

# MBC120 Series

## Low Profile Open Frame Power Supplies Medical

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
- Thermal Shut-Down Feature
- >3.00 Million Hours, Telcordia -SR332-Issue 3
- Standby Power < 0.3 W
- Class II Option Available
- RoHS Compliant
- CE Marked

### Applications

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



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## 1. MODEL SELECTION

MODEL NUMBER <sup>1</sup>	DESCRIPTION	VOLTAGE	MAX. LOAD (CONVECTION)	MAX. LOAD (300 LFM)	MIN. LOAD	RIPPLE & NOISE <sup>2</sup>
MBC120-1T12L	Screw Terminal	12 V	8.33 A	10.0 A	0.0 A	1%
MBC120-1012L	Molex Header					
MBC120-1T15L	Screw Terminal	15 V	6.66 A	8.0 A	0.0 A	1%
MBC120-1015L	Molex Header					
MBC120-1T24L	Screw Terminal	24 V	4.16 A	5.0 A	0.0 A	1%
MBC120-1024L	Molex Header					
MBC120-1T30L	Screw Terminal	30 V	3.33 A	4.0 A	0.0 A	1%
MBC120-1030L	Molex Header					
MBC120-1T48L	Screw Terminal	48 V	2.08 A	2.5 A	0.0 A	1%
MBC120-1048L	Molex Header					
MBC120-1T58L	Screw Terminal	58 V	1.72 A	2.07 A	0.0 A	1%
MBC120-1058L	Molex Header					
COVER-120-XBC <sup>3</sup>	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 (see derating under output power)	85-264 VAC / 390 VDC <sup>4</sup>
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 $\mu$ A <100 $\mu$ A
Power Factor	@ Full Load, Active PFC	> 0.95
Switching Frequency	Typical	60 KHz

<sup>1</sup> For Class II Option (without input Earth pin) add suffix: -2 (e.g.: MBC120-1012L-2).

<sup>2</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>3</sup> When used in Cover Kit, de-rate output power to 70 % under all operating conditions

<sup>4</sup> Functional, not approved.

### 3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Output Power	Forced cooling (with 300 LFM):	120 W
	Convection cooling (for input 100-264 VAC, de-rate linearly to 80 W @ 85 VAC):	100 W
Efficiency	48 V, 58 V:	93%
	24 V, 30 V:	91%
	12 V, 15 V:	90%
Hold-up Time	Typical	>10 ms
Line Regulation		+/-0.5%
Load Regulation		+/-1%
Transient Response	25% step load change, at 0.1A/uS slew rate, 50% duty cycle, 50 Hz = 4%	recovery time < 5 ms
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	

### 4. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Operating Temperature <sup>5</sup>	Startup guaranteed (derate linearly above 50°C to 70°C as per Fig 1)	-40 to +70°C * -40 to 0°C
Storage Temperature		-40 to +85°C
Cooling	Forced: with 300 LFM (Refer to Mech. Drawing)	120 W
	Convection: for input 100-264 VAC (derate linearly to 80 W @ 85 VAC)	100 W
Relative Humidity	Noncondensing	5% to 95%
Altitude	Operating:	16,000 ft
	Nonoperating:	40,000 ft.
Reliability	MTBF according to Telcordia –SR332-Issue 3	3.00 million hours

\* 85°C operating temperature available on request.

### 5. EMC SPECIFICATIONS

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

<sup>5</sup> Output ripple can be more than 10% of the output voltage.



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## 6. SAFETY SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Isolation Voltage	Input to Output: (For medical applications)	4000 VAC
	Input to GND: (Not Applicable For Class II Option)	1500 VAC
	Output to GND: for type BF	1500 VAC
	for type B (N/A For Class II Option)	500 VAC
Protection Level	Primary to Secondary:	2 MOPP
	Primary to Earth:	1 MOPP
	Secondary to Earth:	1 MOPP
Safety Standard(s)	Approved to the latest edition of the following standards: CSA/UL60601-1, EN60601-1 and IEC60601-1.	
Agency Approvals	Nemko, cULus, CB	
CE mark	Complies with LVD Directive	

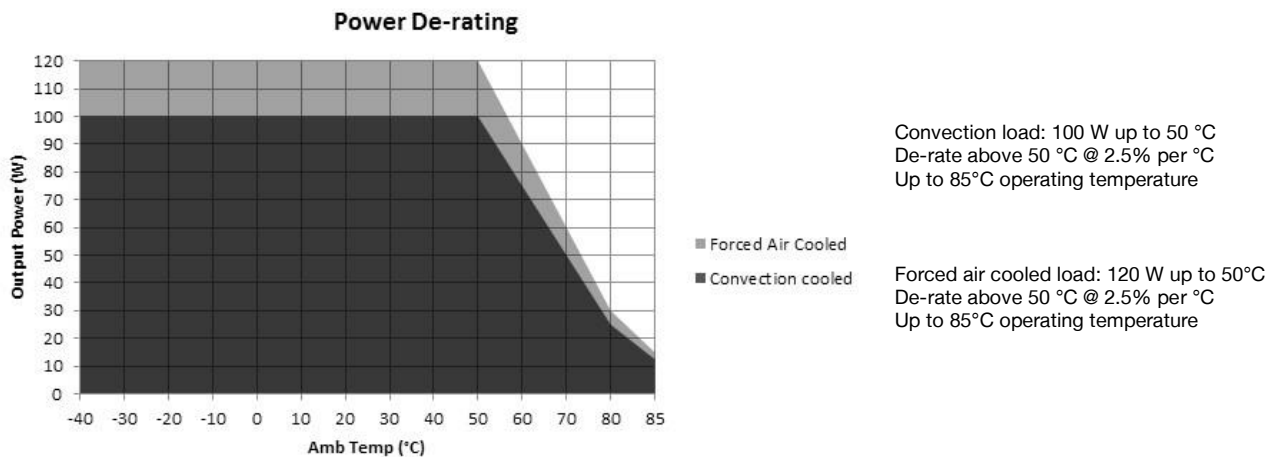


Figure 1. Derating Curve

## 7. CONNECTOR & PIN DESCRIPTION

CONNECTOR	PIN	DESCRIPTION / CONDITION	MANUFACTURER / PN
AC Input Connector	J1	Pin 1	AC Line
		Pin 2	Not Fitted
		Pin 3	AC Neutral
DC Output Connector	J2	Pin 1, 2	V1 -VE
		Pin 3, 4	V1 +VE

Options for connectors:

- AC Input Connector: Screw Terminal (Option 1) or Molex Header (Option 2)
- DC Output Connector: Screw Terminal (Option 1) or Molex Header (Option 2)

Manufacturer Part Numbers (PN):

- Molex: 39357-0003
- Tyco-2-1776112-3
- Molex: 1722861103
- (Mating conn: Molex 1722561003)
- Molex: 39357-0004
- Tyco-2-1776112-4
- Molex: 1722861104
- (Mating conn: Molex 1722561004)

## 8. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION
Weight	150 g
Dimensions	76.2 x 50.8 x 30.1 mm (3 x 2 x 1.18 inch)

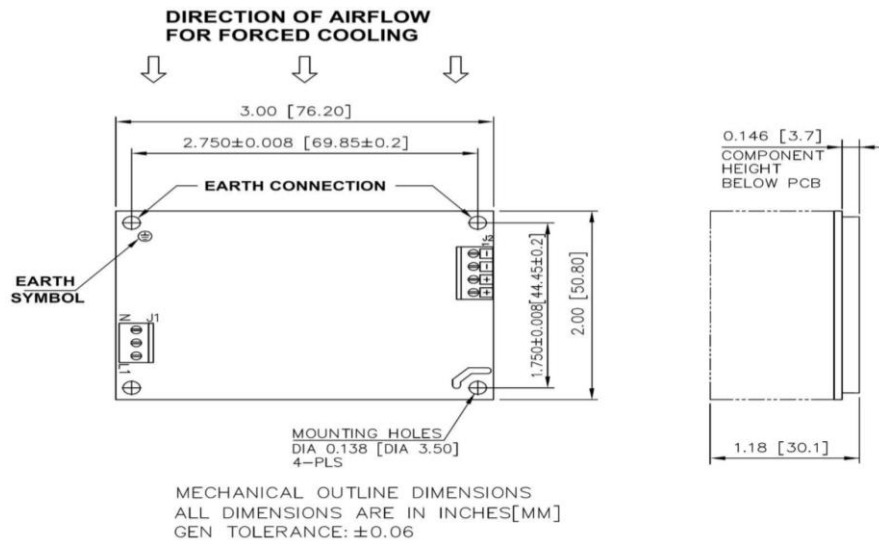


Figure 2. Mechanical Drawing - Screw Terminal (Option 1)

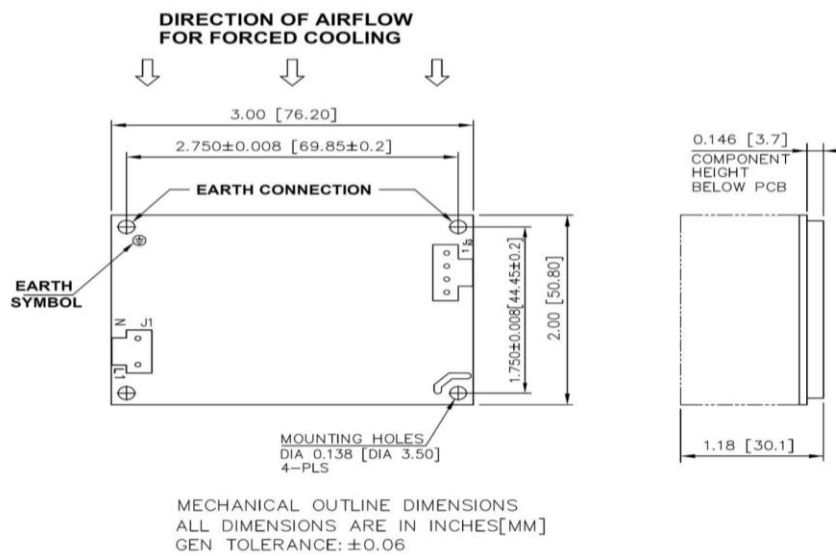


Figure 3. Mechanical Drawing - Molex Header (Option 2)

**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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