

## PBM200 Series



- Worldwide Medical Approvals
- Single, Dual, Triple and Quad Outputs
- Power Fail Detect
- Remote On/Off
- U-Channel and Enclosed Versions
- 100 Watt Convection-cooled Rating
- 3 Year Warranty

## Specification

## Input

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| Input Voltage         | • 90-264 VAC                                                |
| Input Frequency       | • 47-63 Hz                                                  |
| Input Current         | • 3.2 A rms at 115 VAC,<br>1.6 A rms at 230 VAC             |
| Inrush Current        | • 20 A at 115 VAC, 40 A at 230 VAC<br>cold start 25 °C      |
| Power Factor          | • 0.98 typical                                              |
| Earth Leakage Current | • 90 µA max at 115 VAC/60 Hz<br>150 µA max at 230 VAC/50 Hz |
| Input Protection      | • Internal T4 A/250 V in line and neutral                   |

## Output

|                               |                                                                                                         |
|-------------------------------|---------------------------------------------------------------------------------------------------------|
| Output Voltage                | • See table                                                                                             |
| Output Voltage Trim           | • Not user-adjustable                                                                                   |
| Initial Set Accuracy          | • ±2%                                                                                                   |
| Minimum Load                  | • See table & note 5                                                                                    |
| Start Up Delay                | • 2 s max                                                                                               |
| Start Up Rise Time            | • 18 ms typical                                                                                         |
| Hold Up Time                  | • 20 ms minimum at full load & 110 VAC                                                                  |
| Drift                         | • ±0.2%                                                                                                 |
| Line Regulation               | • ±0.5% max                                                                                             |
| Load Regulation               | • See note 7                                                                                            |
| Transient Response            | • 4% max deviation, recovery to within<br>1% in 500 µs for a 25% load change                            |
| Ripple & Noise                | • 2% max pk-pk, 20 MHz bandwidth with<br>a 22 µF electrolytic & a 0.47 µF tantalum<br>capacitor         |
| Overvoltage Protection        | • 112-140% Vnom output 1 only, recycle<br>input to reset                                                |
| Overtemperature<br>Protection | • Shutdown at +85 °C (singles) or +105 °C<br>(multi outputs) with auto recovery,<br>measured internally |
| Overload Protection           | • 110-150% typical, auto recovery                                                                       |
| Short Circuit Protection      | • Trip and restart (Hiccup mode)                                                                        |
| Temperature<br>Coefficient    | • 0.04%/°C                                                                                              |
| Remote Sense                  | • Single output models only.<br>Compensates for up to 0.5 V drop                                        |
| Remote On/Off                 | • On = Logic low or open circuit<br>Off = Logic high                                                    |

## General

|                     |                                                                                    |
|---------------------|------------------------------------------------------------------------------------|
| Efficiency          | • 80% maximum                                                                      |
| Isolation           | • 4000 VAC Input to Output<br>1500 VAC Input to Ground<br>500 VAC Output to Ground |
| Switching Frequency | • 100 kHz ±12 kHz                                                                  |
| Signals             | • Power fail detect, remote on/off                                                 |
| Power Density       | • 4.76 W/In <sup>3</sup>                                                           |
| Power Fail Detect   | • AC OK = TTL logic high<br>AC not OK = TTL logic low                              |
| MTBF                | • 350 kHrs to MIL-HDBK-217F at<br>+25 °C, GB                                       |

## Environmental

|                       |                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature | • 0 °C to +70 °C, derate linearly from 100%<br>power at +50 °C to 50% power at +70 °C                                   |
| Cooling               | • 'C' versions have internal fan,<br>'B' versions are derated with convection<br>cooling or require 25 CFM (see note 4) |
| Operating Humidity    | • Up to 95% RH, non-condensing                                                                                          |
| Storage Temperature   | • -40 °C to +85 °C                                                                                                      |
| Operating Altitude    | • 2500 m                                                                                                                |
| Shock                 | • Half sine pulse. acceleration 50 g, 11 ms<br>duration, 3 shocks in each direction,<br>unpacked, non-operating         |
| Vibration             | • Sinusoidal 10-55 Hz, amplitude 0.15 mm,<br>30 min/axis, unpackaged, non-operating                                     |

## EMC &amp; Safety

|                      |                                                                                  |
|----------------------|----------------------------------------------------------------------------------|
| Emissions            | • EN55011 & FCC Class B conducted<br>& radiated                                  |
| Harmonic Currents    | • EN61000-3-2, Class A                                                           |
| Voltage Flicker      | • EN61000-3-3                                                                    |
| ESD Immunity         | • EN61000-4-2, level 3 Perf Criteria A                                           |
| Radiated Immunity    | • EN61000-4-3, level 3 Perf Criteria A                                           |
| EFT/Burst            | • EN61000-4-4, level 3 Perf Criteria A                                           |
| Surge                | • EN61000-4-5, level 3 Perf Criteria A                                           |
| Conducted Immunity   | • EN61000-4-6 3 V, Perf Criteria A                                               |
| Dips & Interruptions | • EN61000-4-11, 30% 10 ms,<br>60% 100 ms, >95% 5000 ms,<br>Perf Criteria A, B, B |
| Safety Approvals     | • EN60601-1, UL60601-1,<br>CSA22.2 No. 601-1 per cUL                             |

## Models and Ratings

PBM200 **XP**

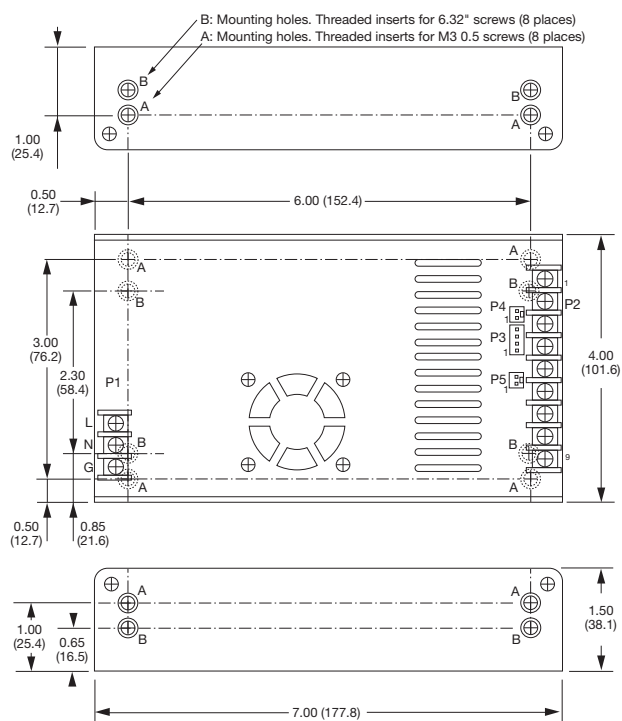
| Output Power <sup>(4)</sup> | Output 1 <sup>(8)</sup> |                     |                  |                    | Output 2 <sup>(2,5)</sup> |                  |                    | Output 3 <sup>(5)</sup> |                  |                    | Output 4 <sup>(5,5)</sup> |                  |                    | Model Number <sup>(1)</sup> |
|-----------------------------|-------------------------|---------------------|------------------|--------------------|---------------------------|------------------|--------------------|-------------------------|------------------|--------------------|---------------------------|------------------|--------------------|-----------------------------|
|                             | Vnom                    | Imin <sup>(5)</sup> | I <sub>max</sub> | Reg <sup>(7)</sup> | Vnom                      | I <sub>max</sub> | Reg <sup>(7)</sup> | Vnom                    | I <sub>max</sub> | Reg <sup>(7)</sup> | Vnom                      | I <sub>max</sub> | Reg <sup>(7)</sup> |                             |
| 150 W                       | 3.3 V                   | 3.0 A               | 46.0 A           | 3%                 |                           |                  |                    |                         |                  |                    |                           |                  |                    | PBM200PS3V3-C               |
| 175 W                       | 5.1 V                   | 3.0 A               | 35.0 A           | 2%                 |                           |                  |                    |                         |                  |                    |                           |                  |                    | PBM200PS05-C                |
| 200 W                       | 12.0 V                  | 1.2 A               | 16.7 A           | 2%                 |                           |                  |                    |                         |                  |                    |                           |                  |                    | PBM200PS12-C                |
| 200 W                       | 15.0 V                  | 1.0 A               | 13.4 A           | 2%                 |                           |                  |                    |                         |                  |                    |                           |                  |                    | PBM200PS15-C                |
| 200 W                       | 24.0 V                  | 0.6 A               | 8.4 A            | 2%                 |                           |                  |                    |                         |                  |                    |                           |                  |                    | PBM200PS24-C                |
| 200 W                       | 30.0 V                  | 0.5 A               | 6.7 A            | 2%                 |                           |                  |                    |                         |                  |                    |                           |                  |                    | PBM200PS30-C                |
| 200 W                       | 48.0 V                  | 0.5 A               | 4.2 A            | 2%                 |                           |                  |                    |                         |                  |                    |                           |                  |                    | PBM200PS48-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +12 V                     | 8.0 A            | 4%                 |                         |                  |                    |                           |                  |                    | PBM200PD01-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +15 V                     | 6.0 A            | 4%                 |                         |                  |                    |                           |                  |                    | PBM200PD02-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +24 V                     | 4.0 A            | 4%                 |                         |                  |                    |                           |                  |                    | PBM200PD03-C                |
| 200 W                       | +12.0 V                 | 1.0 A               | 8.7 A            | 2%                 | +24 V                     | 4.0 A            | 4%                 |                         |                  |                    |                           |                  |                    | PBM200PD04-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +12 V                     | 8.0 A            | 4%                 | -5 V                    | 6.0 A            | 4%                 |                           |                  |                    | PBM200PT01-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +12 V                     | 8.0 A            | 4%                 | -12 V                   | 4.0 A            | 4%                 |                           |                  |                    | PBM200PT02-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +15 V                     | 6.0 A            | 4%                 | -15 V                   | 4.0 A            | 4%                 |                           |                  |                    | PBM200PT03-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +12 V                     | 8.0 A            | 4%                 |                         |                  |                    | F 24 V                    | 4.0 A            | 4%                 | PBM200PT04-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +15 V                     | 6.0 A            | 4%                 | -12 V                   | 4.0 A            | 4%                 |                           |                  |                    | PBM200PT05-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +12 V                     | 8.0 A            | 4%                 | -12 V                   | 4.0 A            | 4%                 | F 5 V                     | 6.0 A            | 4%                 | PBM200PQ01-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +15 V                     | 6.0 A            | 4%                 | -15 V                   | 4.0 A            | 4%                 | F 24 V                    | 4.0 A            | 4%                 | PBM200PQ02-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +12 V                     | 8.0 A            | 4%                 | -12 V                   | 4.0 A            | 4%                 | F 12 V                    | 4.0 A            | 4%                 | PBM200PQ03-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +12 V                     | 8.0 A            | 4%                 | -15 V                   | 4.0 A            | 4%                 | F 15 V                    | 4.0 A            | 4%                 | PBM200PQ04-C                |
| 200 W                       | +5.1 V                  | 3.0 A               | 30.0 A           | 2%                 | +12 V                     | 8.0 A            | 4%                 | -12 V                   | 4.0 A            | 4%                 | F 24 V                    | 4.0 A            | 4%                 | PBM200PQ05-C                |
| 175 W                       | +3.3 V                  | 3.0 A               | 30.0 A           | 3%                 | +5.1 V                    | 8.0 A            | 4%                 | -12 V                   | 4.0 A            | 4%                 | F 12 V                    | 4.0 A            | 4%                 | PBM200PQ06-C                |

## Notes

- For U-bracket format, replace suffix '-C' with suffix '-B'.
- Output 2 peak current is 12 A on +12 V, 9 A on +15 V, and 6 A on +24 V. Maximum 2 s duration with total load <200 W.
- Output 4 is floating and can be connected externally for positive or negative output.
- 200 W for '-C' version with a cover and fan assembly. 100 W for '-B' version with convection cooling (maximum current of output 1 & 2 derated to 50%). 200 W for '-B' version with 25 CFM forced air provided by user.

- Zero minimum load for outputs 2, 3 & 4. 10% minimum load required on output 1 for all outputs to meet regulation.
- When the Remote Sense facility is not used, +Sense must be connected to +V, and -Sense to return, on P2 connector.
- Total regulation includes initial tolerance, line regulation and load regulation.
- Peak current for single output models is 110% of I<sub>max</sub>. Maximum 2 s duration with 10% duty cycle.

## Mechanical Details



| Conn | Pin | Model Number(s) |         |                  |         |         |
|------|-----|-----------------|---------|------------------|---------|---------|
|      |     | PSXX            | PDXX    | PTXX (except 04) | PT04    | PQXX    |
| P2   | 1   | -SENSE          | OP1     | OP1              | OP1     | OP1     |
|      | 2   | Return          | OP1     | OP1              | OP1     | OP1     |
|      | 3   | Return          | Com Ret | Com Ret          | Com Ret | Com Ret |
|      | 4   | Return          | Com Ret | Com Ret          | Com Ret | Com Ret |
|      | 5   | Return          | Com Ret | Com Ret          | Com Ret | Com Ret |
|      | 6   | OP1             | OP2     | OP2              | OP2     | OP2     |
|      | 7   | OP1             | N.C.    | OP3              | N.C.    | OP3     |
|      | 8   | OP1             | N.C.    | N.C.             | OP4 Ret | OP4 Ret |
|      | 9   | +SENSE          | N.C.    | N.C.             | OP4     | OP4     |
| P3   | 1   | Fan             |         |                  |         |         |
|      | 2   | Com Ret         |         |                  |         |         |
|      | 3   | Com Ret         |         |                  |         |         |
|      | 4   | PFD             | PFD     | PFD              | PFD     | PFD     |

## Notes

- Dimensions shown in inches (mm).
- Tolerance 0.02 [0.5] maximum.
- Input connector P1 is Dinkle DT-35-B01W-03, output connector P2 is Dinkle DT-35-B01W-09 screws are M3, Nickel plated.
- Connector P3 mates with Molex housing 22-01-1043 & Molex 40445 series crimp terminal.
- Connectors P4 & P5 mate with Molex housing 22-01-1023 & Molex 40445 series crimp terminal.
- P4 is for DC fan rated at 24 V/0.2 A (models PBM200PD03 & PD04), 5 V/0.38 A (PBM200PQ06), or 12 V/0.2 A (all other models). Pin 1 Fan+, pin 2 Fan-.
- P5 is for Remote On/Off. Pin 1 is positive, pin 2 is return.
- Weight: 1.83 lb (0.82kg) approx. for '-B' version, 2.14 lb (0.96kg) approx. for '-C' version.
- Maximum mounting screw length from surface of chassis is 0.17 inch (4.3 mm)