

### 500 Watts

- 450-500W forced air cooled
- 250W convection cooled
- Class II applications
- Medical (BF) safety approvals
- U-channel 4" x 7" package
- 5V standby & 12V fan supply
- Power OK, inhibit & remote sense
- Class B conducted & radiated emissions
- 3 year warranty



#### Dimensions:

**PBL500 (U-channel):**  
7.1 x 4.00 x 1.56" (180.34 x 101.6 x 39.62 mm)

**PBL500 (Covered):**  
7.1 x 4.00 x 2.64" (180.34 x 101.6 x 67.05 mm)

The Class II PBL500 series of AC-DC switching power supplies, in a package of just 4 x 7 x 1.56 inches, deliver 450-500 watts of continuous power with forced air cooling or 250 watts with convection cooling. The units are constructed on a U-Channel for mechanical support and heat sinking. A cover and fan assembly can be added during manufacturing. They are designed for medical applications including those needing BF rated insulation with an operation altitude up to 5000 meters.

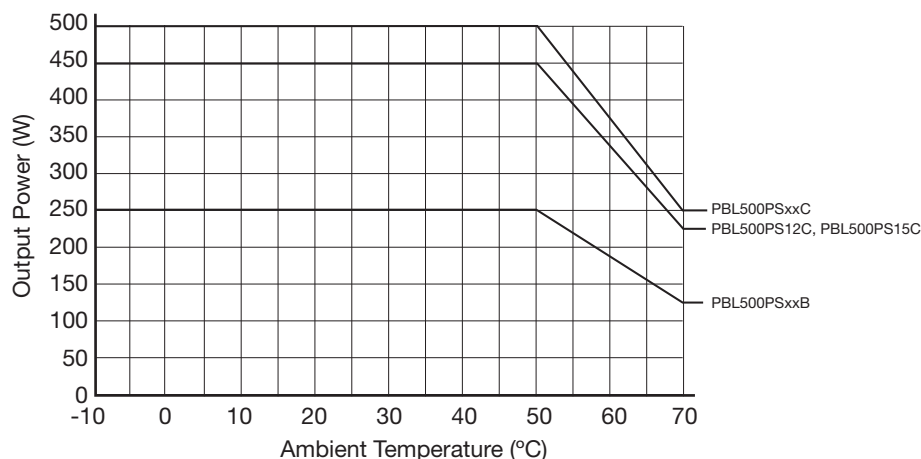
### Models & Ratings

| Output Voltage<br>V1 | Output Current V1 |         | Standby Supply<br>V2 | Fan Supply<br>V3 | Output Power |                       | Ripple & Noise <sup>(3)</sup> | Model Number <sup>(1)</sup> |
|----------------------|-------------------|---------|----------------------|------------------|--------------|-----------------------|-------------------------------|-----------------------------|
|                      | Convection        | Forced  |                      |                  | Convection   | Forced <sup>(2)</sup> |                               |                             |
| 12 V                 | 20.83 A           | 37.50 A | 5.0 V / 2.0 A        | 12.0 V / 0.3 A   | 250 W        | 450 W                 | 120 mV                        | PBL500PS12B                 |
| 15 V                 | 16.67 A           | 30.00 A |                      |                  |              |                       | 150 mV                        | PBL500PS15B                 |
| 18 V                 | 13.89 A           | 27.78 A |                      |                  |              |                       | 180 mV                        | PBL500PS18B                 |
| 24 V                 | 10.42 A           | 20.84 A |                      |                  |              |                       | 240 mV                        | PBL500PS24B                 |
| 28 V                 | 8.93 A            | 17.86 A |                      |                  |              | 500 W                 | 280 mV                        | PBL500PS28B                 |
| 36 V                 | 8.94 A            | 13.89 A |                      |                  |              |                       | 360 mV                        | PBL500PS36B                 |
| 48 V                 | 5.21 A            | 10.42 A |                      |                  |              |                       | 480 mV                        | PBL500PS48B                 |
| 57 V                 | 4.38 A            | 8.78 A  |                      |                  |              |                       | 570 mV                        | PBL500PS57B                 |

### Notes

1. For covered version with integral fan, replace B in the part number with C, e.g. PBL500PS12C. V3 not available on covered version.
2. 250 W without moving air or 450-500 W with 30 CFM forced air provided by the user. 450-500 W for '-C' version
3. Ripple and noise is the maximum peak-to-peak voltage value measured at the output with 20 MHz bandwidth, at rated line voltage and output load, and with a 10  $\mu$ F tantalum capacitor in parallel with a 0.1  $\mu$ F ceramic capacitor.

### Temperature Derating Curve



### Input

| Characteristic            | Minimum                                  | Typical | Maximum | Units   | Notes & Conditions                      |
|---------------------------|------------------------------------------|---------|---------|---------|-----------------------------------------|
| Input Voltage             | 80                                       |         | 264     | VAC     | Derate to 90% at 85 VAC & 80% at 80 VAC |
| Input Frequency           | 47                                       |         | 63      | Hz      |                                         |
| Input Current - Full Load |                                          | 5.2/2.6 |         | A (rms) | 115/230 VAC, 60/50 Hz                   |
| No Load Input Power       |                                          |         | 1       | W       | When inhibit used                       |
| Inrush Current            |                                          | 30/60   |         | A       | 115 VAC/230 VAC at 25 °C, cold start    |
| Input Protection          | Internal fuse fitted in line and neutral |         |         |         |                                         |

### Output

| Characteristic          | Minimum | Typical | Maximum | Units   | Notes & Conditions                                                         |
|-------------------------|---------|---------|---------|---------|----------------------------------------------------------------------------|
| Output Voltage (V1)     | 12      |         | 57      | VDC     | See Models and Ratings table                                               |
| Tolerance               |         |         | ±2      | %       | Line and Load Regulation, 0.1% minimum load required to meet specification |
| Transient Response      |         |         | 4       | %       | Recovery within 1% in less than 500 µs for a 25% step load change          |
| Ripple & Noise          |         |         | 1       | % pk-pk | 20 MHz bandwidth, see model table notes                                    |
| Overvoltage Protection  | 112     |         | 140     | %       | Latching                                                                   |
| Overcurrent Protection  | 105     |         | 140     | %       | Trip & restart characteristic                                              |
| Thermal Shutdown        |         |         |         |         | Protected for overtemperature conditions, latching                         |
| Temperature Coefficient |         |         | ±0.04   | %/°C    |                                                                            |
| 5 V Standby Supply (V2) |         | 5       |         | V       | At 2.0 A                                                                   |
| Fan Supply (V3)         |         | 12      |         | V       | At 300 mA                                                                  |
| Patient Leakage Current |         | 50      | 80      | µA      | 264 VAC, 63 Hz                                                             |

### Environmental

| Characteristic        | Minimum | Typical | Maximum | Units | Notes & Conditions                                                                                                                                                                                                                            |
|-----------------------|---------|---------|---------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature | -10     |         | +70     | °C    | Derate Linearly from 100% load at +50 °C to 50% load at +70 °C                                                                                                                                                                                |
| Storage Temperature   | -40     |         | +85     | °C    |                                                                                                                                                                                                                                               |
| Humidity              | 5       |         | 95      | %RH   | Non-condensing                                                                                                                                                                                                                                |
| Cooling (-C version)  |         |         |         |       | Integral temperature controlled fan. Fan speed based on temperature of transformer T1, internally monitored. Fan will not rotate until T1 temperature reaches approx. 30 °C and reaches full speed when T1 temperature reaches approx. 60 °C. |
| Operating Altitude    |         |         | 5000    | m     |                                                                                                                                                                                                                                               |

### General

| Characteristic            |                   | Minimum | Typical       | Maximum | Units             | Notes & Conditions                   |
|---------------------------|-------------------|---------|---------------|---------|-------------------|--------------------------------------|
| Efficiency                |                   |         | 90            |         | %                 | 230 VAC, 100% load                   |
| Isolation                 | Input to Output   | 4000    |               |         | VAC               | 2 x MOPP                             |
|                           | Input to Case     | 4000    |               |         | VAC               | 2 x MOPP                             |
|                           | Output to Case    | 1500    |               |         | VAC               | 1 x MOPP                             |
| Switching Frequency       | PFC               | 55      | 65            | 75      | kHz               | Fixed                                |
|                           | Main Converter    | 90      |               | 300     |                   | Variable                             |
|                           | Standby Converter | 80      |               | 120     |                   | Variable                             |
| Hold Up Time              |                   | 20      |               |         | ms                | At 110 VAC & 500 W                   |
| Power Density             |                   |         |               | 11.2    | W/in <sup>3</sup> |                                      |
| Mean Time Between Failure |                   |         | 100,000       |         | Hrs               | MIL-HDBK-217F, Full load at 25 °C GB |
| Weight                    |                   |         | 2.23 (1011.5) |         | lb (g)            | PBL500PSxxB                          |
|                           |                   |         | 2.52 (1143.0) |         |                   | PBL500PSxxC                          |

### Signals & Controls

| Characteristic              | Notes & Conditions                                                                                                                                           |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remote Sense                | Compensates for 0.5 V total voltage drop.                                                                                                                    |
| Inhibit                     | To inhibit, apply TTL high signal.                                                                                                                           |
| Power OK (P <sub>OK</sub> ) | TTL high for normal operation, monitors input bus and output voltage. Turn on delay 100-1000ms, 1ms warning of loss of output following loss of input power. |

### EMC: Emissions

| Phenomenon           | Standard    | Test Level | Notes & Conditions |
|----------------------|-------------|------------|--------------------|
| Conducted            | EN55011     | Class B    |                    |
| Radiated             | EN55011     | Class B    |                    |
| Harmonic Current     | EN61000-3-2 | Class A    |                    |
| Voltage Fluctuations | EN61000-3-3 |            |                    |

### EMC: Immunity

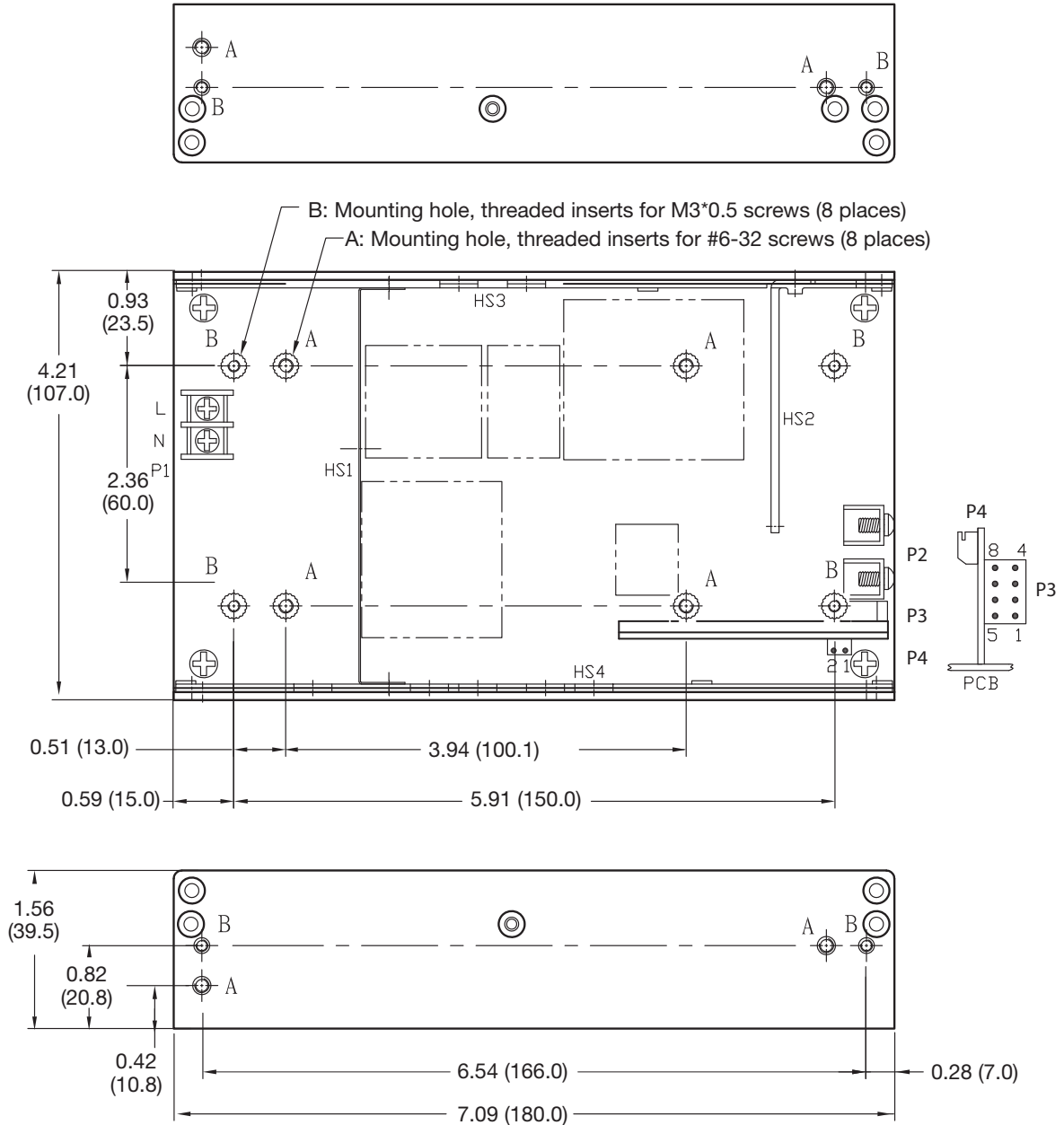
| Phenomenon             | Standard      | Test Level               | Criteria | Notes & Conditions        |
|------------------------|---------------|--------------------------|----------|---------------------------|
| ESD                    | EN61000-4-2   | 4                        | A        | ±8 kV contact, ±15 kV air |
| Radiated               | EN61000-4-3   | 10 V/m                   | A        |                           |
| EFT                    | EN61000-4-4   | ±2 kV                    | A        |                           |
| Surges                 | EN61000-4-5   | 3                        | A        | +/-2kV L-N                |
| Conducted              | EN61000-4-6   | 10 Vrms                  | A        |                           |
| Magnetic Field         | EN61000-4-8   | 30 A/m                   | A        |                           |
| Dips and Interruptions | 100 VAC/50 Hz | Dip 30% (70 VAC), 500ms  | A        |                           |
|                        |               | Dip 60% (40 VAC), 100ms  | B        |                           |
|                        |               | Int >95% (0 VAC), 10ms   | A        |                           |
|                        |               | Int 100% (0 VAC), 20ms   | A        |                           |
|                        |               | Int 100% (0 VAC), 5000ms | B        |                           |
|                        | 240 VAC/50 Hz | Dip 30% (168 VAC), 500ms | A        |                           |
|                        |               | Dip 60% (96 VAC), 100ms  | A        |                           |
|                        |               | Int >95% (0 VAC), 10ms   | A        |                           |
|                        |               | Int 100% (0 VAC), 20ms   | A        |                           |
|                        |               | Int 100% (0 VAC), 5000ms | B        |                           |

### Safety Approvals

| Safety Agency | Safety Standard                  | Notes & Conditions |
|---------------|----------------------------------|--------------------|
| CB Report     | IEC60601-1                       | Medical            |
| UL            | ES60601-1, CSA C22.2 No.60601-1  | Medical            |
| TUV           | EN60601-1                        | Medical            |
| CE            | Meets all applicable directives  |                    |
| UKCA          | Meets all applicable legislation |                    |

### Mechanical Details

#### PBL500PSxxB



| Input Connector - P1 |   |
|----------------------|---|
| Pin 1                | L |
| Pin 2                | N |

| Output Connector - P2 |                     |
|-----------------------|---------------------|
| Pin 1                 | +V1                 |
| Pin 2                 | -V1 (common return) |

| Signals and Controls - P3 |               |       |               |
|---------------------------|---------------|-------|---------------|
| Pin 1                     | Common Return | Pin 5 | Inhibit       |
| Pin 2                     | +V1 Sense     | Pin 6 | +5V Standby   |
| Pin 3                     | -V1 Sense     | Pin 7 | +5V Standby   |
| Pin 4                     | PoK           | Pin 8 | Common Return |

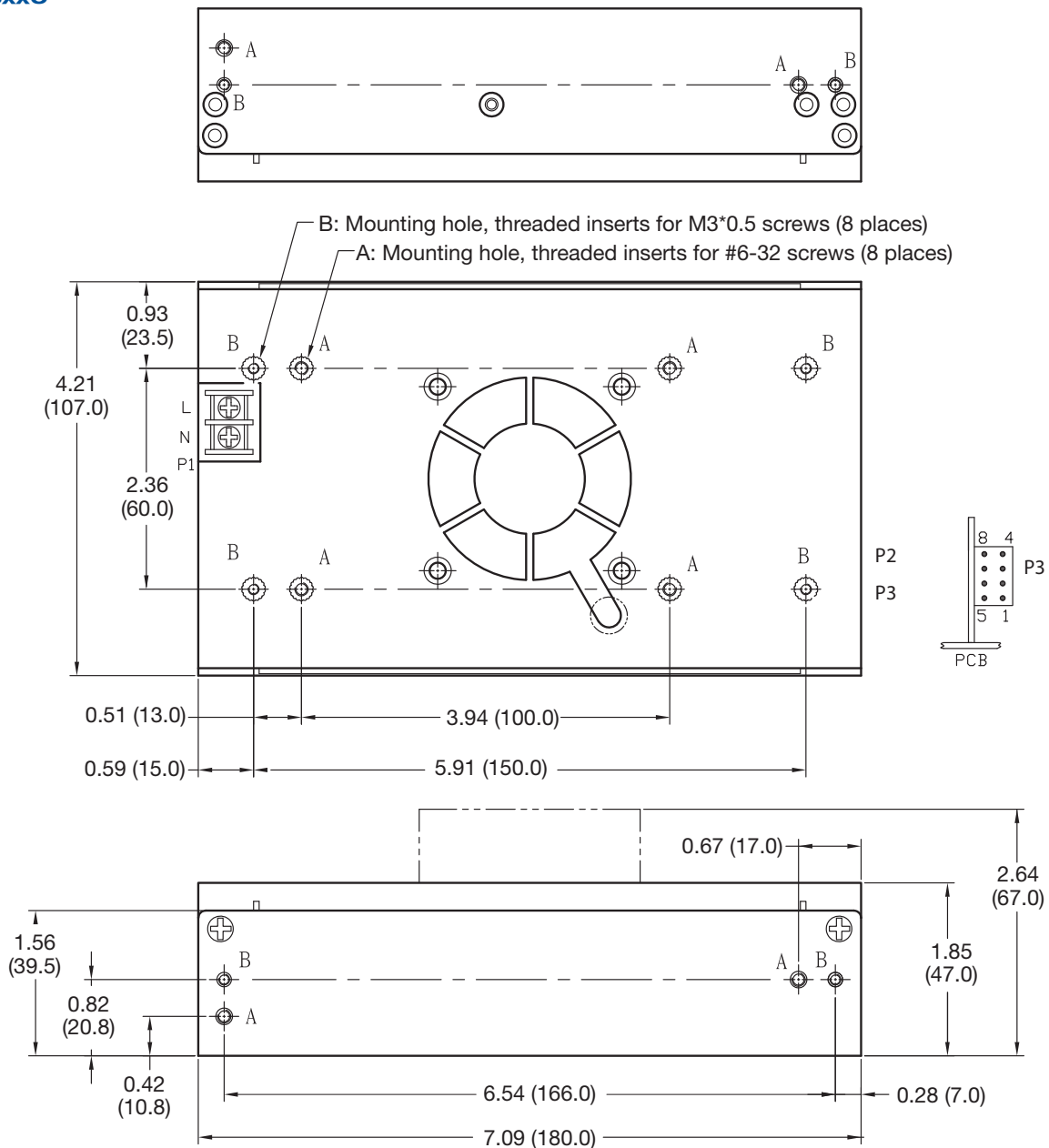
| Output Connector - P4 |               |
|-----------------------|---------------|
| Pin 1                 | Common Return |
| Pin 2                 | +V3           |

### Notes

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1 is Dinkle terminal P/N DT-35C-B01W-03, with nickel plated M3 screws.
- Output connector P2 is M4x0.7 screw connections.
- Connector P3 is Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
- Fan connector P4 is JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
- Weight: 1.0 Kg (2.23 lbs.) approx.
- Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.

### Mechanical Details

#### PBL500PSxxC



| Input Connector - P1 |   |
|----------------------|---|
| Pin 1                | L |
| Pin 2                | N |

| Output Connector - P2 |                     |
|-----------------------|---------------------|
| Pin 1                 | +V1                 |
| Pin 2                 | -V1 (common return) |

| Signals and Controls -P3 |               |       |               |
|--------------------------|---------------|-------|---------------|
| Pin 1                    | Common Return | Pin 5 | Inhibit       |
| Pin 2                    | +V1 Sense     | Pin 6 | +5V Standby   |
| Pin 3                    | -V1 Sense     | Pin 7 | 5V Standby    |
| Pin 4                    | AC OK         | Pin 8 | Common Return |

#### Notes

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1 is Dinkle terminal P/N DT-35C-B01W-03, with nickel plated M3 screws.
- Output connector P2 is M4x0.7 screw connections.
- Connector P3 is Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
- Weight: 1.14 Kgs. (2.52 lbs.) approx.
- Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.