Dual-Feed 20x20 GMT Fuse Alarm Panel

Installation Guide

Telect's low-cost Dual-Feed 20x20 GMT Fuse Alarm Panels are 1RU (EIA) power shelves providing protection and redundancy for -48 Vdc telecommunications equipment.

Each side of 20 GMT fuses handles a combined continuous load of 50A (max,) at a max. output of 10A per position. Power-fail and fuse alarm relays provide standard, Form-C dry contacts.

009-0004-1044
Black

009-0004-1045
White

Input connectors on Model 009-0004-1044 are screw-tight, handling a wire size range of 22-6 AWG; input connectors on Model 009-004-1045 are for dual-hole compression lugs, handling a wire size of #10-#2 AWG[1]. Output and alarm terminals on both panels are wire binding under #3 panhead screws[2]. Outputs and alarms accommodate up to 16 AWG bare wire, or 14 AWG with a Burndy forked lug. (Output and alarm lugs are not provided.) All terminals are covered by a removable one-piece transparent cover.

Hardware is included for flush or extended 3-in. or 4-in. mounting in 19-in. or 23-in. racks with either EIA or WECO spacing. ETSI mounting kit is available. Visit our website for ordering Telect accessories and replaceable parts: output fuses, dummy fuses, GMT safety covers, ETSI mounting kit, color-codes fuse designation rivets, and more.

General / Mechanical / Environmental Specifications

Dimensions (nominal without brackets)*	Width: 17.25 in. (438.2 mm) Height: 1.70 in. (43.2 mm) Depth: 8 in. (203.2 mm)	Input terminals 009-0004-1044	Type:	Screw-tight
			Cable:	#22 - #6 AWG copper, depending on input interruption device
Weight	Installed: ~5 lb (~2.25 kg) Shipping: ~7 lb (~3 kg)		Torque:	14 in.-lb (~7 N•m), max.
		009-0004-1045	Type:	Dual-hole compression, #10 studs with washers and 10-32 KEPS nuts on .625 in. centers. Max. lug width is 0.55 in. (13.9 mm)
Acoustic noise	0 dBA above ambient			
Temperature range	-25°C to 60°C (-13°F to 140°F)			
Humidity	5% to 85% and noncondensing		Cable:	#10 - #2 AWG copper, depending on lug and PDU circuit breaker or fuse
Compliance 009-0004-1044	Not tested for NEBS, UL or Telcordia)		Torque:	20 in.-lb (2.25 N•m)
009-0004-1045	NEBS Certified, UL, Telcordia GR-1089-CORE & GR63-CORE	Output & Alarm terminals (Wire Binding Screw)	Screw:	#3 slotted captive screws
			Wire:	#16 AWG (max.) bare wire; #16 - #14 AWG (max.) with lug
Ground terminal	Screws: #6-32 stud with washer and KEPS nut. KEPS nut diameter is 0.375 in. (9.6 mm) Lugs: Single compression to accommodate KEPS nut Cable: #10 - #12 AWG copper, depending on PDU circuit interrupter Torque: 8.7 in.-lb (~0.98 N•m), max.		Forked Lug:	Burndy TP14-2F or TP14-2Z**
			Spacing:	.25 in. (6.35 mm) centerline with.19 in. (4.8 mm) between barriers
			Torque:	3.5 in.-lb (0.39 N•m)

* See Page 9 for full dimensioning. ** Lug with flanged (dog eared) tongue.

1. Wire size depends on barrel size of lug.
2. Telect's Dual-Feed, Low-Current 20/20 GMT Series Fuse Panels (Models 06004-01, 06004-05 & 06004-11) use screw-tight, wire-clamping input and output terminals. Alarm terminals are wire-wrap pins.

Telect®
CONNECTING THE FUTURE®

| Operating voltages	-20 to -60 Vdc
Current capacity	50A per bus (100A total)
Fuse capacity	20 GMT fuses per bus
Maximum input interruption device rating	60A per feed
Maximum output interruption device rating	10A GMT fuse
Maximum continuous output load rating	7A per 10A fuse position
Alarm relay contacts	2A @ 30 Vdc, 0.6A @ 60 Vdc
Alarm board power rating @ 48 Vdc	1W
Worst case heat dissipation @50A per bus	less than 20W (68.3 Btu/hr)
Percentage of full load heat dissipation at nominal voltage	less than 1% of total load wattage

The front of the panel includes —

- 20 GMT fuse positions for each power feed;

- two green LEDs (**A POWER** and **B POWER**) that light to indicate that power is on[1];

- a red **FUSE ALARM** lamp that will light when any active GMT fuse blows; and

- reserved locations above the fuse positions for designation rivet holders (supplied) for holding optional color-coded designation rivets (pins) to indicate active fuse positions and their amperage.
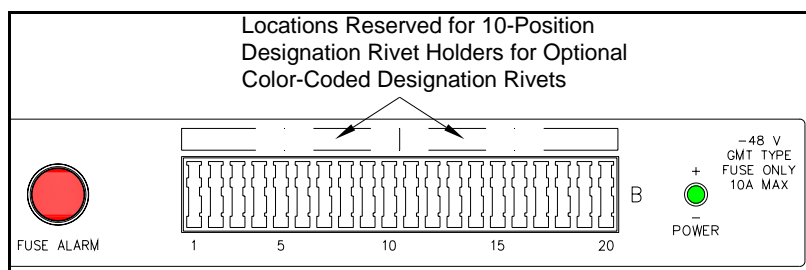
The rear of the panel panels contains input, output, chassis ground, and alarm terminals.

The FUSE and POWER FAIL alarms are Form-C, dry relay contacts[2]:

- FUSE is asserted when a fuse blows. (Also the **FUSE ALARM** LED on the front of the panel will light.)

- POWER FAIL is asserted when either Side A or Side B power fails. (Also, the **A POWER** or **B POWER** LED will go off.)
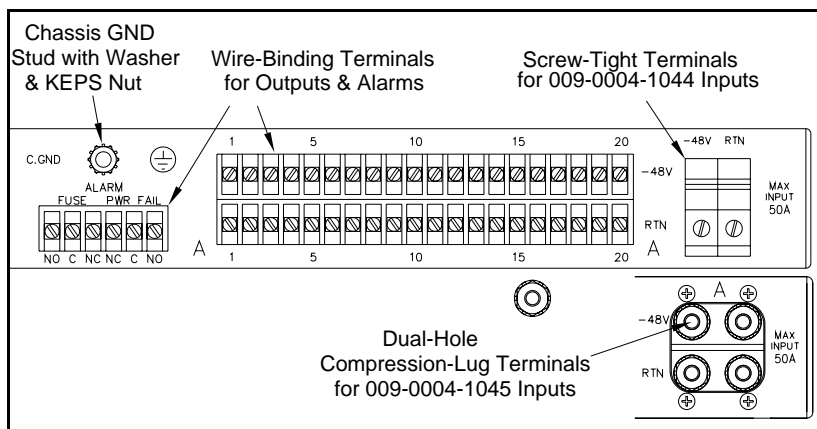
INSTALLATION

(!) ALERT

ALERT! This product must be installed within a restricted access location where access is through the use of a tool, lock and key, or other means of security, and is controlled by the authority responsible for the location. This product must be installed and maintained only by qualified personnel.

ALERT! 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".

1. The plus and minus symbols above and below POWER LEDs indicate orientation for LED replacement.
2. Conditions are normally open/closed when power on both feeds is OK and no fuses are blown.
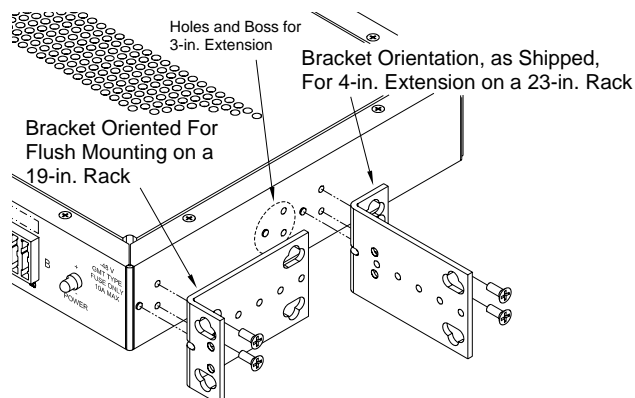
Please read these instructions carefully before beginning installation. If you need assistance call Technical Support at 888-821-4856 (domestic calls), or 509-921-6161 (Option 2), or eMAIL us at getinfo@telect.com

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.

   NOTES

   - *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.*

   - *Panel brackets provide either flush or extended EIA or WECO mounting in a 19 in. or 23 in. rack. The front of the panel can be extended 3 in. (76.2 mm) or 4 in. (101.6 mm) beyond the front flange of the rack. As shipped, the brackets are positioned for a 4-in. extension on a 23-in. rack.*

Holes and Boss for 3-in. Extension

Bracket Orientation, as Shipped, For 4-in. Extension on a 23-in. Rack

Bracket Oriented For Flush Mounting on a 19-in. Rack

2. If necessary, remove two screws and reposition/re-align brackets on sides of panel for flush or extended mounting on a 19-in. or 23-in. rack, as shown.

3. Locate an unused rack position and mount panel using four, 12-24 thread-cutting screws provided, as shown on the right. Tighten screws to 35 in.-lb (4.29 N•m).
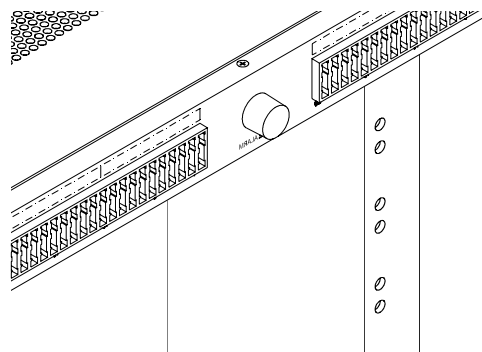
⚠ **WARNING**

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.

AVERTISSEMENT ! 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.

4. Remove plastic terminal cover on rear of panel.

5. <u>For ground wiring</u>, use a listed (approved) crimping tool to attach a 10 AWG or 12 AWG ground conductor to the single-hole compression lug provided on the rear of the panel. (Ground wire can be 12 AWG for PDU circuit protected feeds up to 20A. Otherwise, the ground wire must be 10 AWG for feeds up to 50 A.)

6. Use a coarse, nonmetallic cleaning pad to clean terminals and stud.
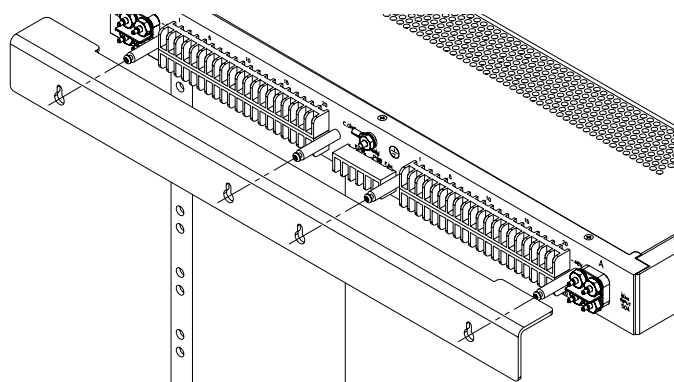
<u>Removing Rear Cover</u>

7. Telect recommends that you lightly coat anti-oxidant on lug, grounding screw, and surrounding contacting surface. Connect lug to rear panel using #6-32 KEPS nut provided, shown in "Ground Lug Connection" on the right. Tighten KEPS nut to 8.7 in.lb (0.98 N•m)
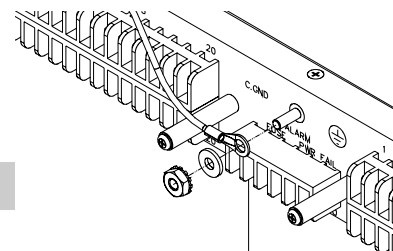
Ground Lug Connection

⚠ 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.

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

8. 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.

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

For Compression Lug Inputs (Model 009-0004-1045)

a. Crimp dual-hole compression lugs onto suitable copper wires (#10 to #2 AWG) for **-48V** and **RTN** terminals, Feeds A and B.

b. Use a coarse, nonmetallic cleaning pad to clean terminals and studs.

c. Lightly coat anti-oxidant on lugs and input **-48V** and **RTN** terminals, and then connect lugs to Feed A and B input terminals on back of panel using KEPs nuts and washers provided, as shown in "Compression Lug Inputs".
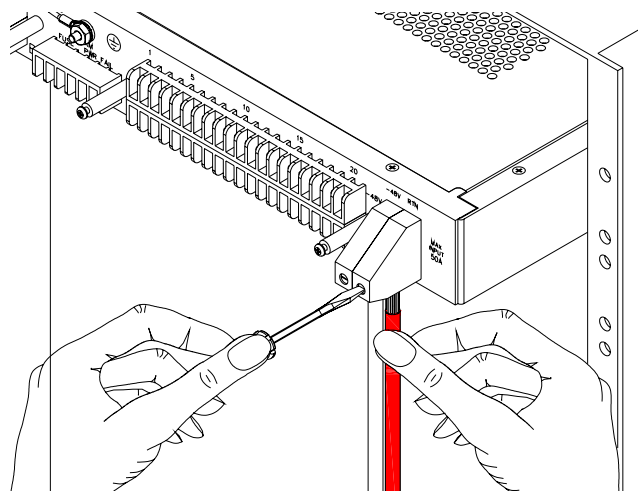

Heat Shrink Tubing
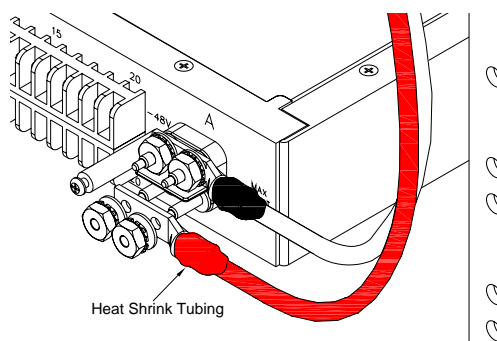
Compression Lug Inputs

d, Tighten lugs to 20 in.-lb (2.25 N•m).

For Screw-Tight Inputs (Model 009-0004-1044)

a. Strip $^3/_8$ in. (9.5 mm) of insulation from input cables (22 AWG to 6 AWG).

b. Lightly coat antioxidant on bare **-48V** and **RTN** input conductors and insert input all of the way into connectors of both feeds, as shown in "Screw-Tight Inputs".

Screw-Tight Inputs

c. Tighten to 14 in.-lb (~1.5 N•m).

10. Make sure that only dummy GMT fuses are install in *this* panel or that the GMT fuse holders are vacant.

11. Enable fuse or breaker at PDU (60A max.) to turn on Feed A to Side A.

12. Check voltage and polarity *at input connectors of panel*. Also, check that —

   • The **A POWER** LED on front of panel turns on (green).

   • The **FAIL ALARM** lamp and **B POWER** LED is off.

13. On the rear of the panel, with **A POWER** lit (normal operation) — but with **B POWER** LED off (failure operation) — test power-fail relay and contacts at PWR FAIL terminal block:

   • Expect an open circuit ($\infty\Omega$) between Terminals **C** and **NC**.

   • Expect continuity (0Ω) between Terminals **C** and **NO**.

14. Repeat Steps 11 to 13 for Feed B and observe that **B POWER** LED turns green. For the PWR FAIL alarm contacts,

   • Expect continuity (0Ω) between Terminals **C** and **NC**.

   • Expect an open circuit ($\infty\Omega$) between Terminals **C** and **NO**.

15. For output wiring, do either of the following:

   • *If using a Burndy TP14-2F forked lug or a TP14-2Z forked lug with dog ears*[1], strip off $^3/_8$ in. (~10 mm) of insulation from one end of copper output wires (16 to 14 AWG), and then crimp on lugs, as required by NEC.

   • *If using bare wire (16 AWG, max.)*, strip off $^5/_8$ in. (~15 mm) of insulation. (Stranded wires should be tinned.)

   Remember: Output wires must be rated at or above the amperage rating of the GMT fuse. For example, use no smaller than #14 AWG output wiring for 10A output fuses.
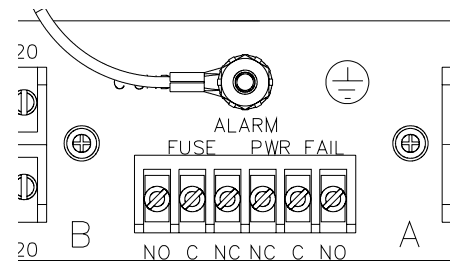
Alarm Terminals

⊙ ALERT

ALERT! GMT fuses have a small inherent electrical resistance resulting in a small inherent power loss. For this reason, the GMT fuse manufacturer recommends that the load for GMT fuses up to and including 7.5A not exceed 80% of the fuse rating and that the load for 10A GMT fuses not exceed 70% of the fuse rating. (For example, 10A fuse x .70 = 7A max. load).

ALERT! *Total load for all GMT outputs on each side* must not exceed 50A for a panel.

16. Telect recommends lightly coating anti-oxidant on lugs, wires, and output **-48V** and **RTN** terminals before connecting lugs/wires to outputs. (NEC specifies only one lug/wire and load for each output terminal.) Tighten screws to 3.5 in.-lb (0.39 N•m).

17. Connect other end of output wires to *load*.

18. Use designation label, shown on the right, to record circuits, as required by operating company standard procedures.

19. If desired, install designation rivet holders above GMT fuse slots.[2]

20. Make sure inputs at *loads are disabled* by removing all power cards or all input fuses at load equipment.
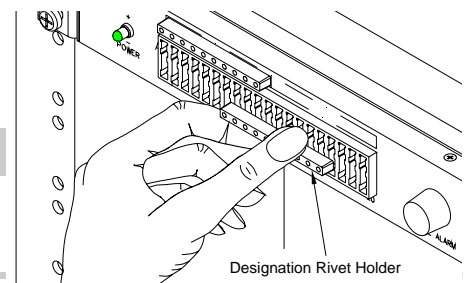
   Always follow recommended operating company guidelines when disabling load equipment.

POS	LOCATION	POS	LOCATION
1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

Circuit Designation Label

⚠ WARNING

WARNING! Use only UL-listed or UL-recognized component secondary protection devices.
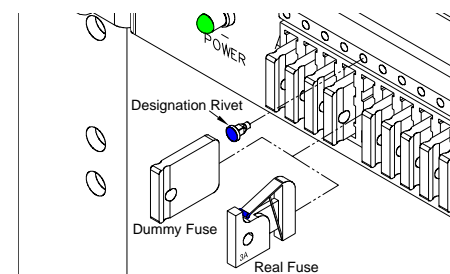

Designation Rivet Holders

21. Insert the proper sizes of GMT fuses in designated fuse holders using the designation label to identify circuits. If applicable, install color-coded designation pins to match the fuses.

22. Check voltage and polarity *at input of loads*.

   1. Use only Burndy TP14-2F or Burndy TP14-2Z forked lugs.
   2. Four, 10-place designation rivet holders on adhesive release paper are supplied with the panel. The rivets (color-coded plastic pins to match fuse sizes) are optional. (See "Accessories" on Page 7.)

23. <u>After all designated GMT fuses have been installed</u>, check that the **FAIL ALARM** LED is still off. Check FUSE alarm contacts on rear of panel:

- Expect continuity (0Ω) between Terminals **C** and **NC**.

- Expect an open circuit (∞Ω) between Terminals **C** and **NO**.

24. If available, replace one of the fuses with a blown fuse and check that the **FAIL ALARM** LED changes to red. Check the FUSE alarm contacts again:

   ◊ Expect an open circuit (∞Ω) between Terminals **C** and **NC**.

   ◊ Expect continuity (0Ω) between Terminals **C** and **NO**.

When finished, re-install the operable fuse.

GMT Fuses & Designation Rivets

25. <u>If desired</u>, install FUSE and PWR FAIL alarm wiring.

   Use the same type of bare wire or lugs specified in Step 15 for the output wiring.

26. One by one, re-enable load equipment and verify proper operation.
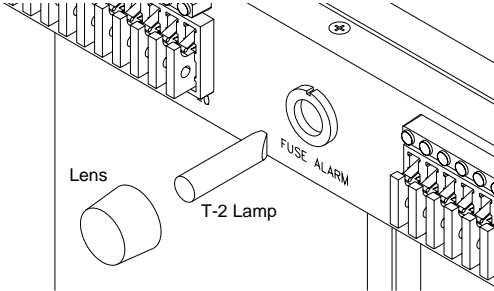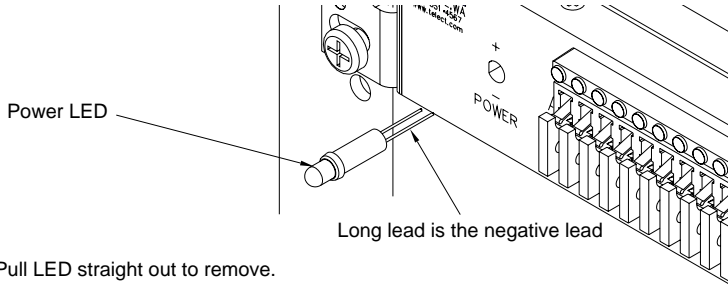
27. Re-install rear cover.

LAMP & LED REPLACEMENT

⚠ **WARNING**

WARNING! Use only UL-listed or UL-recognized components.

	Part Numbers	Replacement Procedure
T-2 Fuse Alarm Lamp	097102	 To remove the T-2 incandescent lamp, pull off lens and then pull the lamp straight out. When installing a new lamp, orient the lamp as shown and then push it into the lamp holder. Then, orient the lens so that the two bosses on the inside lip of the lens meshes with the two notches at the top and bottom of the holder.
Power LED (Green)	114209	 Long lead is the negative lead Pull LED straight out to remove. When inserting the LED, make sure that the leads are straight and that the long lead is at the bottom. Slowly push the LED into the receptacle. DO NOT FORCE. DO NOT TWIST.

ACCESSORIES

The following tables list optional and replacement panel items.

GMT FUSES*

GMT Fuse	Part Numbers GMT Fuse	Colored Designation Pin Part No.
.18A Yellow (YEL)	130781	102435-21
¼A Violet (VIO)	100151	102435-2
½A Red (RED)	004001	102435-5
¾A Brown (BRN)	004008	102435-7
1A Gray (GRY)	100991	102435-8
$1^1/3$A White (WHT)	004006	102435-9
1½A White/Yellow (WHT/YEL)	004011	102435-10
2A Orange (ORN)	004002	102435-11
2.5A White/Orange (WHT/ORN)	130783	102435-12
3A Blue (BLU)	004012	102435-13
3.5A White/Blue (WHT/BLU)	130782	102435-14
4A White/Brown (WHT/BRN)	004013	102435-15
5A Green (GRN)	004014	102435-16
7½A Black/White (BLK/WHT)	004010	102435-17
10A Red/White (RED/WHT)	004015	102435-18

*For dummy fuses order 101557. For each GMT safety (splash/splatter) cover order 116915.

DUAL-HOLE COMPRESSION LUG PART NOS. VS INPUT WIRE SIZE
(For #10-in. Studs on $5/8$-in. Centers)

	#2 AWG	#4 AWG	#6 AWG	#8 AWG	#10 AWG
T&B	542050310 (T&B Die Code 33)	542060310 (T&B Die Code 29)	542050310 (T&B Die Code 24)	54204 (T&B Die Code 21)	—
Burndy	—	—	YA6CL2TC10 (Burndy Die Code 7)	—	YAV102TC10
Panduit	—	—	LCD6-10A-L (Panduit Die Code 24) (Burndy Die Code 7)		LCD10-10A-L

SINGLE-HOLE RING LUG PART NOS. VS GROUND WIRE SIZE
(For #6 Panhead Screws)

Burndy YAV10_BOX is a ring lug without insulation for a 12 AWG stranded copper ground conductor. Common *Insulated* lug style may apply. Lug tongue must accommodate the 0.375 in. (9.6 mm) diameter of the #6 KEPS nut.

SINGLE-HOLE LUG PART NOS. VS OUTPUT WIRE SIZE
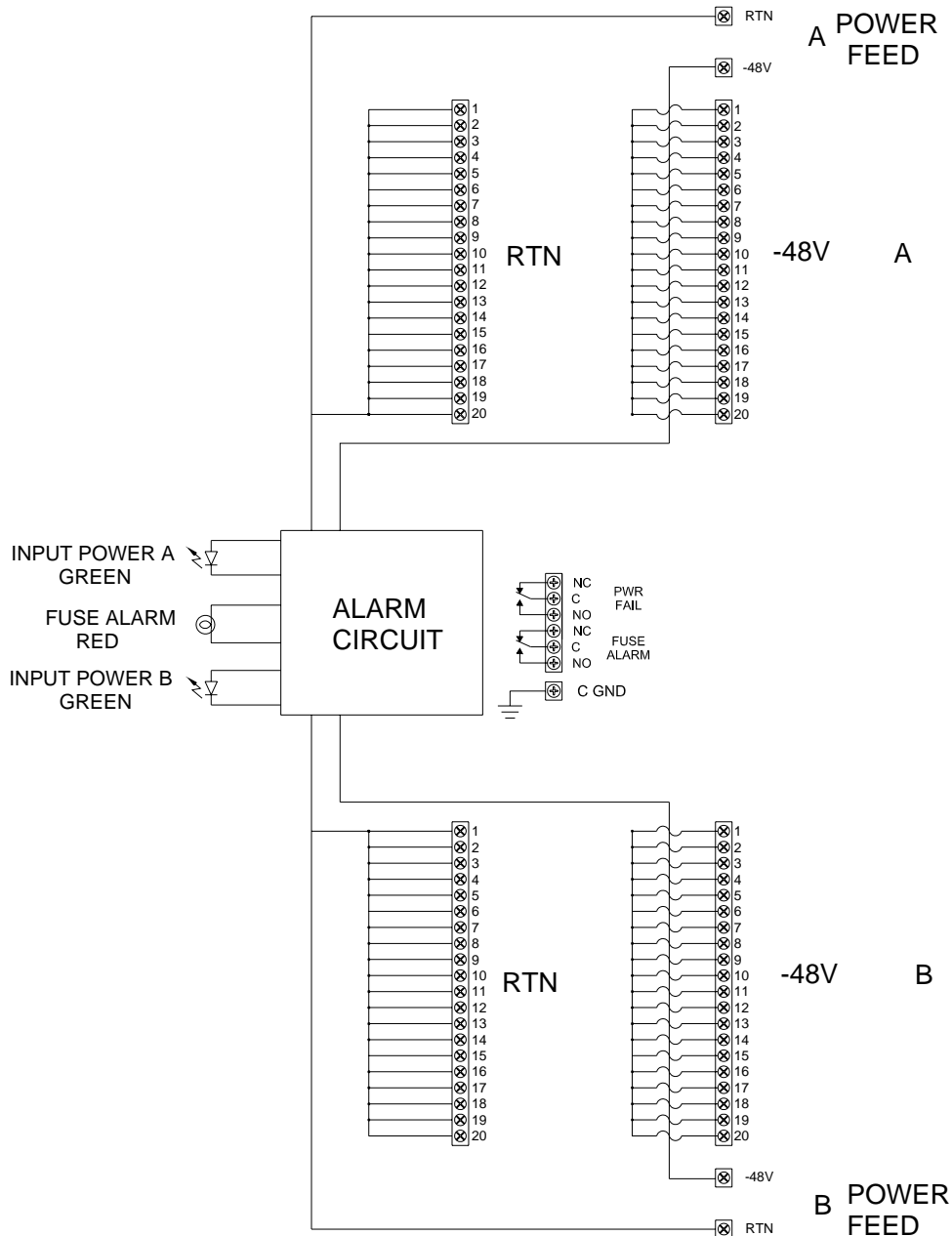
(For #3 Panhead Screws)

The output terminals accommodate bare wire up to #16 AWG. If lugs are required, only three with insulated barrels apply for accommodating #22 - #14 AWG:

- AMP 324608 with a flanged (dog-eared), straight, forked tongue for #22 - #16 AWG,

- Burndy TP14-2F with a straight, forked tongue for #16 - #14 AWG, and

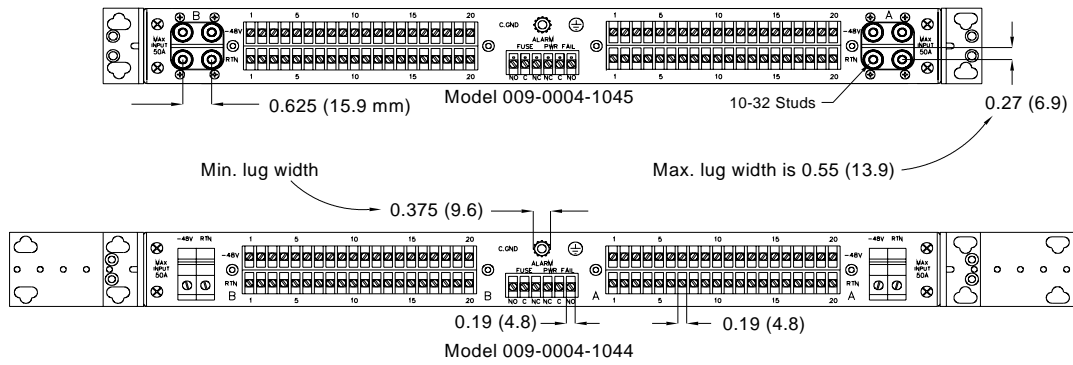- Burndy TP14-2Z with a flanged, straight, forked tongue, also for #16 - #14 AWG.

MAINTENANCE / SERVICE /WARRANTY

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

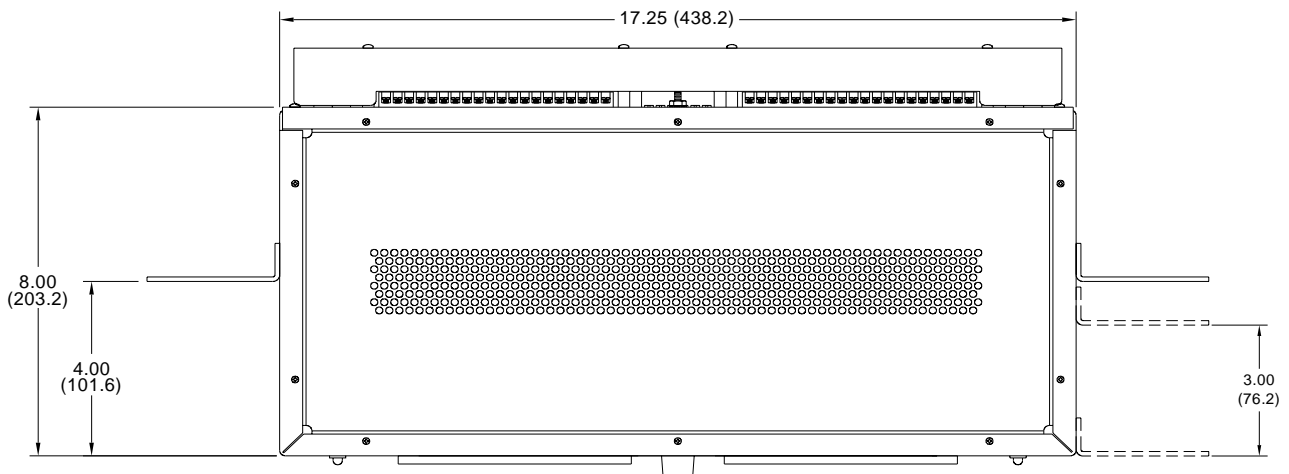- Telect's GMT Fuse Alarm Panels do not require special preventive maintenance.
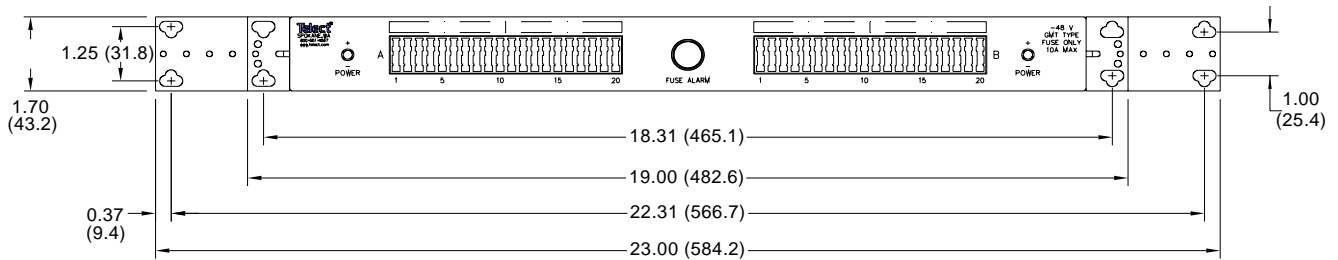
BLOCK DIAGRAM

DRAWING

Model 009-0004-1045
0.625 (15.9 mm)
10-32 Studs
0.27 (6.9)

Min. lug width
Max. lug width is 0.55 (13.9)

0.375 (9.6)

0.19 (4.8)
0.19 (4.8)

Model 009-0004-1044

REAR VIEWS
(ROTATED, SHOWN WITHOUT COVER)

17.25 (438.2)

8.00
(203.2)

4.00
(101.6)

3.00
(76.2)

TOP VIEW

1.25 (31.8)

POWER A
FUSE ALARM
POWER B

1.70
(43.2)

1.00
(25.4)

18.31 (465.1)

19.00 (482.6)

0.37
(9.4)

22.31 (566.7)

23.00 (584.2)

FRONT VIEW

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.
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P.O. Box 665   Liberty Lake, WA 99019
509.926.6000 or 800.551.4567   Fax 509.926.8915
E-mail: getinfo@telect.com   Internet: http://www.telect.com

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Declaration of Conformity

Telect, Inc. attests to conformity to the following European Norm(s):

EN 55022: 1998 Limits and Methods of Measurement
EN 50081-1: 1997 Generic Emission Standard
EN 50082-1: 1997 Generic Immunity Standard

IEC 60950 (1991) Second Edition: +A1 (1992): +A2 (1993): +A3 (1995): +A4 (1996); EN60950 (1992): +A1, A2, A3, A4 and A11 Safety of Information Technology Equipment, Including Electrical Business Equipment (ITE)

Manufactured by:

Telect, Inc.
1730 N. Madson Road
Liberty Lake, WA 99019 USA

Represented by:

Telect, Inc.
2111 N. Molter Road
Liberty Lake, WA 99019 USA

Product Covered: Telect Fuse Panel, Part Number 009-0004-1045; - 48 VDC, 50 A per side

Production Lots: July 1, 2001 or greater
New Additions: Not Applicable

Safety Report: 009-0004-1045 TCF
Previous: Not Applicable

July 1, 2001
Date

July 1, 2001
Date

Roger Turner
Senior Compliance Engineer
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Vice President & General Manager - Power
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Telect
CONNECTING THE FUTURE ℠

046074-52/01/26/01/A0