

# Installation Guide

## High Power Connection Fuse & Alarm Panel (HPCFAP)





## 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 and electrically instructed 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 equipment can create hazardous conditions to installation personnel and to 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.
- This equipment is designed to permit the connection of the earthed conductor of the D.C. supply circuit to the earthing 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 earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the D.C. supply system earthing 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 earthing conductor, and also the point of earthing 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 earthing electrode conductor.
- The delivered equipment may slightly vary from the described version.
- The supply voltage and frequency must correspond with the electrical data stated in the product specifications.
- 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 shall be used.

## General Rack Mounting Guidelines

- 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 equipment in an environment compatible with the max. ambient temperature specified by the manufacturer at 50 °C.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- 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.
- 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.
- Reliable earthing - Reliable earthing 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).
- Cable Strain Relief – Generally accepted electrical codes and regulations require an effective cable strain relief.
- 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.

## HPCFAP Product Specifications

Electrical Ratings	
Rated Voltage	- 48 V / - 60 V DC
Breaker Channels	6 (3 per side)
Rated Current per Channel / Total	125 A / 375 A ( <i>see also pg. 2 Cautions</i> )
Circuit Breaker Type	E-T-A Model No. 8345, nominal current versions available: 0,1 ...125 A
Short Circuit Current Rating	10 kA
Mechanical Specifications	
Panel Dimensions	438 x 270 x 98 mm or 17.24" x 10.63" x 3.86"
Mounting Installation	Rack Mount – ETSI & ANSI
Input Terminal*	M8, double hole lug, 25.4 mm spacing
Width	28 mm
Cable Size	Up to 85 mm <sup>2</sup> or 3/0 AWG with distribution rail (RTN, Minus) Up to 50 mm <sup>2</sup> or 1/0 AWG without distribution rail
Output Terminal*	M8, double hole lug, 25.4 mm spacing
Width	25 mm
Cable Size	35 mm <sup>2</sup> or 1 AWG
Return Terminal*	M8, double hole lug, 25.4 mm spacing
Width	22 mm
Cable Size	35 mm <sup>2</sup> or 1 AWG
GND Terminal*	M8, double hole lug, 25.4 mm spacing
Width	28 mm (max)
Cable Size	50 mm <sup>2</sup> or 1/0 AWG
*Recommended Cable Lugs	<i>Use cable lugs for copper only. Recommended cable lugs Thomas &amp; Betts 256-30695-1018. Any UL listed cable lug meeting the specifications will be suitable.</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

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

### 1.1 ETSI Installation

Install mounting bracket on each side of the unit as shown in Fig. 1 below. ETSI mount condition is the standard HPCFAP delivery package. Use four M6 screws to attach bracket. Recommended tightening torque: 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 below. Use two 12-24 screws to install each bracket to unit. Recommended tightening torque: 4.3 to 5.8 Nm (38 to 51 lb in).



*Fig. 2 – Mounting Bracket Position for ANSI Installation*

## 2. Terminal Connections

To access all HPCFAP main terminals, first remove the top cover by loosening the four Phillips fastening screws located on top of the unit. Loosen each screw for max. 1 full turn. The screws shall be left attached to unit. Lift top cover.

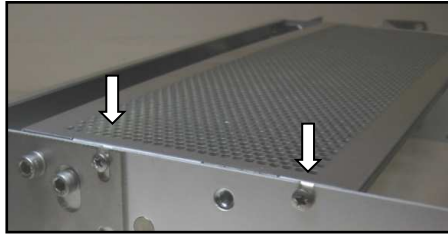


Fig. 3 – Top Cover Fastening Screws

### 2.1 Supply Feed Terminals (Batt – )

The HPCFAP features 6 supply feed terminals. Each terminal is intended to feed one breaker channel and labeled -A1 in, -A2 in, ... -B1 in, -B2 in... etc.

The alpha digit indicates the zone/side, the numeric digit indicates the channel number with its respective breaker feed. Make sure to use an appropriately sized cable lug as specified on Page 1 of this document. All supply feed terminals are located on the lower terminal level (see Fig. 4a & 4b).

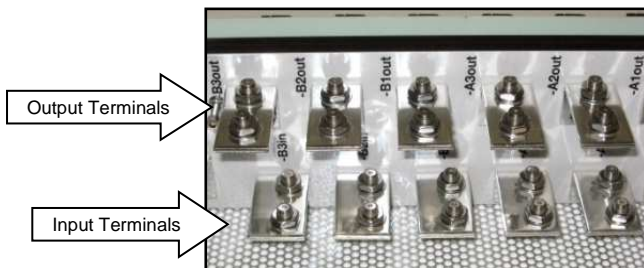


Fig. 4a – Supply Feed Terminals

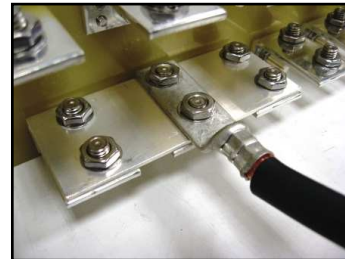


Fig. 4b – Supply Feed Cable Lug (Distribution Rail installed)

Each terminal is provided with two sets of M8 nuts and washers. Remove these before attempting any connections to the HPCFAP. Mount each cable lug with two sets of M8 nuts and washers.

Recommended tightening torque: 7-9 Nm or 62-80 lbs in.

Each supply feed cable shall be routed through the top of the HPCFAP unit and attached to the cable strain relief on the rear panel. Note that the cable bending radius shall not be less than 50 mm (see Fig. 5).

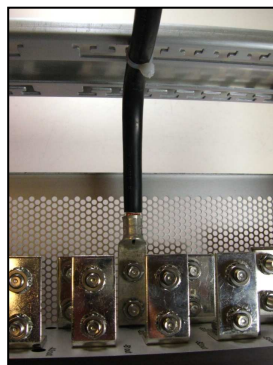


Fig. 5 – Cable Strain Relief (view from top of unit)

## 2.2 Load Terminals

The HPCFAP also features 6 load terminals. Each load terminal is a breaker output. The load terminals are labeled -A1 out, -A2 out, ... -B1 out, -B2 out ...etc. The alpha digit identifies the zone/side and the numeric digit the breaker output channel number. Make sure to use an appropriately sized cable lug as specified on Page 1 of this document. All output terminals are located on the upper terminal level (see Fig. 4a).

Each terminal is provided with two sets of M8 nuts and washers. Remove these before attempting any connections to the HPCFAP. Mount each cable lug with two sets of M8 nuts and washers.

Recommended tightening torque: 7-9 Nm or 62-80 lbs in.

Each load output cable shall be routed through the bottom of the HPCFAP unit and attached to the cable strain relief on the rear wall. Note that the cable bending radius shall not be less than 50 mm (see Fig. 6).

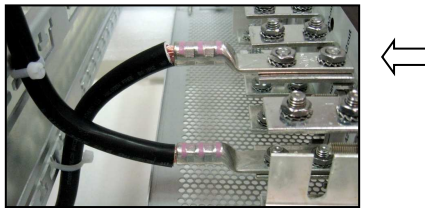


Fig. 6 – Load Cable Connection

## 2.3 Return Terminals

The return terminals may be connected in three different setups:

### 2.3.1 Isolated Return

With this setup, each terminal is isolated from one another and from chassis ground. This is the standard delivery setup for the HPCFAP unit (see Fig. 7).



Fig. 7 – Isolated Return

### 2.3.2 Common Return, ungrounded

Here all return terminals in the zone are connected through a jumper (provided separately). They are not, however, connected to chassis ground. Please note if Common Return option “ungrounded” is chosen, the holes closest to the jumper’s angled flange shall be used. See Fig. 8a and 8b below for correct jumper connection and orientation.



Fig. 8a – Common Return, ungrounded  
(A Side – flange pointing up)



Fig. 8b – Common Return, ungrounded  
(B Side – flange pointing down)

### 2.3.3 Common Return, grounded

With this option, all return terminals in the zone and chassis ground are connected by a jumper (provided separately). See Fig. 9a and 9b below for correct jumper connection and orientation.

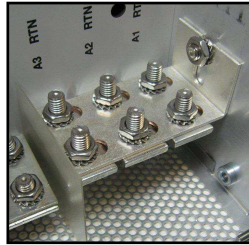


Fig. 9a – Common Return, grounded (A Side)



Fig. 9b – Common Return, grounded (B Side)

Remove the M8 nuts and washers securing the jumper to the terminal. Next, place jumper on terminal in the desired fashion and secure it by using the M8 nuts and washers. Recommended tightening torque: 7-9 Nm or 62-80 lbs in.

If the setup is an “Isolated Return” setup, make sure to connect the return supply and return load wires to their corresponding RTN terminals. For example, A1 supply (in) and A1 load (out) shall have their return cables connected to the A1 RTN terminal.

If the setup is a “Common Return” setup, regardless if grounded or ungrounded, the return cables can be connected to a single designated terminal or to any of the return terminal positions within the same zone (see Fig. 10a).

Remove M8 nuts and washers before connecting any return wire(s). Make sure to use an appropriately sized cable lug as specified on Page 1 of this document. Place cable lug(s) on terminal and secure it with the M8 nuts and washers provided.

Recommended tightening torque: 7-9 Nm or 62-80 lbs in.

The supply return cable shall be routed through the top of the HPCFAP and the load return cable shall be routed through the bottom of the HPCFAP. Note that the cable bend radius shall be no less than 50 mm. Cable strain relief is provided on the rear wall of the unit (see Fig. 10b).

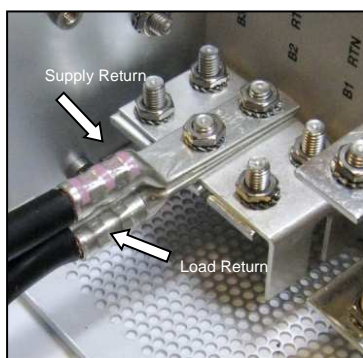


Fig. 10a – Return Cables, common return

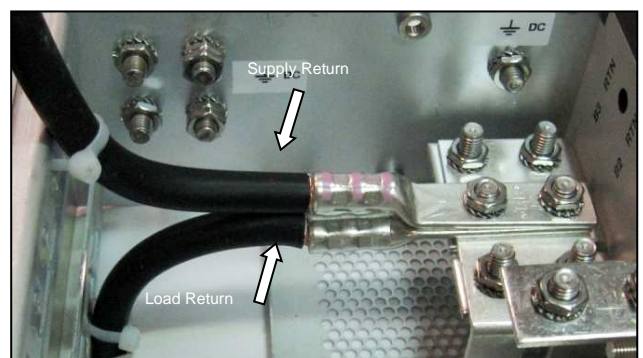


Fig. 10b – Return Cable Strain Relief

## 2.4 Ground Connection

Grounding terminals are located on either side of the sidepanels near the rear wall. Grounding cables may be routed through either the top or the bottom of the HPCFAP. If grounding cables for both supply and load are to be connected, we recommend routing the supply grounding cable through the top and the load grounding cable through the bottom of the HPCFAP.

Multiple grounding terminals are provided within the HPCFAP. All grounding terminals are common, thus all grounding cables can be terminated in any grounding terminals. However, consideration should be given to the best cable routing option.

Remove M8 nuts and washers before connecting any grounding cable(s). Make sure to use an appropriately sized cable lug as specified on Page 1 of this document. Place cable lug(s) on grounding terminal(s) and secure it with the M8 nuts and washers provided.

Recommended torque: 7-9 Nm or 62-80 lbs in (see Fig. 11).



*Fig. 11 – Termination of Grounding Cables*

**Note:** Following the completion of all cable connections, make sure to install the top cover back on to the HPCFAP. Tighten the top cover Phillips screws by applying 1 to 1.5 Nm (or 9 to 13 lb in) of tightening torque.



### 3. Breaker Removal and Insertion



**CAUTION!**

Make sure Input Power to panel is disconnected. Do not install breaker(s) in reset “ON” position. Doing so may damage breaker(s) or panel. To switch off a breaker, use a flat head screwdriver and toggle down the actuator to the “OFF” position.

#### 3.1 Breaker Removal

Remove front plate by loosening each of the captive screws holding the front plate. A breaker removal tool is provided inside the HPCFAP and can be found attached to the breaker retaining board (see Fig. 12). To use the removal tool, loose the two thumbscrews holding the tool in position. Apply the removal tool to the breaker front as shown in Fig. 13a. Pull breaker straight towards you to remove it from the panel (see Fig. 13b). After use, make sure to put the removal tool back in its place, attach the front plate and tighten the thumbscrews until securely fixed.



Fig. 12 – Removal Tool Location



Fig. 13a – Removal tool attached to breaker



Fig. 13b – Breaker removed

#### 3.2 Breaker Insertion

No special tool is required for breaker insertion. Simply insert the breaker, which is switched OFF, into an empty channel. Make sure to insert breaker until it is fully seated. Install front plate back to the unit once service is completed. Secure front plate by applying hand- tight torque on the captive screws.

For reordering Circuit Breakers, please provide to the following order code:  
E-T-A- Circuit Breaker Type: **8345-S00219-.....(0,1 ... 125 A)**

### 4. Signaling Connector PINs

Remove front plate by loosening captive screws. A Signaling PIN Connector is located in the recess on the right hand side of the circuit breaker retaining board. For Signaling PIN assignment see Fig. 15a and Fig. 16 - Wiring Diagram.

1	2	3	4	5	6
BAT-	SIG Out A	SIG Out B	SIG In	RTN	GND

Fig. 15a – Signaling Connector PIN Assignment

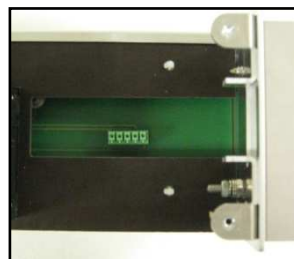


Fig. 15b – Signaling Connector PINs

## 5. Wiring Diagram

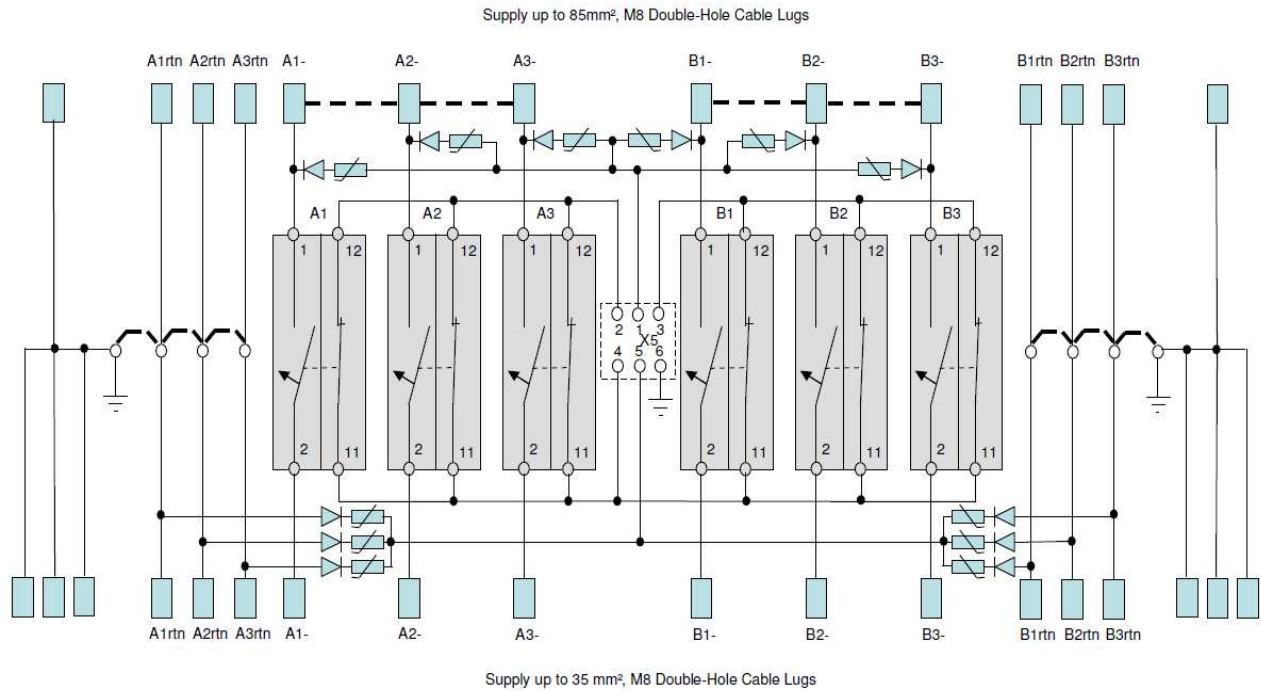


Fig. 16 – HPCFAP Wiring Diagram



### 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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