

Installation Guide

High Power Connection Fuse & Alarm Panel (HPCFAP) Chassis Version: HPCFAP_C





CAUTIONS!

- PDU must be located in a restricted access location.
- PDU is intended to be used in a redundant distribution system where under a normal operation power is distributed at 50 % through each side of the panel. In the event of a single source power loss, the unit is designed to be able to carry 100 % of the load through one side of the panel.
- Installation and service must be performed by qualified personnel and meet local electrical codes or operating company guidelines.
- The use of protective equipment, including insulated tools, is recommended during installation or service at all times. Electronic components are susceptible to ESD.
- Failure to properly ground this equipment can create hazardous conditions to installation personnel and to the equipment.
- Before connecting or disconnecting input power cables, make sure input power to panel is turned off.
- Do not install breakers in reset position. Doing so may damage breakers or panel.
- The supply voltage and frequency must correspond with the electrical data stated in the product specifications section of this Installation Guide.
- If the equipment is not in use over a prolonged period of time, it is recommended to disconnect it from the power source and to protect its parts from the elements.
- With the exception of standardized, generally available components, only original spare parts may be used.
- This equipment is designed to permit the connection of the earthed conductor of the D.C. supply circuit to the grounding conductor at the equipment.
- If this connection is made, all of the following conditions must be met:
 - This equipment shall be connected directly to the D.C. supply system grounding electrode conductor or to a bonding jumper from an grounding terminal bar or bus to which the D.C. supply system grounding electrode conductor is connected.
 - This equipment shall be located in the same immediate area (such as, adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same D.C. supply circuit and the grounding conductor, and also the point of grounding of the D.C. system.
 - The D.C. system shall not be earthed elsewhere.
 - The D.C. supply source shall be located within the same premise as this equipment.
 - Switching or disconnecting devices shall not be in the earthed circuit conductor between the D.C. source and the point of connection of the grounding electrode conductor.



**Unpacking must be performed by qualified personnel only.
Observe Precautions for handling electrostatic sensitive devices.**

General Rack Mounting Guidelines

- a) **Elevated Operating Ambient Temperature**
If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Consideration should be given to installing the equipment in an environment compatible with the max. ambient temperature specified by the manufacturer at 50 °C.
- b) **Mechanical Loading**
Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- c) **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.
- d) **Circuit Overloading**
Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- e) **Reliable Grounding**
Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).
- f) **Cable Strain Relief**
Generally accepted electrical codes and regulations require an effective cable strain relief.
- g) **Disconnect Device (Branch Circuit)**
A readily accessible disconnect device shall be incorporated in the building installation wiring.



Waste Management Guidelines: HPCFAP unit must not be disposed among common domestic waste. Packaging and packaging materials are recyclable.

Product Specifications

Electrical Ratings	
Rated Voltage	- 48 V / - 60 V DC
Breakers per Channel	6 (3 per side)
Rated Current per Channel / Total	125 A / 375 A (see also pg. 2 Cautions)
Circuit Breaker Type	E-T-A Model No. 8345
Short Circuit Current Rating	10 kA
Mechanical Specifications	
Panel Dimensions	438 mm x 270 mm x 98 mm or 17.24" x 10.63" x 3.86"
Rack Mounting	Rack Mount – ETSI & ANSI
Input Terminal*	M8 double hole cable lug, 25.4 mm spacing
Width	28 mm
Cable Size	50 mm ² or 1/0 AWG
Output Terminal*	M8 double hole cable lug, 25.4 mm spacing
Width	25 mm
Cable Size	35 mm ² (AWG 1)
Return Terminal*	M8, double hole lug, 25.4 mm spacing
Width	22 mm
Cable Size	35 mm ² or (AWG 1)
GND Terminal*	M8 double hole cable lug, 25.4 mm spacing
Width	28 mm (max)
Cable Size	50 mm ² (AWG 1/0)
*Recommended Cable Lugs	<i>Use cable lugs for copper only. Recommended cable lugs Thomas & Betts 256-30695-1018 or any UL listed cable lug meeting the specifications will be acceptable.</i>
Recommended Torque (all terminals)	7-9 Nm or 62-80 lbs in
Recommended Cable Ratings	High-flex cable recommended. Use copper conductors only. Input / Ground: UL Certified 90 °C ampacity wire. Output / Return: UL Certified 150 °C type Z ampacity wire.
Ambient Temperature	0 °C ... 50 °C
Storage Temperature	-25 °C ... 75 °C

1. Rack Installation

- The HPCFAP can be installed in ETSI or ANSI type racks.
- The HPCFAP shall be mounted in the rack's uppermost position.
- Mounting brackets are supplied with the unit and can be used interchangeably for both ETSI and ANSI rack installation.

1.1 ETSI Installation

- Install mounting brackets on each side of the unit as shown in fig. 1.
- ETSI brackets mounted is the standard HPCFAP delivery condition.
- Use four M6 screws to attach the ETSI brackets to an ETSI type rack.
- Rec. torque for M6 mounting screws: 4.3 to 5.8 Nm (38 to 51 lb in).

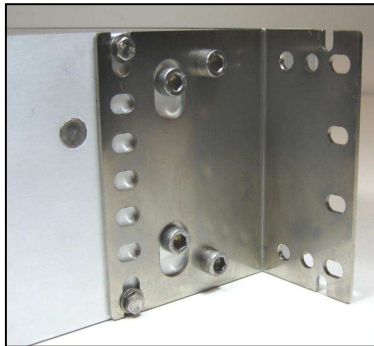


Fig. 1 – Mounting Bracket Position for ETSI Installation

1.2 ANSI Installation.

- Install mounting bracket on each side of the unit as shown in fig. 2.
- Use four 12-24 screws to install the ANSI brackets to the an ANSI type rack.
- Rec. torque for 12-24 mounting screws: 4.3 to 5.8 Nm (38 to 51 lb in).

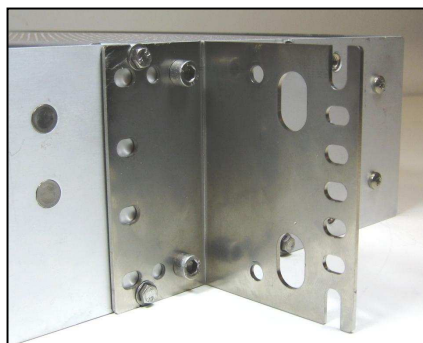


Fig. 2 – Mounting Bracket Position for ANSI Installation

2. Connections

- To access the HPCFAP main terminals, loosen the four hexagon head screws holding the cover in place and remove top cover.
- Loosen each screw 1 full turn max. Screws shall be left attached to unit. See fig. 3 for screw positions.
- Once all service is completed, make sure to reinstall the top cover and fasten the four Phillips screws. Rec. torque: 1 to 1.5 Nm (or 9 to 13 lb in).

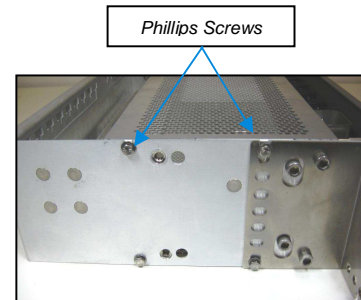


Fig. 3 – Top Cover Phillips Screws

2.1 Initial Rack Alarm Unit (RAU) Insertion



Important Note: The E-T-A Rack Alarm Unit Type SBG-RAU-00-V0023 is an integral part of the HPCFAP and provided separately. Proper performance of the HPCFAP relies on the Rack Alarm Unit's alarm and signaling functions. For this reason, do not operate the HPCFAP without Rack Alarm Unit.

- In order to insert the RAU into the HPCFAP, please refer to chapter 4.1 RAU Insertion.

2.2 Supply Feed Terminals (Batt –)

- The HPCFAP is designed with 6 supply feed terminals. Each terminal works as feed to one breaker channel. The terminals are labeled as -A1 in, -A2 in, ... -B1 in, -B2 in...
- The alpha digit indicates the zone/side and the numeric digit indicates the channel number into which the respective breaker output is led.
- Make sure to use an appropriate size cable lug as specified in Page 1 of this document.
- Supply feed terminals are located on the lower row of terminals (see fig. 4a and 4b) .

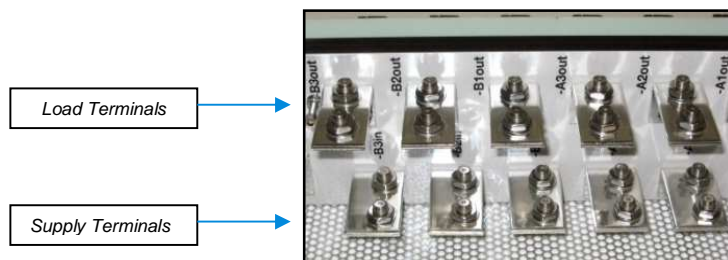


Fig. 4a – Supply Feed Terminals



Fig. 4b – Supply Cable Lug

- Each individual terminal is provided with two sets of M8 nuts and washers.
- Remove the nuts and washers before attempting any connections to the terminal.
- Fasten each cable lug with two M8 nuts and washers. Rec. torque: 7-9 Nm or 62-80 lbs in.
- The cable for each supply feed shall be routed through the top of the HPCFAP.
- The cable bend radius shall be no less than 50 mm.
- Tie cables to the cable strain relief on the rear wall of the unit (see fig. 5).

2.3 Load Terminals

- The HPCFAP is designed with 6 load terminals. Each terminal works as an output from a breaker.
- The load terminals connect to the loads labeled as -A1 out, -A2 out, ... -B1 out, -B2 out ...
- The alpha digits indicate the zone/side and the numeric digits indicate the channel number the breaker output line originates from.
- Make sure to use a suitably sized cable lug as specified on page 1 of this document.
- Output terminals are located on the upper terminal row (see fig. 4a).
- Each terminal is provided with two sets of M8 nuts and washers.
- Remove the nuts and washers before attempting any connections to the terminal.
- Mount each lug with two of the M8 nuts and washers provided. Rec. torque: 7-9 Nm or 62-80 lbs in.
- Each load output cable shall be routed through the bottom of the HPCFAP unit.
- The cable bending radius shall be no less than 50 mm
- Tie cables to the cable strain relief on the rear wall of the unit (see fig. 5).
- A jumper (provided separately) may combine the supply terminals of each zone to one supply input per zone (see fig. 6).

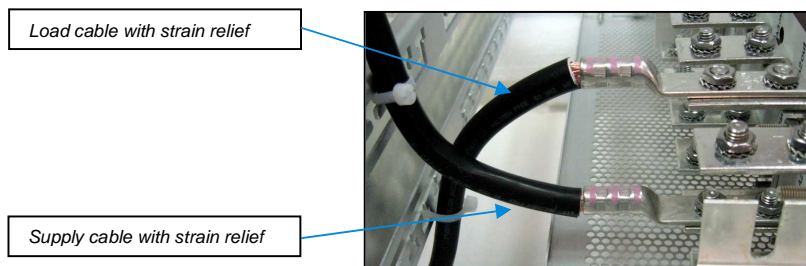


Fig. 5 – Load and Supply Cables

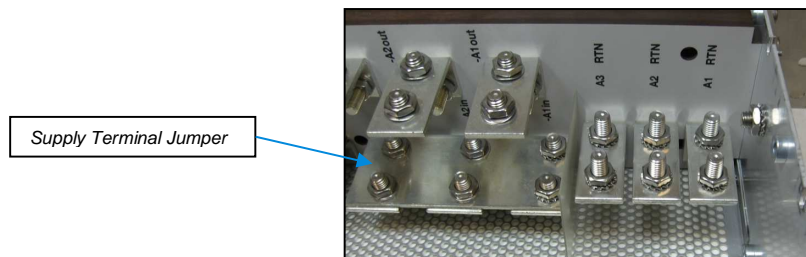


Fig. 6 – Supply Terminal Jumper

2.4 Return Terminals

- Return terminal connection options
 - Isolated RTN
 - Ungrounded Common RTN
 - Grounded Common RTN (condition as delivered)
- Unscrew M8 terminal nuts, remove serrated washers.
- Decide on the RTN option required for your application, then place jumper on the RTN terminals.
- Make sure to use a suitably sized cable lug as specified on page 1 of this document.
- After placing the RTN jumper, fix jumper with the M8 nuts and serrated washers. Rec. torque: 7-9 Nm or 62-80 lbs in.
- Supply RTN cables shall be routed through the top of the panel and load RTN cables shall be routed through the bottom of the panel.
- Cable bending radius shall be no less than 50 mm (see fig. 10b).
- A cable strain relief is provided on the rear wall of the unit (see fig. 10b).

2.4.1. Isolated Return

The Isolated Return option connects each terminal isolated from the adjacent terminal and from the chassis ground. This is the standard HPCFAP delivery condition (see fig. 7).

With this set up, make sure to connect the RTN supply and RTN load wires to the respective RTN terminal. For example: Both A1 supply (in) and A1 load (out) shall have their return cables connected to the A1 RTN terminal. Rec. torque: 7-9 Nm or 62-80 lbs in.



Fig. 7 – Isolated Return

2.4.2. Ungrounded Common Return

A jumper combines the individual RTN terminals in one zone. The combined RTN terminals are not connected to the chassis ground. See fig. 8a and 8b for correct jumper orientation - please note that misalignment will inhibit the holes in the jumpers from lining up with the bolts on the RTN terminals.

Any supply (in) and load (out) RTN cable may be connected to any RTN terminal position within the same zone (see fig. 10a).



Fig. 8a – Ungrounded Common RTN (zone A – flange pointing up)



Fig. 8b – Ungrounded Common RTN (zone B – flange pointing down)

2.4.3 Grounded Common Return

A jumper combines the individual RTN terminals in one zone and the RTN terminals are connected to the chassis ground (condition as delivered). See fig. 9a and 9b for correct jumper orientation - please note that misalignment will inhibit the holes in the jumpers from lining up with the bolts on the RTN terminals.

Any supply (in) and load (out) RTN cable may be connected to any RTN terminal position within the same zone (see 2.4.2 and fig. 10a).

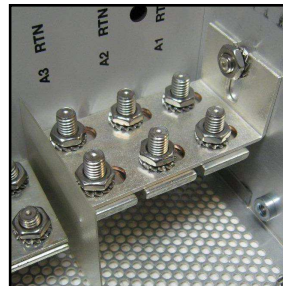


Fig. 9a – Grounded Common Return (zone A)



Fig. 9b – Grounded Common Return (zone B)

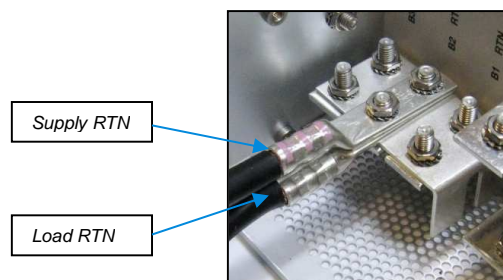


Fig. 10a – Return Cables Ungrounded common RTN



Fig. 10b – Return Cable Strain Relief

2.5 Ground Connection

- Ground terminals are located on the rear side panels.
- Grounding cables may be routed through either the top or the bottom of the HPCFAP panel.
- If both supply and load cables are to be grounded, we recommend routing the supply grounding cable through the top and the load grounding cable through the bottom of the panel.
- The HPCFAP grounding terminals are universal, meaning that grounding cables can be terminated at any grounding terminal point, while consideration should be given to the optimum cable routing.
- Make sure to use a suitably sized cable lug as specified on page 1 of this document. Fasten cable lugs with the M8 nuts and serrated washers provided. Rec. torque: 7-9 Nm or 62-80 lbs in (see fig. 11).



Fig. 11 – Grounding Cables Termination

3. Breaker Removal and Insertion



CAUTION!

Before removing or inserting a breaker, make sure that Input Power to the panel is disconnected. Do not install breaker in reset (ON) position. Doing so may damage breaker or panel. To switch OFF a breaker, use a flat head screwdriver and toggle down the actuator.

3.1 Breaker Removal

- Loosen the four captive screws on the front panel and remove the panel.
- A breaker removal tool is provided inside the HPCFAP. The tool can be found attached to the left hand side of the circuit breaker retaining plate (see fig. 12)
- To use the removal tool, unscrew the two thumbscrews holding the tool in place and attach the removal tool to the breaker housing as shown in fig. 13a.
- Note that the arrow on the removal tool shall be pointing upward.
- Pull breaker straight out and remove it from the HPCFAP.
- After service, put the removal tool back and turn thumbscrews until the tool sits firmly in its storage position.
- Install front panel to the unit once the service is completed and hand-tighten the captive screws.

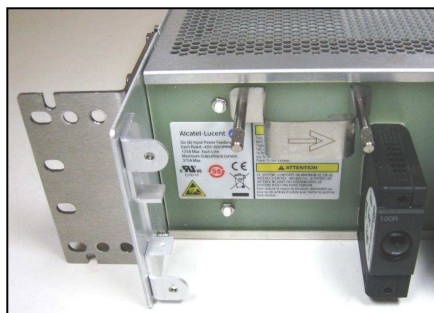


Fig. 12 – Removal Tool Storage position



Fig. 13a – Removal tool applied to breaker

3.2 Breaker Insertion

- Loosen the four captive screws on the front panel and remove the panel.
- No special tool is required for breaker insertion.
- Before installing a breaker, make sure the breaker's toggle switch is in "OFF" position.
- Simply insert the breaker into the open breaker position and check that the breaker is fully seated.
- To switch ON a breaker, use a flat head screwdriver and toggle up the actuator.
- Reinstall front panel back to the unit once the service is completed and hand-tighten the captive screws.
- For reordering Circuit Breakers, please provide to the following order code: **8345-S00219-100A**

4. RACK ALARM UNIT (RAU)



Important Note: The E-T-A Rack Alarm Unit Type **SBG-RAU-00-V0023** is an integral part of the HPCFAP and sold separately. Proper performance of the unit relies on the RAU's alarm and signaling functions. For this reason, do not operate the HPCFAP without Rack Alarm Unit.

4.1 RAU Insertion

- Loosen the four captive screws and remove the front panel.
- Remove retaining screw from RAU (see fig. 15c).
- Make sure the RAU's RJ45 connectors are facing up before attempting to insert RAU (see Fig. 15b, 15c).
- Slide RAU through the guiding pins and the opening in the circuit breaker retaining plate into its position (see Fig. 15a).
- Check if RAU is inserted correctly and its connector is fully seated.
- Hand-tighten RAU retaining screw (see fig. 15b and 15c).
- If applicable, connect cables fitted with RJ45 plugs.
- Install front panel to the unit once the service is completed and hand-tighten the captive screws.

For ordering a Rack Alarm Unit, please provide the following order code:

E-T-A Rack Alarm Unit Type: **SBG-RAU-00-V0023**

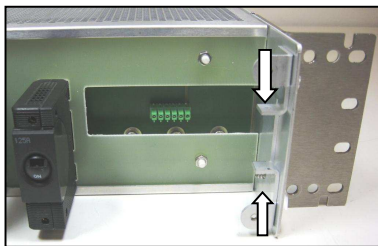


Fig. 15a – RAU Connector
(guiding pins – see white arrows)

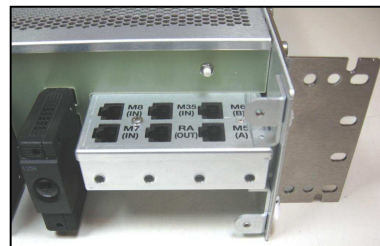


Fig. 15b – RAU installed

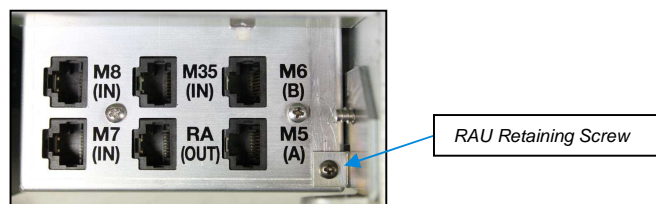


Fig. 15c – RAU Retaining Screw

4.2 RAU Removal

- Loosen the four captive screws and remove the front panel.
- Unscrew RAU retaining screw (see fig. 15c).
- If any cables are plugged into the RJ45 connectors, remove them and mark the cables with their designated ports.
- Pull RAU out straight.



CAUTION! Avoid direct contact to any of the exposed RJ45 pins if the HPCFAP is live. Potential electric shock hazard!

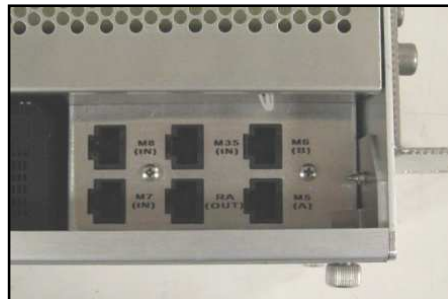


Fig. 14 – RAU RJ45 Connectors (top view)



Important Note:

Please follow these instructions carefully and keep this Installation Guide for further reference. Failure to comply or misuse of this equipment could result in serious injury to personnel, damage to the equipment itself and to the installation. The manufacturer is unable to accept responsibility for customer or third party liability, warranty claims or damage caused by incorrect installation or improper handling resulting from non-observance of these instructions. This installation manual reflects the current technical specifications at time of print. We reserve the right to change the technical or physical specifications.



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