

P R B X

POWERBOX Medline 650
OBR04 Series
600-650W
Single Output
AC/DC Medical Switch Mode Power Supply

Features

BF Class insulation
Operation up to 5000 meters
100-240 VAC input with active PFC, 0.98 typical
Less than 350 μ A leakage current
Standby output 5VDC at 200mA
EN55011 Class B conducted emissions
Inhibit - TTL high to disable output
Compliant with RoHS requirements

Input

| | |
|-----------------|--|
| Voltage range | 90-264VAC. |
| Frequency | 47-63Hz. |
| Current | 8.4A (rms) for 115VAC, 60Hz. 4.2A (rms) for 230VAC, 50Hz. |
| Leakage current | 350 μ A max @ 264VAC, 63Hz. |
| Touch current | 100 μ A max @ 264 VAC, 63Hz. |

Output

| | |
|-------------------------|---|
| Power | See table. |
| Voltage/current | See table. |
| Ripple and noise | 1% peak to peak maximum. |
| Remote sense | Compensation for cable losses up to 0.5V. |
| Over voltage protection | Set at 115-140% of its nominal output voltage. |
| Over current protection | Protected to output short circuit conditions. |
| Thermal shutdown | Protected to over temperature conditions. |
| Temperature coefficient | $\pm 0.04\%/^{\circ}\text{C}$ max. |
| Transient response | Max excursion of 4% or better on all models, recovering to 1% of final value within 500 μ s after a 25% step load change. |
| Standby power | 5 V at 200 mA maximum. |
| Fan power | 12 V at 500 mA maximum. |

Environmental

| | |
|-----------------------|--|
| Operating temperature | -10°C to $+70^{\circ}\text{C}$. |
| Storage temperature | -40°C to $+85^{\circ}\text{C}$. |
| Relative humidity | 5-95% non-condensing. |
| Derating | Derate from 100% at $+50^{\circ}\text{C}$ linearly to 50% at $+70^{\circ}\text{C}$, applicable to convection and forced-air cooling conditions. |

General

| | |
|---------------------|--|
| Switching frequency | 85KHz typical. |
| Efficiency | Typical 90%. |
| Hold-up time | 12ms min at 110VAC and 650W. |
| Line regulation | $\pm 0.5\%$ max at full load. |
| Inrush current | 20A @ 115VAC, or 40A @ 230VAC, at 25°C cold start. |



| | |
|-------------------|---|
| Withstand voltage | 4,000VAC from input to output (2MOPP). |
| | 1,500VAC from input to ground (1MOPP). |
| | 1,500VAC from output to ground. |
| MTBF | 190,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F. |

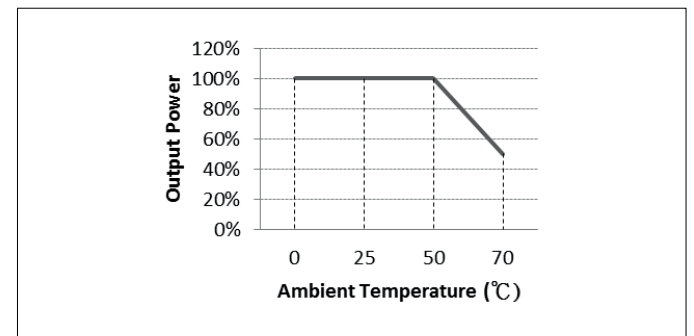
Interface Signals

| | |
|---------|--------------------|
| PFD | See figure page 2. |
| Inhibit | See figure page 2. |

Standards

| | |
|------------------|--|
| Safety standards | TÜV EN 60601-1, UL ES 60601-1, CSA C22.2 No. 60601-1. |
| EMC performance | EN55011 Class B conducted, Class B radiated. |
| FCC | Class B conducted, Class B radiated. |
| VCCI | Class B conducted, Class B radiated. |
| EN61000-3-2 | Harmonic distortion Class A and D. |
| EN61000-3-3 | Line flicker. |
| EN61000-4-2 | ESD, $\pm 15\text{KV}$ air and $\pm 8\text{KV}$ contact. |
| EN61000-4-3 | Radiated immunity, 10V/m. |
| EN61000-4-4 | Fast transient/burst, $\pm 2\text{KV}$. |
| EN61000-4-5 | Surge, $\pm 1\text{KV}$ diff., $\pm 2\text{KV}$ com. |
| EN61000-4-6 | Conducted immunity, 10Vrms. |
| EN6100-4-8 | Magnetic field immunity, 30A/m. |
| EN61000-4-11 | Voltage dip immunity, 30% reduction for 500ms, 100% reduction for 10 ms. |

Derating Curve



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| Model Number | Output V1 | Min Current ² | Max Current at 30 CFM ³ | Peak Current ⁵ | Tol | Ripple & Noise ⁴ | Max Output Power ³ | Efficiency (typ) @ 115/230VAC |
|--------------|-----------|--------------------------|------------------------------------|---------------------------|-----|-----------------------------|-------------------------------|-------------------------------|
| OBR04031B | 12 V | 0.1 A | 50.00 A | 50.00 A | ±2% | 120 mV | 600 W | 88 /90% |
| OBR04037B | 15 V | 0.1 A | 40.00 A | 44.00 A | ±2% | 150 mV | 600 W | 88 /90% |
| OBR04040B | 18 V | 0.1 A | 36.12 A | 40.00 A | ±2% | 180 mV | 650 W | 88 /90% |
| OBR04046B | 24 V | 0.1 A | 27.09 A | 30.00 A | ±2% | 240 mV | 650 W | 88 /90% |
| OBR04052B | 28 V | 0.1 A | 23.22 A | 25.5 A | ±2% | 280 mV | 650 W | 89 /91% |
| OBR04055B | 30V | 0.1 A | 21.67 A | 23.8 A | ±2% | 300 mV | 650 W | 89 /91% |
| OBR04058B | 32V | 0.1 A | 20.32 A | 22.4 A | ±2% | 320 mV | 650 W | 89 /91% |
| OBR04060B | 34 V | 0.1 A | 19.12 A | 21.0 A | ±2% | 340 mV | 650 W | 89 /91% |
| OBR04061B | 36 V | 0.1 A | 18.06 A | 20.0 A | ±2% | 360 mV | 650 W | 89 /91% |
| OBR04070B | 48 V | 0.1 A | 13.55 A | 15.0 A | ±2% | 480 mV | 650 W | 89 /91% |
| OBR04077B | 57 V | 0.1 A | 11.41 A | 12.5 A | ±2% | 570 mV | 650 W | 89 /91% |
| OBR04079B | 58 V | 0.1 A | 11.21 A | 12.3 A | ±2% | 580 mV | 650 W | 89 /91% |

Notes:

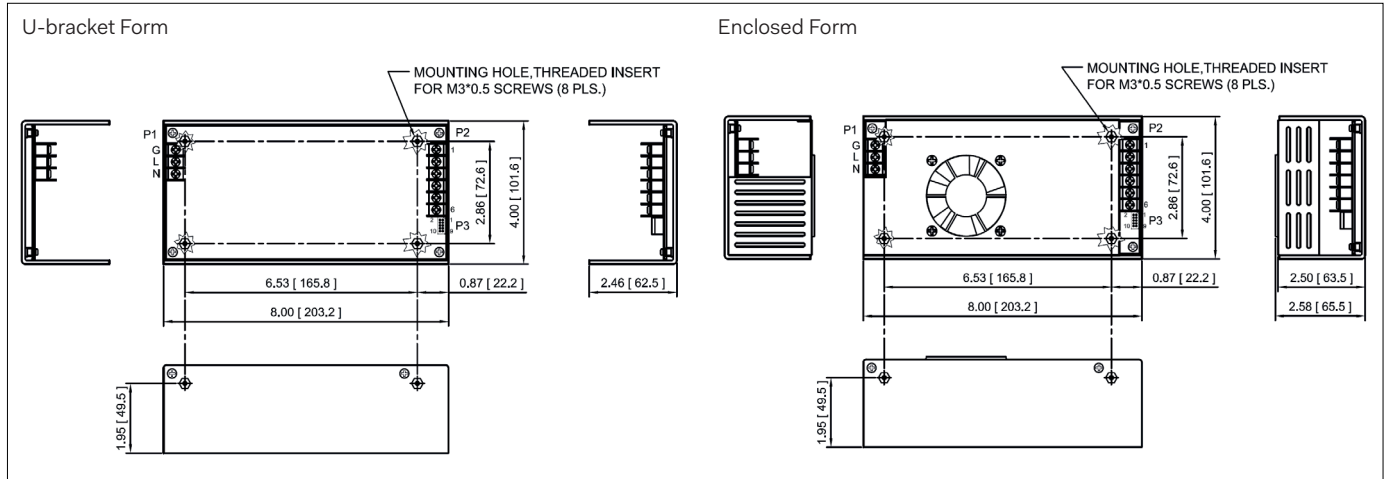
1. Change suffix "B" for U-Bracket form to "C" for enclosed form with cover and fan assembly, e.g. OBR04046C. Temperature sensor for fan cooling is located at T1. Start, full speed T1>+80°C. Stop, T1<+60°C.
2. All models may be operated at no-load without damage. At no load, output voltage fluctuates beyond 5% due to the burst-mode operation of the control IC in them for energy saving.
3. 600-650 W for "C" version, or with 30 CFM forced air provided by user for "B" version
4. Ripple and noise is maximum peak-to-peak voltage value measured at output within 20 MHz bandwidth, at rated line voltage and output load ranges, and with a 10 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor across the output.
5. Peak output current with 10% duty cycle maximum for less than 15 seconds, average power not to exceed maximum power rating.

Interface Signals

| Signal | Figure | Description |
|-------------------------|-----------------------|---|
| Power fail detect (PFD) | | TTL high for normal operation, low upon loss of output power, turn-on delay time 100-750ms, turn-off delay time 1 ms minimum. |
| Inhibit | | Requires an external TTL high level signal inhibit output for standard models. |
| Status | Voltage limits | |
| TTL logic low | 0 - 0.8 VDC | |
| TTL logic high | 3.5 - 5.0 VDC | |

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Mechanical



Notes:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle terminal P/N DT-35-B01W-03, with nickel plated M3 screws.
4. Output connector P2 is Dinkle terminal P/N DT-4N-B01W-06, with nickel plated M3.5 screws.
5. Output connector P3 is JST header S10B-PHDSS or equivalent, mating with JST housing PHDR-10VS or equivalent.
6. Fan connector P4 is JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
7. Weight: 1.8 Kgs (3.97 lbs.) approx. for U-bracket form, 2.0 Kgs. (4.41 lbs.) approx. for enclosed form.
8. Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis.

Pin Connection

| Connector | P1 (AC) | | | P2 | | | | | | P4 | |
|-----------|---------|------|---------|-----|-----|-----|---------------|---------------|---------------|----------|---------------|
| Pin No | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 |
| Polarity | Ground | Live | Neutral | +V1 | +V1 | +V1 | Common Return | Common Return | Common Return | +12V Fan | Common Return |

| Connector | P3 | | | | | | | | | |
|-----------|-----------|-----------|----|---------------|------|------|---------|------|-------------|--------------------|
| Pin No | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Polarity | +V1 Sense | +V1 Sense | PF | Common Return | N.A. | N.A. | Inhibit | N.A. | +5V Standby | +5V Standby Return |

Specifications are subject to change without notice.