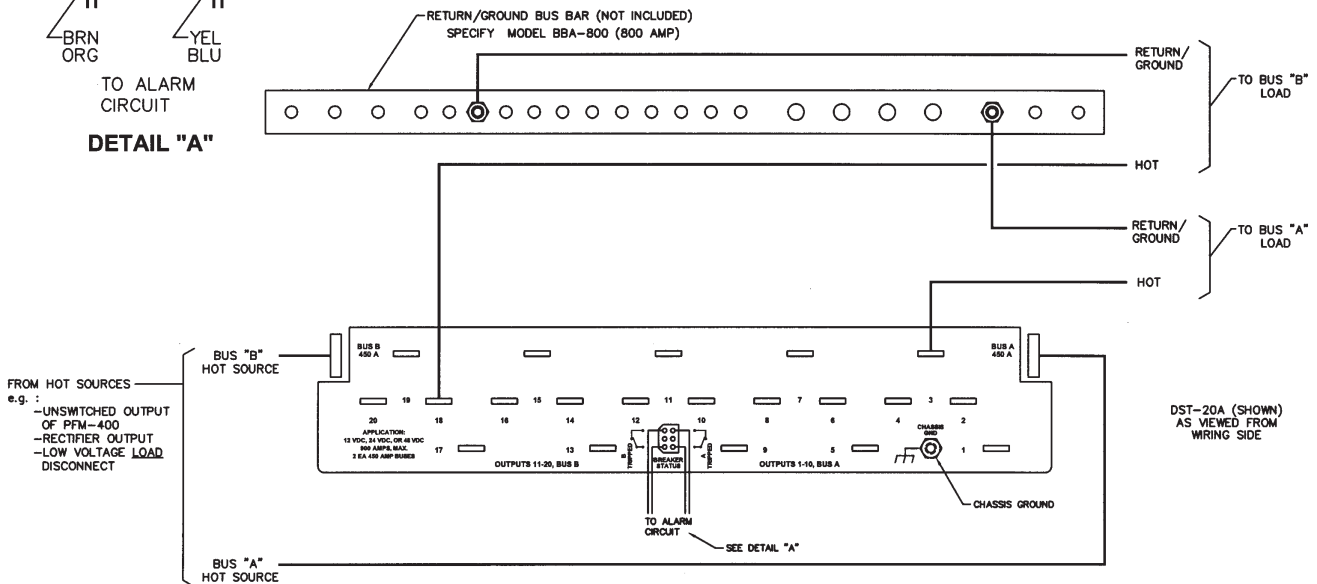
\* MODEL DST-20A, ONLY

DST-20A:  
20 CIRCUITS  
900 AMPS, MAX  
(450 A, BUS "A" & 450 A, BUS "B")

DST-10:  
10 CIRCUITS  
450 AMPS, MAX

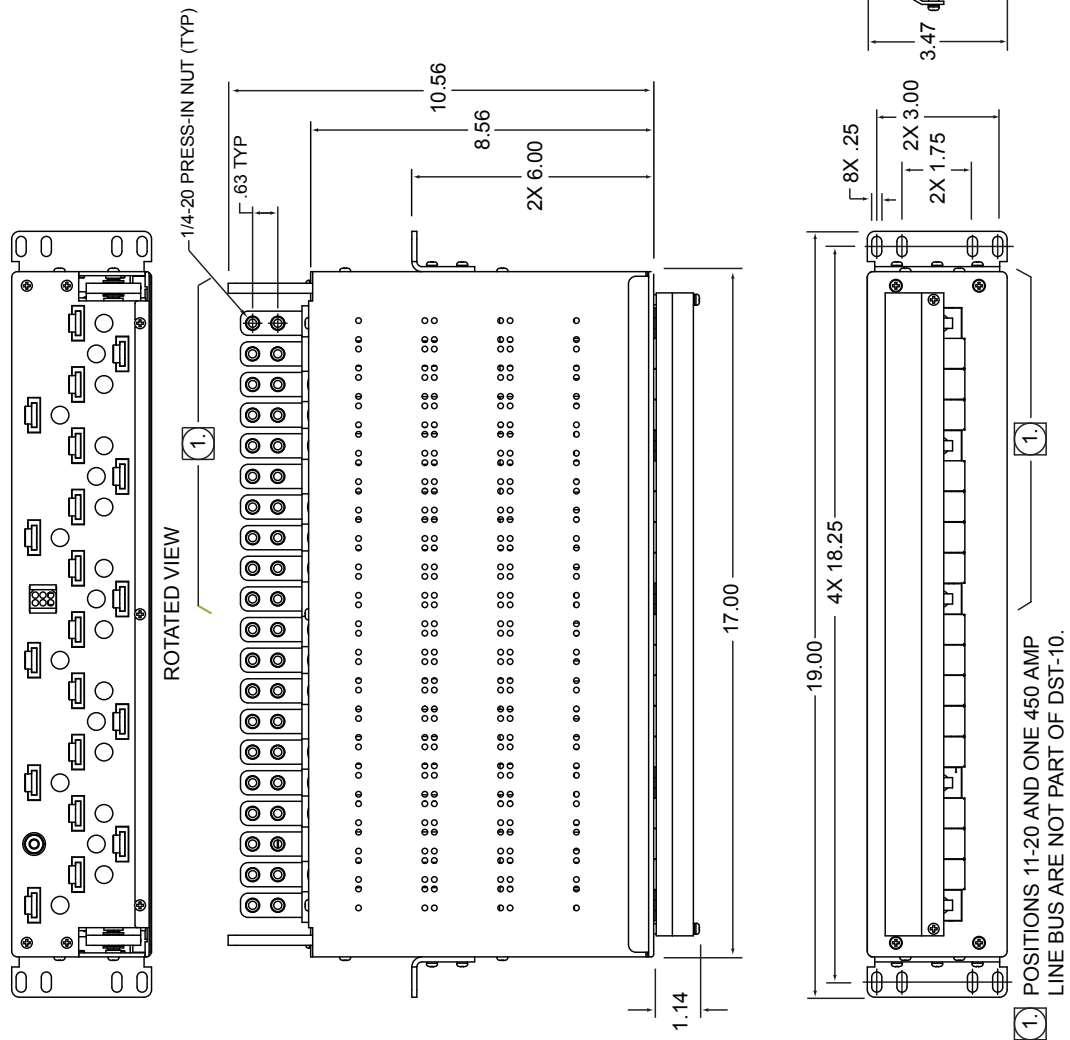
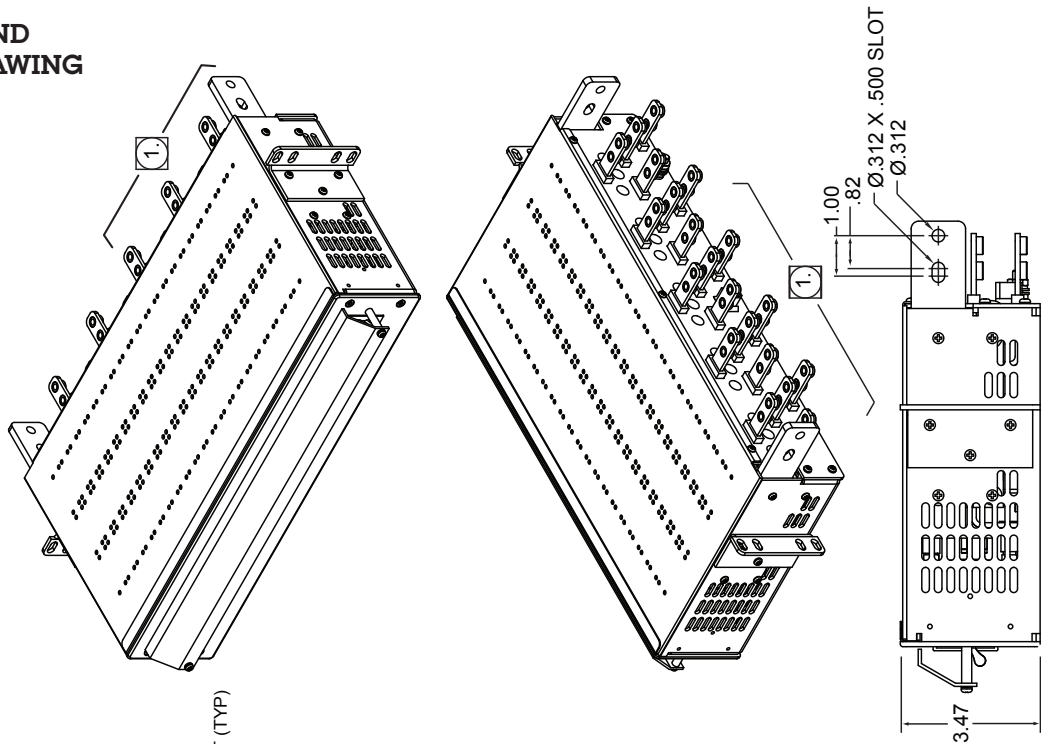


**DETAIL "A"**



- SPLIT BUS INSTALLATION, MODEL DST-20A ONLY -  
UP TO 10 CIRCUITS PER BUS ("A" & "B")  
450 AMPS, MAX PER BUS

**XII) OUTLINE AND MOUNTING DRAWING**



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**Note: All Dimensions In Inches**