

MBC180 Series

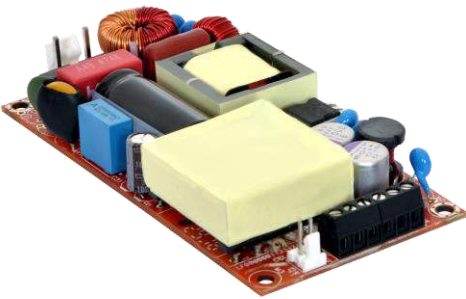
Ultra-Low Profile Open Frame Power Supplies Medical

Not For New Design
Please refer to exact equivalent product series
MULP180

The MBC180 Series of ultra low open frame medical power supplies feature a wide universal AC input range of 85 V – 264 VAC, offering output power 180 W with 13 CFM of forced air cooling or up to 120 W with natural convection cooling. They are available in 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

- 4 x 2 x 0.75 Inches Form factor
- 180 Watts with Forced Air Cooling
- Approved to EN/IEC 60601-1
- Efficiencies up to 92%
- -40 to 70°C degree operating temperature
- Dual Fusing
- 12 V / 0.5 A Fan Output, Thermal Shut-Down feature
- 3.37 million Hours, Telcordia -SR332-issue 3 MTBF
- Standby Power < 0.5 W
- Medical (BF) Safety Approvals

Applications

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

1. MODEL SELECTION

MODEL NUMBER ¹	OUTPUT CONNECTOR	VOLTAGE	MAX. LOAD			POWER
			CONVECTION 50°C (112.5 W)	CONVECTION 40°C (120 W)	13 CFM (180 W)	
MBC180-1T12L	Screw Terminal	12 V	9.37 A	10 A	15 A	180 W
MBC180-1012L	Header Molex Connector					
MBC180-1T15L	Screw Terminal	15 V	7.5 A	8 A	12 A	180 W
MBC180-1015L	Header Molex Connector					
MBC180-1T24L	Screw Terminal	24 V	4.68 A	5 A	7.5 A	180 W
MBC180-1024L	Header Molex Connector					
MBC180-1T30L	Screw Terminal	30 V	3.75 A	4 A	6 A	180 W
MBC180-1030L	Header Molex Connector					
MBC180-1T48L	Screw Terminal	48 V	2.34 A	2.5 A	3.75 A	180 W
MBC180-1048L	Header Molex Connector					
MBC180-1T58L	Screw Terminal	58 V	1.94 A	2.07 A	3.1 A	180 W
MBC180-1058L	Header Molex Connector					
COVER-180-XBC ²	Metal Cover Kit (accessory)					

¹ Class II version available. Add suffix "-2" at the end of the Model Number

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 (Derate from 100% at 100 VAC to 77% at 80 VAC)	80 – 264 VAC / 390 VDC
Input Frequency		47 – 63 Hz
Input Current	115 VAC: 230 VAC:	2.2 A max. 1.1 A max.
No Load Power	Typical	< 0.5 W (models without PGPF) < 0.85 W (models with PGPF)
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 µA < 100 µA
Switching Frequency	PFC PWM	70 – 130 kHz 50 – 80 kHz

3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Output Voltage	Refer to Model selection table	From 12 V to 58 V
Output Power ³	13 CFM (forced air cooling) Convection (natural cooling)	180 W up to 120 W
Efficiency	48 V, 58 V: 24 V, 30 V: 12 V, 15 V:	92% 90% 88%
Hold-up Time	At 180 W: At 120 W:	10 ms 16 ms
Power Factor	115 VAC: 230 VAC:	> 0.95 0.90
Line Regulation ⁴		± 0.5%
Load Regulation ⁴		± 1%
Minimum Load		0.0 A
Transient Response	25% step load change, at 0.1 A/ μ s slew rate, 50% duty cycle, 50 Hz = 4%	recovery time < 5 ms
Ripple ^{4,5}	24, 30, 48 & 58 V outputs 12 V & 15 V outputs	1.0 % max. 2.0 % max.
Output Voltage Adjustment ⁶		± 3%
Rise Time	Typical	55 ms
Set Point Tolerance ⁴		± 1%
Over Current Protection		> 110%
Over Voltage Protection		110 to 140%
Short Circuit Protection	Hiccup mode	
Cooling	With 13 CFM forced air cooling (100 to 264 VAC) ⁷ With natural convection cooling (100 to 264 VAC) ⁸	180 W Up to 120 W

³ Combined output power of main output, fan supply shall not exceed max. power rating.

⁴ Fan supply output voltage tolerance including set point accuracy, line and load regulation is ± 10% and ripple and noise is less than 10%.

⁵ Ripple is peak to peak with 20 MHz bandwidth and 10 μ F (Electrolytic capacitor) in parallel with a 0.1 μ F capacitor at rated line voltage and load ranges.

⁶ Adjustment potentiometer is located on the SMT side of the PCB

⁷ Refer to Mechanical Drawing

⁸ Refer to Derating Curve

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

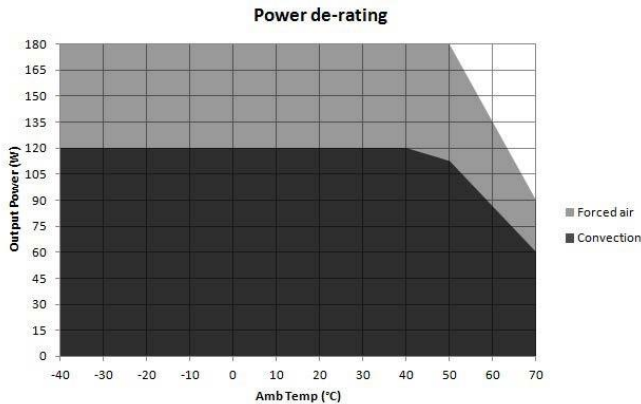
PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Isolation Voltage	Input to Output: (Medical applications)	4000 VAC
	Input to GND: (N/A for Class II Option)	1500 VAC
	Output to GND: for type BF (for type B (N/A for Class II Option))	1500 VAC 500 VAC
Safety Standard(s)	EN 60601-1, IEC 60601-1 (ed.3), ANSI / AAMI ES 60601 - 1, 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	-40 to 0°C startup guaranteed, with spec deviation ⁹	-40 to +70°C
Storage Temperature		-40 to +85°C
Relative Humidity	Non-condensing	5% to 95%
Altitude	Operating:	16,000 ft.
	Non-operating:	40,000 ft.
MTBF	Telcordia -SR332-issue 3	3.37 million hours

⁹ Output ripple can be more than 10% of the output voltage.

DERATING CURVES



Convection load: 120 W up to 40 °C
De-rate between 40-50 °C @ 0.625% per °C
De-rate above 50 °C @ 2.33% per °C

Forced air cooled load: 180 W up to 50°C
De-rate above 50 °C @ 2.5% per °C

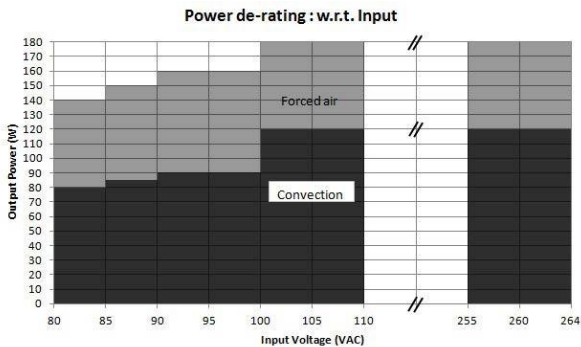


Figure 1. Power Derating Curves

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 ¹⁰	Molex: 26-60-4030 Mating: 09-50-3031; Pins: 08-50-0106
DC Output Connector	J2	Pin 1, 2, 3 V1 +VE Pin 4, 5, 6 V1 -VE	Option 1 (Screw Terminal): Molex: 39357 Series or equivalent Option 2 (Molex Connector): Molex: 26-60-4060 Mating: 09-50-3061; Pins: 08-50-0106
Aux (Fan) Output	J3	Pin 1 FAN +VE Pin 2 FAN -VE	AMP: 640456-2 Mating: 640440-2

¹⁰ Fusing on neutral for ITE model is optional.

8. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION
Weight	approx. 200 g
Dimensions	101.6 x 50.8 x 19.05 mm (4 x 2 x 0.75 inches)

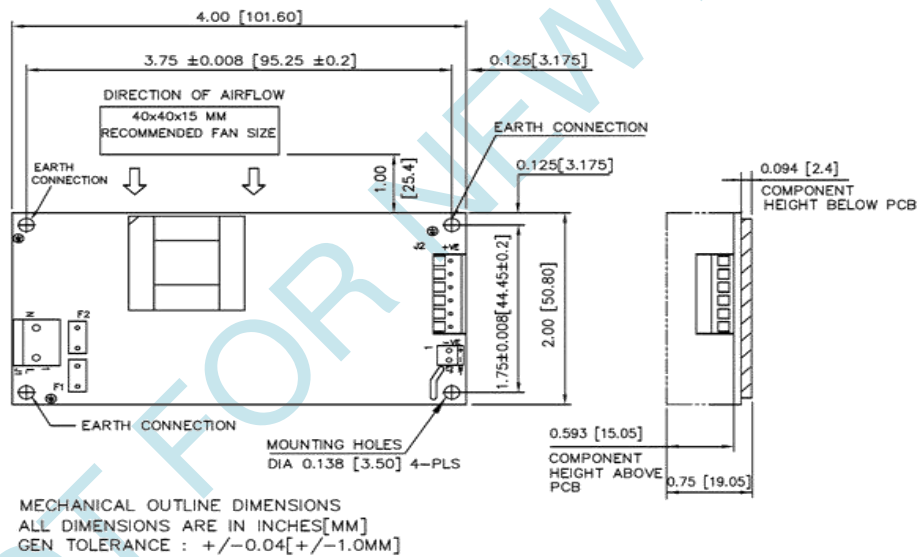


Figure 3. Mechanical Drawing – Option 1 (Output Connector – Screw Terminal)

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.

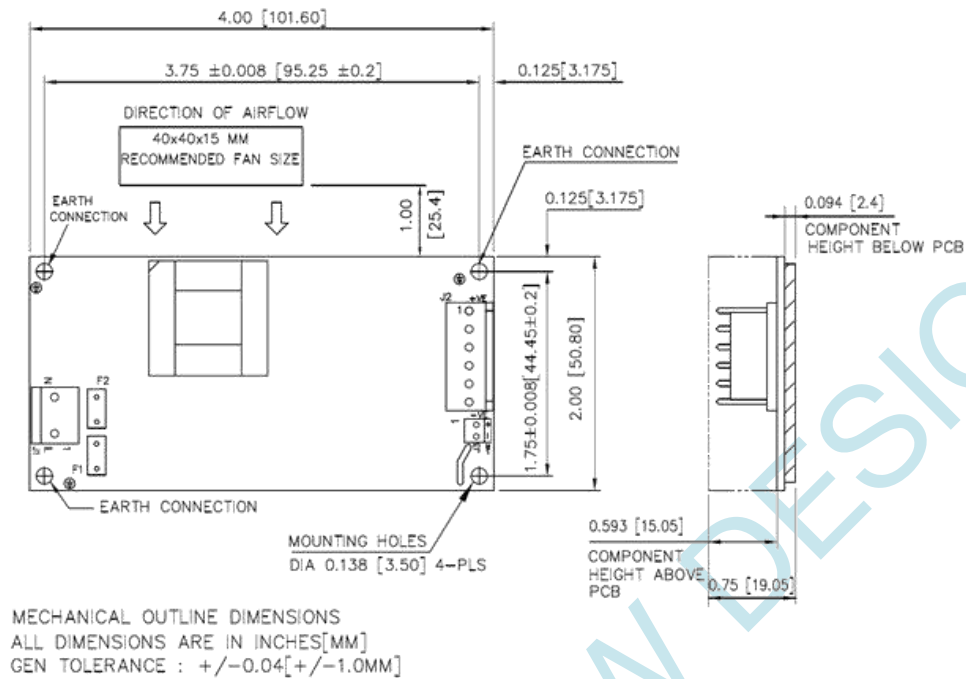


Figure 4. Mechanical Drawing – Option 2 (Output Connector – Header Molex)

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

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

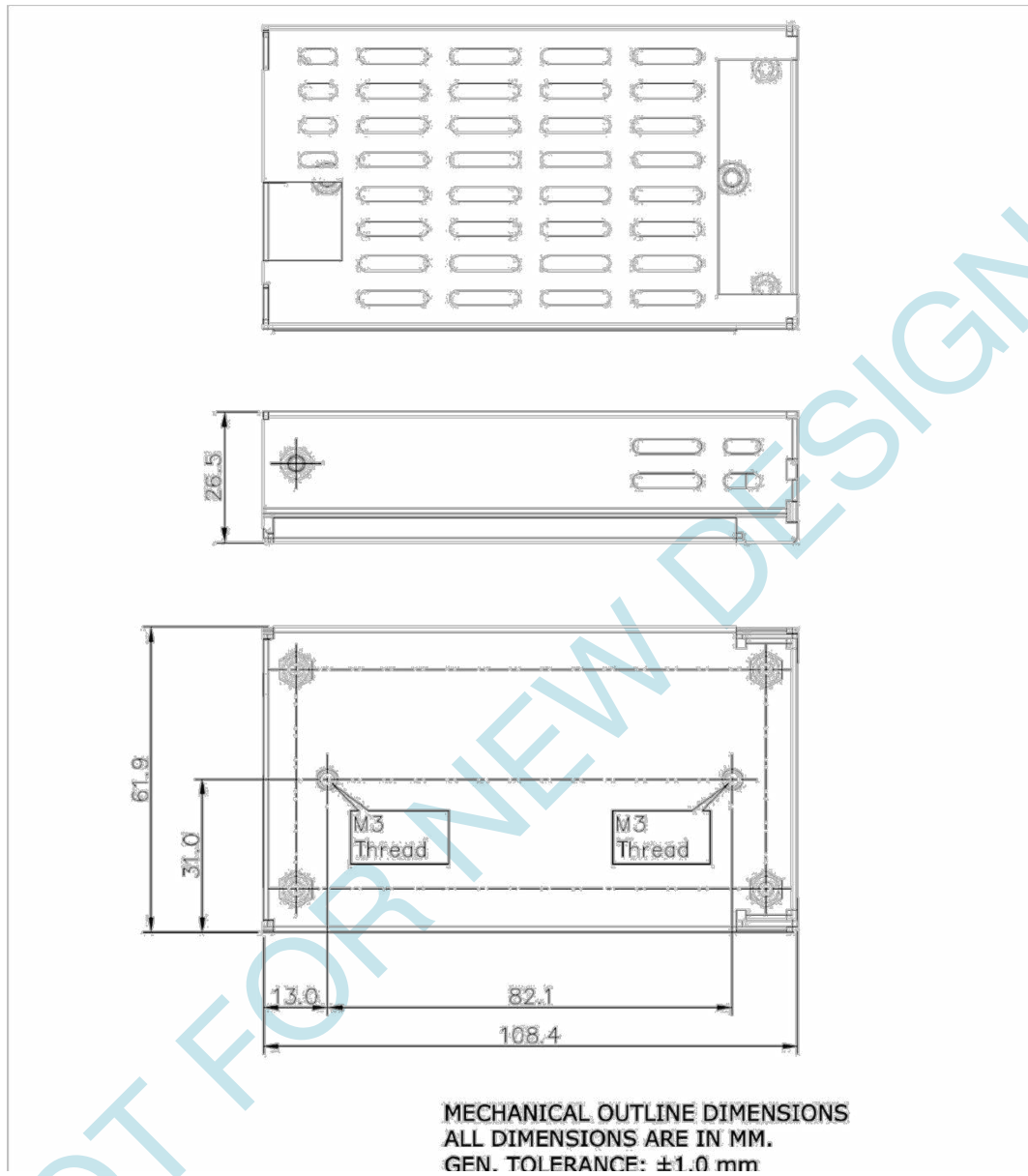


Figure 5. Mechanical Drawing – Cover Kit Option

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.