180 Watt Medical



Features

- 4 x 2 x 0.75 Inches Form factor
- 180 Watts with Forced Air Cooling
- Approval to EN60601 3rd Edition
- Efficiencies upto 92%
- -40 to 70 degree operating temperature*
- Dual fusing
- 12V / 0.5A Fan Output, Thermal Shut-Down feature
- 3.37m Hours, Telcordia -SR332-issue 3 MTBF
- No Load Power < 0.5W
- Medical (BF) Safety Approvals
- Meets standard IEC60601-1-2 : 2014 (4th Edition)

	Electrical Specifications				
Input Voltage	80-264 VAC/390 VDC, Universal (Derate from 100% at 100V AC to 77% at 80V AC)				
Input Frequency	47-63 Hz				
Input Current	115 VAC: 2.2 A max. 230 VAC: 1.1 A max.				
No Load Power	<0.5W typical for MULP180-1XXX and <0.85W typical for MULP180-0XXX				
Inrush Current	115 VAC – 25 A, 230 VAC – 45 A, 264 VAC – 75 A				
Leakage Current	300 uA Typical, (N.A. For Class II Option) Touch current <100uA				
Efficiency	92%(48V,58V), 90%(24V,30V), 88%(12V,15V)				
Hold-up Time	at 180W:10 ms ; 120W: 16 ms				
Power Factor	>0.95@115 VAC and 0.9@230 VAC				
Output Power	180W with 13 CFM, upto 120W Convection				
Line Regulation	+/-0.5%				
Load Regulation	+/-1%				
Transient Response	25% step load change, at 0.1A/uS slew rate, 50% duty cycle, 50Hz=4%,				
	recovery time < 5 ms				
Rise Time	55ms typical				
Set Point Tolerance	+/-1%				
Output Voltage Adjustment	+/-3% (Ref. Note 8)				
Over Current Protection	>110%				
Over Voltage Protection	110 to 140%				
Short Circuit Protection	Hiccup mode				
Switching Frequency	PFC – 70 to 130 KHz ,PWM – 50-80 KHz				
Operating Temperature ⁷	-40 to +70°C, * -40 to 0°C startup is guaranteed with spec deviation				
Storage Temperature	-40 to +85°C				
Relative Humidity	5% to 95%, noncondensing				
Altitude	Operating: 16,000 ft.; Nonoperating: 40,000 ft.				
MTBF	3.37m Hours, Telcordia -SR332-issue 3				
Isolation Voltage	Input to Output — 4000 VAC medical applications.				
	Input to GND - 1500 VAC (Not Applicable For Class II Option)				
	Output to GND- 1500VAC for type BF , 500 VAC for type B (Not Applicable For Class II Option				
Cooling	180W with 13 CFM forced air cooling ⁶ (refer Mechanical Drawing)				
	upto 120 W with natural convection cooling ⁶ (refer Derating Curve)				

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Model Number	Type of Connector	Voltage	Max. Load (Convection) (112.5W) @50°C	Max.Load (Convection) (120W) @40°C	Max. Load 1 (13 CFM)	Min. Load	Ripple ¹	Signal
MULP180-1012	Header Molex @ I/P	12 V	9.37A	10.00A	15.00A	0.0 A	2%	N.A
	Screw Terminal @ 0/P							
MULP180-1312	Header Molex @ I/P	12 V	9.37A	10.00A	15.00A	0.0 A	2%	N.A
	Header Molex @ 0/P							
MULP180-1015	Header Molex @ I/P	15 V	7.50A	A00.8	12.00A	0.0 A	2%	N.A
	Screw Terminal @ O/P							
MULP180-1315	Header Molex @ I/P	15 V	7.50A	8.00A	12.00A	0.0 A	2%	N.A
	Header Molex @ 0/P							
MULP180-1024	Header Molex @ I/P	24 V	4.68A	5.00A	7.50A	0.0 A	1%	N.A
	Screw Terminal @ O/P							
MULP180-1324	Header Molex @ I/P	24 V	4.68A	5.00A	7.50A	0.0 A	1%	N.A
	Header Molex @ O/P							
MULP180-1030	Header Molex @ I/P	30 V	3.75A	4.00A	6.00A	0.0 A	1%	N.A
	Screw Terminal @ O/P							
MULP180-1330	Header Molex @ I/P	30 V	3.75A	4.00A	6.00A	0.0 A	1%	N.A
	Header Molex @ O/P							
MULP180-1048	Header Molex @ I/P	48 V	2.34A	2.50A	3.75A	0.0 A	1%	N.A
	Screw Terminal @ O/P							
MULP180-1348	Header Molex @ I/P	48 V	2.34A	2.50A	3.75A	0.0 A	1%	N.A
	Header Molex @ 0/P							
MULP180-1058	Header Molex @ I/P	58 V	1.94A	2.07A	3.10A	0.0 A	1%	N.A
	Screw Terminal @ O/P							
MULP180-1358	Header Molex @ I/P	58 V	1.94A	2.07A	3.10A	0.0 A	1%	N.A
	Header Molex @ O/P							
ULP180-CK metal cove	er kit accessory							



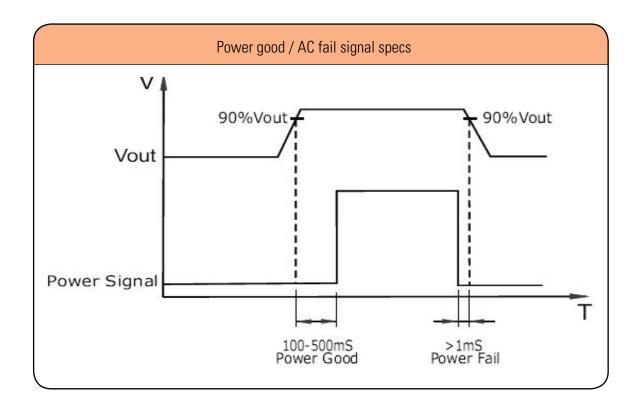
Model Number	Type of Connector	Voltage	Max. Load (Convection) (112.5W) @50°C	Max.Load (Convection) (120W) @40°C	Max. Load (13 CFM)	Min. Load	Ripple ¹	Signal
MULP180-0012	Header Molex @ I/P	12 V	9.37A	10.00A	15.00A	0.0 A	2%	PG & AC PF ¹⁰
	Screw Terminal @ 0/P							
MULP180-0312	Header Molex @ I/P	12 V	9.37A	10.00A	15.00A	0.0 A	2%	PG & AC PF ¹⁰
	Header Molex @ 0/P							
MULP180-0015	Header Molex @ I/P	15 V	7.50A	8.00A	12.00A	0.0 A	2%	PG & AC PF ¹⁰
	Screw Terminal @ 0/P							
MULP180-0315	Header Molex @ I/P	15 V	7.50A	8.00A	12.00A	0.0 A	2%	PG & AC PF ¹⁰
	Header Molex @ 0/P							
MULP180-0024	Header Molex @ I/PI	24 V	4.68A	5.00A	7.50A	0.0 A	1%	PG & AC PF ¹⁰
	Screw Terminal @ O/P							
MULP180-0324	Header Molex @ I/P	24 V	4.68A	5.00A	7.50A	0.0 A	1%	PG & AC PF ¹⁰
	Header Molex @ 0/P							
MULP180-0030	Header Molex @ I/P	30 V	3.75A	4.00A	6.00A	0.0 A	1%	PG & AC PF ¹⁰
	Screw Terminal @ O/P							
MULP180-0330	Header Molex @ I/P	30 V	3.75A	4.00A	6.00A	0.0 A	1%	PG & AC PF ¹⁰
	Header Molex @ O/P							
MULP180-0048	Header Molex @ I/P	48 V	2.34A	2.50A	3.75A	0.0 A	1%	PG & AC PF ¹⁰
	Screw Terminal @ O/P							
MULP180-0348	Header Molex @ I/P	48 V	2.34A	2.50A	3.75A	0.0 A	1%	PG & AC PF ¹⁰
	Header Molex @ 0/P							
MULP180-0058	Header Molex @ I/P	58 V	1.94A	2.07A	3.10A	0.0 A	1%	PG & AC PF ¹⁰
	Screw Terminal @ O/P							
MULP180-0358	Header Molex @ I/P	58 V	1.94A	2.07A	3.10A	0.0 A	1%	PG & AC PF ¹⁰
	Header Molex @ 0/P							
ULP180-CKP metal co	over kit accessory							

	Connecto	ors
J1	Pin 1	AC LINE
	Pin 2	NOT FITTED
	Pin 3	AC NEUTRAL
J2 Option 1 & 2	Pin 1,2,3	V1 +VE
	Pin 4,5,6	V1 -VE
J3	Pin 1	FAN +VE
	Pin 2	FAN -VE
J4	Pin 1	Vs
(For PGPF Option Only)	Pin 2	PGPF
	Pin 3	GND

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Notes

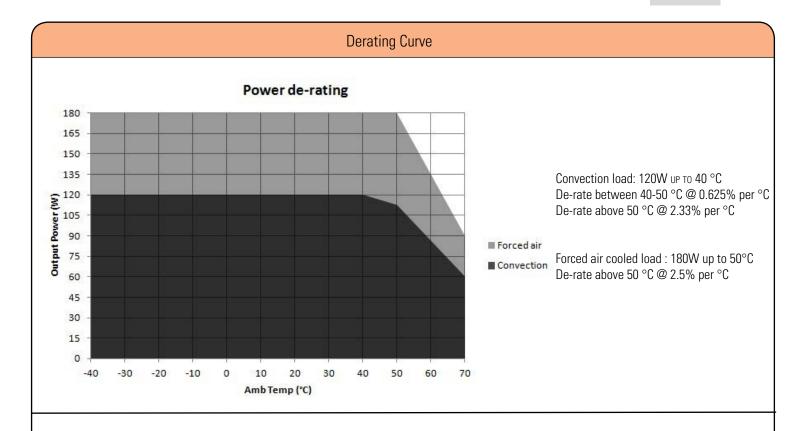
- 1. Ripple is peak to peak with 20 MHz bandwidth and 10 μ F (Electrolytic capacitor) in parallel with a 0.1 μ F capacitor at rated line voltage and load ranges.
- 2. Class II version available, Add "-II" suffix at the end of the Model Number.
- 3. Combined output power of main output, fan supply shall 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. Specifications are for nominal input voltage, 25°C unless otherwise stated.
- 6. 180W with 13CFM forced air cooling and 120W with natural convection cooling at 100 to 264VAC.
- 7. Output ripple can be more than 10% of the output voltage.
- 8. Adjustment potentiometer is located on the SMT side of the PCB.
- 9. When used in Cover Kit, de-rate output power to 70 % under all operating conditions
- 10. A TTL signal is available at pin 2 of J4 which goes high 100-500mS after output voltage reaches 90% of set value. It goes low a minimum of 1mS before output falls below 90% of the set value, when input AC is switched off.
- 11. Add suffix "S1" to get model number with Input connector Screw terminal and Output Connector Screw Terminal. e.g. MULP180-1012-S1.
- 12. Add suffix "S2" to get model number with Input connector Right Angle Type and Output Connector Right Angle Type. e.g. MULP180-1012-S2.

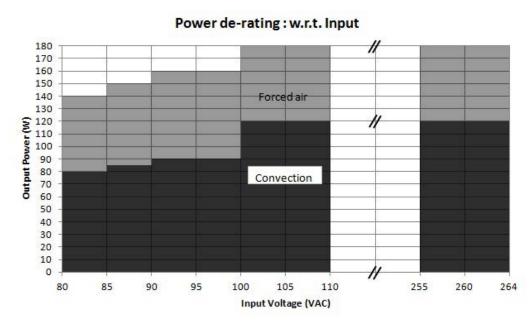


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	Mechanical Specification	ns		
AC Input Connector (J1) Option 1	Molex: 26-60-4030			
(Molex Connector @ I/P)	Mating: 09-50-3031; Pins: 08-50-010	6		
AC Input Connector (J1) Option 2 (Screw Terminal @ I/P)	Molex: 39357 Series or equivalent			
DC Output Connector (J2) Option 1	Molex: 26-60-4060			
(Molex Connector @ O/P)	Mating: 09-50-3061; Pins: 08-50-0106			
DC Output Connector (J2) Option 2 (Screw Terminal @ O/P)	Molex: 39357 Series or equivalent			
AC Input Connector (J1) Option 3	TE Connectivity: 647676-3			
(Right Angle Type @ I/P)	Mating: 1-1123722-3; Crimp: 1123721	-2		
DC Output Connector (J2) Option 3	TE Connectivity: 647676-6			
(Molex Connector @ 0/P)	Mating: 1-1123722-6; Crimp: 1123721	-2		
Aux (Fan) Output(J3)	AMP :640456-2			
	Mating: 640440-2			
Signal Output (J4)	AMP :640456-3			
	Mating: 640440-3			
Dimensions	4 x 2 x 0.75 inches			
	(101.60 x 50.8x 19.05 mm)			
Weight	200 gm approx			
	EMC			
Parameter	Conditions/Description	Criteria		
Conducted Emissions	EN 55011-B,CISPR22-B, FCC PART15-B	Pass		
Radiated Emissions	EN 55011 A	Pass (Level B with external core (King core K5B RC 25x12x15-M in input cable))		
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		
	Safety			
CE Mark	Complies with LVD Directive			
Safety Standard(s)	EN60601-1, IEC 60601-1 (ed.3), ANSI / AAN	ЛI ES 60601 - 1, CSA C22.2 No. 60601-1		
Approval Agency	Nemko, UL, C-UL			
Safety File Number(s)	Class-I: UL: E173812,VOL D1, Nemko: Certificate No: P16221541, CB Test Certificate No: N094796			
	Class-II: UL: E173812,VOL D1, NEMKO: Cer	rtificate No: P16221548, CB Test Certificate No: N094850		

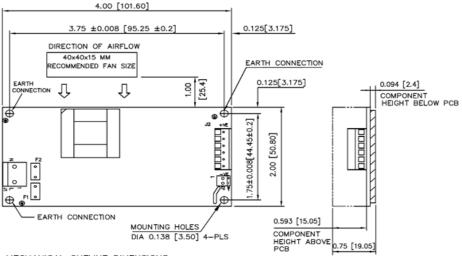






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Input connector – Header Molex and Output Connector – Screw Terminal (Without PGPF)



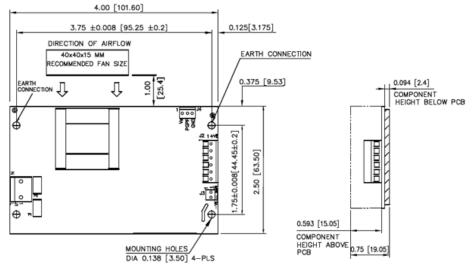
MECHANICAL OUTLINE DIMENSIONS ALL DIMENSIONS ARE IN INCHES[MM] GEN TOLERANCE: +/-0.04[+/-1.0MM]

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.

Mechanical Drawing

Input connector — Header Molex and Output Connector — Screw Terminal. (With PGPF)

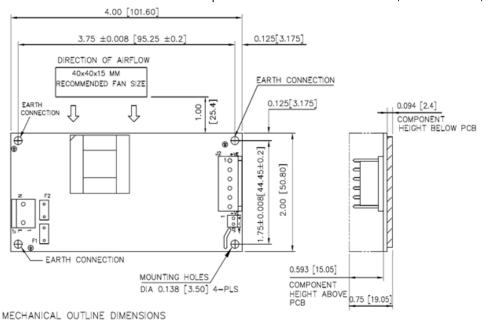


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Input connector – Header Molex and Output Connector – Header Molex. (Without PGPF)



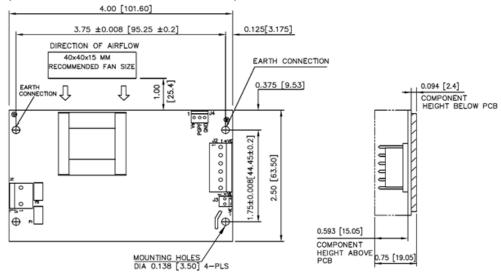
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Mechanical Drawing

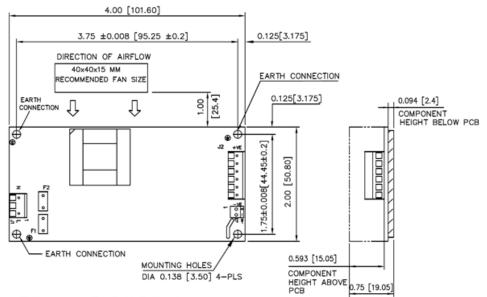
Input connector — Header Molex and Output Connector — Header Molex. (With PGPF)



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Input connector – Screw terminal and Output Connector – Screw Terminal. (Without PGPF)



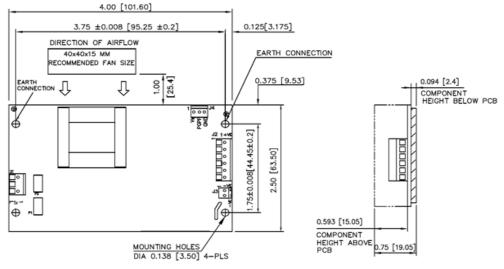
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Mechanical Drawing

Input connector – Screw terminal and Output Connector – Screw Terminal. (With PGPF)

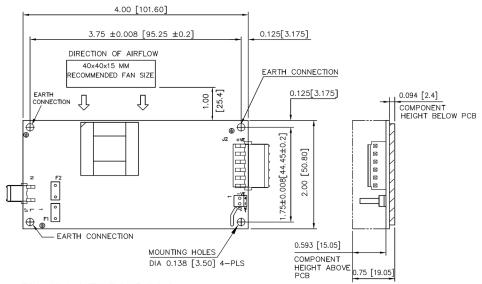


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Input connector – Right Angle Type and Output Connector – Right Angle (Without PGPF)



MECHANICAL OUTLINE DIMENSIONS
ALL DIMENSIONS ARE IN INCHES[MM]
GEN TOLERANCE: +/-0.04[+/-1.0MM]

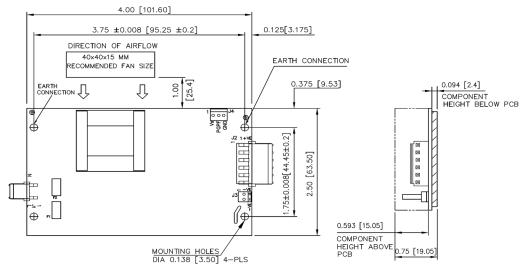
MPN FOR INPUT CONNECTOR: 647676-3 MPN FOR OUTPUT CONNECTOR: 647676-6

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Mechanical Drawing

Input connector — Right Angle Type and Output Connector — Right Angle (With PGPF)



MECHANICAL OUTLINE DIMENSIONS
ALL DIMENSIONS ARE IN INCHES[MM]
GEN TOLERANCE: +/-0.04[+/-1.0MM]
MPN FOR INPUT CONNECTOR: 647676-3

MPN FOR OUTPUT CONNECTOR: 647676-6

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