

PFC250 Series

AC-DC Power Supplies

The PerFormanCe Power PFC250 Series combines Power Factor Correction (PFC) with wide-range outputs to meet the requirements of data communications and industrial controls. The PFC250-4350G and PFC250-4350G provide high current +3.3 V and +5 V on a single platform to support mixed-mode, high-speed digital circuitry.

Bel Power Solutions unique dual-converter architecture combines high reliability with exceptional regulation. All models feature remote sense on outputs V1 and V2 to provide independent compensation of output cable losses. Other standard features include independent current sharing on V1 and V2, thermal shutdown, and remote inhibit. Airflow of 300 linear feet per minute (LFM) is required to deliver the full power density of 3.0 watts per cubic inch.

The PerFormanCe Power PFC250 meets international safety requirements and is CE Marked to the Low Voltage Directive.



Key Features & Benefits

- RoHS Compliant
- Greater than 1 million hours demonstrated MTBF
- Active Power Factor Correction (PFC) meets EN61000-3-2
- Dual main outputs provide 3.3 V and 5 V for mixed-mode applications
- Single-wire current sense on outputs V1 and V2
- Remote sense on outputs V1 and V2
- Overtemperature, overload, and overvoltage protection
- Available with metric or SAE mountings
- Isolated V3 and V4 can be used as positive or negative outputs

1. SINGLE-OUTPUT MODEL SELECTION

| MODEL ³ | OUTPUT VOLTAGE | ADJUSTMENT RANGE | MAX. OUTPUT CURRENT ¹ | LINE REGULATION | LOAD REGULATION | RIPPLE & NOISE % p-p ² | INITIAL SETTING ACCURACY |
|--------------------|----------------|------------------|----------------------------------|-----------------|-----------------|-----------------------------------|--------------------------|
| PFC250-1003G | 3.3V | 3.15V to 3.45V | 50A | 0.5% | 0.8% | 1% | 3.28V to 3.32V |
| PFC250-1005G | 5V | 4.5V to 5.5V | 50A | 0.5% | 0.8% | 1% | 4.98V to 5.02V |
| PFC250-1012G | 12V | 10.8V to 13.5V | 23A | 0.5% | 0.8% | 1% | 11.94V to 12.06V |
| PFC250-1015G | 15V | 13.5V to 18.3V | 18.3A | 0.2% | 1.0% | 1% | 14.92V to 15.08V |
| PFC250-1024G | 24V | 21.6V to 26.4V | 10.5A | 0.5% | 0.8% | 1% | 23.88V to 24.12V |
| PFC250-1048G | 48V | 46.0V to 56.0V | 6A | 0.5% | 1.0% | 1% | 47.52V to 48.48V |

NOTES:

- ¹ Output currents ratings are expressed with 300 LFM forced air.
- ² Maximum peak-to-peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.
- ³ Models without suffix G use the lead solder exemption

2. MULTIPLE-OUTPUT MODEL SELECTION

250 W with 300 LFM Forced-Air Cooling. Isolated V3 and V4 can be used as Positive or Negative Outputs

| MODEL ⁵ | OUTPUT VOLTAGE | ADJUSTMENT RANGE | OUTPUT CURRENT | LINE REGULATION | LOAD REGULATION | RIPPLE & NOISE % p-p ¹ | INITIAL SETTING ACCURACY |
|-----------------------------|----------------|------------------|----------------|-----------------|-----------------|-----------------------------------|--------------------------|
| PFC250-4000G ² | +5V | 5.0V to 5.5V | 40A | 0.5% | 1% | 1% | 4.98V to 5.02V |
| | +12V | 10.8V to 13.2V | 10A | 0.5% | 1% | 1% | 11.94V to 12.06V |
| | 12V | 10.8V to 13.2V | 6A | 0.5% | 7% | 1% | 11.94V to 12.06V |
| | 5V | 5.0V to 5.5V | 3A | 0.5% | 2% | 1% | 4.98V to 5.02V |
| PFC250-4001G ^{2,4} | +5V | 5.0V to 5.5V | 40A | 0.5% | 1% | 1% | 4.98V to 5.02V |
| | +12V | 10.8V to 13.2V | 10A | 0.5% | 1% | 1% | 11.94V to 12.06V |
| | 12V | 10.8V to 13.2V | 6A | 0.5% | 7% | 1% | 11.75V to 12.06V |
| | 12V | 10.8V to 13.2V | 3A | 0.5% | 7% | 1% | 11.75V to 12.06V |
| PFC250-4004G ^{3,4} | +5V | 5.0V to 5.5V | 40A | 0.5% | 1% | 1% | 4.98V to 5.02V |
| | +12V | 10.8V to 13.2V | 10A | 0.5% | 1% | 1% | 11.94V to 12.06V |
| | 15V | 13.5V to 16.5V | 6A | 0.5% | 7% | 1% | 14.70V to 15.30V |
| | 15V | 13.5V to 16.5V | 3A | 0.5% | 7% | 1% | 14.70V to 15.30V |
| PFC250-4350G ^{2,4} | +3.3V | 3.15V to 3.45V | 40A | 0.5% | 1.5% | 1% | 3.28V to 3.32V |
| | +5V | 5.0V to 5.5V | 20A | 0.5% | 1% | 1% | 5.00V to 5.04V |
| | 12V | 10.8V to 13.2V | 6A | 0.5% | 7% | 1% | 11.75V to 12.06V |
| | 12V | 10.8V to 13.2V | 3A | 0.5% | 7% | 1% | 11.75V to 12.06V |
| PFC250-4530G ^{2,4} | +5V | 5.0V to 5.5V | 40A | 0.5% | 1% | 1% | 4.98V to 5.02V |
| | +3.3V | 3.15V to 3.45V | 20A | 0.5% | 1.5% | 1% | 3.28V to 3.32V |
| | 12V | 10.8V to 13.2V | 6A | 0.5% | 7% | 1% | 11.75V to 12.06V |
| | 12V | 10.8V to 13.2V | 3A | 0.5% | 7% | 1% | 11.75V to 12.06V |

NOTES:

- ¹ Maximum peak-to-peak expressed as a percentage of output voltage, 20 MHz bandwidth.
 - ² Total current available from V1 + V2 is 40 amperes, total current available from V3 + V4 is 6.6 amperes.
 - ³ Total current available from V1 + V2 is 40 amperes, total current available from V3 + V4 is 6.0 amperes.
 - ⁴ One adjustment pot is provided for both V3 and V4 outputs. One-to-one tracking is provided on V3 and V4 when equally loaded.
 - ⁵ Models without suffix G use the lead solder exemption
- Model numbers highlighted in yellow are not recommended for new designs or EOL.

3. 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. | 80 | | | VAC |
| Hold-up Time | After last AC line peak at 250 watts. | 20 | | | ms |
| Input Current | 85 VAC at full rated load. | | | 4.5 | ARMS |
| Input Protection | Non-user serviceable internally located AC input line fuse. | | | | |
| Inrush Surge Current | Internally limited by thermistor. Vin = 230 VAC, one cycle, 25°C. | | | 35 | APK |
| Power Factor | Per EN61000-3-2. | 0.95 | | | W/VA |
| Operating Frequency | Switching frequency of main output transformer. | | 129 | | |
| | Switching frequency of secondary transformer. | | 70 | | kHz |
| | Switching frequency of Power Factor Correction circuit. | | 60 | | |

4. OUTPUT SPECIFICATIONS

| PARAMETER | CONDITIONS / DESCRIPTION | MIN | NOM | MAX | UNITS |
|-----------------------|---|----------------------|------|-----|----------------------|
| Efficiency | Full rated load, 110 VAC. Varies with distribution of loads among outputs. | 65 | 75 | | % |
| Minimum Load, V1 | Min. load required to maintain regulation on V2 | Single output models | 0 | | Amps |
| | | All other models | 4 | | |
| Minimum Load, V3 | Min. load required to maintain regulation on V4 | Single output models | N/A | | Amps |
| | | PFC250-4000G | 1.25 | | |
| | | All other models | 0.6 | | |
| Ripple and Noise | Full load, 20 MHz bandwidth. | | | | See Model Selections |
| Output Power | 300 LFM forced-air cooling. | | | 250 | Watts |
| Overshoot /Undershoot | Output voltage overshoot/undershoot at turn-on. | | | 0 | % |
| | Varies by output. Total regulation includes: line changes over the specified input range, changes in load starting at 20% load and changing to 100% load. | | | | See Model Selections |
| Transient Response | Recovery time to within 1% of initial set point due to a 25% step load from any load setting from minimum to maximum load. | | 500 | | µs |
| Turn-on Delay | Time required for initial output voltage stabilization. | | 2 | | s |
| Turn-on Rise Time | Time required for output voltage to rise from 10% to 90%. | | 20 | | ms |



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5. INTERFACE SIGNALS & INTERNAL PROTECTION

| PARAMETER | CONDITIONS / DESCRIPTION | MIN | NOM | MAX | UNITS |
|----------------------------|--|--------------------|------|------|-------|
| Overvoltage Protection | Latch style overvoltage protection. Available on all single output models and V1, V2, and V3 on all multiple-output models. | 3.3V output, V1 | 4.1 | 4.65 | V |
| | | 3.3V output, V2 | 4.2 | 4.2 | |
| | | 5V output, V1, V2 | 6.0 | 6.4 | |
| | | 12V output, V1, V2 | 14.0 | 16.0 | |
| | | 15V output, V1 | 18.3 | 19.8 | |
| | | 24V output, V1 | 27.0 | 30.7 | |
| 48V output, V1 | 60.0 | 70.0 | | | |
| 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. | | | | |
| Output Good | TTL compatible signal. Signal is high when V1 output is within 5% of nominal. Signal shall remain low for 20 milliseconds following loss of Output Good. | 3.3 V | 3.16 | | V |
| | | 5 V | 4.75 | | |
| Input Power Fail Warning | TTL compatible logic signal. Time before regulation dropout due to loss of input power. May be used as independent PSOK signal in redundant applications. | | 5 | | ms |
| Current Share | Accuracy of shared current with up to 6 parallel units. Single-wire current share on V1 and V2 with return via negative (-) Sense return. Minimum current share load is 6 A or 50 W, whichever is smaller. | | | 10 | % |
| Remote Sense | Available on V1 and V2. Total voltage compensation for cable losses with respect to the main output. | | | 250 | mV |
| Inhibit | Output voltage is inhibited by application of external high (5 V) signal. | | | | |
| Standby Power | Available with fan option versions only (+5 VDC). | | | 100 | mA |

6. SAFETY, REGULATORY AND EMC SPECIFICATIONS

| PARAMETER | CONDITIONS / DESCRIPTION | MIN | NOM | MAX | UNITS |
|------------------------------|--|----------------|-----|----------|-------|
| Agency Approvals | Approved to the latest edition of the following standards. UL/CSA60950-1, EN60950-1 and IEC60950-1 | | | Approved | |
| Dielectric Withstand Voltage | Input to Output per EN60950. | 2600 | | | VDC |
| Electromagnetic Interference | FCC CFR title 47 Part 15 Sub-Part B - Conducted. EN55022 / CISPR 22 Conducted. | B B | | | 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 level 3. | Line-to-Line | 1 | | kV |
| | | Line-to-Ground | 2 | | |
| Insulation Resistance | Input-to-Output. | | | 10 | MΩ |
| Leakage Current | Per EN60950, 264 VAC. | | | 1500 | μA |

7. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER | CONDITIONS / DESCRIPTION | MIN | NOM | MAX | UNITS |
|-------------------------|--|-------------------------------|--------|------------|------------------|
| Altitude | Operating, Non-Operating. | | | 10k 40k | ASL Ft. |
| Operating Temperature | Derate linearly above 50°C by 2.5% per °C. | At 100% load: At 50% load: | 0 | 50 70 | °C |
| Storage Temperature | | -55 | | 85 | °C |
| Temperature Coefficient | 0°C to 70°C (after 15 minute warmup). | | ± 0.02 | ± 0.05 | %/°C |
| Relative Humidity | Non-Condensing. | 5 | | 95 | %RH |
| Shock | Peak acceleration. | | | 20 | G _{PK} |
| Vibration | Random vibration, 10 Hz to 2 kHz, 3 axes. | | | 6 | G _{RMS} |

8. MECHANICAL SPECIFICATIONS

| PARAMETER | CONDITIONS / DESCRIPTION | MIN | NOM | MAX | UNITS |
|------------|--------------------------|-----|----------------------|-----|----------|
| Dimensions | Overall Size | | 215.9 x 120.7 x 50.8 | | mm in |
| | | | 8.50 x 4.75 x 2.00 | | |
| Weight | Overall Length With Fan | | 250.4 | | mm in |
| | | | 10.00 | | |
| Weight | | | 1.12 | | kg lb |
| | | | 2.75 | | |

9. OPTIONS

| PARAMETER | CONDITIONS / DESCRIPTION | MIN | NOM | MAX | UNITS |
|-----------------|---|-----|---|-----|----------|
| Metric Mounting | Add "M" as a suffix to the model number to order chassis with M4 x 0.7 mounting inserts. | | 215.9 x 120.7 x 50.8 8.50 x 4.75 x 2.00 | | mm in |
| Fan | Add "F" as a suffix to the model number to order integral fan. Adds 1.5" (38.1 mm) to overall length and 0.5" (12.7 mm) to height. | | 250.4 x 120.7 x 63.5 10.00 x 4.75 x 2.50 | | mm in |

10. CONNECTIONS

| CONNECTOR | MOLEX SERIES | HOUSING | PIN SERIES | PINS (LOOSE) | PINS (CHAIN) | WIRE GAUGE |
|-----------|--------------|------------|------------|--------------|--------------|------------|
| J1 | 41695 | 09-50-8051 | 6838 | 08-50-0189 | 08-50-0187 | 18-20 AWG |
| | 41695 | 09-50-8051 | 2478 | 08-50-0106 | 08-50-0105 | 18-20 AWG |
| | 2139 | 09-50-3051 | 2478 | 08-50-0106 | 08-50-0105 | 18-20 AWG |
| J3 | 41695 | 09-50-8061 | 6838 | 08-50-0189 | 08-50-0187 | 18-20 AWG |
| | 41695 | 09-50-8061 | 2478 | 08-50-0106 | 08-50-0105 | 18-20 AWG |
| | 2139 | 09-50-3061 | 2478 | 08-50-0106 | 08-50-0105 | 18-20 AWG |
| J6 * | 5264-N | 50-37-5113 | 5263 | 08-70-1040 | 08-70-1039 | 22-28 AWG |

NOTE: * The +5V @ 100mA standby power output (J6-11) is available only on units with the fan option.



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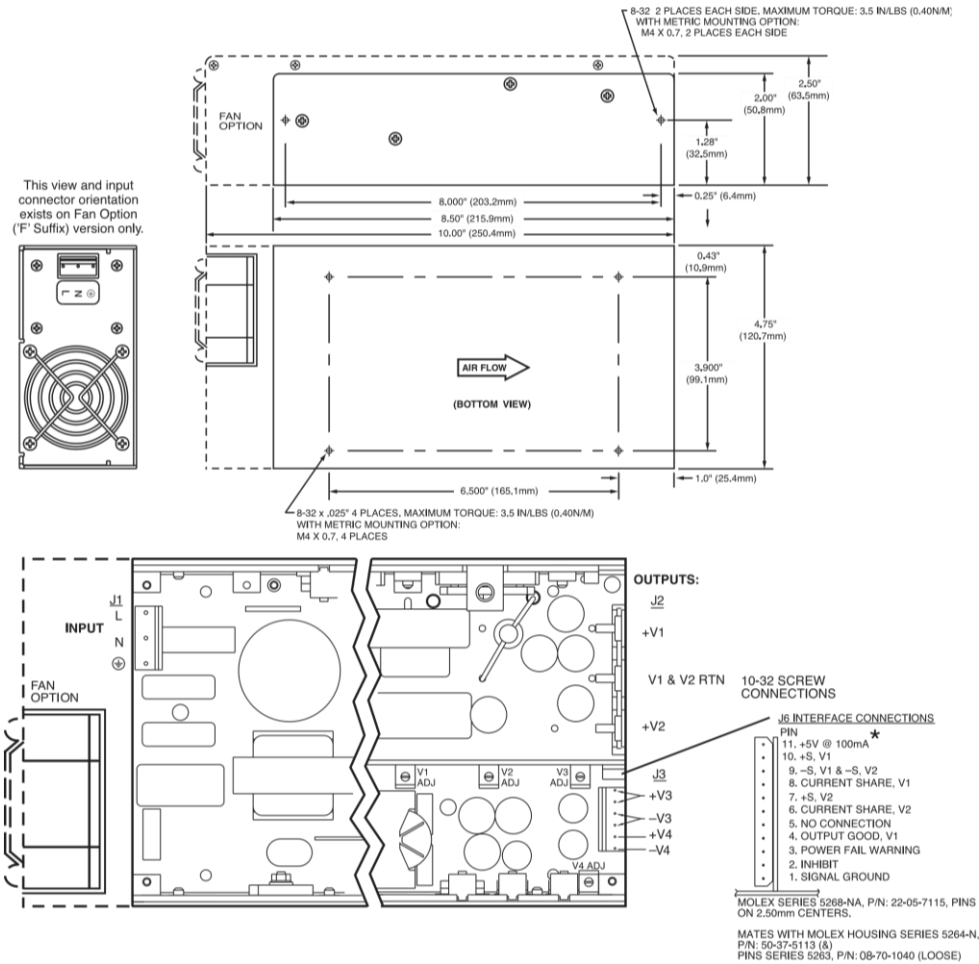


Figure 1. Mechanical Drawing PFC250

11. REVISION HISTORY

| DATE | REVISION | DESCRIPTION OF CHANGE | ECO/MCO REFERENCE NO. |
|-------------|----------|---|-----------------------|
| 2019-Jun-27 | AC | Page 3: Transient Response updated from 500 s to 500 μs Page 4: Insulation Resistance updated from 10 M to 10 MΩ Leakage Current updated from 1500 A to 1500 μA | C94228 |

For more information on these products consult: 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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- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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