

Distributed Power Front-End



FXP7000
Front and Rear Views

Features

- Three-phase AC input
- Suitable for 3U or 5U height mounting
- Single-wire current share or Droop current share
- Remote voltage adjust and current monitoring
- Overtemperature, overload, and overvoltage protection
- LED supply status indicators
- Current share control for up to 30 units
- Standard & customized rack adaptors available
- Front panel selectable-input-range

The FXP7000 Series of rack-mounted power systems provides AC front-end capability to automatic test equipment, telecom, data communications, and other distributed power designs. The pluggable FXP supplies do not include an output isolation diode and may be paralleled up to 210 kW of total output power. These supplies provide excellent protection against input voltage transients.

Access to interfaces for remote sensing, remote voltage adjust, current sharing, current monitoring, power supply status, standby voltage and inhibit, as well as power connections, is through a connector at the rear of the supply. The FXP has its fan, handles, voltage adjust, and

indicator lights on the front panel and a single hot-plug connector on the rear. Airflow is from the front through the rear. Alarm, monitoring, and control signals are floating from the main output and can be referenced to the positive or negative output or sense line of the power supply. The output is floating with respect to the chassis and may be used as a positive or negative polarity supply.

The FXP7000 Series meets international safety requirements and is CE Marked to the Low Voltage Directive. This series operates on three-phase European voltages as well as (up to) 480VAC, delta or wye.

Hot-Pluggable Model

| MODEL | OUTPUT VOLTAGE | INPUT VOLTAGE RANGE 3-PHASE (VAC) | ADJUSTMENT RANGE | MAXIMUM OUTPUT CURRENT | LINE REGULATION | LOAD REGULATION (NOTE 1) | INITIAL SETTING ACCURACY |
|---------------------|----------------|-----------------------------------|------------------|------------------------|-----------------|--------------------------|--------------------------|
| FXP7000-48-S | 48V | 180 to 264 or 342 to 528 | 45.6V to 50.4V | 145A | 0.15% | 0.2% | 47.90V to 48.10V |

NOTES: 1) With Remote Sense connected.

Input Specifications

| PARAMETER | DESCRIPTION/CONDITIONS | MIN | NOM | MAX | UNITS | |
|----------------------|---|----------------------------------|-----|-----|-------|------|
| Input Voltage - AC | 3-phase delta low input range, nominal. | 200 | | 240 | VAC | |
| | 3-phase delta high input range, nominal. | 380 | | 480 | | |
| | Continuous deviation from the above nominals. | -10 | | +10 | % | |
| Input Current | Per phase at full rated load. | FXP7000 at 180 VAC: | | | 30 | ARMS |
| Inrush Surge Current | Internally limited. | Vin = 264VAC (one cycle). 25° C: | | | 38 | APK |
| | | Vin = 528VAC (one cycle). 25° C: | | | 38 | |
| Input Frequency | AC input. | 50 | | 60 | Hz | |
| Hold-up Time | After last AC line peak at full power. | 208 VAC: | 17 | | ms | |
| | | 400 VAC: | 13 | | | |
| Operating Frequency | Switching frequency, fixed. | | 100 | | kHz | |
| Power Factor | | 0.90 | | | W/VA | |

Output Specifications

| PARAMETER | DESCRIPTION/CONDITIONS | MIN | NOM | MAX | UNITS |
|---------------------------------|--|------|-----|---------------------------|--------------|
| Output Voltage Adjustment Range | An additional 1.0 Volt is provided to the output terminals to provide for load lead losses. | 45.6 | 48 | 50.4 | V |
| Output Power | Continuous duty rating. | | | 7000 | Watts |
| Output Current | Continuous duty rating. | | | 145 | A |
| Efficiency | Full rated load (208Vac). | 88 | 91 | | % |
| Regulation | Load, Maximum deviation with 0 to 100% load change: With Remote Sense connected: With Remote Sense not connected: Utilizing Droop Current Share: Line, Under all specified operating conditions. | | | 0.2 0.75 2.0 0.2 | % |
| Ripple & Noise | Measured at mating connector w/ 0.01 μ F + 10 μ F Tant. 20 MHz BW: 100 MHz BW: | | | 1 2 | % p-p |
| Overshoot / Undershoot | Output voltage overshoot/undershoot at turn-on. | | | 0 | % |
| Minimum Loads | Minimum loading required to maintain regulation. | 0 | | | A |
| Transient Response | Maximum recovery time, to within 1% of initial set point due to a 25% load change, 1A/ μ S. Time: Deviation: | | | 800 3.2 | μ s % |
| Turn-On Delay | Time required for initial output voltage stabilization after power-up. | | | 3 | s |
| Turn-on Rise Time | Time required for output voltage to rise from 10% to 90%. | | | 100 | ms |

Interface Signals and Protection

| PARAMETER (NOTE 1,2) | DESCRIPTION/CONDITIONS | MIN | NOM | MAX | UNITS |
|---|--|-----------|-----------|-------------|------------|
| AC Power Fail Warning | Warning provided prior to Vout dropping 5% after loss of AC input. | 4 | | | ms |
| Auxiliary Power | Output voltage - diode isolated. Inclusive of line, load, and initial tolerances. Output current. | 11.6 | 12.0 | 12.4 500 | V mA |
| Current Monitor | Monitor output current over a compliance range of 0~10V. Normal output: Total error current: | | 0.10 0 | | mA/A mA |
| Current Share | Static sharing deviation as a percent of full-load rating for loads >10%. Active: Passive: | | | 5 10 | % |
| Input Range Select Status | Maximum signal resistance in high input voltage range selection. | | | 0.10 | |
| Loss of Phase Warning | Warning provided prior to protective reduction in current limit. | 500 | | | ms |
| Output Inhibit | Voltage required to enable supply (0.5 mA sink). (NOTE 3) | | | 1.0 | V |
| Output Interlock | Voltage required to enable supply (6 mA sink). (NOTE 3) | | | 1.0 | V |
| Output Overload Protection | Straight line current limit (above approx. 5V Vout). | 149 | | 156 | A |
| Output Overload Warning | Signal level on overload. | 2.2 | | | V |
| Output Short Circuit Protection | Occurs on overload when Vout is below approx. 5V. May operate in burst-mode. Iavg: | 25 | | 90 | A |
| Output Voltage Fault Signal | Deviation from adjusted Vout that is considered as a fault. | \pm 3 | \pm 4 | \pm 5 | % |
| Output Voltage Margin | Output voltage swing available through Margin pin (analog). | \pm 4.8 | \pm 5.0 | \pm 5.2 | % |
| Overtemperature/ Fan Failure Warning | Time between fault warning and shutdown. Latching shutdown. | 100 | | | ms |
| Overvoltage Protection | Latch style overvoltage protection. | 55.2 | 57.6 | 60.0 | V |
| Power Supply Present Signal | Resistance to logic ground upon insertion of supply. | | 1000 | | |
| Remote Sense | Maximum load lead loss compensation (round trip). | | | 1.0 | V |

- NOTES:**
- 1) All logic outputs listed below feature a standard active pull-down output with 0.4V max at 40 mA sink capability, and a 100k pull-up to 5V.
 - 2) In addition to those listed below, signals and front-panel LEDs are provided to indicate: overtemperature/fan fault, AC phase imbalance, output good, interlock open, and supply inhibited. The FXP also provides 4 LED's indicating output loading.
 - 3) **Both signals must be pulled to logic ground for the unit to operate.** Enables are 100% redundant internally for applications where redundant inhibit is desirable. Contact factory for additional design details.

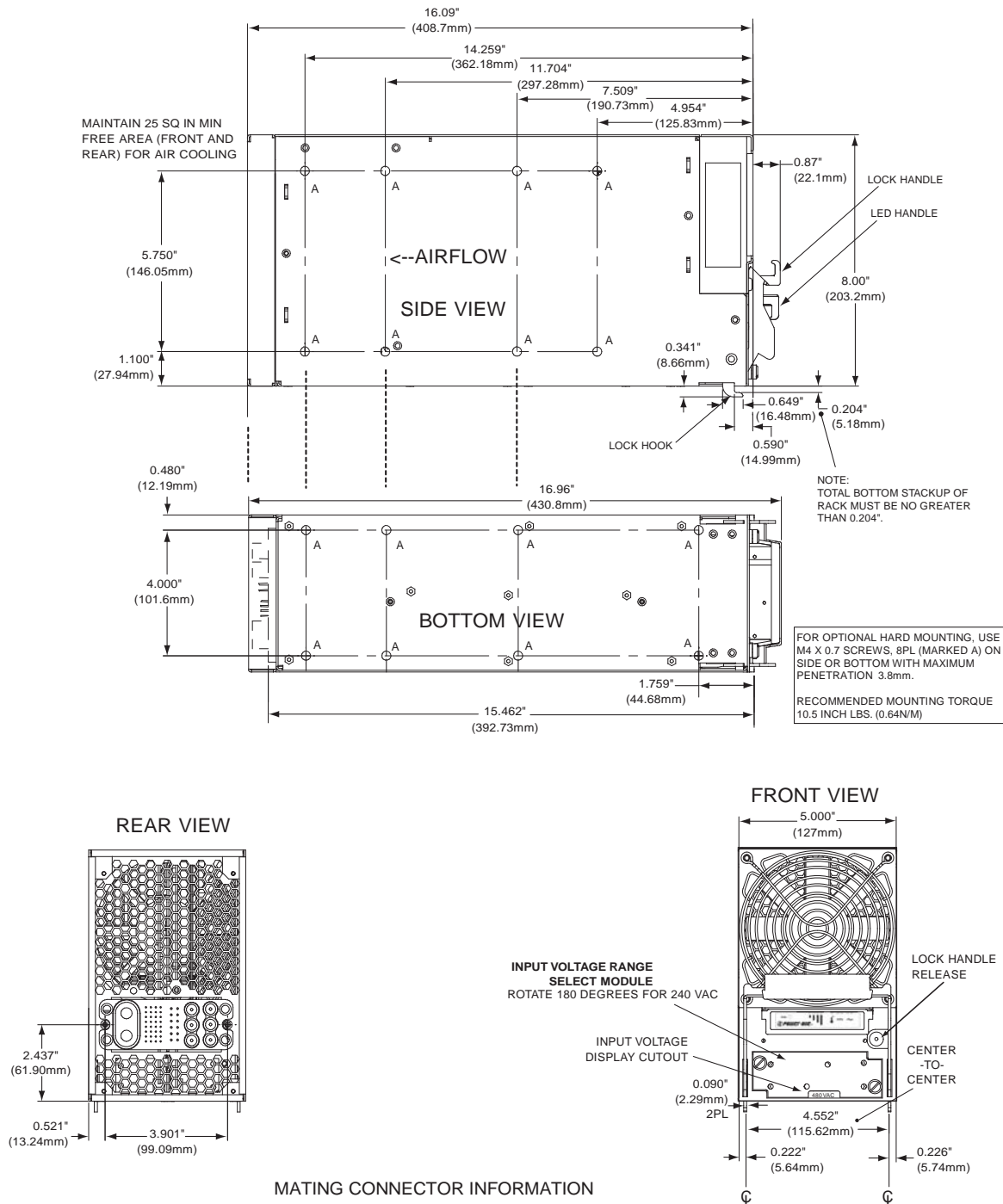
Safety, Regulatory, and EMI Specifications

| PARAMETER | CONDITIONS/DESCRIPTION | MIN | NOM | MAX | UNITS |
|------------------------------|--|--------|-----|--------------|-------|
| Agency Approvals | UL60950/CSA60950-00 (cULus), IEC60950, EN60950 (TÜV), CE marked for the Low Voltage Directive | | | | |
| Electromagnetic Interference | FCC CFR title 47 Part 15 Sub-Part B - Conducted. EN55022 / CISPR 22 Conducted. | A A | | | Class |
| ESD Susceptibility | Per EN61000-4-2, level 4. | 8 | | | kV |
| Radiated Susceptibility | Per EN61000-4-3, level 3. | 10 | | | V/M |
| EFT/Burst | Per EN61000-4-4, level 4. | ±4 | | | kV |
| Input Transient Protection | Per EN61000-4-5. Line-to-Line: Line-to-Ground: | 4 3 | | | kV |
| Voltage Sag Immunity | Per SEMI F47-0200 FXC/FXP7000 | | | Pending | |
| Leakage Current | Per UL60950 and EN60950: FXP7000 at 240 VAC, 60 Hz: FXP7000 at 400 VAC, 50 Hz: FXP7000 at 480 VAC, 60 Hz: | | | 5 7 10 | mA |

Environmental Specifications

| PARAMETER | CONDITIONS/DESCRIPTION | MIN | NOM | MAX | UNITS |
|-------------------------|---|-----|-----|------------|---------------------|
| Altitude | Operating. Non-Operating. | | | 10k 40k | ASL Ft. |
| Operating Temperature | At 100% load: At 50% load: | 0 | | 40 70 | °C |
| Storage Temperature | | -40 | | 85 | °C |
| Temperature Coefficient | 0°C to 70°C (after 15-minute warm-up). | | | .02 | %/°C |
| Relative Humidity | Non-Condensing. | | | 95 | %RH |
| Shock | Operating: half-sine 10 ms, 3 axis Non-operating: half-sine 10 ms, 3 axis | | | +20 +40 | GPK |
| Vibration | Operating: swept sine 5-2000-5 Hz, 5-32 Hz, 0.02iDA, 32-2000 Hz Non-operating: random 10-2000 Hz | | | 1 6.15 | GPK Grms |
| Airflow | Airflow provided through the supply from front to rear. | | 155 | | cfm |
| | | | 4.4 | | m ³ /min |
| | | | 555 | | lfm |
| | | | 2.8 | | m/s |
| Weight | | | | 29 | lb |
| | | | | 13 | kg |

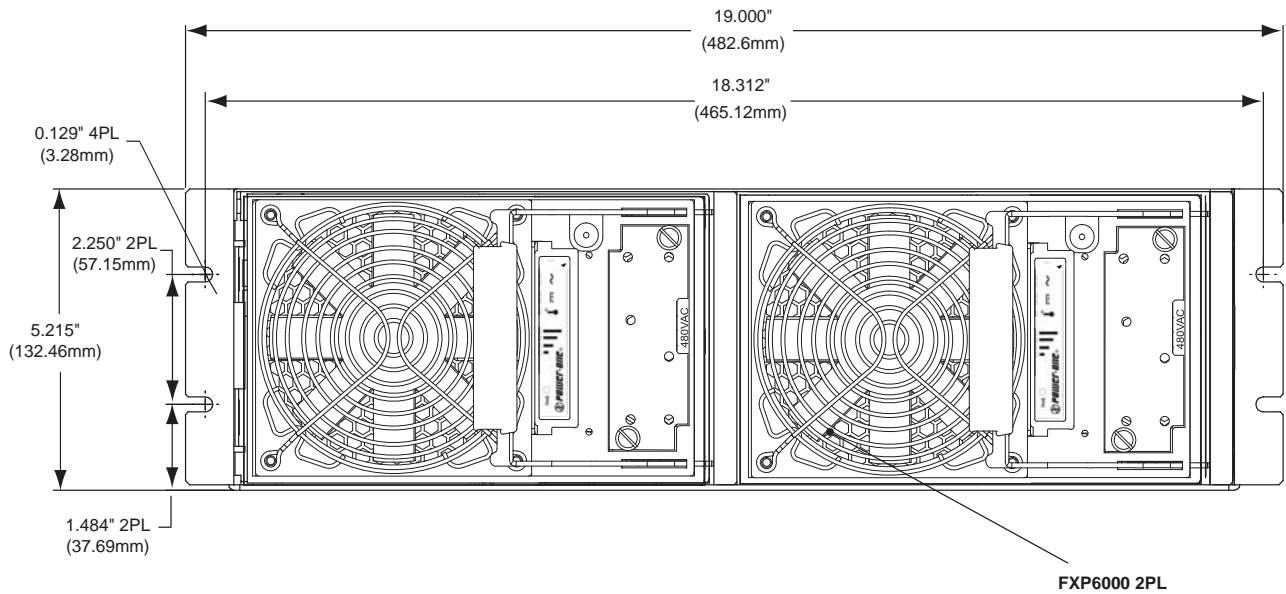
FXP7000 OVERALL SIZE: 16.96" x 8.00" x 5.00" (430.8mm x 203.2mm x 127.0mm)





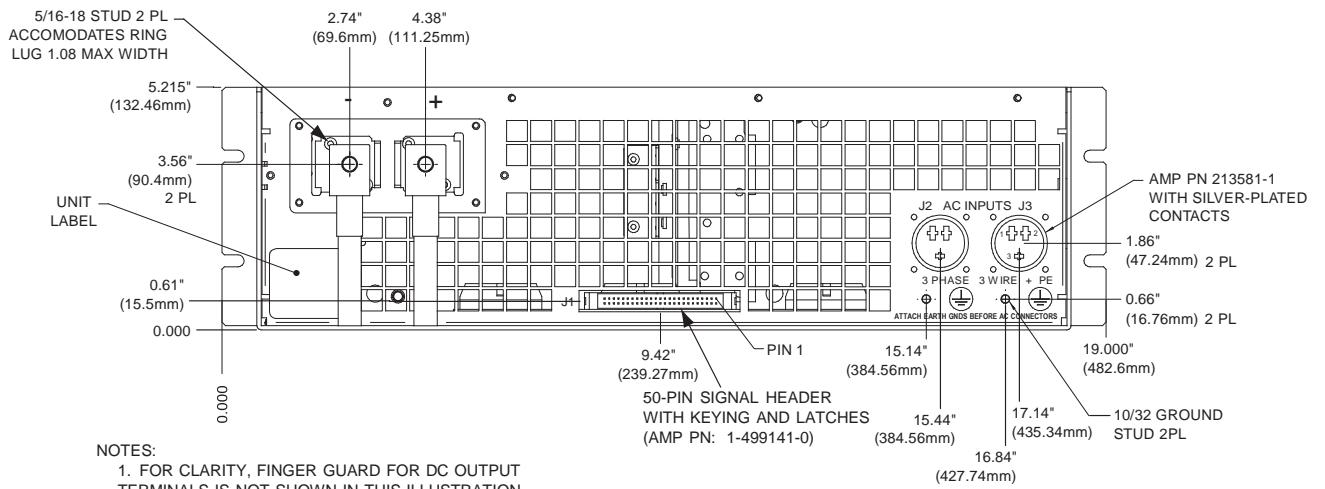
FRH7000 POWER SHELF, FRONT VIEW

NOTE:
FXP6000 POWER SUPPLIES ARE SHOWN FOR ILLUSTRATION PURPOSES ONLY AND ARE NOT INCLUDED AS PART OF POWER SHELF ASSEMBLY.

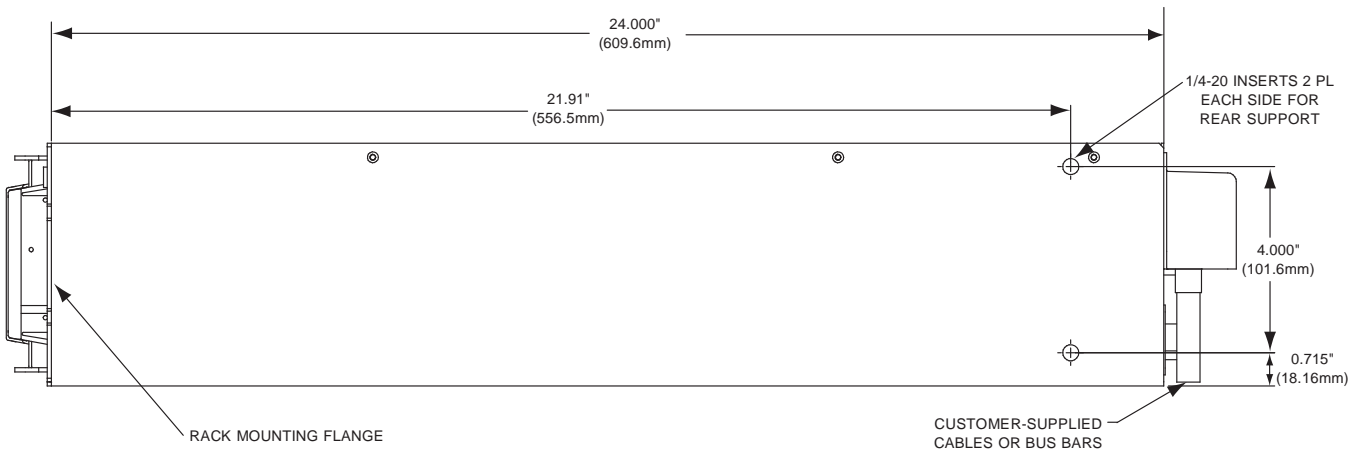


Note: The FRH7000 Power Shelf is designed for alternative vertical mounting with the right side down.

FRH7000 POWER SHELF, REAR VIEW



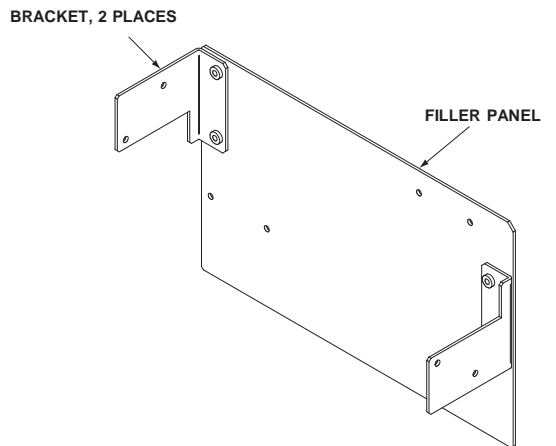
FRH7000 POWER SHELF, RIGHT-SIDE VIEW



FILLER PANEL KIT, PN: 088-101378

(Used with FRH7000 Power Shelf)

This kit is used to cover an unused right-side slot of the FRH7000 Power Shelf (as viewed from the front of the FRH7000). The kit can be installed before, or after installation of the power shelf into the rack.

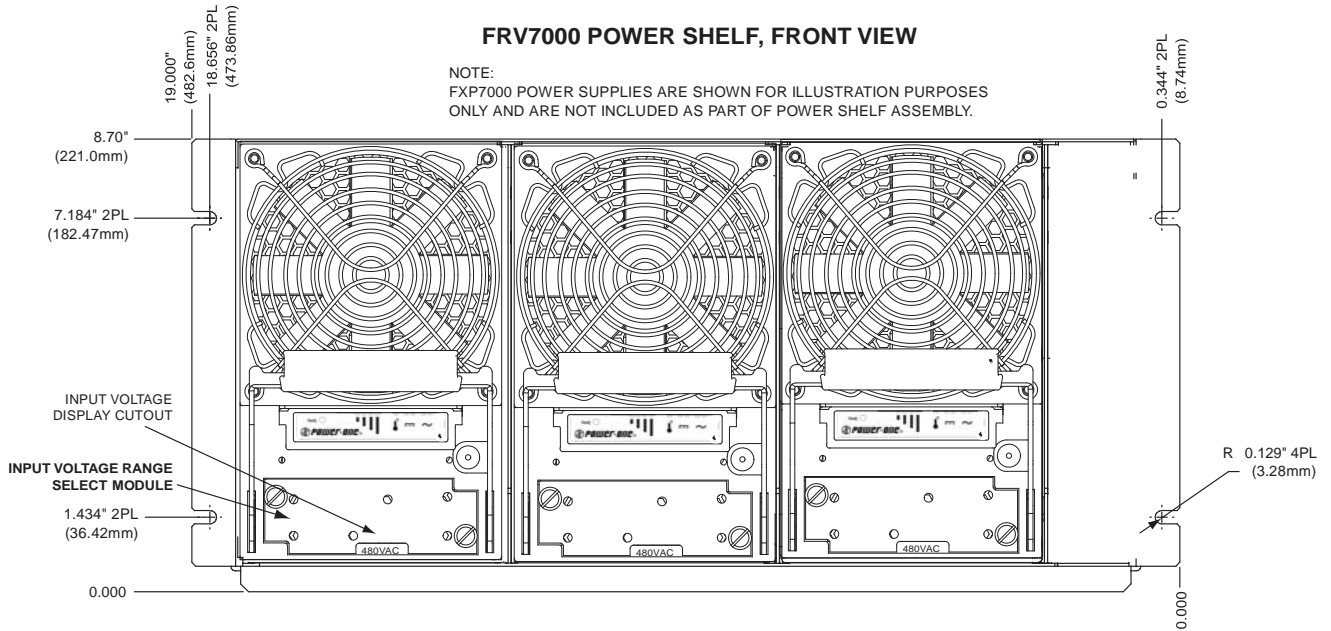


(FILLER PANEL KIT AS SEEN FROM INSIDE OF POWER SHELF)

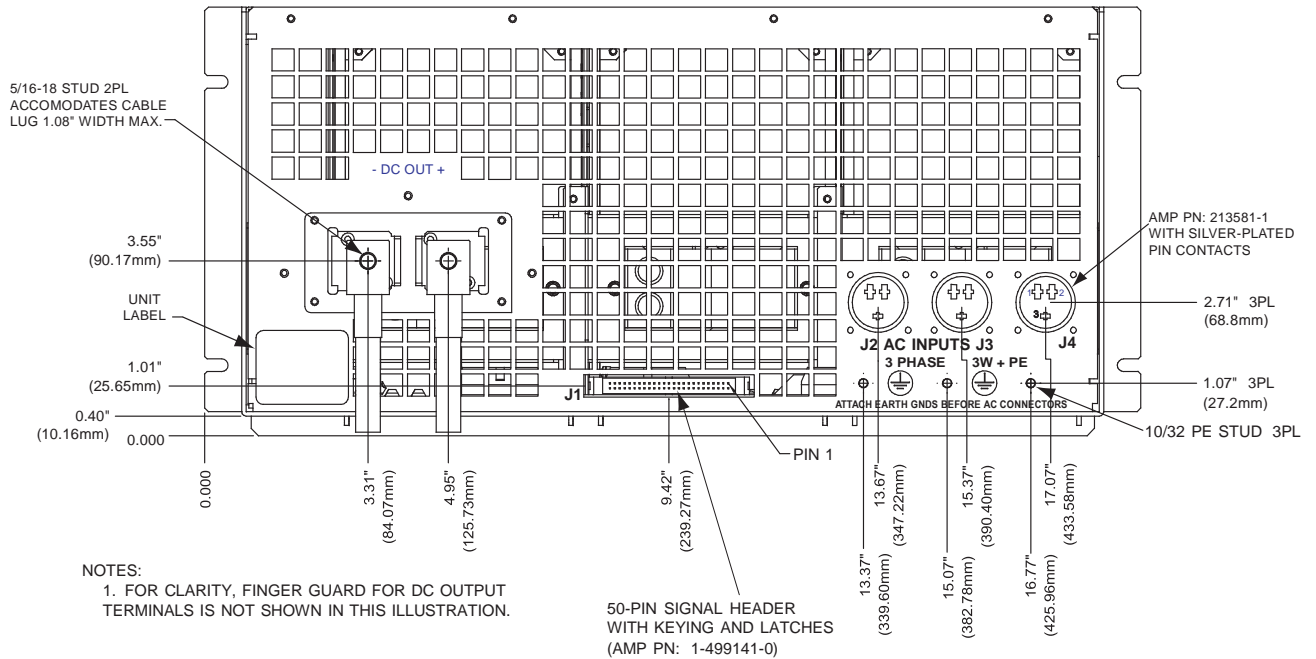


FRV7000 POWER SHELF, FRONT VIEW

NOTE:
FXP7000 POWER SUPPLIES ARE SHOWN FOR ILLUSTRATION PURPOSES ONLY AND ARE NOT INCLUDED AS PART OF POWER SHELF ASSEMBLY.



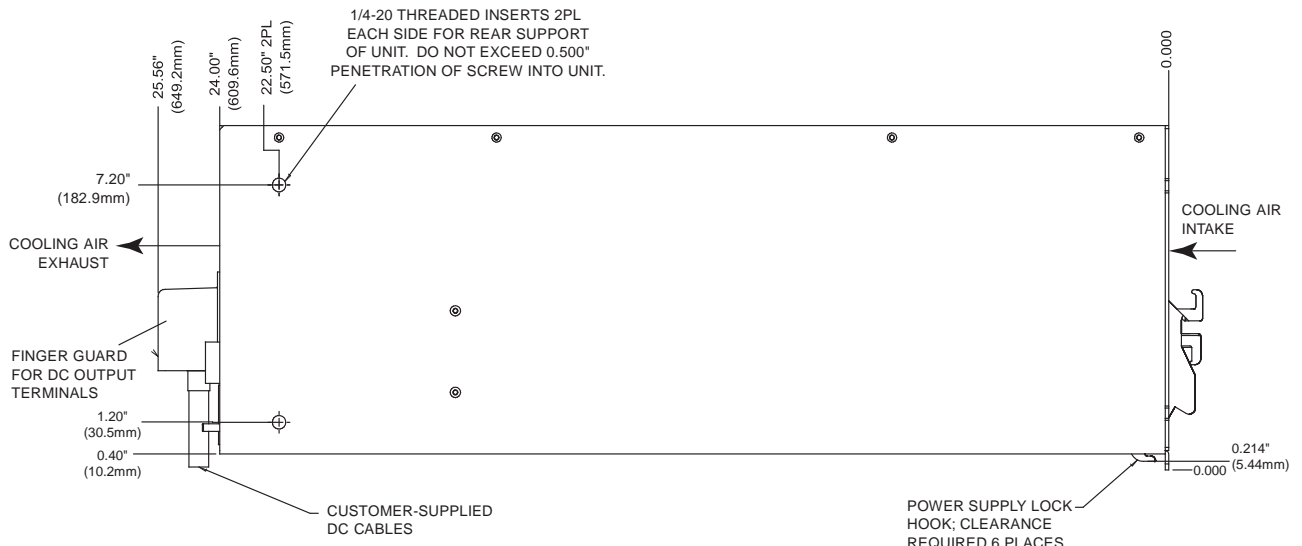
FRV7000 POWER SHELF, REAR VIEW



NOTES:
1. FOR CLARITY, FINGER GUARD FOR DC OUTPUT TERMINALS IS NOT SHOWN IN THIS ILLUSTRATION.

50-PIN SIGNAL HEADER WITH KEYING AND LATCHES (AMP PN: 1-499141-0)

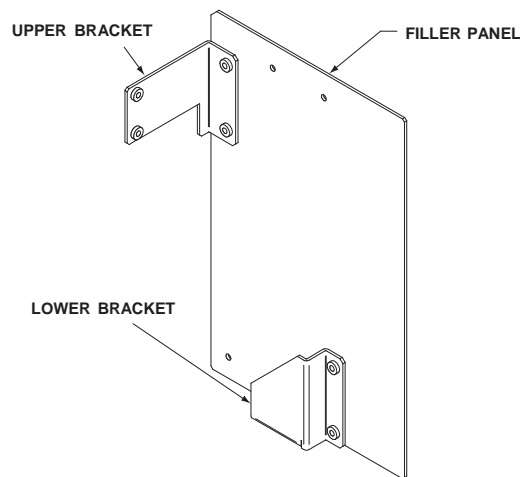
FRV7000 POWER SHELF, LEFT-SIDE VIEW



FILLER PANEL KIT, PN: 088-101348

(Used with FRV7000 Power Shelf)

This kit is used to cover an unused left or center slot of the FRV7000 Power Shelf (as viewed from the front of the FRV7000). One kit is required per slot. Kits can be installed before, or after installation of the power shelf into the rack.



(FILLER PANEL KIT AS SEEN FROM INSIDE OF POWER SHELF)

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