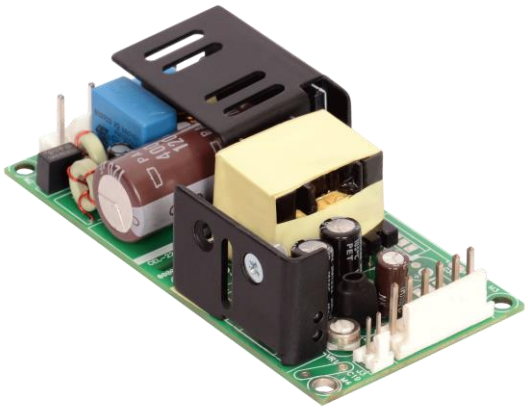
MBC60 Series

AC-DC Open Frame Power Supplies

Medical



The MBC60 Series of open-frame medical power supplies, with its wide universal 90-264 VAC input range, is available at 60 W of output power and a variety of single and multiple output voltages.

The MBC series was designed to 4th edition medical approvals and provides 2x MOPP (Means of Patient Protection) isolation for Class I and Class II installations.

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

Key Features & Benefits

- 50 - 65 W Single to Triple Outputs
- Ultra High Efficiency > 85%
- Form Factor 4 x 2 x 1.2 inches (101.6 x 50.8 x 30.48 mm)
- Low leakage current < 250 µA
- No Load Power < 0.3 W
- Approved to EN/IEC 60601-1
- 2x MOPP
- IEC Protection Class Options:
  - Class I: Earth pin J4 (no suffix)
  - Class II: No Earth pin (-2 suffix)
- Conducted EMI EN 55022-B, FCC Part 15 Level B
- Medical Safety Agency Approvals
- RoHS Compliant
- Cover Kit Accessory Available

Applications

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

1. MODEL SELECTION

MODEL[1]	OUTPUT VOLTAGE (VDC) [2]	OUTPUT CURRENT MAX (A)	MINIMUM LOAD (A) [3]	RIPPLE & NOISE [4]	TOTAL REGULATION
MBC60-1005G	5.2	10.0	0.0	1.25%	± 0.8%
MBC60-1012G	12	5.4	0.0	1%	± 0.8%
MBC60-1015G	15	4.33	0.0	1%	± 0.8%
MBC60-1024G	24	2.7	0.0	1%	± 0.8%
MBC60-1048G	48	1.35	0.0	1%	± 0.8%
MBC60-3000G	5.2	8.0	0.5	1.25%	± 0.8%
	12.5	3.0	0.1	1%	± 5.3%
	-12.5	0.5	0.0	1%	± 5.3%
MBC60-3001G	5.2	8.0	0.5	1.25%	± 0.8%
	23.8	1.5	0.1	1%	± 5.3%
	-12.5	0.5	0.0	1%	± 5.3%
MBC60-3002G	5.2	8.0	0.5	1.25%	± 0.8%
	14.6	2.5	0.1	1%	± 5.3%
	-16.2	0.5	0.0	1%	± 5.3%
MBC60-3003G	3.3	6.0	1.0	1.5%	± 0.8%
	5.2	3.0	0.1	1%	± 5.3%
	-12.8	0.5	0.0	1%	± 5.3%
Cover-60-XCB[5]	Metal cover kit accessory				

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[6]		47 to 400 Hz
Input Current	120 VAC: 230 VAC:	1.5 A max. 0.75 A max.
No Load Power	Single output models Multi output models	< 0.3 W < 0.5 W
Inrush Current	120 VAC: 230 VAC:	30 A max. 60 A max.
Leakage Current	120 VAC: 230 VAC:	< 140 µA <250 µA
Switching Frequency	Typical	67 Hz

[1] Single output models deliver 65 W, except MBC60-1005G (50 W). Triple output models deliver 60 W, except MBC60-3003G (45 W).
[2] Maximum outputs for each output. Max power rating should not be exceeded
[3] Minimum load specified to meet cross regulation.
[4] Ripple is peak to peak with 20 MHz bandwidth and 10 µF (Tantalum capacitor) in parallel with a 0.1 µF capacitor at rated line voltage and load ranges.
[5] When used in Cover Kit, de-rate output power to 70 % under all operating conditions.
[6] Safety Approved: 47 to 63 Hz

3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Efficiency[7]	Typical	85%
Hold Up Time	@ 120 VAC typical	>10 ms
Output Power	Derate output power linearly to 80% from 90 to 80 VAC input.	50 - 65 W
Line Regulation		+/-0.3%
Load Regulation	V1: V2 & V3:	+/-0.5% +/-5%
Transient Response	50% to 100% load change, 50/60 Hz, 50% duty cycle, 0.1 A/µs	< 10%, recovery time < 5 ms
Rise Time		< 100 ms
Set Point Tolerance	V1: V2 & V3:	± 3% ± 5%
Output Voltage Adjustment	V1	± 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 Start-up is guaranteed	-20 to 70°C -20 to 0°C
Storage Temperature		-40 to +85°C
Relative Humidity	Non Condensing	95%
Altitude	Operating: Non-Operating:	10,000 ft. 40,000 ft.
Reliability	MTBF according to Telcordia -SR332-Issue 3	1.87 million hours
Cooling	Convection	



Figure 1. Derating Curve

De-rate linearly from 100% at 50°C to 50% at 70°C

[7] For MBC60-3003G efficiency is 75% typical.

© 2017 Bel Power Solutions & Protection

5. EMC SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Conducted Emissions	EN 55011-B, CISPR22-B, FCC PART15-B	Pass
Radiated Emissions	EN 55011	Pass
Input Current Harmonics	EN 61000-3-2	Class D
Voltage Fluctuation and Flicker	EN 61000-3-3	Pass
ESD Immunity	EN 61000-4-2	Level 4, Criterion A
Radiated Field Immunity	EN 61000-4-3	Level 3, Criterion A
Electrical Fast Transient Immunity	EN 61000-4-4	Level 3, Criterion A
Surge Immunity	EN 61000-4-5	Level 3, Criterion A
Conducted Immunity	EN 61000-4-6	Level 3, Criterion A
Magnetic Field Immunity	EN 61000-4-8	Level 4, Criterion A
Voltage Dips, Interruptions	EN 61000-4-11	Criterion A & B

6. SAFETY SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Isolation Voltage	Input to Output, 2M0PP Input to Ground, 1M0PP Output to Ground	Min. 5700 VDC 1500 VAC 500 VAC
Safety Standards	Approved to the latest edition of the following standards: 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 Pin 2	AC Neutral AC Line	Molex: 26-60-4030 or equivalent Mating: 09-50-3031; Pins: 08-50-0106
DC Output Connector	J2	Pin 1,2 Pin 3,4 Pin 5 Pin 6	V1 RTN V3 V2	Tyco: 640445-6 or equivalent Mating: 647402-6; Pins: 3-647409-1
Signal Connector	J3	Pin 1 Pin 2	+V1 Sense -V1 Sense	Molex: 22-23-2021 or equivalent Mating: 22-01-2021
Earth	J4			Molex: 19705-4301 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)

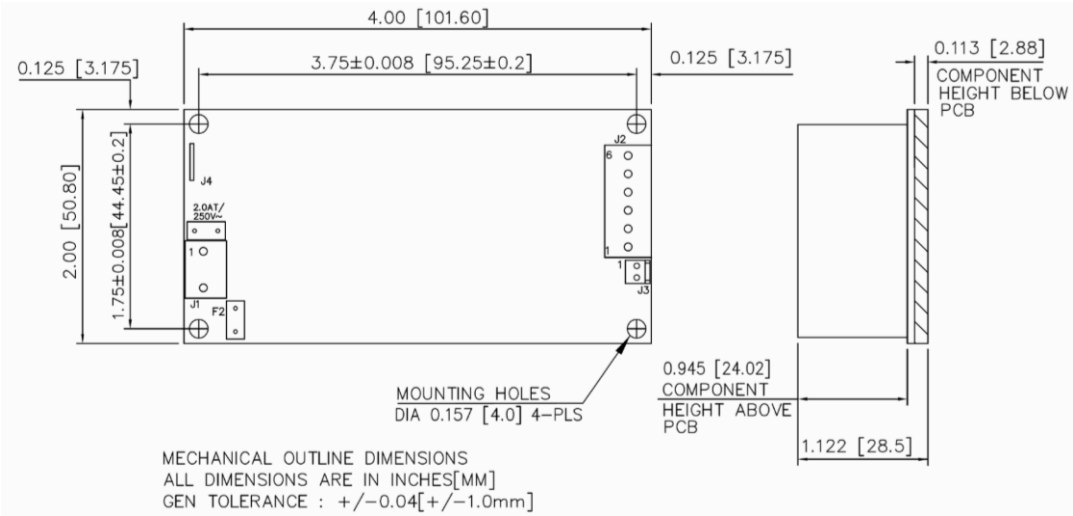


Figure 2. Mechanical Drawing MBC60-1xxxG

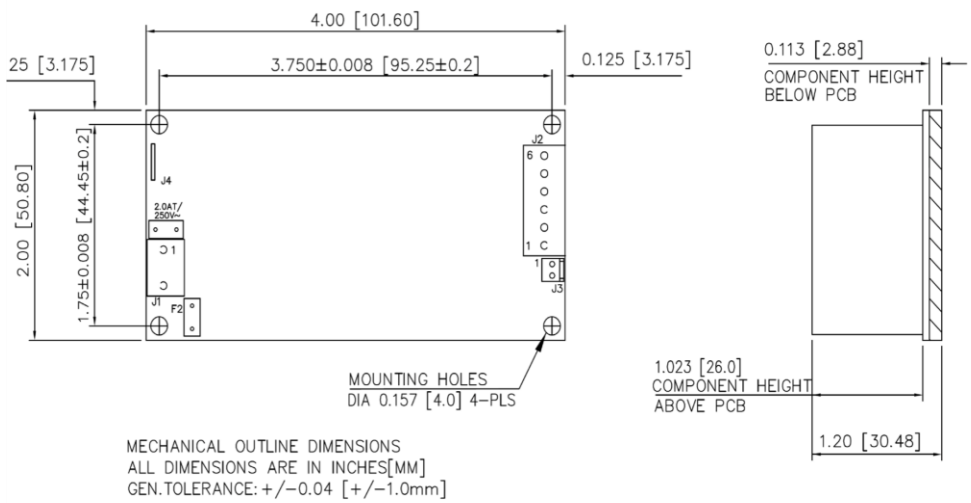


Figure 3. Mechanical Drawing MBC60-3xxxG

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

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.

bel POWER SOLUTIONS & PROTECTION
a bel group

Asia-Pacific +86 755 298 85888
Europe, Middle East +353 61 225 977
North America +1 408 785 5200

© 2017 Bel Power Solutions & Protection