

# PFC500 Series

## AC-DC Power Supplies



The PFC500 products of the PerFormanCe Power Series combine high performance midrange power with high power density (4.4 watts/in<sup>3</sup>) and high reliability to meet the requirements of communications, commercial, and industrial systems.

Providing tightly regulated DC power, the PFC500 delivers full output performance with only 300 Linear Feet per Minute (LFM) forced-air cooling (factory-installed fan optional). Main channel current sharing is provided for redundant applications.

Units are available with SAE mountings or optional metric mountings.

The PFC500 Series is approved to the latest international regulatory standards.

### KEY FEATURES

- RoHS Compliant
- Power Factor Correction meets EN 61000-3-2 (AC input versions)
- Fully-regulated outputs
- Remote sense
- Logic level Inhibit
- Current Share, Power Fail, and Power Good Signals
- Overtemperature, overvoltage, and overcurrent protected
- Available with metric or SAE mountings
- Input transient & ESD compliance to EN 61000-4-2/-3/-4/-5
- Fan output voltage and optional fan
- Optional isolation diodes for parallel or redundant operation



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## 1. SINGLE-OUTPUT MODEL SELECTION

| MODEL <sup>5</sup>        | OUTPUT VOLTAGE | ADJUSTMENT RANGE | MAX. OUTPUT CURRENT <sup>2</sup> | LINE REGULATION | LOAD REGULATION <sup>3</sup> | RIPPLE & NOISE % p-p <sup>4</sup> | INITIAL SETTING ACCURACY |
|---------------------------|----------------|------------------|----------------------------------|-----------------|------------------------------|-----------------------------------|--------------------------|
| PFC500-1024G              | 24 V           | 21.6 V to 26.4 V | 21.0 A                           | 0.5%            | 0.2 %                        | 1 %                               | 23.88 V to 24.12 V       |
| PFC500-1028G <sup>1</sup> | 28 V           | 25.2 V to 30.8 V | 17.9 A                           | 0.5%            | 0.2 %                        | 1 %                               | 27.86 V to 28.14 V       |
| PFC500-1048G <sup>1</sup> | 48 V           | 46.0 V to 56.0 V | 10.4 A                           | 0.5%            | 0.5 %                        | 1 %                               | 47.52 V to 48.48 V       |

### NOTES:

- <sup>1</sup> Consult factory for availability of 28 V and 48 V units with DC input.
- <sup>2</sup> Output currents ratings are expressed with 300 LFM forced air.
- <sup>3</sup> Remote sense connected. See Application note for load regulation when using the D option for 24 V units.
- <sup>4</sup> Maximum peak to peak noise expressed as a percentage of output voltage, 20 MHz bandwidth. For ripple/noise on "D" option models, see options data.
- <sup>5</sup> Models without suffix G are not RoHS-compliant (lead solder used) and are not recommended for new designs or already EOL.

## 2. INPUT SPECIFICATIONS

| PARAMETER            | CONDITIONS / DESCRIPTION                                                     | MIN                | NOM | MAX      | UNITS            |
|----------------------|------------------------------------------------------------------------------|--------------------|-----|----------|------------------|
| Input Voltage - AC   | Continuous input range.                                                      | 85                 |     | 264      | VAC              |
| Input Frequency      | AC Input.                                                                    | 47                 |     | 63       | Hz               |
| Brown Out Protection | Lowest AC input voltage that regulation is maintained with full rated loads. | 85                 |     |          | VAC              |
| Hold-Up Time         | Over full AC input voltage range at full rated load.                         | 20                 |     |          | ms               |
| Input Current        | 85 VAC at full rated load.                                                   |                    |     | 7.8      | A <sub>RMS</sub> |
| Input Protection     | Non-user serviceable internally located AC input line fuse, F10A, 250 V.     |                    |     |          |                  |
| Inrush Surge Current | Internally limited by thermistor, one cycle, 25°C.                           | 110 VAC<br>220 VAC |     | 35<br>65 | APK              |
| Power Factor         | Per EN61000-3-2.                                                             | 0.98               |     |          | W/VA             |
| Operating Frequency  | Switching frequency of main transformer.                                     |                    | 100 |          | kHz              |

## 3. OUTPUT SPECIFICATIONS

| PARAMETER              | CONDITIONS / DESCRIPTION                                                                                          | MIN                                          | NOM               | MAX               | UNITS |
|------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|-------------------|-------|
| Efficiency             | Full rated load, 110 VAC.                                                                                         | 75                                           |                   |                   | %     |
| Minimum loads          |                                                                                                                   | PFC500-1024G<br>PFC500-1028G<br>PFC500-1048G | 0.6<br>0.6<br>1.2 |                   | A     |
| Ripple and Noise       | Full load, 20 MHz bandwidth.                                                                                      | See Model Selection Charts                   |                   |                   |       |
| Output Power           | 300 LFM forced air cooling required for operation. See optional fan.<br>Continuous power, multiple output models. |                                              | 500               |                   | W     |
| Overshoot / Undershoot | Output voltage overshoot/undershoot at turn-on.                                                                   |                                              |                   | 0                 | V     |
| Regulation             | Without connection of remote sense.                                                                               | PFC500-1024G<br>PFC500-1028G<br>PFC500-1048G |                   | 0.8<br>0.7<br>1.0 | %     |
| Transient Response     | Recovery time, to within 1% of initial set point due to a 50-100% load change, 3% max. deviation.                 |                                              | 1                 |                   | ms    |
| Turn-on Delay          | Time required for initial output voltage stabilization.                                                           |                                              |                   | 1                 | s     |
| Turn-on Rise Time      | Time required for output voltage to rise from 10% to 90%.                                                         |                                              | 10                |                   | ms    |



#### 4. INTERFACE SIGNALS & INTERNAL PROTECTION

| PARAMETER                  | CONDITIONS / DESCRIPTION                                                                                                                                                                                                                                    | MIN                                          | NOM                     | MAX                     | UNITS |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------|-------------------------|-------|
| Overvoltage Protection     | PFC500-1024G<br>PFC500-1028G<br>PFC500-1048G                                                                                                                                                                                                                | 27.0<br>32.0<br>60.0                         |                         | 30.7<br>35.0<br>70.0    | V     |
| Overload Protection        | Fully protected against output overload and short circuit. Automatic recovery upon removal of overload condition.                                                                                                                                           |                                              |                         |                         |       |
| Overtemperature Protection | System shutdown due to excessive internal temperature, automatic reset.                                                                                                                                                                                     |                                              |                         |                         |       |
| Remote Sense               | Total voltage compensation for cable losses with respect to the main output.                                                                                                                                                                                |                                              |                         | 250                     | mV    |
| Current Share              | Accuracy of shared current with up to 6 parallel units.                                                                                                                                                                                                     |                                              |                         | 10                      | %     |
| Inhibit                    | TTL compatible logic signal will inhibit outputs by the application of a logic low signal. An open circuit or external TTL high signal allows normal operation.                                                                                             |                                              |                         |                         |       |
| Input Power Fail Warning   | TTL compatible logic signal. Time before regulation dropout due to loss of input power at 110 VAC.                                                                                                                                                          | 4                                            |                         |                         | ms    |
| Power Good                 | TTL compatible signal. Signal is low if main output is greater or less than 10% of nominal. For models without the "D" option, internal pull-up resistor is 1k $\Omega$ . For "D" option, pull-up resistor is 475 $\Omega$ . See Apps Note #P1 for details. | PFC500-1024G<br>PFC500-1028G<br>PFC500-1048G | 22.08<br>25.20<br>44.20 | 27.36<br>30.80<br>54.72 | V     |
| Fan Voltage                | Provides 170 mA current to user supplied fan if fan option is not selected.                                                                                                                                                                                 |                                              | 12                      |                         | V     |

#### 5. SAFETY, REGULATORY AND EMI SPECIFICATIONS

| PARAMETER                    | CONDITIONS / DESCRIPTION                                                                              | MIN                            | NOM      | MAX | UNITS      |
|------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------|----------|-----|------------|
| Agency Approvals             | Approved to the latest edition of the following standards: UL/CSA 60950-1, EN 62368-1 and IEC 62368-1 |                                | Approved |     |            |
| Dielectric Withstand         | Input to Output                                                                                       | 4242                           |          |     | VDC        |
| Electromagnetic Interference | FCC CFR title 47 Part 15 Sub-Part B - Conducted.<br>EN 55032 / CISPR 32 Conducted.                    | B<br>B                         |          |     | Class      |
| ESD Susceptibility           | Per EN 61000-4-2, level 4.                                                                            | 8                              |          |     | kV         |
| Radiated Susceptibility      | Per EN 61000-4-3, level 3.                                                                            | 10                             |          |     | V/M        |
| EFT/Burst                    | Per EN 61000-4-4, level 4.                                                                            | $\pm 4$                        |          |     | kV         |
| Input Transient Protection   | Per EN 61000-4-5 class 3.                                                                             | Line to Line<br>Line to Ground | 1<br>2   |     | kV         |
| Insulation Resistance        | Input to output.                                                                                      |                                | 10       |     | M $\Omega$ |
| Touch Current                | Per EN 62368-1, 264 VAC.                                                                              |                                |          | 2   | mA         |



## 6. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER               | CONDITIONS / DESCRIPTION                                                                                                                                                                                                      | MIN | NOM   | MAX   | UNITS            |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|-------|------------------|
| Altitude                | Operating.                                                                                                                                                                                                                    |     |       | 10k   | ASL Ft.          |
|                         | Non-Operating.                                                                                                                                                                                                                |     |       | 40k   |                  |
| Operating Temperature   | At 100% load                                                                                                                                                                                                                  | 0   |       | 50    | °C               |
|                         | At 50% load                                                                                                                                                                                                                   | 0   |       | 70    |                  |
| Storage Temperature     | Derate linearly above 50°C by 2.5% per °C.                                                                                                                                                                                    | -55 |       | 85    | °C               |
| Forced Air Cooling      | Forced air cooling of 300 LFM is required if the internal fan is not specified. Cooling air velocity is measured at the output exiting window (2.5" x 5"). Airflow direction is from the input section to the output section. |     |       |       |                  |
| Temperature Coefficient | 0°C to 70°C (after 15 minute warm-up).                                                                                                                                                                                        |     | ±0.02 | ±0.05 | %/°C             |
| Relative Humidity       | Non-Condensing.                                                                                                                                                                                                               | 5   |       | 95    | %RH              |
| Shock                   | Operating: 10±3mSec, 3 axis, Half Sine.                                                                                                                                                                                       |     |       | 20    | G                |
|                         | Non-operating: 10±3mSec, 3 axis, Half Sine.                                                                                                                                                                                   |     |       | 40    |                  |
| Vibration               | Operating: 5-32 Hz                                                                                                                                                                                                            |     |       | 0.02  | in (DA)          |
|                         | 32-2000 Hz Sinusoidal                                                                                                                                                                                                         |     |       | 1     |                  |
|                         | Non-operating:                                                                                                                                                                                                                |     |       | 6.15  | G <sub>RMS</sub> |

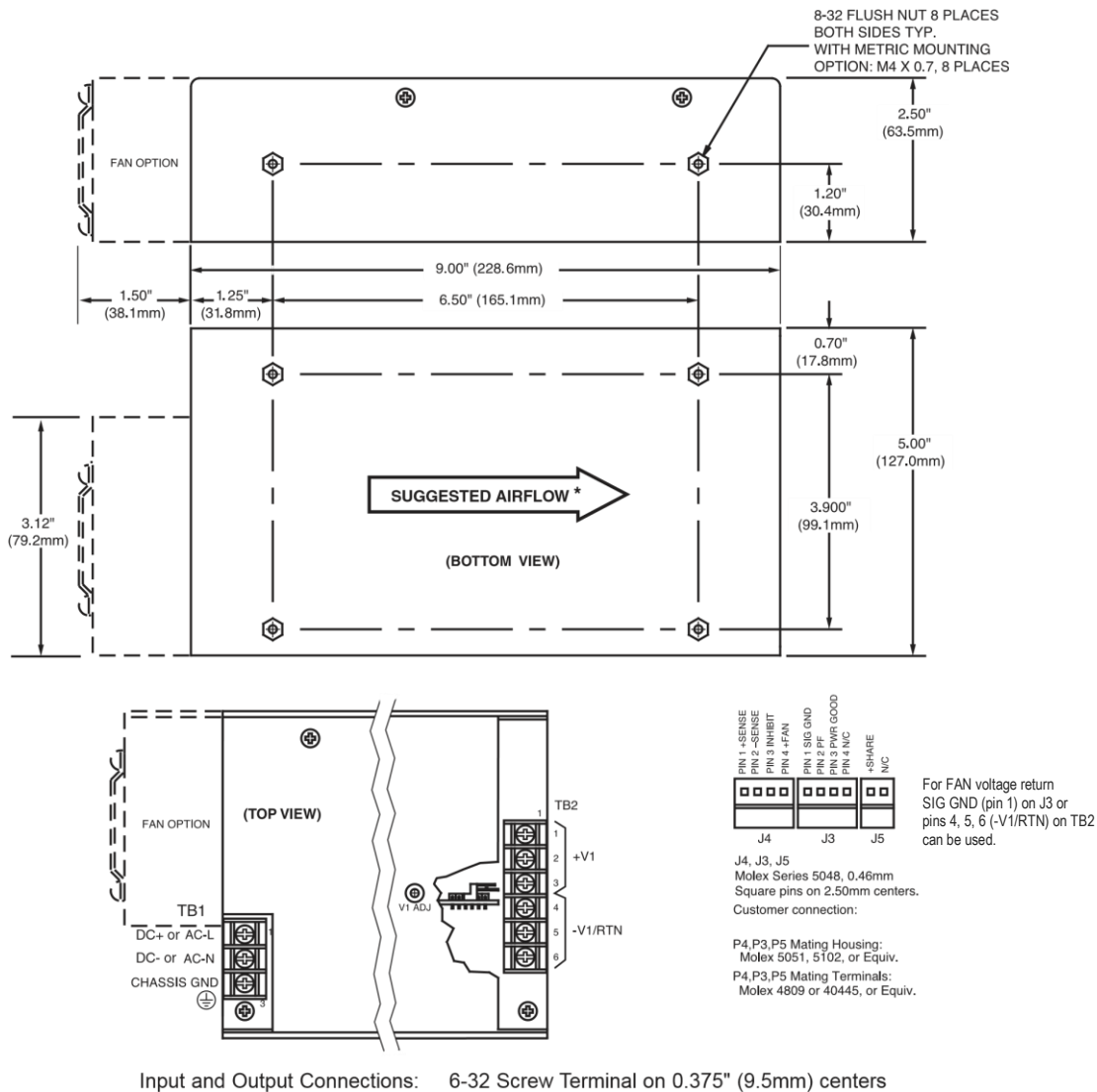
## 7. MECHANICAL SPECIFICATIONS

| PARAMETER  | CONDITIONS / DESCRIPTION | MIN                  | NOM   | MAX | UNITS |
|------------|--------------------------|----------------------|-------|-----|-------|
| Dimensions | Overall Size             | 228.6 x 127.0 x 63.5 |       |     | mm    |
|            |                          | 9.00 x 5.00 x 2.50   |       |     | in    |
|            | Overall Length With Fan  |                      | 266.7 |     | mm    |
| Weight     |                          |                      | 10.50 |     | in    |
|            |                          |                      | 1.95  |     | kg    |
|            |                          |                      | 4.3   |     | lb    |

## 8. OPTIONS

| PARAMETER        | CONDITIONS / DESCRIPTION                                                                                                                                                                                                                                                                                                    | MIN                  | NOM | MAX | UNITS |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----|-----|-------|
| Isolation Diodes | Add "D" as a suffix to the model number to order factory installed isolation diodes for parallel or redundant operation. For 24V models with the "D" option, external caps are required to meet the 1% noise/ripple spec. Power Good has a pull-up resistor of 475 on the 24V models. See Application Note #P1 for details. |                      | N/A |     |       |
| Fan              | Add "F" as a suffix to the model number to order integral fan. Fan provides the required 300 LFM of forced air cooling, or otherwise provided by the end user.                                                                                                                                                              | 266.7 x 127.0 x 63.5 |     |     | mm    |
|                  |                                                                                                                                                                                                                                                                                                                             | 10.50 x 5.00 x 2.50  |     |     | in    |
| Metric Mounting  | Add "M" as a suffix to the model number to order chassis with M4 x 0.7 mounting inserts.                                                                                                                                                                                                                                    |                      | N/A |     |       |





For more information on these products consult: [tech.support@psbel.com](mailto:tech.support@psbel.com)

**NUCLEAR AND MEDICAL APPLICATIONS** - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

**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.



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