



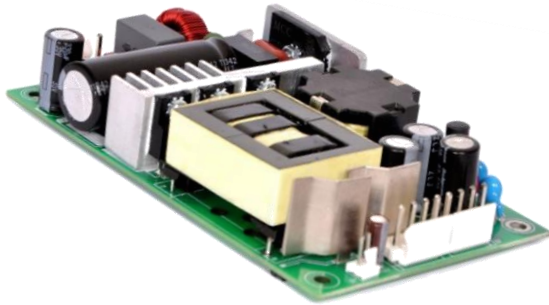
# MBC350 Series

Low Profile  
Open Frame Power Supplies  
Medical

The MBC350 Series of open frame medical power supplies feature a wide universal AC input range of 90 – 264 VAC, offering 350 W of output power in a compact 3 x 5 x 1 inch 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 5 x 1 Inch Form Factor
- 350 W with Forced Air Cooling & 200 W with Convection Cooling
- Approved to EN/IEC 60601-1
- Efficiencies up to 94%
- -40 to 70°C Operating Temperature
- 12 V / 0.5 A Fan Output, Thermal Shut-Down Feature
- 2.56 Million Hours, Telcordia -SR332-Issue 3 MTBF
- Standby Power < 0.5 W
- Medical (BF) Safety Approvals
- RoHS Compliant

## Applications

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



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## 1. MODEL SELECTION

MODEL NUMBER	DESCRIPTION	VOLTAGE	MAX. LOAD (CONVECTION)	MAX. LOAD (375 LFM)	MIN. LOAD	RIPPLE & NOISE <sup>1</sup>
MBC350-1T12L	Screw Terminal	12 V	15 A	25 A	0.0 A	1%
MBC350-1012L	Molex Connector			18.75 A		
MBC350-1T15L	Screw Terminal	15 V	12 A	21.67 A	0.0 A	1%
MBC350-1015L	Molex Connector			18. A		
MBC350-1T24L	Screw Terminal	24 V	8.33 A	14.60 A	0.0 A	1%
MBC350-1024L	Molex Connector					
MBC350-1T30L	Screw Terminal	30 V	6.67 A	11.67 A	0.0 A	1%
MBC350-1030L	Molex Connector					
MBC350-1T48L	Screw Terminal	48 V	4.17 A	7.30 A	0.0 A	1%
MBC350-1048L	Molex Connector					
MBC350-1T58L	Screw Terminal	58 V	3.45 A	6.04 A	0.0 A	1%
MBC350-1058L	Molex Connector					
COVER-350-XBC	metal cover kit accessory					

### NOTES:

1. 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.
2. Combined output power of main output, fan supply shall not exceed max. power rating.
3. Fan supply output voltage tolerance including set point accuracy, line and load regulation is +/-10% and ripple and noise is less than 10%.
4. Thermal shutdown feature: The power supply goes in hiccup mode when the temperature of PCB exceeds 110 °C (+/-10 °C).
5. Output ripple can be more than 10% of the output voltage.

## 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 90% at 90 VAC)	90-264 VAC / 390 VDC
Input Frequency		47 - 63 Hz
Input Current	115 VAC: 230 VAC:	3.6 A max. 1.8 A max.
No Load Power	Typical	>0.5 W
Inrush Current	115 VAC: 230 VAC: 264 VAC:	25 A 45 A 75 A
Leakage Current	Typical Touch Current	300 $\mu$ A <100 $\mu$ A
Power Factor	Full Load	>0.95
Switching Frequency	PFC: PWM:	70 - 130 KHz 50 - 80 KHz

### 3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Output Power	With 375 LFM:	350 W
	Convection:	200 W
Efficiency	48 V, 58 V:	94%
	24 V, 30 V:	93%
	12 V, 15 V:	92%
Hold-up Time	Full Load:	8 ms typical
	Convection Load:	14 ms typical
Line Regulation		+/-0.5%
Load Regulation		+/-1%
Transient Response	50-100% step load change, at 0.1A/uS slew rate, 50% duty cycle, 50 Hz = 5% ,	recovery time < 5 ms
Voltage Adjustment		+/-3%
Rise Time	Typical	55 ms
Set Point Tolerance		+/-1%
Over Current Protection	Hiccup mode / Auto Recovery	>110%
Over Voltage Protection	Hiccup mode / Auto Recovery	110 to 140%
Short Circuit Protection	Hiccup mode / Auto Recovery	

### 4. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Operating Temperature	Startup guaranteed, with spec deviation, see Fig. 1	-40 to +70°C
		-40 to 0°C
Storage Temperature		-40 to 85° C
Cooling	With 375 LFM forced air cooling at 100 to 264 VAC:	350 W
	With natural convection cooling at 100 to 264 VAC:	200 W
Altitude	Operating:	16,000 ft.
	Non-operating:	40,000 ft.
Humidity	Non Condensing	5% to 95%
Reliability	MTBF according to Telcordia - SR332-Issue 3	2.56 million hours

### 5. EMC SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	SPECIFICATION
Conducted Emissions	EN55022-B, CISPR22-B, FCC PART15 – B	
Static Discharge	EN61000-4-2:	Level-3
RF Field Susceptibility	EN61000-4-3:	Level-3
Fast Transients/Bursts	EN61000-4-4:	Level-3
Radiated Emissions	Radiated:	Level A
	Radiated with external core: (King core K5B RC 25x12x15-M in input cable with 5 Turns)	Level B
Surge Susceptibility	EN61000-4-5:	Level-3
Harmonic Current	EN61000-3-2:	Class D
AC Flicker	EN61000-3-3:	Pass

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, UL, C-UL	
CE mark	Complies with LVD Directive	

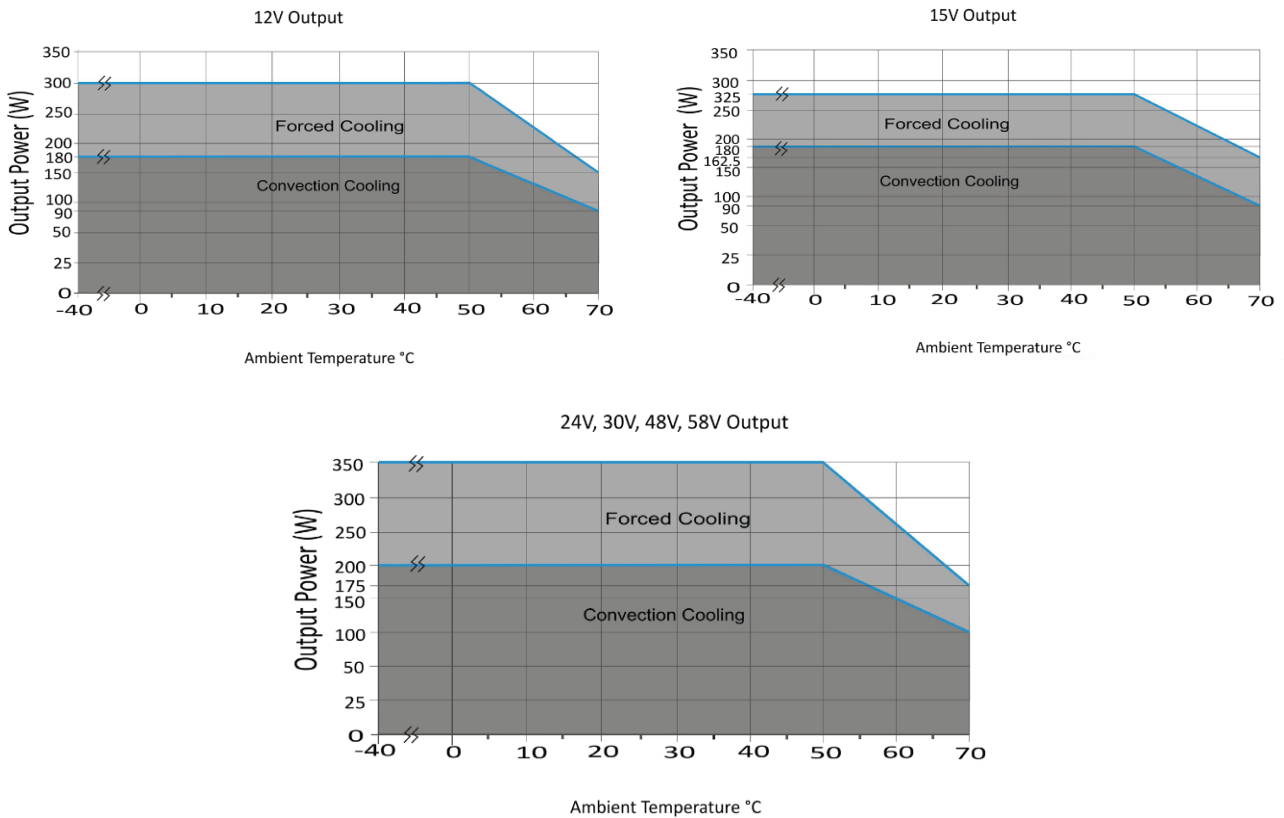


Figure 1. Derating Curves

## 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	Molex: 26-60-4030 Mating: 09-50-3031; Pins: 08-50-0106
DC Output Connector	J2	Screw Terminal (Option 1) Pin 1 V1 +VE Pin 2 V1 - VE	6-32 inches Screw Pan HD Mating: 16 AWG wire crimped to Ring Tongue Terminal AMP: 8-31886-1
		Molex Connector (Option 2) Pin 1,2,3,4 V1 +VE Pin 5,6,7,8 V1 - VE	Molex: 26-60-4080 Mating: 09-50-3081; Pins: 08-50-0106
Aux (Fan) Output	J3	Pin 1 FAN +VE Pin 2 FAN -VE	AMP :640456-2 Mating: 640440-2
Earth	J4		Molex: 19705-4301 Mating: 19003-0001

## 8. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION
Weight	300 g
Dimensions	76.2 x 127.0 x 25.4 mm (3 x 5 x 1 inch)



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

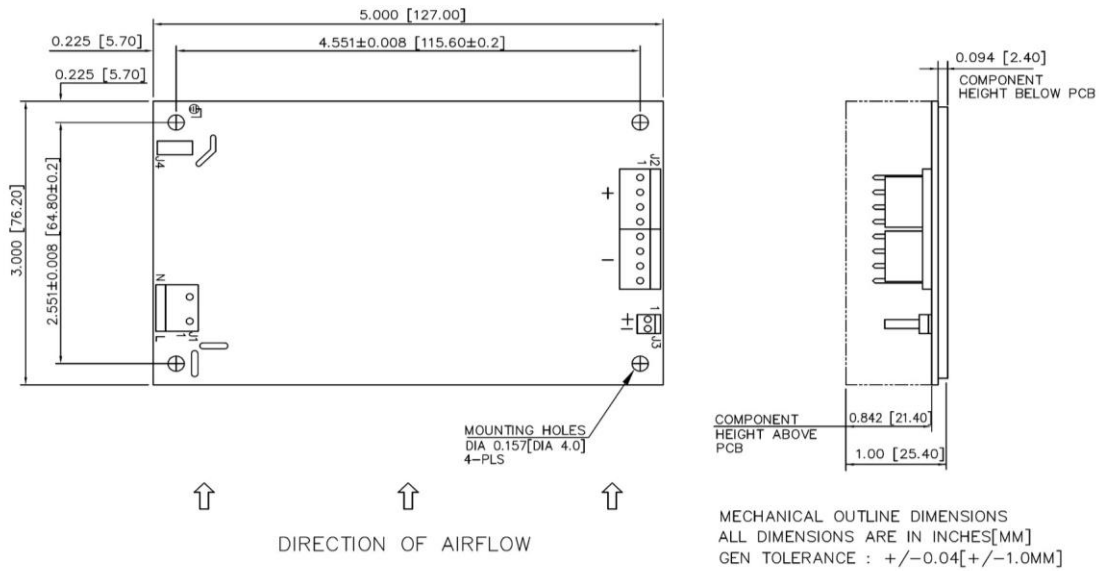


Figure 3. Mechanical Drawing - Molex Header (Option 2)

**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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