

## Distributed Power Front-End



**FXC6000**  
Front & 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
- Front panel selectable-input-range

### Description

The FXC6000 Series of standalone or rack-mounted power systems provides true AC front-end capability to automatic test equipment, telecom, data communications, and other distributed power designs. The FXC systems may be paralleled up to 180 kW of output power and is intended for chassis-mounted installations with bolted connections. These power supplies provide excellent protection against input voltage transients.

The FXC has its fan located at the front of the supply, and voltage adjust, indicator lights, output bussbars, and connectors 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 FXC6000 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, D or Y.

### Chassis-Mountable Model

| MODEL                        | OUTPUT VOLTAGE | INPUT VOLTAGE RANGE 3-PHASE (VAC) | ADJUSTMENT RANGE | MAXIMUM OUTPUT CURRENT | LINE REGULATION | LOAD REGULATION (NOTE 1) | INITIAL SETTING ACCURACY |
|------------------------------|----------------|-----------------------------------|------------------|------------------------|-----------------|--------------------------|--------------------------|
| <b>FXC6000-48-S</b> (NOTE 2) | 48V            | 180 to 264 or 342 to 528          | 45.6V to 50.4V   | 125A                   | 0.15%           | 0.2%                     | 47.90V to 48.10V         |

NOTES: 1) With Remote Sense connected.

2) User-selectable input voltage ranges.

### Input Specifications

| PARAMETER            | DESCRIPTION/CONDITIONS                                                                                                               | MIN                                                                  | NOM      | MAX               | UNITS        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------|-------------------|--------------|
| Input Voltage - AC   | 3-phase delta low input range, nominal.<br>3-phase delta high input range, nominal.<br>Continuous deviation from the above nominals. | 200<br>380<br>-10                                                    |          | 240<br>480<br>+10 | %            |
| Input Current        | Per phase at full rated load.                                                                                                        | FXC6000 at 180 VAC:                                                  |          |                   | 28 ARMS      |
| Inrush Surge Current | Internally limited.                                                                                                                  | Vin = 264VAC (one cycle). 25° C:<br>Vin = 528VAC (one cycle). 25° C: |          |                   | 38<br>38 APK |
| Input Frequency      | AC input.                                                                                                                            | 50                                                                   |          | 60                | Hz           |
| Hold-up Time         | After last AC line peak at full power.                                                                                               | 208 VAC:<br>415 VAC:                                                 | 20<br>20 |                   | ms           |
| 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.                                                                                                                                                                                      |      |     | 6000                      | Watts   |
| Output Current                  | Continuous duty rating.                                                                                                                                                                                      |      |     | 125                       | A       |
| Efficiency                      | Full rated load (208Vac).                                                                                                                                                                                    | 88   | 91  |                           | %       |
| Regulation                      | Load, Maximum deviation with 0 to 100% load change:<br>With Remote Sense connected:<br>With Remote Sense not connected:<br>Utilizing Droop Current Share:<br>Line, Under all specified operating conditions. |      |     | 0.2<br>0.75<br>2.0<br>0.2 | %       |
| Ripple & Noise                  | Measured at mating connector w/ 0.01µF + 10µF Tant.<br>20 MHz BW:<br>100 MHz BW:                                                                                                                             |      |     | 1<br>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/µS.<br>Time:<br>Deviation:                                                                                             |      |     | 400<br>3                  | µs<br>% |
| 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 Internal 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.                                                                       | 5    |                |             | ms                 |
| Auxiliary Power                         | Output voltage - diode isolated. Inclusive of line, load, and initial tolerances.<br>Output current.                                     | 11.5 | 12.0           | 12.7<br>500 | V<br>mA            |
| Current Monitor                         | Monitor output current over a compliance range of 0~10V.<br>Nominal full load output:<br>50~100% load tolerance:<br><50% load tolerance: |      | 12.5<br>0<br>0 |             | mA<br>µA/A<br>µA/A |
| Current Share                           | Static sharing deviation as a percent of full-load rating for loads >10%.<br>Active:<br>Passive:                                         |      |                | 5<br>10     | %                  |
| Input Range Select Status               | Maximum signal resistance in high input voltage range selection.                                                                         |      |                | 0.10        | Ω                  |
| 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).                                                                                     | 129  |                | 134         | 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.<br>Iavg:                                                    | 21   |                | 65          | A                  |
| Output Voltage Fault Signal             | Deviation from adjusted Vout that is considered as a fault.                                                                              | ±3   | ±4             | ±5          | %                  |
| Output Voltage Margin                   | Output voltage swing available from Margin pin (analog).                                                                                 | ±4.8 | ±5.0           | ±5.2        | %                  |
| Overtemperature/<br>Fan Failure Warning | Time between fault warning and shutdown.<br>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           |             | Ω                  |
| 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), IEC60950-1, EN60950 (TÜV), CE marked for the Low Voltage Directive                    |        |     |              |       |
| Electromagnetic Interference | FCC CFR title 47 Part 15 Sub-Part B - Conducted.<br>EN55022 / CISPR 22 Conducted.                                  | A<br>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.<br>Line-to-Line:<br>Line-to-Ground:                                                               | 4<br>3 |     |              | kV    |
| Voltage Sag Immunity         | Per SEMI F47-0200 FXC/FXP6000                                                                                      |        |     | Pending      |       |
| Leakage Current              | Per UL60950 and EN60950:<br>FXC6000 at 240 VAC, 60 Hz:<br>FXC6000 at 400 VAC, 50 Hz:<br>FXC6000 at 480 VAC, 60 Hz: |        |     | 5<br>7<br>10 | mA    |

### Environmental Specifications

| PARAMETER               | CONDITIONS/DESCRIPTION                                                                              | MIN | NOM                      | MAX        | UNITS                                    |
|-------------------------|-----------------------------------------------------------------------------------------------------|-----|--------------------------|------------|------------------------------------------|
| Altitude                | Operating.<br>Non-Operating.                                                                        |     |                          | 10k<br>40k | ASL Ft.                                  |
| Operating Temperature   | At 100% load:<br>At 60% load:                                                                       | 0   |                          | 50<br>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<br>Non-operating: half-sine 10 ms, 3 axis                        |     |                          | +20<br>+40 | GPK                                      |
| Vibration               | Operating: swept sine 5-2000-5 Hz, 5-32 Hz, 0.02iDA, 32-2000 Hz<br>Non-operating: random 10-2000 Hz |     |                          | 1<br>6.15  | GPK<br>Grms                              |
| Airflow                 | Airflow provided through the supply from front to rear.                                             |     | 135<br>3.8<br>483<br>2.5 |            | cfm<br>m <sup>3</sup> /min<br>lfm<br>m/s |
| Weight                  |                                                                                                     |     |                          | 27<br>12   | lb<br>kg                                 |

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TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

**FXC6000 OVERALL SIZE: 15.17" x 8.00" x 5.00" (385.3mm x 203.2mm x 127.0mm)**

