MBC120 Series

Low Profile

Open Frame Power Supplies

Medical

RoHS Compliant

The MBC120 Series of open frame medical power supplies feature a wide universal AC input range of 85 V – 264 VAC, offering 120 W of output power in a compact footprint, with a variety of isolated single 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 power supplies are ideal for medical, telecom, datacom, industrial equipment and other applications.

Key Features & Benefits

- 3 x 2 Inch Footprint
- 120 Watts with Forced Air Cooling
- Approved to EN/IEC 60601-1
- Efficiencies up to 93%
- -40 To 70°C Operating Temperature
  (85°C operating temperature available on request)
- Dual Fusing
- Suitable for BF Applications
- Means of Protection: 2x MOPP
- Thermal Shut-Down Feature
- >3.00 Million Hours, Telcordia -SR332-Issue 3
- No Load Power < 0.3 W
- Class II Option Available
- RoHS Compliant
- CE Marked

Applications

- Diagnostic
- Drug Pump
- Dialysis
- Home Health Care
- Monitoring
- Portable Equipment

1. MODEL SELECTION

MODEL NUMBER [1]	DESCRIPTION	VOLTAGE	MAX. LOAD		POWER
			CONVECTION	300 LFM	
MBC120-1T12L MBC120-1012L	Screw Terminal Molex Header	12 V	8.33 A	10.0 A	120 W
MBC120-1T15L MBC120-1015L	Screw Terminal Molex Header	15 V	6.66 A	8.0 A	120 W
MBC120-1T24L MBC120-1024L	Screw Terminal Molex Header	24 V	4.16 A	5.0 A	120 W
MBC120-1T30L MBC120-1030L	Screw Terminal Molex Header	30 V	3.33 A	4.0 A	120 W
MBC120-1T48L MBC120-1048L	Screw Terminal Molex Header	48 V	2.08 A	2.5 A	120 W
MBC120-1T58L MBC120-1058L	Screw Terminal Molex Header	58 V	1.72 A	2.07 A	120 W
COVER-120-XBC [2]	Metal cover kit accessory				

[1] For Class II version contact Bel sales representative.
[2] When used in Cover Kit, de-rate output power to 70 % under all operating conditions.

2. INPUT SPECIFICATIONS

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

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Input Voltage	Universal (see derating under output power)	85 – 264 VAC / 390 VDC
Input Frequency		47 – 63 Hz
Input Current	115 VAC: 230 VAC:	1.2 A max. 0.65 A max.
No Load Power	Typical	< 0.3 W
Inrush Current	115 VAC: 230 VAC: 264 VAC:	25 A 45 A 75 A
Leakage Current	Typical (N/A for Class II Option) Touch current	300 uA <100 uA
Power Factor	With full load, active PFC	> 0.95
Switching Frequency	Typical	60 KHz

[3] Functional, not approved.

3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Output Voltage	Refer to Model selection table	From 12 V to 58 V
Output Power	Forced cooling (with 300 LFM) [4] Convection cooling for input 100 – 264 VAC: (de-rate linearly to 80 W @ 85 VAC)	120 W 100 W
Efficiency	48 V, 58 V: 24 V, 30 V: 12 V, 15 V:	93% 91% 90%
Hold-up Time	Typical	>10 ms
Line Regulation		+/-0.5%
Load Regulation		+/-1%
Minimum Load		0.0 A
Transient Response	25% step load change, at 0.1A/uS slew rate, 50% duty cycle, 50 Hz = 4%	recovery time < 5 ms
Ripple [5]	For all outputs	1.0 % max.
Output Voltage Adjustment		+/-3%
Rise Time	Typical	55 ms
Set Point Tolerance		+/-1%
Over Current Protection		> 110%
Over Voltage Protection	Latch type (AC recycling required)	110 to 140%
Short Circuit Protection	Hiccup mode	
Cooling	With 300 LFM Forced cooling [4] With Convection cooling (for input 100 – 264 VAC) (de-rate linearly to 80 W @ 85 VAC)	up to 120 W up to 100 W

[4] Refer to Mechanical Drawing
[5] Ripple is peak to peak with 20 MHz bandwidth and 10 µF (Electrolytic capacitor) in parallel with a 0.1 µF capacitor at rated line voltage and load ranges.

4. EMC SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Conducted Emissions	EN 55011-B, CISPR22-B, FCC PART15-B	Pass
Radiated Emissions	EN 55011 A; with external core (King core K5B RC 25x12x15-M in input cable)	Pass Level B
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 B

5. SAFETY SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Isolation Voltage	Input to Output: (For medical applications) Input to GND: (Not Applicable for Class II Option) Output to GND: for type BF for type B (N/A for Class II Option)	4000 VAC 1500 VAC 1500 VAC 500 VAC
Protection Level	Primary to Secondary: Primary to Earth: Secondary to Earth:	2 MOPP 1 MOPP 1 MOPP
Safety Standard(s)	IEC/EN 60601-1 Edition 3.0 + AM1, ANSI/AAMI ES60601-1 and CAN/CSA -C22.2 No. 60601-1	
Agency Approvals	Nemko, UL, C-UL	
CE mark	Complies with LVD Directive	

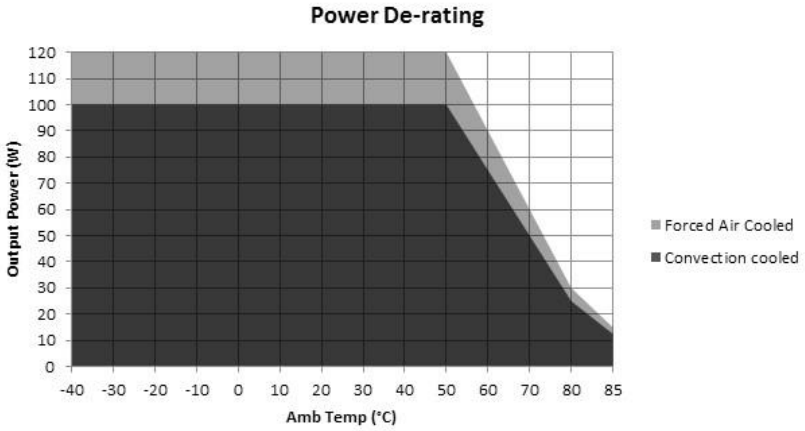
6. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Operating Temperature [6]	-40 to 0°C startup guaranteed, with spec deviation [7]	-40 to +70°C
Storage Temperature		-40 to +85°C
Relative Humidity	Noncondensing	5% to 95%
Altitude	Operating: Non-operating:	16,000 ft 40,000 ft.
Reliability	MTBF according to Telcordia -SR332-Issue 3	3.00 million hours

[6] 85°C operating temperature available on request
[7] Output ripple can be more than 10% of the output voltage.

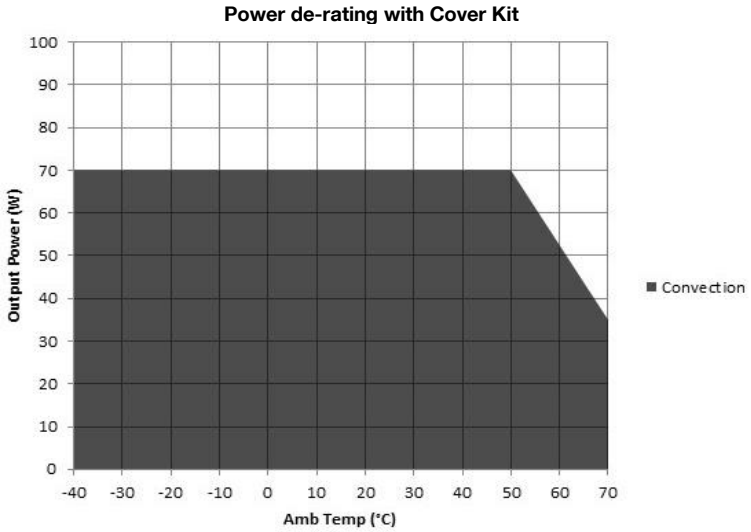
7. CONNECTOR & PIN DESCRIPTION

CONNECTOR	PIN	DESCRIPTION / CONDITION			MANUFACTURER / PN
AC Input Connector	J1	Pin 1 Pin 2 Pin 3	AC Line Not Fitted AC Neutral	Screw Terminal (Option 1) Molex Header (Option 2)	Molex: 39357-0003 Tyco-2-1776112-3 Molex: 1722861103 (Mating conn: Molex 1722561003, Molex 1722561103, Molex 1722563103)
DC Output Connector	J2	Pin 1, 2 Pin 3, 4	V1 -VE V1 +VE	Screw Terminal (Option 1) Molex Header (Option 2)	Molex: 39357-0004 Tyco-2-1776112-4 Molex: 1722861104 (Mating conn: Molex 1722561004, Molex 1722561104, Molex 1722563104)



Convection load: 100 W up to 50 °C
De-rate above 50 °C @ 2.5% per °C
Up to 85°C operating temperature

Forced air cooled load: 120 W up to 50°C
De-rate above 50 °C @ 2.5% per °C
Up to 85°C operating temperature



Convection load: 70W up to 50 °C
De-rate above 50 °C @ 2.5% per °C

Figure 1. Derating Curves

8. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION
Weight	200 g
Dimensions	76.2 x 50.8 x 30.1 mm (3 x 2 x 1.18 inch)

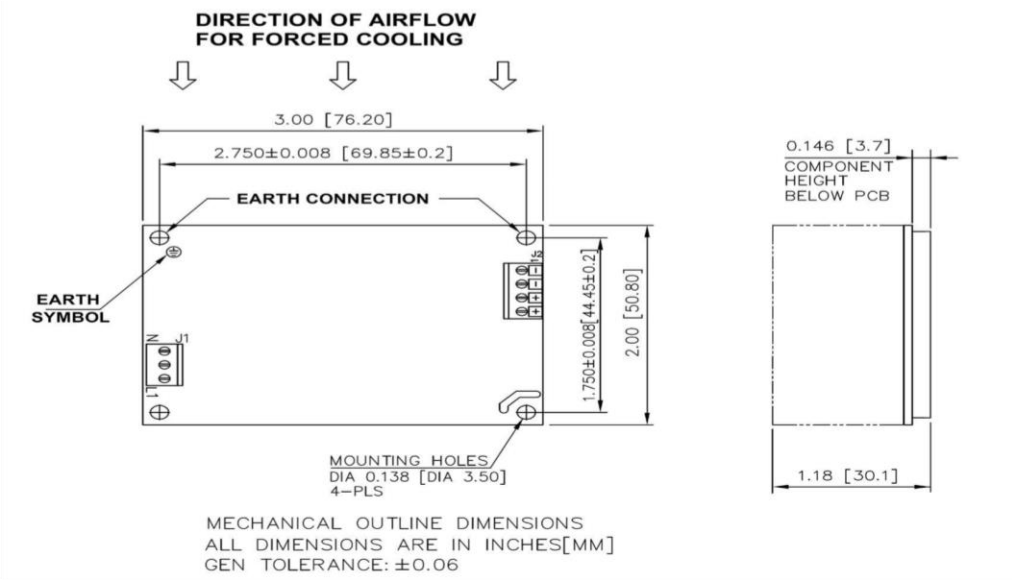


Figure 2. Mechanical Drawing - Screw Terminal (Option 1)

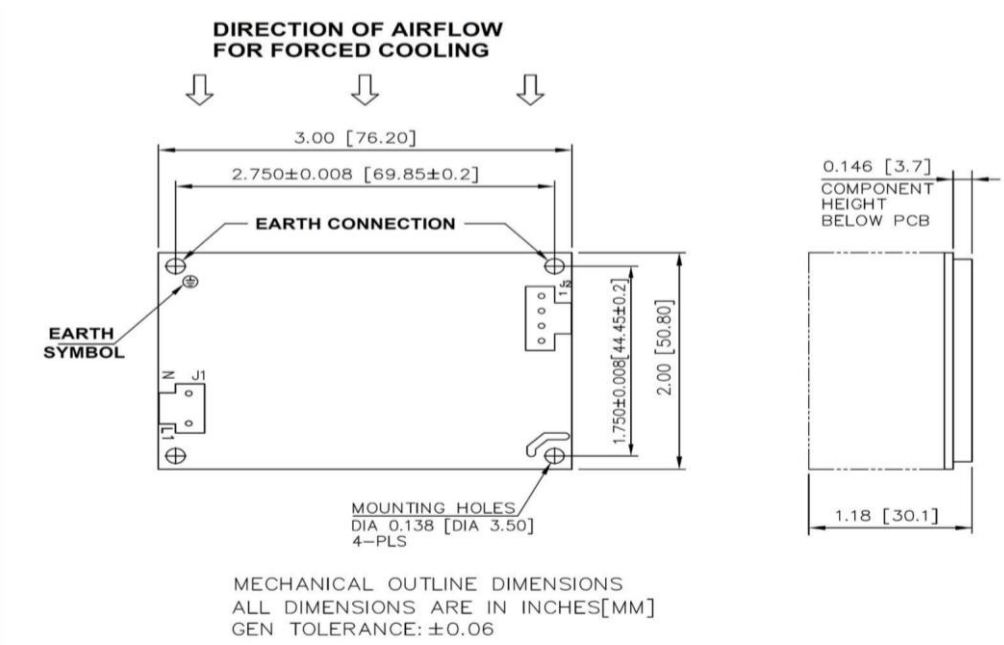


Figure 3. Mechanical Drawing - Molex Header (Option 2)

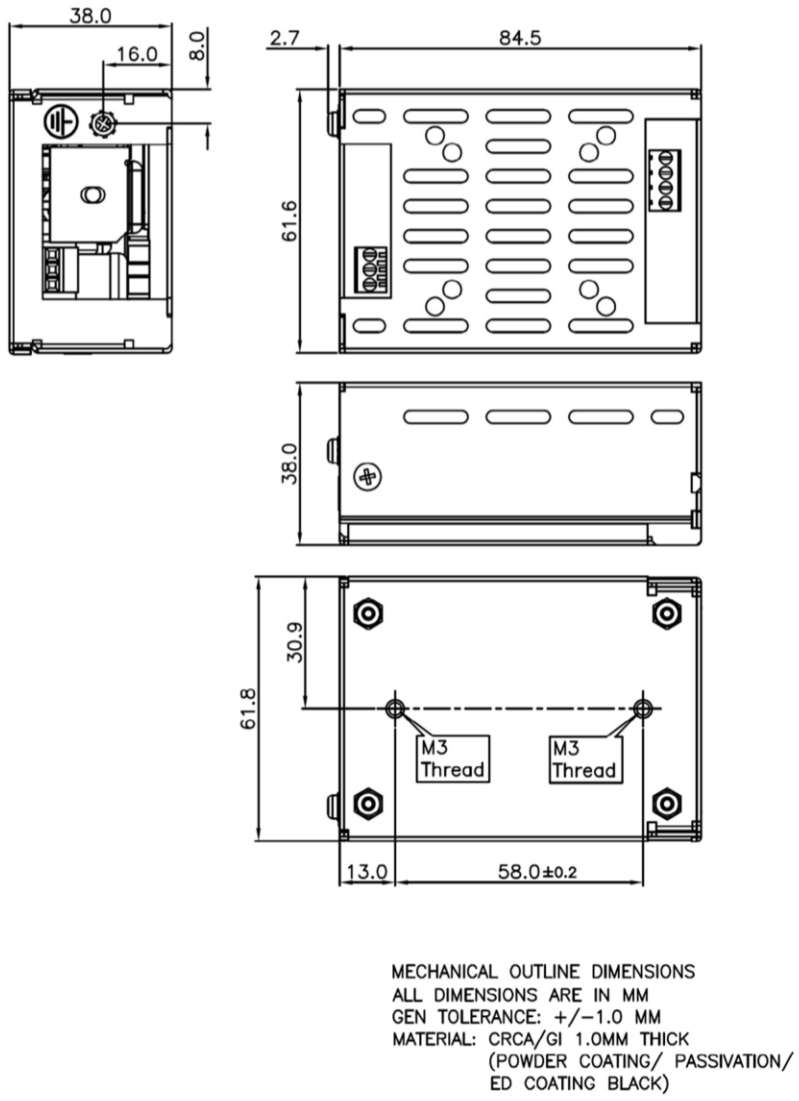


Figure 4 - Mechanical Drawing - With Cover Kit

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.

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