100A Universal Voltage Dual-Feed GMT Fuse Panels

Power :: HPGMT10xx and HPGMT15

Installation Guide

HPGMT10 / HPGMT10RC

HPGMT15 / HPGMT15RC

HPGMT10FA

HPGMT10FA-1RU

Applies to : HPGMT10 :: HPGMT10RC :: HPGMT10FA :: HPGMT10FA-1RU :: HPGMT15 :: HPGMT15RC

Amphenol NETWORK SOLUTIONS™

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1.1 Overview

Amphenol Network Solutions HPGMT10, HPGMT10FA-1RU, and HPGMT15 panels are compact 1RU EIA power panels, while the HPGMT10FA is 2RU, enabling ± 24 and -48 Vdc power protection for a variety of wireline and wireless telecommunications and data equipment. These GMT panels are ideal for powering network equipment with low-to- medium power requirements. The HPGMT10, HPGMT10FA, and HPGMT15 panels fit either 19-in. or 23-in. racks. The HPGMT10FA-1RU fits in 23-in. rack.

Figure 1 - GMT Fuse Panel

The panels provide total front access to fuses and LED status. Below the bezel holding the status LEDs is a pull-out designation card holder.

All terminals for inputs, outputs, ground, and alarms are on the same side - either all on the rear or all on the front of the panel. All terminals are covered by a single full-width transparent terminal cover:

- Inputs are dual-hole lugs for studs.
- Ground terminals accept either single- or dual-hole lugs.
- Output screw-post terminals accept either ring or forked lugs, as well as bare wire.
- Power/fuse and bay alarms terminals, along with external bay alarm trigger terminals, are wirewrap pins.

The GMT fuse holders are mounted upside-down so that the GMT indicator flag flips downward when activated, making identification and detection easier, especially on tall racks. In addition, the GMT fuse holders are mounted separately — not as a fuse block — thereby making fuse- position management unnecessary when dealing with 10A, 15A, and 20A GMT fuses. Holes for color-coded fuse designation pins are located below each fuse position.

The panel also features separate power and fuse failure status LEDs and power alarm relay connections for each feed. Major and minor bay alarm LEDs and wirewrap terminals are controlled via an on-board relay triggered by an external switch closure for all but the HPGMT10-1RU panel which does not feature bay alarms. All on-board relay contacts are dry Form-C. All LEDs and alarm relays and contacts are located on an easily removable alarm card.

Amphenol Network Solutions ships phony fuses for each GMT fuse position. Visit our website (amphenol-ns.com) to order GMT fuses, fuse designation pins, and other accessories.

All Amphenol Network Solutions GMT-Series panels are UL listed (US and Canada, File E139903) and NEBS Level 3 certified, and 5/6 RoHS compliant. The HPGMT10RC and HPGMT15RC are RoHS 6/6 compliant.

12 Specifications

Inputs:	
Voltage & Range	±20 Vdc to ±60 Vdc @ 20°C ±22 Vdc to ±58 Vdc @ 55°C
Max. Input Load Rating	100A
Max. Power Dissipation at Full Load	< 75W per side (max.)
% of Full Load Power Dissipation	less then 1%
Max. Input Interruption Device	125A
Input Terminals	Dual 1/4-20 studs on 5/8 in. centers. Torque KEPS nut (using 7/16 in. or 12 mm socket) to ~50 in.-lb (~5.6 N•m), max.

Outputs:	
Max. GMT Output Fuse (ea.)	20A
Max. GMT Output Load (ea.)	14A
Max. Total GMT Output Per Side	100A
Output Terminals (Wire-Binding Screw Posts)	#6-32
GMT Output Wire Size Range	#22 to #14 AWG, depending on output fuse (.6A to 20A)
Interrupt Rating	450A
Short-Circuit Withstand Current	450A

Grounding:	
Chassis GND Terminal Studs (With KEPS Nuts) for Dual-Hole Compres- sion Lug	#10-32 studs on 5/8-in. centers. Torque KEPS nut (using 3/8 in. or 10 mm socket) to ~20 in.-lb (~2.3 N•m), max.
GND Wire Size	#6 (preferred) or #8 AWG

Alarms:	
Alarm Relay Contacts	Dry Form-C contacts (1A @ 30 Vdc, 0.3A @ 100 Vdc, 0.5A @ 125 Vac)
Max. Alarm Power Rating	@24V: 72 mA (1.73W) @48V: 147 mA (7.06W)
Alarm Wire Size	#22 to #18 AWG
Alarm Terminals	Wirewrap

Environment:	
Operating Temperature	-10°C (14°F) to 55°C (131°F) HPGMT10FA-1RU up to 65°C (149°F) at 80A continuous
Humidity	0 to 90% and noncondensing

Fit & Finish	
Material	16-gauge steel
Color	White powder coat

Dimensions (Nominal):[a]	W x H x D[b]
HPGMT10 / HPGMT10RC / HPGMT15 / HPGMT15RC HPGMT10FA HPGMT10FA-1RU	17 x 1.75 x 11.5 in. (432x44x283mm) 17 x 3.5 x 11.5 in. (432x88x283mm) 21 x 1.75 x 11.5 in. (533x44x283mm)

a. Without mounting brackets.

b. All panels fit either a 19-in. or 23-in. rack except HPGMT10FA-1RU which only mounts in a 23-in. rack. Depth includes the rear cover.

Weight (Approximate)		
HPGMT10 / HPGMT10RC	Installed	8.7 lb (3.9 kg)
	Shipping	11 lb (5 kg)
HPGMT10FA	Installed	10.6 lb (4.8 kg)
	Shipping	13 lb (5.9 kg)
HPGMT10FA-1RU	Installed	9 lb (4 kg)
	Shipping	11 lb (5 kg)
HPGMT15 / HPGMT15RC	Installed	9.3 lb (4.2 kg)
	Shipping	11 lb (5 kg)

13 Important Installation Guidelines

- **Elevated Operating Ambient** - If you install the rack in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, take care to install the equipment in an environment compatible with the maximum ambient temperature (TMA) specified by the manufacturer.
- **Reduced Air Flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading** - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit Overloading** - Give consideration to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Use appropriate consideration for equipment nameplate ratings when addressing this concern.
- **Reliable Earthing** - Maintain reliable earthing of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g., use of power strips).
- **Disconnect Device** - Incorporate a readily accessible disconnect device in the building installation wiring.

14 Inspection

Please read and understand all instructions before starting installation. If you have questions, contact Amphenol Network Solutions Technical Support at support@amphenol-ns.com or call 1.509.926.6000.

When you receive the equipment, carefully unpack it and compare it to the packaging list. Please report any defective or missing parts to Amphenol Network Solutions Quality at quality@amphenol-ns.com or call 1.509.926.6000.

Amphenol Network Solutions is not liable for transit damage. If the product is damaged, please report it to the carrier and contact Amphenol Network Solutions Quality.

1.5 Installation

! ALERT

ALERT! Install this product 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 technicians.

Verify all connections meet requirements specified in local electric codes or operating company guidelines before supplying power. Unit shall be protected by a listed circuit breaker or branch-rated fuse rated maximum 125A.

The panels can be mounted in 19-in. EIA racks (except the HPGMT10FA-1RU must be mounted in a 23-in. rack). Amphenol Network Solutions also offers bracket kits for WECO and ETSI racks. (See our website at amphenol-ns.com.)

The panel can be flush-mounted or extended by 2 in. or 4 in. beyond the rack flange.

1. If necessary, remove three screws and reposition/ re-align brackets on sides of distribution the panel, as shown in Figure 2.
2. Locate an unused rack position, normally at the top of the rack. Mount the panel to the rack using four, #12-24 thread-cutting screws and lock washers provided, as shown in Figure 3.
3. Tighten screws to 35 in.-lb (4.29 N•m).
4. Remove the transparent terminal cover, shown in Figure 4.

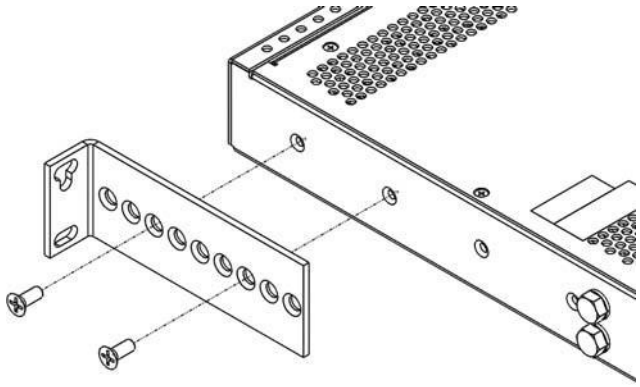


Figure 2 - Bracket Orientation

⚠ WARNING

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

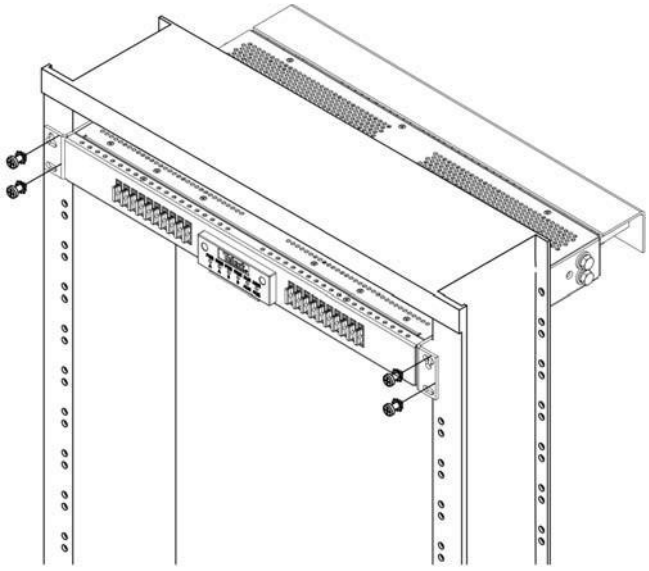


Figure 3 - Rack Mounting

! 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.

5. Use a listed (approved) crimping tool to attach a listed (approved), dual-hole compression lug for #10 studs on 5/8-in. centers onto #6 AWG ground wire. (Minimum #8 AWG for a 100A feed.) Three grounding locations are provided (one on each side near the rear of the panel and one on the rear below the alarm pins). Only one ground location needs to be used.
6. If desired (highly recommended), lightly coat anti-oxidant on lug, grounding terminal, and surrounding contacting surface.
7. Connect the lug using the #10-32 KEPS nuts and flatwashers provided.
8. Tighten KEPS nuts to ~20 in.-lb (~2.3 N•m), max.
9. Make sure input power is off (open breaker, phoney fuse, or open fuse holder at primary power distribution unit [PDU]) before connecting this panel's input cables to that PDU.

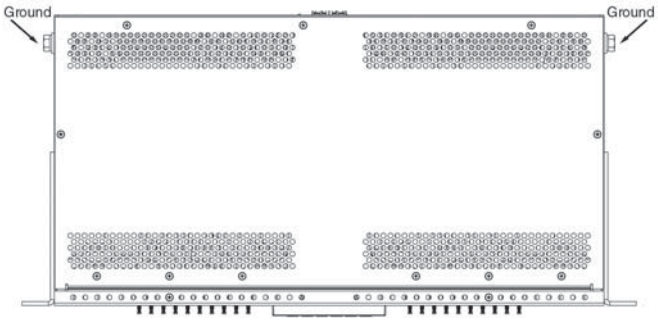


Figure 4 - Ground Lug Connection

⚠ WARNING

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

10. For input wiring — wiring used as inputs to this distribution the panel — do the following: (Refer to the following illustrations.)

    a. Crimp dual-hole compression lugs onto #8 to #1/0 AWG conductors (#1/0 AWG with a 60C insulation rating, minimum for a 100A feed). Insulate lug barrels with UL94 V-0 rated heat-shrink tubing.

    b. Clean terminals and lugs with an nonabrasive, nonmetallic cloth.

    c. If desired (highly recommended), lightly coat anti-oxidant on lugs, terminals, and contacting surfaces.

    d. Connect lugs to input **BATT** and **RTN** terminals on the panel.

    e. Torque KEPS nuts to ~50 in.-lb (~5.6 N•m), max.

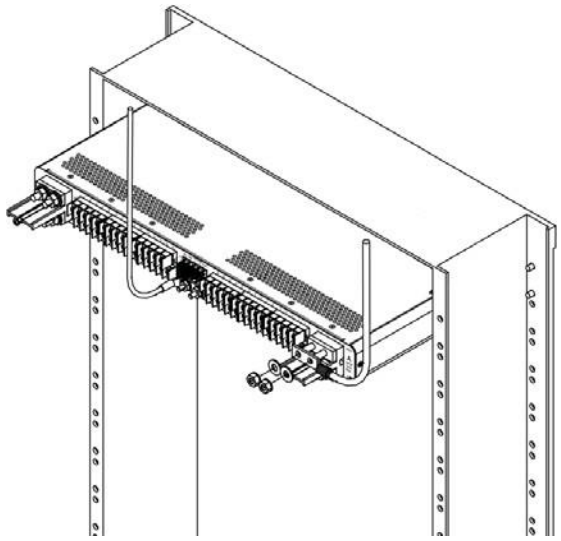


Figure 5 - Input Connections

11. Make sure GMT fuse positions are either empty or contain dummy fuses (phoney, inoperative, all-plastic slugs).
12. Enable protection device (fuse or breaker) at primary PDU to turn on Feed A to Side A of panel and then check voltage and polarity at input connectors of panel. Also, check that
    - PWR A LED on front of panel turns on (green).
    - PWR B LED and both FUSE LEDs must be off.
13. With PWR A lit — but with PWR B LED off — test power-fail relay and contacts at PWR A alarm terminals on rear of panel:
    - Expect continuity (0Ω) between Terminals C and NC.
    - Expect an open circuit (00Ω) between Terminals C and NO.
14. Also, test fuse alarm relay contacts at FUSE alarm terminals, then
    - Expect continuity (0Ω) between Terminals C and NC.
    - Expect an open circuit (00Ω) between Terminals C and NO.
15. Repeat Steps 12 through 14 to power up Side B. PWR A and PWR B LEDs must both be green.
16. With PWR A and PWR B lit, test power-fail relay and contacts at PWR A and PWR B alarm terminals:
    - Expect continuity (0Ω) between Terminals C and NC.
    - Expect an open circuit (00Ω) between Terminals C and NO.
17. Make sure none of the fuse positions contain real, operable fuses.

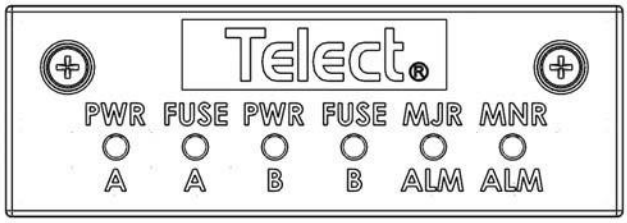


Figure 6 - Status LEDs on Face of Removable Alarm Card

Figure 7 - Alarm Terminals on all panels except HPGTM10FA-1RU

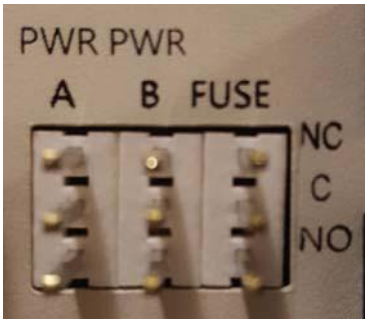


Figure 8 - Alarm Terminals on the HPGTM10FA-1RU

! ALERT

ALERT! Only service personnel may replace fuses. The installer must verify that a readily accessible protection device is incorporated in the building wiring feeding the fuse panel: 125A (max.) protection device.

18. For output wiring, proceed as follows:
    a. Working with one wire at a time, either:
    • Crimp a single-hole ring or fork lug for a #6-32 screw-post terminal, as required by NEC, or
    • Strip 3/8 in. (10 mm) of insulation from a #26 to #12 copper wire for a bare-wire connection.
    b. Clean the panel terminals and lug (if applicable) with a nonabrasive, nonmetallic cleaning pad.
    c. If required, lightly coat anti-oxidant on lug/wire and output BATT and RTN terminals, and then connect to terminals.

    (NEC specifies only one load at each output terminal.) Tighten #6-32 screws using either a flat-tipped screwdriver or Phillips screwdriver (for cross-re- cessed screw heads) to no greater than 6 in.-lb (~0.7 N•m). Connect other end of output wire to load.

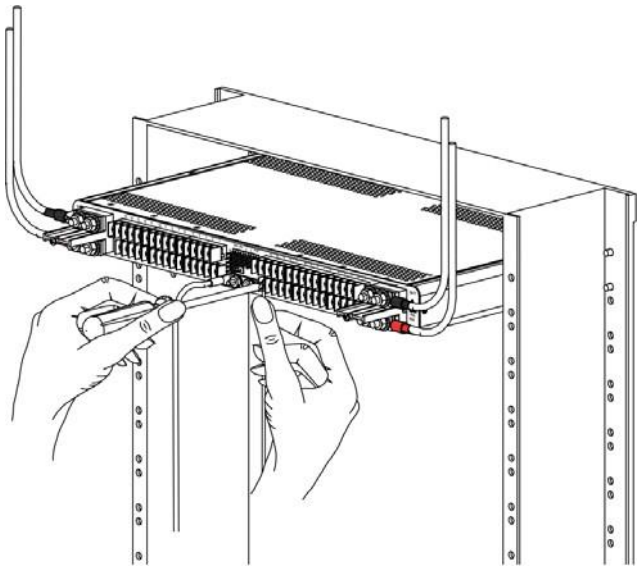


Figure 8 - Output Connections

19. Record circuit assignments in accordance with operating company procedures and guidelines. The manufacturer's designation card, shown below, is a 10 in. (254 mm) by 2½ in. (57 mm) card that folds in half to fit a card holder located below the status LEDs.

SIDE A FUSETYPE			RACK/BAY#		
POS	AMP	DESCRIPTION	POS	AMP	DESCRIPTION

SIDE B FUSETYPE			RACK/BAY#		
POS	AMP	DESCRIPTION	POS	AMP	DESCRIPTION

Figure 9 - Designation Card

20. Make sure load devices are off (disabled) and then install GMT fuses. Remember, GMT fuses need to be installed so that failure indication flags are at the bottom.

    The total load for all fuse outputs on each side must not exceed the panel's load rating of 100A.

21. Test power and polarity at input of each equipment load.

22. If possible, replace one of the operable GMT fuses with a blown fuse to verify that the applicable FUSE Alarm LED turns red. Also, check the FUSE alarm terminals on the rear of the panel:
    • Expect an open circuit (00Ω) between Terminals C and NC.
    • Expect continuity (0Ω) between Terminals C and NO. Re-install operable GMT fuse before proceeding.

    If desired, connect remote, external audio/visual panel alarm indicator wires (solid wires, #22 to #18 AWG) to wirewrap PWR and FUSE alarm pins on rear of panel, as shown below on the right.

23. If desired, connect remote audio/visual bay alarms indicator wires to the **MAJ** (major) and **MIN** (minor) alarm pins. Also install switch closure wires to the A (activate) and R (reference) pins to control the bay alarm relay.

    Note: The HPGMT10FA-1RU does not have major and minor alarm pins.

24. Re-install terminal cover.

25. Lastly, enable equipment loads one at a time to verify the proper operation of loads.

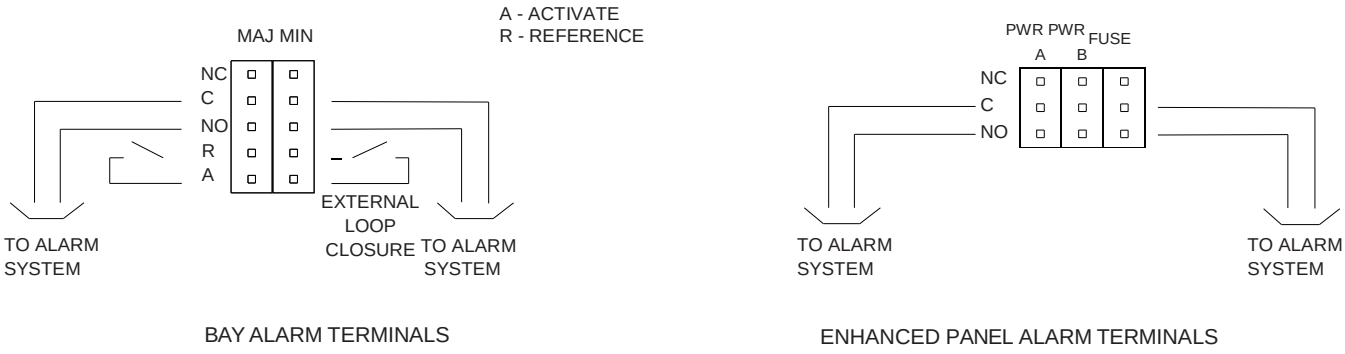


Figure 10 - Alarm Schematics (Rear of Designation Card)

! 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 GMT fuse sizes between 10A and 20A not exceed 70% of the fuse rating. For example, the load for a 15A GMT fuse should not exceed 10.5A (15A x 0.70 = 10.5A).

16 Accessories & Alarm Card

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

An optional rear cover that accomodates 90° lugs is available for the HPGMT10 / HPGMT10RC. Order part number HPGMT10-R90.

⚠ WARNING

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

16.1 Input, Ground & Output Lugs

The following table describes the available input lugs for stranded copper conductors with straight dual-hole lugs for 1/4-in. studs on 5/8-in. centers with a 0.50" max. lug width.

Table 1 - Input Lugs

Source	#1/0 AWG	#2 AWG	#4 AWG	#6 AWG	#8 AWG
Amphenol Network Solutions		06117-02	06117-04	06117-01	06117-11
T & B		54207 (Die Code 33)	54206 (Die Code 29)	54205 (Die Code 24)	542040416 (Die Code 21)
Panduit		LCDN2-14A-Q (Die Code 33)	LCD4-14A- L (Die Code 29)	LCD6-14A-L (Die Code 24)	LCD8-14A-L (Die Code 21)
Burndy	YA25L2NT14 (Die Code12)	YA2CL2NT14 (Die Code 10)	YA4CL2TC14 (Die Code 8)	YA6CL2TC14 (Die Code 7)	YA8CL2TC14 (Die Code 49)

The following table describes the available ground lugs for stranded copper conductors with dual-hole lugs for #10 studs on 5/8-in. centers.

Table 2 - Ground Lugs

Source	#6 AWG	#8 AWG
T&B	90° lug: 256-30695-1356 (Die Code 24) Straight lug: 54852BE0310PH	90° lug: 54850BEUB0310PH (Die Code 21) Straight lug: 54850BE0310PH
Panduit	90° lug: LCD6-10AF-L (Die Code 24) Straight lug: LCD6-10A-L	90° lug: LCD8-10AF-L (Die Code 21) Straight lug: LCD8-10A-L
Burndy	90° lug: YA6CL2TC1090 (Die Code 7) Straight lug: YA6CL-2TC10	90° lug: YA8CL2TC1090 (Die Code 49) Straight lug: N/A

The following table describes the available output lugs for stranded copper conductors for #10-32 ring terminals with a 0.26" max. lug width.

Table 3 - Output Lugs

Source	#10-12 AWG	#14-16 AWG	#18-22 AWG
Amphenol Network Solutions	06122-06	06122-01	06122-02
T & B			RA857
Panduit	PN12-6HDR-D	PV14-6RNB-3K	PN18-6R-M
Burndy		YAE14N-43BOX	YAE18N-21BOX

1.6.2 GMT Fuses

For additional dummy fuses, order part number 132748. For GMT safety (splash/splatter) covers, order part number 116915 for GMT fuses up to 15A. Amphenol Network Solutions recommends using only UL-recognized supplementary protectors.

GMT Fuse	Part Numbers GMT Fuse	Colored Designation Pin Part No.
.18A Yellow (YEL)	130781	102435-21
1/4A Violet (VIO)	100151	102435-2
1/2A Red (RED)	004001	102435-5
3/4A Brown (BRN)	004008	102435-7
1A Gray (GRY)	100991	102435-8
11/3A White (WHT)	004006	102435-9
1 1/2A 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
7 1/2A Black/White (BLK/WHT)	004010	102435-17
10A Red/White (RED/WHT)	004015	102435-18
12A Yellow/Green (YEL/GRN)	102287	102435-19
15A Red/Blue (RED/BLU)	102288	102435-20
20A White/Green Without Safety Cover (WHT/GRN)	127240RC	
20A White/Green With Safety Cover (WHT/GRN)	131340	102435-22

1.6.3 Alarm Card

The alarm card is fastened to the front of the panel by two Phillips screws (screws with cross-recessed heads). To remove the alarm card, remove the screws, gently slide out status LED bezel and alarm card.

HPGMT10 & HPGMT15 panels use edge connectors; slide the card out completely.

HPGMT10FA panels (FA = Front Access) use a ribbon cable connected to a receptacle in the middle of the board. Partially slide out the card and disconnect this ribbon cable.

Replacement alarm card part numbers are shown in the table below.

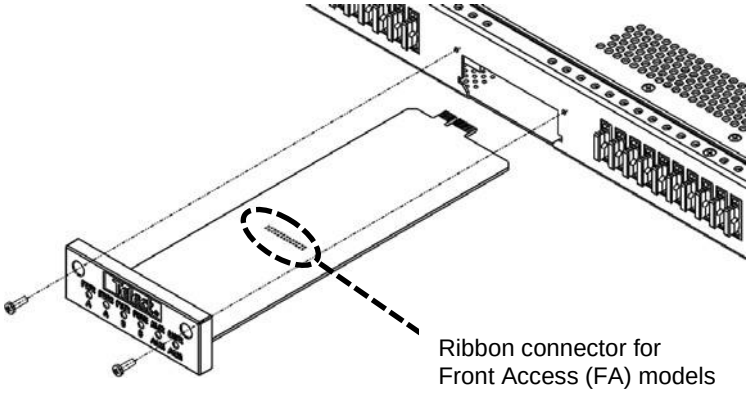


Figure 11 - Alarm Card

Amphenol Network Solutions Panel	Replacement Alarm Card Part Number
HPGMT10	400814
HPGMT10RC	400814RC
HPGMT10FA	400816
HPGMT10FA-1RU	400815
HPGMT15	400814
HPGMT15RC	400814RC

17 Diagrams

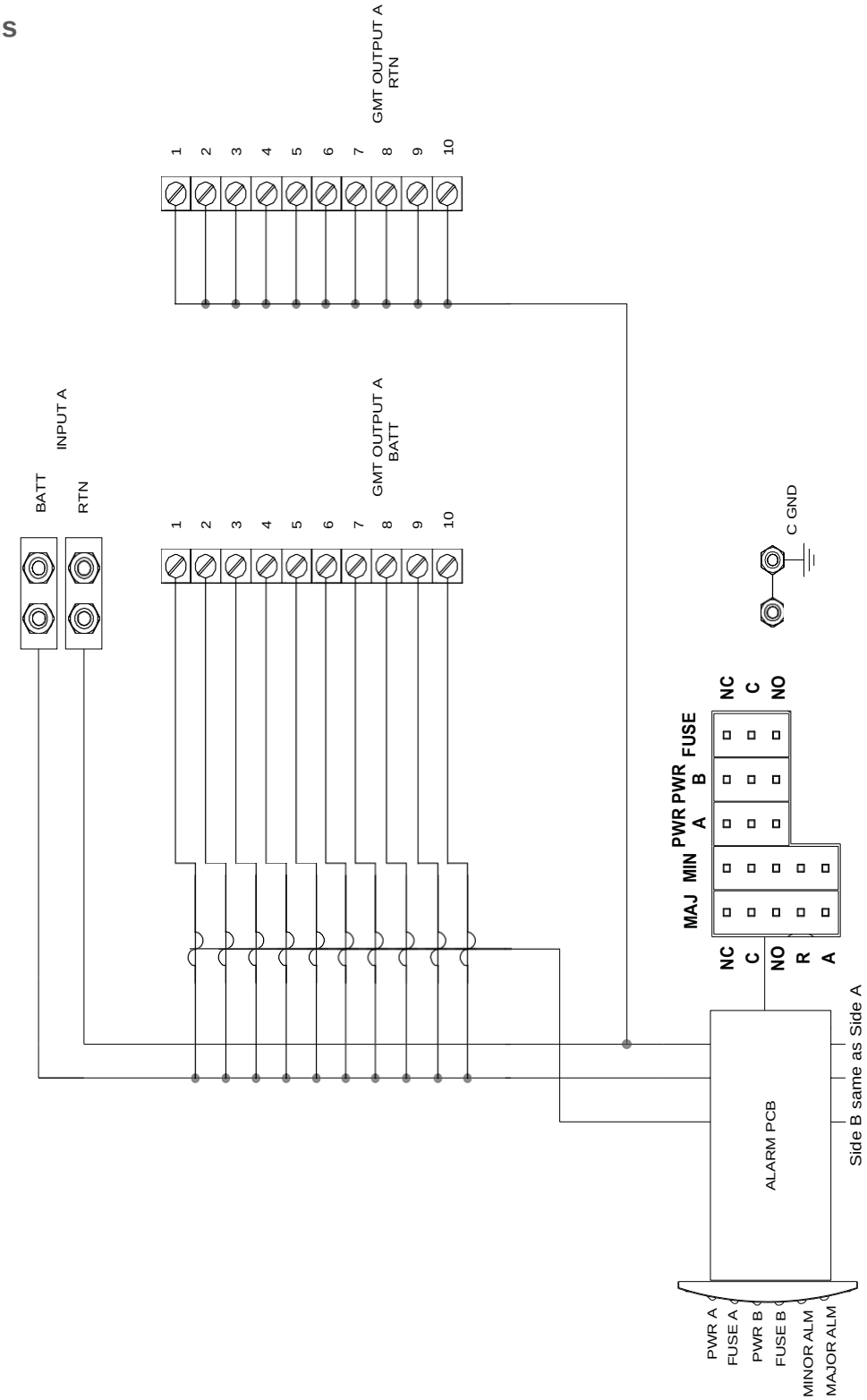


Figure 12 - Representative of all panels
except HPGMT10FA-1RU does not include major and minor bay alarms

18 Dimensions

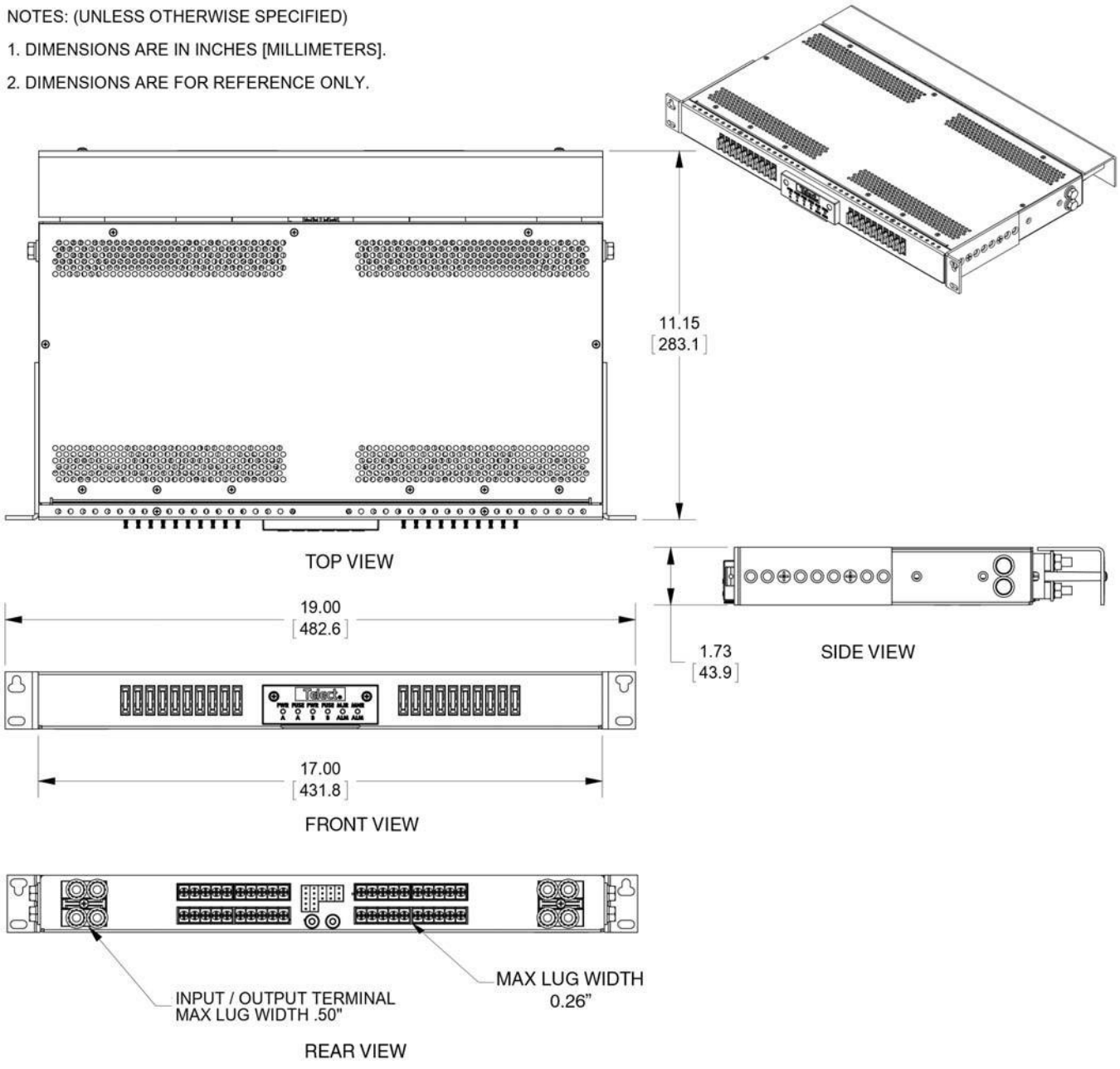


Figure 13 - HPGMT10 / HPGMT10RC
Dimensions are representative of the HPGMT15 and HPGMT15RC

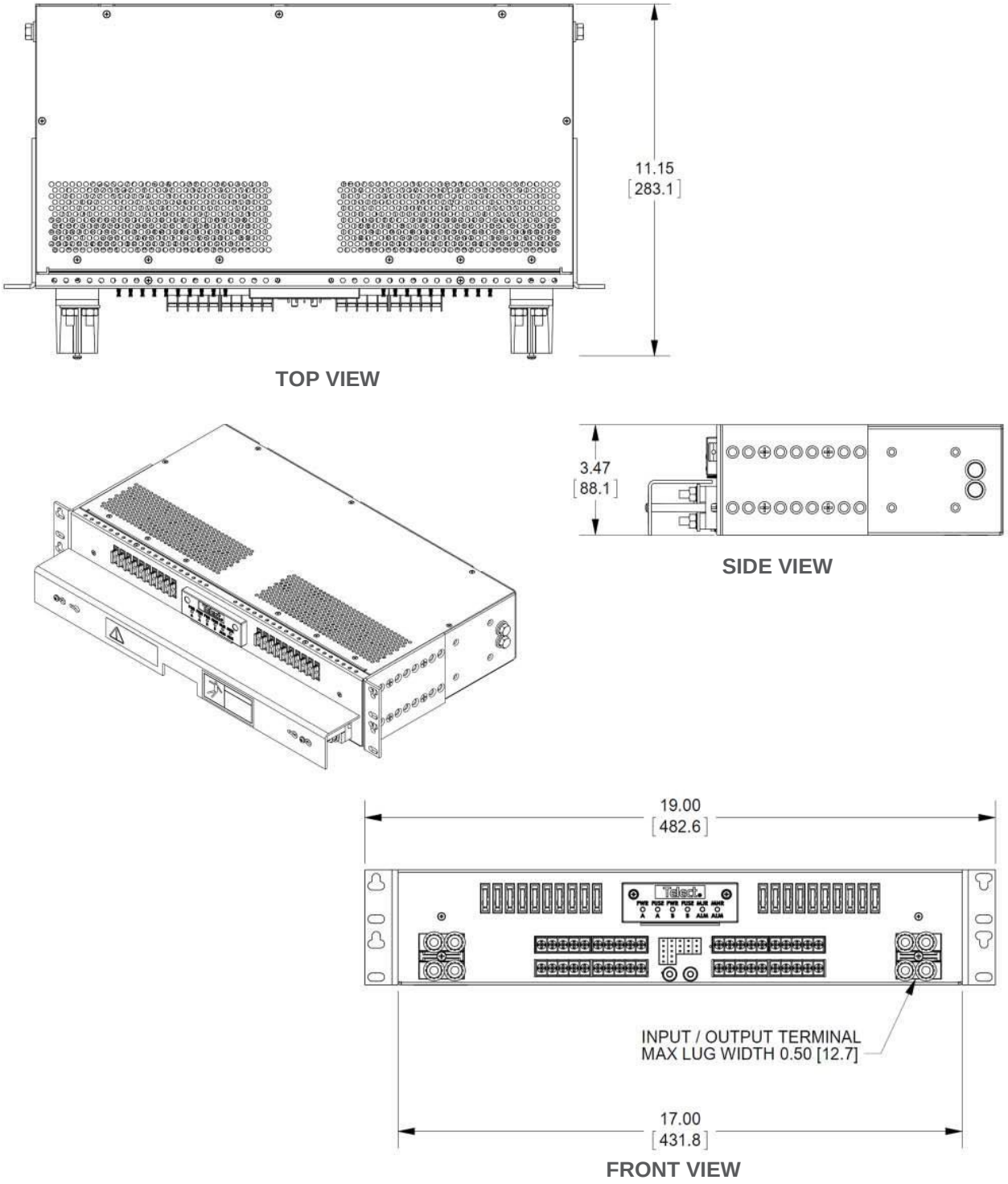
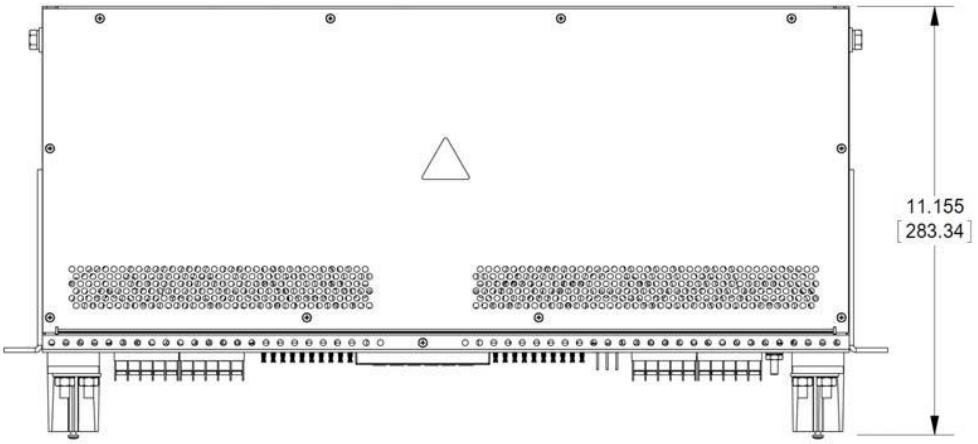
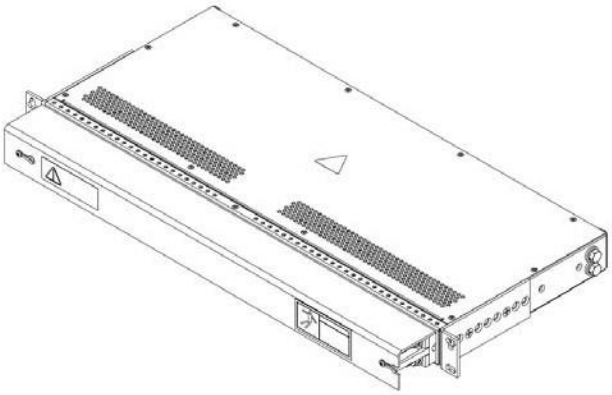
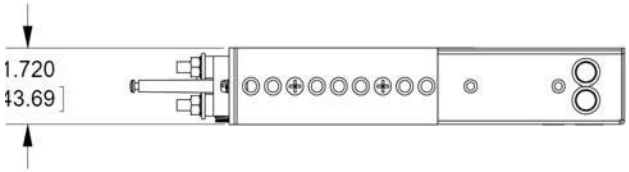


Figure 14 - HPGMT10FA

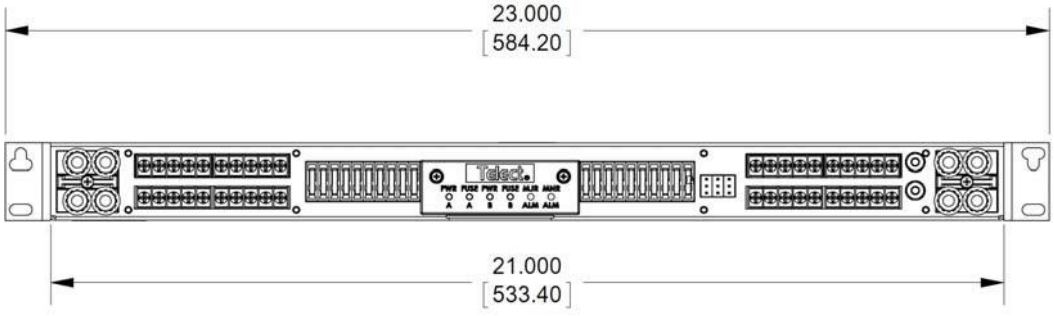


TOP VIEW





SIDE VIEW



FRONT VIEW

Figure 15 - HPGMT10FA-1RU