

# Dual 40/50/100A Configurable Breaker Panel



## Installation Guide

## Model T009-5XXXXXXX

Telect's dual-feed configurable breaker panel provides circuit breaker power protection for a variety of telecommunications equipment. Panel includes up to 7 circuit breakers per side for a total maximum continuous load of 40A, 50A, or 100A:

- 40A with optional 50A thermal input breakers
- 50A *without* optional input breakers (screw-tight inputs)
- 100A *without* optional input breakers (compression inputs only)

White or black panels can be configured with any combination of 1A to 20A Carling, M-Series breakers [oriented with the "on" symbol ( | ) at either the bottom or top], 50A thermal input breaker, and either screw-tight or compression input connectors. Screw-tight connectors can be oriented for sideways or top-down wiring.

Feeds A and B are totally independent except for the replaceable alarm card which contains power and alarm LEDs for both feeds. Also included are breaker alarm and power-fail relay terminals for wiring to external indicators.

Hardware is included for flush or extended mounting in 19" or 23" relay racks. See "Accessories" (Page 7) for ordering optional and replaceable items: output breakers, face plates, lugs, ETSI mounting kit, and more.

### Mechanical Specifications

Dimensions (nominal), without brackets*	Width: 17.25 in. (43.82 cm) Height: 1.75 in. (4.44 cm) Depth: 8.00 in. (20.32 cm)
Weight without breakers	9 lb (4.08 kg)
Weight, shipping	10.5 lb (4.76 kg)
Mounting for standard racks	EIA: 19 in. (48.2 cm) WECO: 23 in. (58.4 cm) ETSI: 53.3 cm. [Kit sold separately. See "Accessories" (Page 7).]
Ground terminals	Quantity: 2 Stud: M5 with hex nut. [Use 8 mm (5/16 in.) socket.] Lugs: Single or dual-hole compression lug [5/8 in. (1.59 cm) center to center] Cable: Up to #10 AWG for single-hole lug Up to #6 AWG for dual-hole lug. (Conductor size depends on in- put interruption device.) Torque: 20 in.-lb (~2.25 N•m), max.

Input terminals — Compression	Quantity: 4—2 BATT, 2 RTN Stud: M5 with KEPS nut. [Use 8 mm (5/16 in.) socket.] Lugs: Dual-hole compression lug [5/8 in. (1.59 cm) center to center] Cable: Up to #1 AWG, depending on in- put interruption device Torque: 20 in.-lb (~2.25 N•m), max.
Input terminals — Phoenix-style screw-tight	Slotted screwhead for wire clamping up to #6 AWG, depending on input interruption device. Torque screws to 14 in.-lb (~1.5 N•m).
Output terminals — Wire binding	Quantity: 28—14 BATT, 14 RTN Screw: #6 Phillips** panhead Cable: Up to #10 AWG Clearance: 0.31 in. (.79 cm) between termi- nal barriers Torque: 9 in.-lb (1.02 N•m), max.
Alarm terminals — Wire binding	Quantity: 6 Screw: #4 Phillips** panhead Cable: #30 to #16 AWG Torque: 4 in.-lb (0.45 N•m), max.

\* See Page 11 for exact dimensions.

\*\* Screws with cross-recessed heads.



## Electrical Specifications

Operating voltages	-20 to -60 Vdc, +20 to +30 Vdc
Maximum input interruption device rating	125A for a 100A panel 60A for all other panels.
Maximum continuous input load rating (total)	100A per feed (with compression inputs but <i>without</i> 50A thermal input breaker) 50A per feed (with screw-tight inputs but <i>without</i> 50A thermal input breaker) 40A per feed ( <i>with</i> 50A thermal input breaker)
Maximum output interruption device rating	20A per circuit breaker
Maximum continuous output load rating	16A per circuit breaker
Alarm contact ratings, continuous	2A at 30 Vdc    0.6A at 60 Vdc
Alarm board power ratings	@20V: 80mA (1.60W)    @24V: 112mA (2.69W) @27V: 120mA (3.24W)    @30V: 122mA (3.66W) @40V: 127mA (5.08W)    @48V: 130mA (6.24W) @54V: 133mA (7.18W)    @60V: 136mA (8.16W)
Max. operating temperature at max. load ratings	55°C (131°F)
Min. operating temperature at max. load ratings	-10°C (14°F)
Ambient operating temp. at half-load	55°C (131°F)
Max. surface temperature of breakers at 26°C (79°F) ambient	35°C (95°F)
Max. panel heat dissipation at full load	18W per side at 1920W (40A x 48V) per side 20W per side at 2400W (50A x 48V) per side 42W per side at 4800W (100A x 48V) per side
Percentage of full load heat dissipation at nominal voltage	less than 1% of total load wattage

## ! ALERT

**ALERT! This product must be installed and maintained only by qualified personnel. Verify all connections meet requirements specified in local electric codes or operating company guidelines before supplying power. Protect this equipment with a fuse or breaker sufficient to interrupt power levels specified under “Electrical Specifications”.**

Please read these instructions carefully before beginning installation. If you need assistance call Technical Support at 888-821-4856 (domestic calls), or 509-921-6161 (Option 2), or eMAIL us at [getinfo@telect.com](mailto:getinfo@telect.com)

1. Inspect equipment after unpacking and compare it to the packing list.

Immediately report any shipping damage, defects, or missing parts to Telect at 1-800-551-4567. Keep all documentation that comes with your shipment.

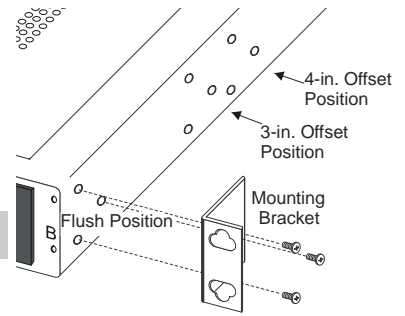
### NOTE

*Telect is not liable for shipping damage. If damaged, notify the carrier and call Telect's Customer Service Department at 1-800-551-4567 (domestic only) or 1-509-926-6000 for further recourse.*

### NOTE

*Panel brackets provide either flush or extended EIA or WECO mounting in a 19" or 23" rack. Panel is configured at the factory for flush mounting in a 19" rack.*

- If necessary, remove 3 screws and reposition/re-align brackets on sides of distribution panel, as shown in "Bracket Orientation".
- Locate an unused rack position and mount panel using 4 screws and lockwashers provided, as shown in "Rack Mounting". (Prefer mounting panel as high as possible on rack.) Tighten screws to 35 in.-lb (4.29 N•m).



Torque #8 screws to  
15 in.-lbs [1.7 N•m]

**Bracket Orientation**

## **! WARNING**

**WARNING!** Failure to properly ground this equipment can create hazardous conditions to installation personnel and to the equipment.

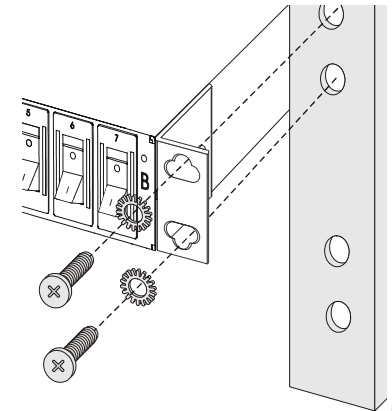
**WARNUNG!** Bei unsachgemäßer Erdung besteht Gefahr für das Installationspersonal und das Gerät!

**¡AVISO!** La conexión incorrecta a tierra puede ser peligrosa tanto para los instaladores como para el equipo.

**ADVERTISSEMENT !** Si vous ne reliez pas correctement cet équipement à la terre, son utilisation présente des dangers pour la personne qui l'installe ainsi que pour l'équipement.

## **! ALERT**

**ALERT!** Only use components and crimping tools approved by agencies or certifying bodies recognized in your country or region such as Underwriter's Laboratories (UL), TUV, etc.



**Rack Mounting**

- For ground wiring, use a listed (approved) crimping tool to attach a listed (approved), single- or dual-hole compression lug onto suitable ground wire. (Use #10 to #6 AWG, depending on input interruption device.)
- Use a coarse, nonmetallic cleaning pad to clean terminals and stud(s).
- Telect recommends that you lightly coat anti-oxidant on lug, grounding terminal, and surrounding contacting surface. Connect lug to stud using M5 washer and nut from terminal, as shown in "Ground Lug Connection". Tighten nut to 20 in.-lb (~2.25 N•m) using a 8 mm (<sup>5</sup>/<sub>16</sub> in.) socket.

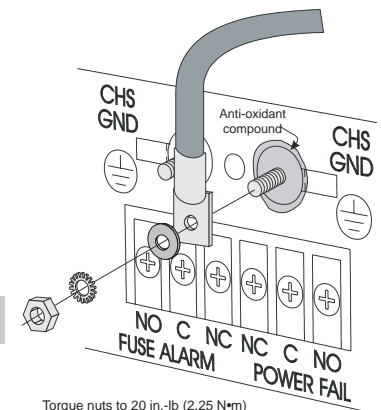
## **! WARNING**

**WARNING!** Before connecting input power cables, make sure input power to panel is turned off.

**WARNUNG!** Vor Anschluss der Eingangsstromkabel ist sicherzustellen, dass der Eingangsstrom ausgeschaltet ist.

**¡AVISO!** Antes de conectar los cables de entrada de la alimentación, compruebe que la alimentación de entrada al panel está cortada.

**ADVERTISSEMENT !** Avant de connecter les câbles d'entrée d'alimentation, assurez-vous que l'alimentation électrique du panneau est coupée.



Torque nuts to 20 in.-lb (2.25 N•m)

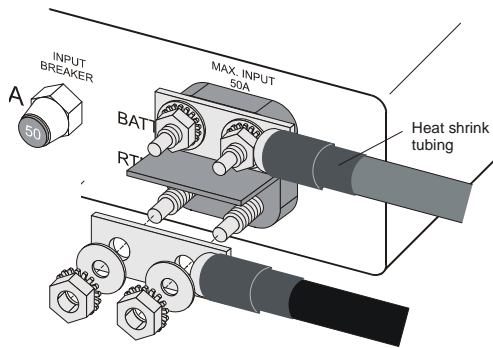
**Ground Lug Connection**

- Make sure input power is off.

8. For input wiring — wiring used as inputs to this distribution panel — proceed as follows:

**For Compression Lug Inputs**

- a. Crimp dual-hole compression lugs onto suitable copper wires (#6 to #1 AWG) for **BATT** and **RTN** terminals, Feeds A and B.
- b. Remove the black plastic terminal covers, if installed.
- c. Use a coarse, nonmetallic cleaning pad to clean terminals and studs.
- d. Lightly coat anti-oxidant on lugs and input **BATTERY** and **RETURN** terminals, and then connect lugs to Feed A and B input terminals on back of panel using M5 KEPs nuts and washers provided, as shown in “Compression Lug Inputs”. Tighten lugs to 20 in.-lb (2.25 N•m).

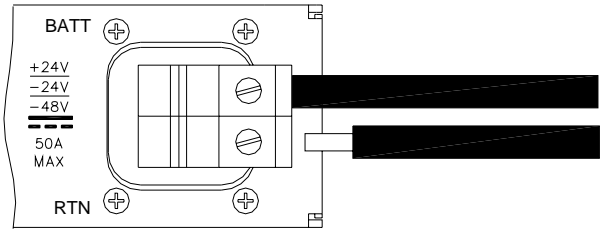
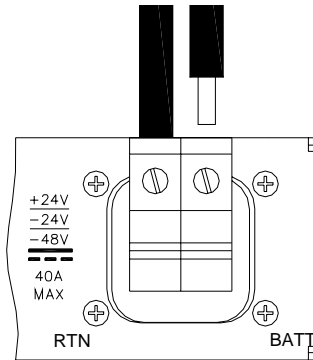


Compression Lug Inputs

e. Re-install terminal covers.

**For Screw-Tight Inputs**

- a. Strip ¼ in. (0.635 cm.) of insulation from of input cables.
- b. For **BATT** and **RTN** of each feed, insert input cables all of the way into connectors and then tighten to 14 in.-lb (~1.5 N•m).



Screw-Tight Vertical & Horizontal Inputs

9. Make sure power is off [open breaker, dummy fuse, or open fuse holder at power distribution unit (PDU)] before connecting this panel's cables to PDU.

10. Make sure breakers on this panel are all off.

11. Enable fuse or breaker at PDU (60A or 125A max., depending on configuration) to turn on Feed A to Side A of panel; check voltage and polarity *at input connectors of panel*. Also, check that —

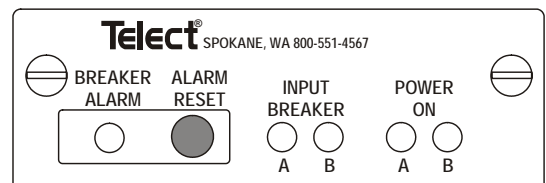
- **POWER ON A** LED on front of panel turns on (green).
- **INPUT BREAKER A** LED (for a panel with optional input breakers) turns on (green).

If not, check that input breakers on rear of panel are pressed in.

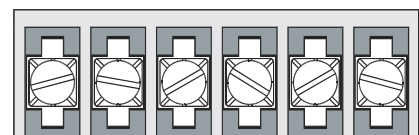
- **BREAKER ALARM** LED turns on (red).
- **POWER ON B** must be *off*.

12. With **POWER ON A** lit (normal operation) — but with **POWER ON B** LED off (failure operation) — test power-fail relay and contacts at **POWER FAIL** terminals on rear of panel:

- Expect an open circuit ( $\infty\Omega$ ) between Terminals **C** and **NC**.
- Expect continuity ( $0\Omega$ ) between Terminals **C** and **NO**.



Alarm Indicators



NO C NC NC C NO  
FUSE ALARM POWER FAIL

Alarm Terminals

13. Repeat Steps 11 and 12 for Feed B and observe that **POWER ON B** LED turns on (green).
14. Press and hold ALARM RESET on front of panel for 5 seconds to verify that *all* LEDs are in working order.
15. With one or all circuit breakers off, test fuse alarm relay contacts at **FUSE ALARM** terminals on rear of panel:
  - Expect an open circuit ( $\infty\Omega$ ) between Terminals **C** and **NC**.
  - Expect continuity ( $0\Omega$ ) between Terminals **C** and **NO**.
16. With both Feeds A and B on, recheck **POWER FAIL** terminals:
  - Expect continuity ( $0\Omega$ ) between Terminals **C** and **NC**.
  - Expect an open circuit ( $\infty\Omega$ ) between Terminals **C** and **NO**.
17. Recheck that all of circuit breakers on panel are off.
18. For output wiring, do either of the following:
  - *If using lugs*, strip off  $\frac{3}{8}$  in. (~1 cm) of insulation from one end of copper output wires and then crimp on ring or forked, single-hole lugs, as required by NEC. (Screw terminals will accommodate lugs for up to 10 AWG.)
  - *If using bare wire*, strip off  $\frac{5}{8}$  in. (~1.5 cm) of insulation. (Stranded wires should be tinned.)

Remember: Output wires must be rated at or above the amperage rating of the output circuit breaker. For example, use no smaller than #12 AWG output wiring for 20A output fuses. Do not exceed 16A continuous load for a 20A breaker.

## ALERT

**ALERT!** Local electrical and operating company guidelines recommend that the individual load not exceed 80% of circuit breaker capacity (for example, 10A breaker x .80 = 8A max. load). **Total load for all breaker outputs on each side must not exceed —**

- 40A for a panel with an optional thermal input breaker,
- 50A for a panel having screw-tight inputs connectors, but *without* an optional thermal input breaker, or
- 100A for a panel having compression input connectors, but *without* an optional thermal input breaker.

19. Clean output terminals and lugs with a nonabrasive, nonmetallic pad.
20. If installed, remove covers over output and alarm connectors.
21. Telect recommends that you lightly coat anti-oxidant on lugs and output **BATTERY** and **RETURN** terminals before connecting lugs/wires to outputs. (NEC specifies only one lug and load for each output terminal.) Tighten screws to 9 in.-lb (1.01 N•m).
22. Connect other end of output wires to *load*.
23. Use designation labels (supplied) to record outputs, as specified by operating company standard installation procedures.
24. Make sure inputs at *loads are disabled* by removing all power cards or all input fuses at load equipment.
 

Always follow recommended operating company guidelines when disabling load equipment.
25. *One by one*, turn on circuit breakers on this panel and check voltage and polarity *at input of loads*.
26. With all circuit breakers on, the **BREAKER ALARM** LED must go off. Test fuse alarm relay contacts at **FUSE ALARM** terminals on rear of panel:
  - Expect continuity ( $0\Omega$ ) between Terminals **C** and **NC**.
  - Expect an open circuit ( $\infty\Omega$ ) between Terminals **C** and **NO**.

POS	LOCATION	POS	LOCATION
1		1	
2	A	2	B
3		3	
4		4	
5		5	
6		6	
7		7	

Designation Label

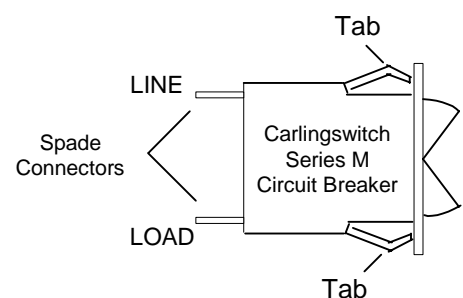
27. Switch off one of the circuit breakers to simulate a tripped breaker.  
Again, the **BREAKER ALARM** LED should light.
28. Press ALARM RESET on front of panel.  
**BREAKER ALARM** LED should go off again. (Pressing ALARM RESET will reset the **BREAKER ALARM** LED on front and clear **FUSE ALARM** on rear of panel.) Recheck **FUSE ALARM** terminals and expect the same status as in Step 26 with all breakers on.
29. If desired, connect remote external audio/visual alarm indicator wires (solid or tinned wires, #30 to #16 AWG) to the **POWER FAIL** and **FUSE ALARM** terminals.
30. One by one, re-enable load equipment and verify proper operation.
31. Re-install covers over output and alarm terminals.

## REPLACING OUTPUT CIRCUIT BREAKERS

### **!** ALERT

**ALERT! Although difficult to remove from the panel, circuit breakers can be disconnected and replaced.**

1. Be sure new breaker is the same size as breaker being replaced.
2. Place new breaker within easy reach of panel. Be sure new breaker is off ( **O** ) position.
3. If possible, turn off all breakers on the side (A or B) where the breaker is to be replaced. Then, turn off input power to that side of panel.
4. Place breaker to be replaced in the off position.
5. Using a very small, flat-tipped screwdriver, carefully pry out on bottom of breaker while applying upward force on face of breaker.  
This should raise the bottom of the breaker so it slightly protrudes out the front of the panel.
6. While preventing breaker from going back into panel, depress bottom tab with the screwdriver and pull out on breaker.  
This starts the tab through the panel front opening so that it is dislodged about  $\frac{1}{16}$  in. (~.15 cm) at the bottom.
7. While pulling on breaker, work the screwdriver at the top to release the top tab.  
If both tabs are released, the breaker should begin to pull out the front of the panel.
8. The breaker conductors can be pulled loose from the assembly at the rear of the panel. Do not pull out on the breaker more than necessary when removing and installing the **LOAD** and **LINE** connectors.
9. Gently work breaker out front of panel until rear connectors can be accessed by pliers.
10. Remove **LOAD** connector from breaker using needle-nose pliers:
  - For standard circuit breaker installations, with “**O**” at the top and “**I**” at the bottom, the **LOAD** connector will be near the bottom.
  - For circuit breaker installations with “**I**” at the top and “**O**” at the bottom, the **LOAD** connector will be near the top.
11. Restrain connector to prevent it from traveling back in to panel.



## ALERT

**ALERT! The LINE side connection of the breaker has live Vdc. Do not allow contact of the connector (or tools holding the connector) to grounded ironwork or panel chassis.**

---

12. While holding breaker out from the front of the panel, grasp **LINE** connector of breaker with needle-nose pliers.
13. Hold the **LINE** connector with pliers and then pull breaker, wiggling it until breaker is free from connector. Continue to hold the **LINE** connector with the pliers. Do not allow the connector to contact the panel chassis.
14. With your free hand, pick up new breaker and check orientation of new breaker.
15. Press spade connector of new breaker into the pliers-held **LINE** connector until fully seated.  
Visually inspect the connection to be sure full contact is made between the **LINE** connector and the breaker spade connector.
16. Place the **LOAD** conductor connector on the **LOAD** spade connector of the breaker.  
Visually inspect the connection.
17. Gently place breaker back into panel. Push on front of breaker until tabs are cleared and breaker is secure in panel.
18. If input power was turned off, restore input power and turn on breakers one at a time.
19. When new breaker is turned on, check output terminal for correct polarity.

## ACCESSORIES

The following lists optional and replacement items for the panel. For compression lugs, please refer to *Wire Sizing, Label Convention, & Lug Chart* (Telect Part No. 117995) included with your panel.

Item	Description	Part Number
Alarm Card	With <b>INPUT BREAKER</b> LEDs	400207
Circuit Breaker <sup>1</sup>	1A long delay	115268
	3A long delay	115266
	5A long delay	115267
	10A long delay	115269
	15A long delay	115265
	20A long delay	115270
	Blank	113882
ETSI Mounting Brackets	Black	090-0041-0030
	White	090-0041-0031
Front Cover	Clear	090-0001-0001
Designation Label	1-7, A & B	115353

1. Breakers are sold for repair/replacement of field breakers and not for reconfiguring the panel.

### NOTE

For service and warranty, see our [telect.com](http://telect.com) website, or eMAIL inquires to [getinfo@telect.com](mailto:getinfo@telect.com), or phone us at 800-551-4567 (domestic only) or 509-926-8915.

## LED & ALARM SUMMARY

### Normal Operation

- **POWER ON A & POWER ON B** LEDs will be on (green).
- **INPUT BREAKER A & INPUT BREAKER B** LEDs will be on (green) for panel with optional input breakers.
- **BREAKER ALARM** LED will be off.
- **FUSE ALARM** relay is de-energized so that —
  - ◇ C to NC is closed and
  - ◇ C to NO is open.
- **POWER FAIL** relay is energized so that —
  - ◇ C to NC is closed and
  - ◇ C to NO is open.

### Input Power Failure

- **POWER ON A** or **POWER ON B** LED(s) will go off.
- **POWER FAIL** relay de-energizes so that —
  - ◇ C to NC opens and
  - ◇ C to NO closes.

### Input Breaker Opens (input breakers are optional)

- **INPUT BREAKER A** or **INPUT BREAKER B** LED(s) will go off.
- **BREAKER ALARM** LED will go on (red).
- **POWER FAIL** relay de-energizes so that —
  - ◇ C to NC opens and
  - ◇ C to NO closes.
- **FUSE ALARM** relay energizes so that —
  - ◇ C to NC opens and
  - ◇ C to NO closes.

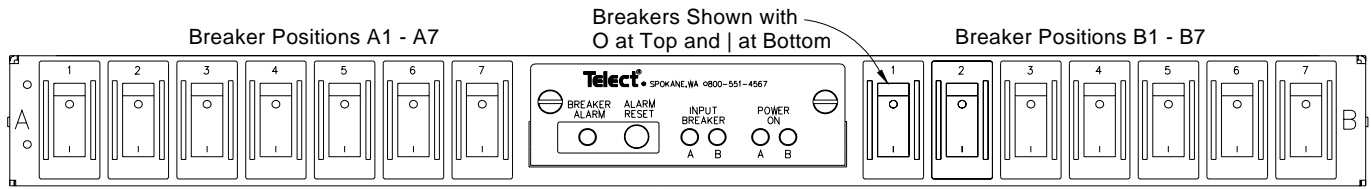
### Output Breaker Opens (either being tripped or manually turned off)

- **BREAKER ALARM** will go on (red).
- **FUSE ALARM** relay energizes so that —
  - ◇ C to NC opens and
  - ◇ C to NO closes.

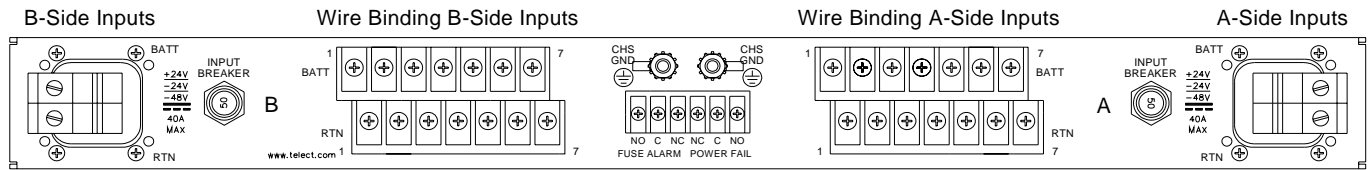
Pressing ALARM RESET turns off **BREAKER ALARM** LED and de-energizes **FUSE ALARM** relay.



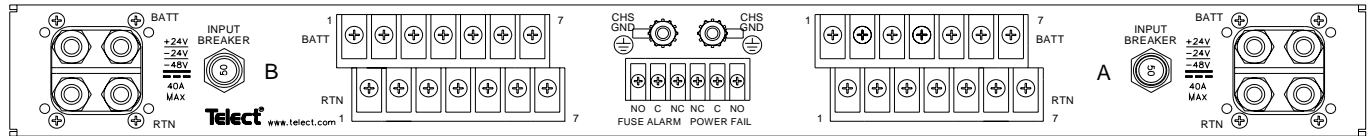
# PHYSICAL ATTRIBUTES



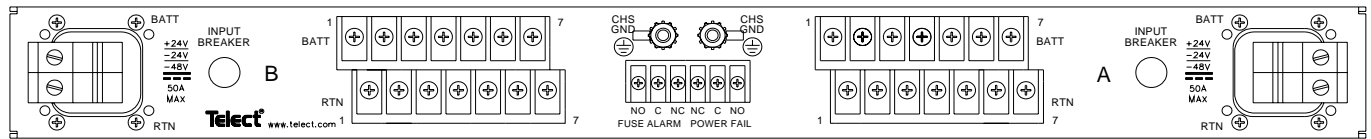
FRONT VIEW



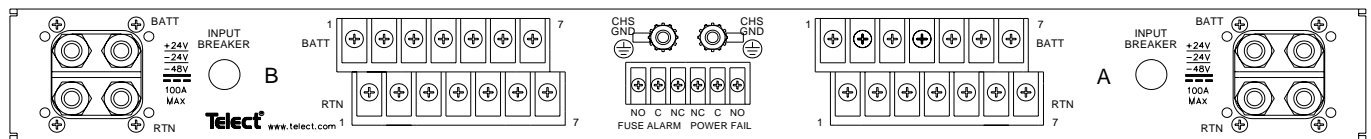
Screw-Tight Horizontal Inputs With 50A Input Breakers



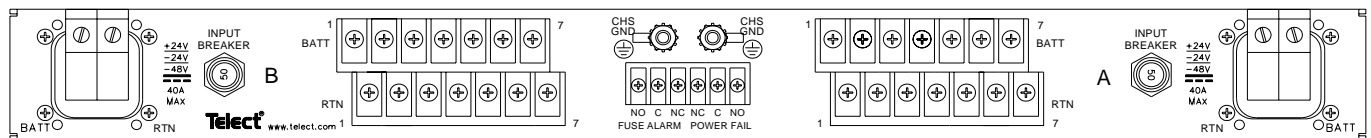
Compression Inputs With 50A Input Breakers



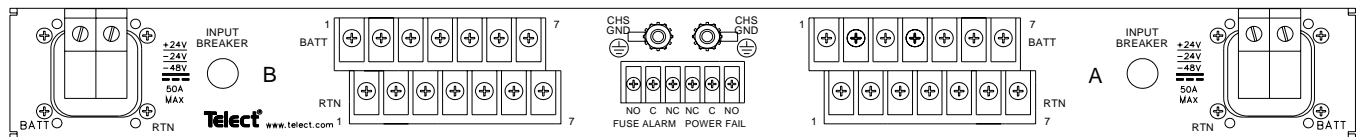
Screw-Tight Horizontal Inputs Without 50A Input Breakers



Compression Inputs Without 50A Input Breakers (100A max./side)



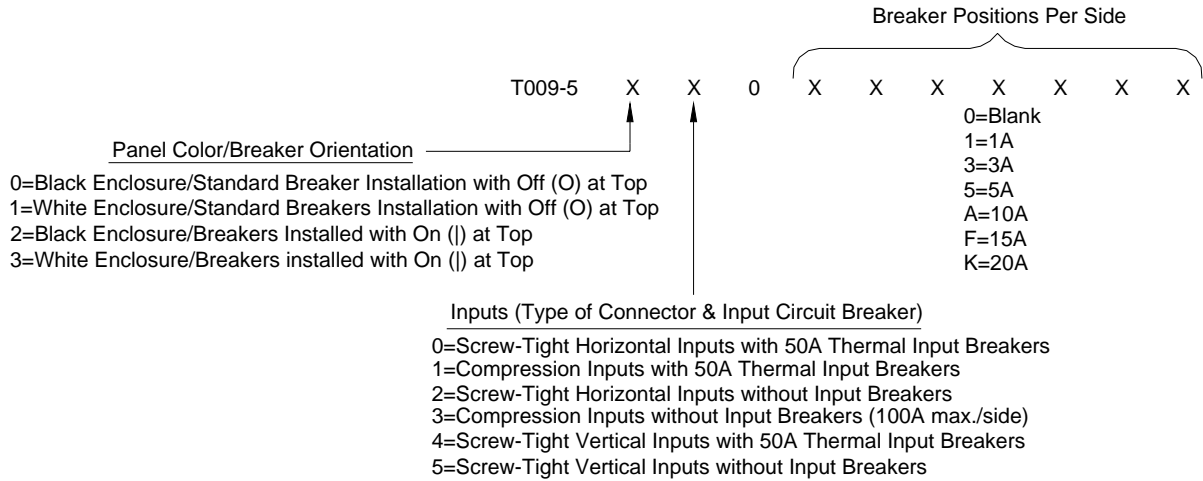
Screw-Tight Vertical Inputs With 50A Input Breakers



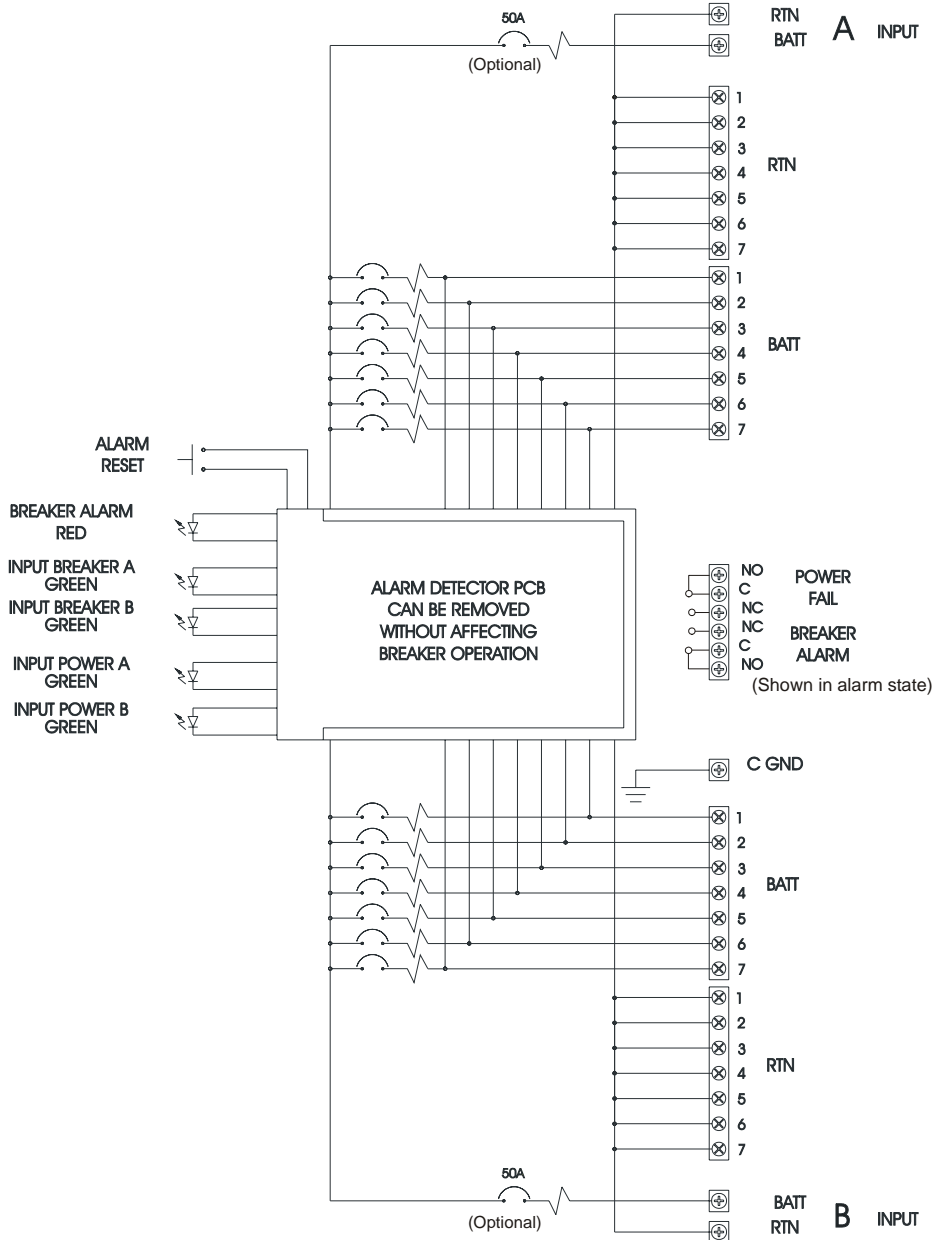
Screw-Tight Vertical Inputs Without 50A Input Breakers

REAR VIEW

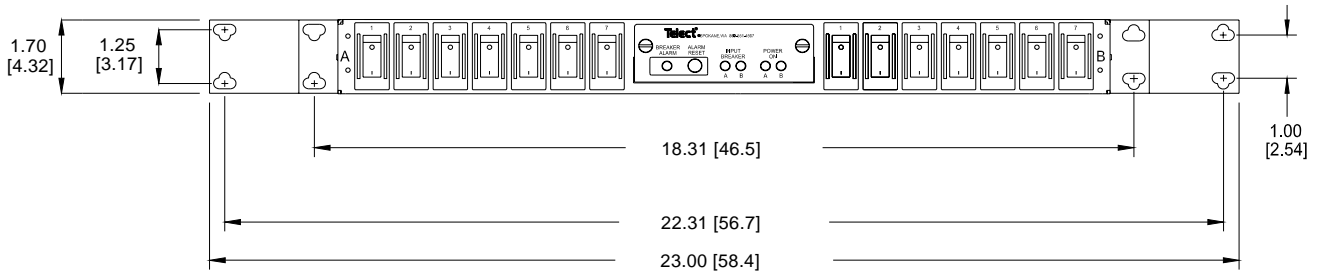
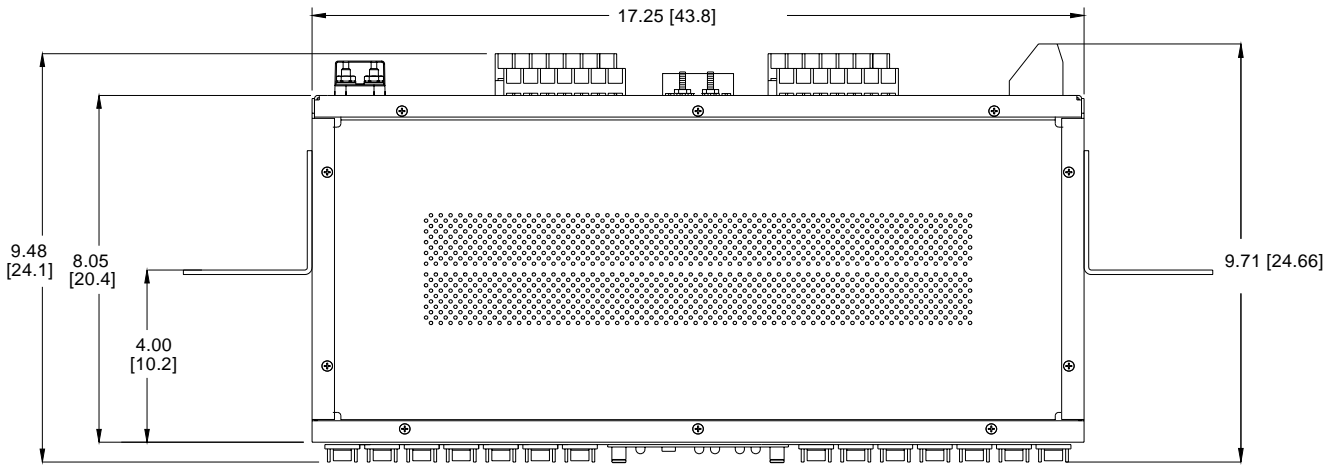
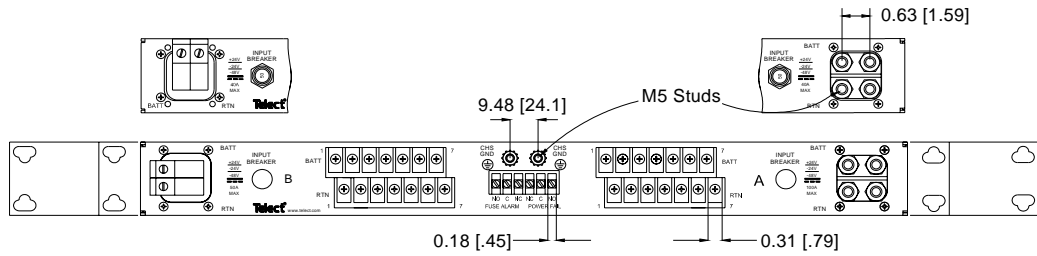
# CONFIGURATION



# SCHEMATIC DRAWING



# ASSEMBLY DRAWING



If you need help or have a question about this or other product applications, contact a Telect Customer Service Representative. You can reach us at —

Telect, Inc.  
 2111 N. Molter Rd.  
 P.O. Box 665 Liberty Lake, WA 99019  
 509.926.6000 or 800.551.4567 Fax 509.926.8915  
 E-mail: [getinfo@telect.com](mailto:getinfo@telect.com) Internet: <http://www.telect.com>

Telect assumes no liability from the application or use of these products. Neither does Telect convey any license under its patent rights or the patent rights of others. This document and the products described herein are subject to change without notice.