

# MBC40 Series

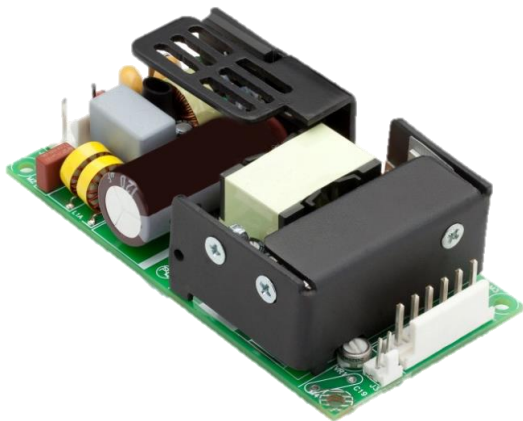
## AC-DC Open Frame Power Supplies

### Medical

The **MBC40 Series** of open-frame medical power supplies, with its wide universal 90-264 VAC input range, is available at 40 W of output power and a variety of single and multiple output voltages.

The MBC series is designed and approved to the latest Medical standards (EN/IEC 60601-1), providing 2 x MOPP isolation for Class I & Class II applications.

These medical power supplies are ideal for, monitoring, home health equipment as well as surgical devices.



#### Key Features & Benefits

- 4 x 2 x 1.2 Inch Form Factor
- Single to Triple Outputs
- Ultra High Efficiency > 85%
- Approved to EN/IEC 60601-1
- Low leakage current < 250  $\mu$ A
- No Load Power < 0.3 W
- IEC Protection Class Options:
  - Class I: Earth pin J4 (no suffix)
  - Class II: No Earth pin (-2 suffix)
- RoHS Compliant
- Cover Kit Accessory Available

#### Applications

- Dialysis
- Monitoring
- Pumps
- Surgical Devices
- Home Health
- Ultrasound

## 1. MODEL SELECTION

| MODEL <sup>5</sup>       | OUTPUT VOLTAGE (VDC)      | MAX LOAD (A) <sup>2</sup> | MINIMUM LOAD (A) <sup>3</sup> | RIPPLE & NOISE <sup>4</sup> |
|--------------------------|---------------------------|---------------------------|-------------------------------|-----------------------------|
| MBC40-1005G              | 5.1                       | 8.0                       | 0.0                           | 1%                          |
| MBC40-1012G              | 12                        | 3.5                       | 0.0                           | 1%                          |
| MBC40-1015G              | 15                        | 2.7                       | 0.0                           | 1%                          |
| MBC40-1024G              | 24                        | 1.7                       | 0.0                           | 1%                          |
| MBC40-1048G              | 48                        | 0.83                      | 0.0                           | 1%                          |
| MBC40-3000G              | 5.2                       | 6.0                       | 0.5                           | 1%                          |
|                          | 12.5                      | 2.0                       | 0.1                           | 1%                          |
|                          | -12.8                     | 0.5                       | 0.0                           | 1%                          |
| MBC40-3001G              | 5.2                       | 6.0                       | 0.5                           | 1%                          |
|                          | 23.8                      | 1.0                       | 0.1                           | 1%                          |
|                          | -12.8                     | 0.5                       | 0.0                           | 1%                          |
| MBC40-3002G              | 5.2                       | 6.0                       | 0.5                           | 1%                          |
|                          | 14.6                      | 1.5                       | 0.1                           | 1%                          |
|                          | -14.8                     | 0.5                       | 0.0                           | 1%                          |
| MBC40-3003G <sup>1</sup> | 3.3                       | 6.0                       | 1.0                           | 1.5%                        |
|                          | 5.2                       | 3.0                       | 0.1                           | 1%                          |
|                          | -12.8                     | 0.5                       | 0.0                           | 1%                          |
| Cover-40-XCB             | Metal cover kit accessory |                           |                               |                             |

### NOTES:

- <sup>1</sup> For MBC40-3003G efficiency is 75% typical.
- <sup>2</sup> Maximum current per output channel. Do not exceed total output power rating.
- <sup>3</sup> Minimum load specified to meet cross regulation.
- <sup>4</sup> Ripple is peak to peak with 20 MHz bandwidth and 10  $\mu$ F (Tantalum capacitor) in parallel with a 0.1  $\mu$ F capacitor at rated line voltage and load ranges.
- <sup>5</sup> For Class II add suffix -2 (e.g.: MBC40-1012G-2).

## 2. INPUT SPECIFICATIONS

Specifications are for nominal input voltage, 25°C unless otherwise stated.

| PARAMETER                    | DESCRIPTION / CONDITION                     | SPECIFICATION                  |
|------------------------------|---------------------------------------------|--------------------------------|
| Input Voltage                | Universal                                   | 90 - 264 VAC                   |
| Input Frequency <sup>6</sup> |                                             | 47 to 400 Hz                   |
| Input Current                | 120 VAC:<br>230 VAC:                        | 0.85 A max.<br>0.45 A max.     |
| No Load Power                | Single output models<br>Multi output models | < 0.3 W<br>< 0.5 W             |
| Inrush Current               | 120 VAC:<br>230 VAC:                        | 30 A max.<br>60 A max.         |
| Leakage Current              | 120 VAC:<br>230 VAC:                        | < 140 $\mu$ A<br>< 250 $\mu$ A |
| Switching Frequency          | Typical                                     | 67 Hz                          |

<sup>6</sup> Safety Approved: 47 to 63 Hz

### 3. OUTPUT SPECIFICATIONS

| PARAMETER                 | DESCRIPTION / CONDITION                                           | SPECIFICATION                  |
|---------------------------|-------------------------------------------------------------------|--------------------------------|
| Efficiency                | Typical                                                           | 85%                            |
| Hold Up Time              | @ 120 VAC typical                                                 | >10 ms                         |
| Output Power              | Derate output power linearly to 80% from 90 VAC to 80 VAC input.  | 40 W                           |
| Line Regulation           |                                                                   | +/-0.3%                        |
| Load Regulation           | V1:<br>V2 & V3:                                                   | +/-0.5%<br>+/-5%               |
| Transient Response        | 50% to 100% load change, 50/60 Hz, 50% duty cycle, 0.1 A/ $\mu$ s | < 10%,<br>recovery time < 5 ms |
| Rise Time                 |                                                                   | < 100 ms                       |
| Set Point Tolerance       | V1:<br>V2 & V3:                                                   | $\pm$ 3%<br>$\pm$ 5%           |
| Output Voltage Adjustment | V1                                                                | $\pm$ 10%                      |
| Over Current Protection   | Typical above rating                                              | 130%                           |
| Over Voltage Protection   | Typical for V1 only                                               | 130%                           |
| Short Circuit Protection  | Short term, autorecovery                                          |                                |

### 4. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER             | DESCRIPTION / CONDITION                                   | SPECIFICATION             |
|-----------------------|-----------------------------------------------------------|---------------------------|
| Operating Temperature | Refer to derating curve, Fig. 1<br>Start-up is guaranteed | -20 to 70°C<br>-20 to 0°C |
| Storage Temperature   |                                                           | -40 to +85°C              |
| Relative Humidity     | Non Condensing                                            | 95%                       |
| Altitude              | Operating:<br>Non-Operating:                              | 10,000 ft.<br>40,000 ft.  |
| Reliability           | MTBF according to Telcordia -SR332-Issue 3                | 1.87 million hours        |
| Cooling               | Convection                                                |                           |

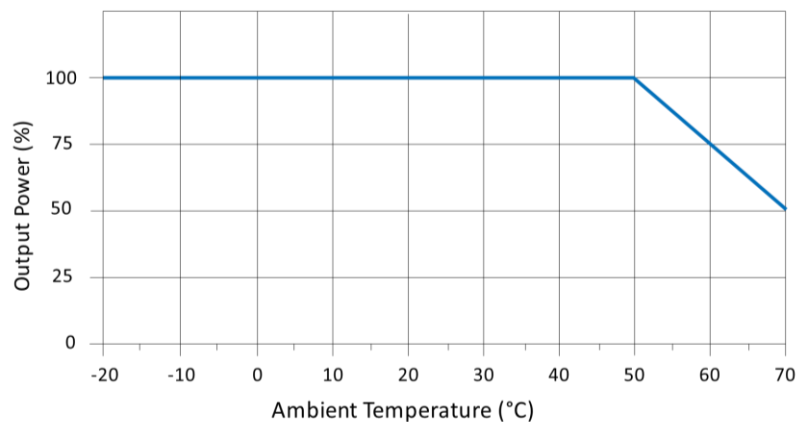


Figure 1. Output Power Vs. Temperature

### 5. EMC SPECIFICATIONS

| PARAMETER               | DESCRIPTION / CONDITION            | SPECIFICATION                  |
|-------------------------|------------------------------------|--------------------------------|
| Conducted Emissions     | EN55022-B, CISPR22-B, FCC PART15-B |                                |
| Radiated Emissions      | EN55022-B, CISPR22-B, FCC PART15-B | To be controlled in end system |
| Harmonic Current        | EN61000-3-2                        | Class A                        |
| AC Flicker              | EN61000-3-3                        | Pass                           |
| Static Discharge        | EN61000-4-2                        | Level 3                        |
| RF Field Susceptibility | EN61000-4-3                        | Level 3                        |
| Fast Transients/Bursts  | EN61000-4-4                        | Level 3                        |
| Surge Susceptibility    | EN61000-4-5                        | Level 3                        |

## 6. SAFETY SPECIFICATIONS

| PARAMETER         | DESCRIPTION / CONDITION                                                                                | SPECIFICATION                        |
|-------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------|
| Isolation Voltage | Input to Output, 2M0PP<br>Input to Ground, 1M0PP<br>Output to Ground                                   | Min. 5700 VDC<br>1500 VAC<br>500 VAC |
| Safety Standards  | Approved to the latest edition of the following standards:<br>CSA/UL60601-1, EN60601-1 and IEC60601-1. |                                      |
| Agency Approvals  | Nemko, UL, C-UL                                                                                        |                                      |
| CE mark           | Complies with LVD Directive                                                                            |                                      |

## 7. CONNECTOR & PIN DESCRIPTION

| CONNECTOR           | PIN | DESCRIPTION / CONDITION                           | MANUFACTURER / PN                                                       |
|---------------------|-----|---------------------------------------------------|-------------------------------------------------------------------------|
| AC Input Connector  | J1  | Pin 1 AC Neutral<br>Pin 2 AC Line                 | Molex: 26-60-4030 or equivalent<br>Mating: 09-50-3031; Pins: 08-50-0106 |
| DC Output Connector | J2  | Pin 1,2 V1<br>Pin 3,4 RTN<br>Pin 5 V3<br>Pin 6 V2 | Tyco: 640445-6 or equivalent<br>Mating: 647402-6; Pins: 3-647409-1      |
| Signal Connector    | J3  | Pin 1 +V1 Sense<br>Pin 2 -V1 Sense                | Molex: 22-23-2021 or equivalent<br>Mating: 22-01-2021                   |
| Earth               | J4  |                                                   | Molex: 19705-4301<br>Mating: 190030001                                  |

## 8. MECHANICAL SPECIFICATIONS

| PARAMETER  | DESCRIPTION / CONDITION                    |
|------------|--------------------------------------------|
| Weight     | 150 g (0.33 lbs.)                          |
| Dimensions | 101.6 x 50.8 x 30.48 mm (4 x 2 x 1.2 inch) |

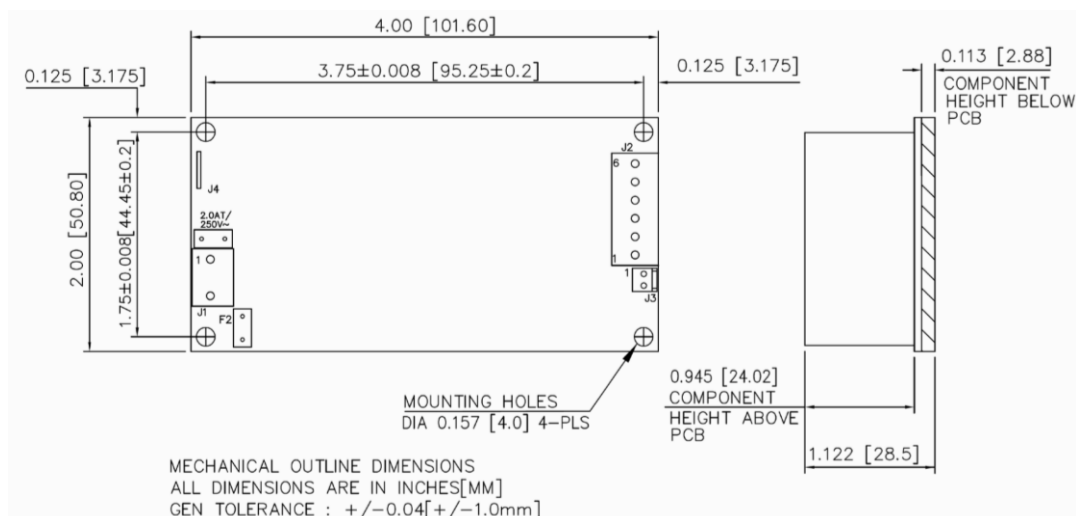


Figure 2. Mechanical Drawing MBC40-1xxxG

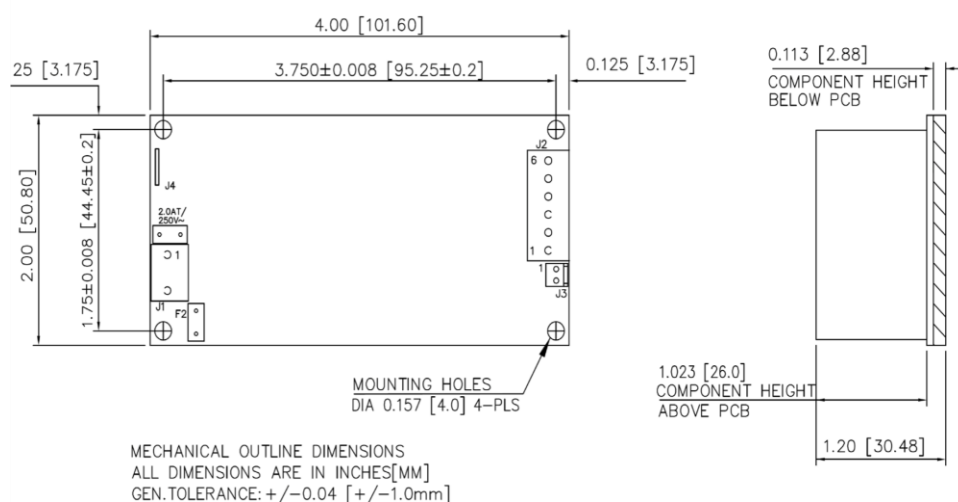


Figure 3. Mechanical Drawing MBC40-3xxxG

**NOTES:** In case the PCB is mounted in a metal enclosure, using metal hardware ensure the following:

- 1 Stand off, used to mount PCB has OD of 5.4 mm max.
- 2 Screws, used to fix PCB on stand off, have head dia of 6.0 mm max.
- 3 Washer, if used, to have dia of 6.5 mm max.

**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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На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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