

## Product Specification

Universal AC Input with PFC  
2" x 4" Footprint  
Single Output with 12V Aux fan

## Key Product Features

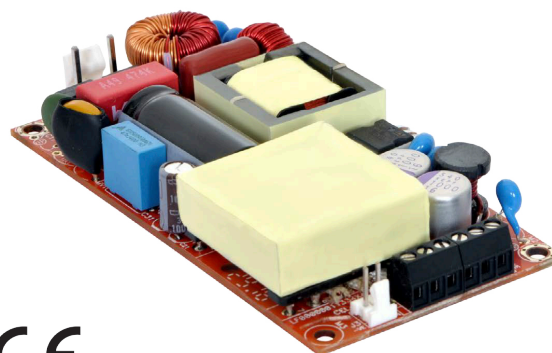
- EN60601 3rd Ed. Safety Approved
- Class I or Class II
- High Power Density—30W/in<sup>3</sup>
- Active PFC
- High Efficiency—up to 92% typ.

## Safety and EMC

- UL/CSA 60601-1 (ed.3) Medical Safety
- IEC/EN60601-1 (ed.3)
- ANSI / AAMI ES 60601-1
- CAN/CSA C22.2 No. 60601-1 Class 1 SELV
- Nemko, UL, cUL and CE Marks
- EN50022-B (CISPR 22-B) FCC Part 15 Conducted—Level B
- EN61000-3-2 Class D Harmonics
- EN61000-4-2, 3, 4, 5 Level 3 Immunity

# DPMULP180 Series

180 Watt AC/DC Medical Grade Power Supply



## Description

The MULP180 Series of open frame switching power supplies utilizes a highly advanced circuit topology to deliver 180 Watts in an industry standard package that has a 2.00 x 4.00 inch footprint and 0.75 in. height. The series has been designed meet to the requirements of Medical, Telecom, and Industrial applications and operates over the universal AC input range with active PFC. These supplies are fully compliant with worldwide safety and EMC standards.

## Ratings

Input Voltage Range—AC Input	85–264VAC/390VDC, Universal (see derating curves)
Input Frequency Range	47–63Hz
Input Current	2.2A at 115VAC max., 1.1A at 230VAC max.
Output Power—forced convection	180W with 13CFM airflow—see derating curves
Output Power—natural convection	120W natural convection—see derating curves
Operating Temperature Range	-40°C to +70°C
Power Factor	>0.95 at full load

## Model Selection

Model	Output Voltage, VDC	Rated Current, A	
		13CFM Convection	Natural Convection
DPMULP180-WZ12	12.0	15.0	10.0
DPMULP180-WZ15	15.0	12.0	8.0
DPMULP180-WZ24	24.0	7.5	5.0
DPMULP180-WZ30	30.0	6.0	4.0
DPMULP180-WZ48	48.0	3.75	2.5
DPMULP180-WZ58	58.0	3.1	2.1
MULP180-CK	Metal Cover Kit		

Complete model number as follows:

Replace Z in model number with 3 for Molex type header connectors or 0 for Euro Style Terminal Blocks. Replace W in the model with I for N.A. on PGPF Or 0 with PFPG. Add - II for class II.

## Electrical Specifications

### Input

Input Voltage	85–264VAC/390VDC, Universal (see derating under output power)
Input Frequency	47–63Hz
Input Current	2.2A at 115VAC max. , 1.1A at 230VAC max.
No Load Power	<0.5W typical for MULP180-1XXX and <0.85W typical for MULP180-0XXX
Inrush Current	115VAC – 25A, 230VAC – 45A, 264VAC – 75A
Leakage Current	300uA Typical, (N.A. For Class II option), Touch current<100uA
Efficiency	92% (48V, 58V), 90% (24V, 30V), 88% (12V, 15V)
Hold-up Time	Full Load: 10ms, 120W: 16ms
Power Factor	> 0.95 @115VAC and 0.9 @230VAC

### Output

Output Voltage Adjustability	+/-3% (Ref. Note 9)
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 < 5ms
Rise Time	55ms typical
Set Point Tolerance	+/-1%
Over Current Protection	> 110%
Over Voltage Protection	110 to 140%
Short Circuit Protection	Hiccup mode

## EMC and Safety Certifications

### EMC

CE Mark	Complies with LVD Directive
Conducted Emissions	EN55022-B, CISPR22-B, FCC PART15-B
Static Discharge	EN61000-4-2, Level-4
RF Field Susceptibility	EN61000-4-3, Level-3
Fast Transients/Bursts	EN61000-4-4, Level-3
Radiated Emissions	Level A radiated, Level B radiated with external core (King core K5B RC 25x12x15-M in input cable (5 turns))
Surge Susceptibility	EN61000-4-5, Level-3
Harmonic Current	EN61000-3-2, Class D

### Safety

Safety Standard(s)	EN 60601-1, IEC 60601-1 (ed.3), AAMI ES 60601 – 1, CSA C22.2 No. 60601-1
Approval Agency	Nemko, UL, C-UL
Isolation Voltage	Input to Output—4000VAC medical applications. Input to GND—1500VAC (Not Applicable For Class II Option) Output to GND—1500VAC for type BE, 500 VAC for type B (Not Applicable For Class II Option)

### Environmental Specifications

Operating Temperature*	-40 to +70°C
Storage Temperature	-40 to +85°C
Relative Humidity	5% to 95%, noncondensing
Altitude	Operating: 16,000 ft.; Nonoperating: 40,000ft.
MTBF	3.37m Hours, Telcordia-SR332-issue 3

### Mechanical Specifications

AC Input Connector (J1)	Molex: 26-60-4030 Mating: 09-50-3031; Pins: 08-50-0106
DC Output Connector (J2) Option 1 (Screw Terminal)	Molex: 39357 Series or equivalent
DC Output Connector (J2) Option 2 (Molex Connector)	Molex: 26-60-4060 Mating: 09-50-3061; Pins: 08-50-0106
Aux (Fan) Output (J3)	AMP: 640456-2 Mating: 640440-2
Dimensions	4 x 2 x 0.75 inches (101.60 x 50.8 x 19.05mm)
Weight	200gm Max.

### Connector Pin Assignments

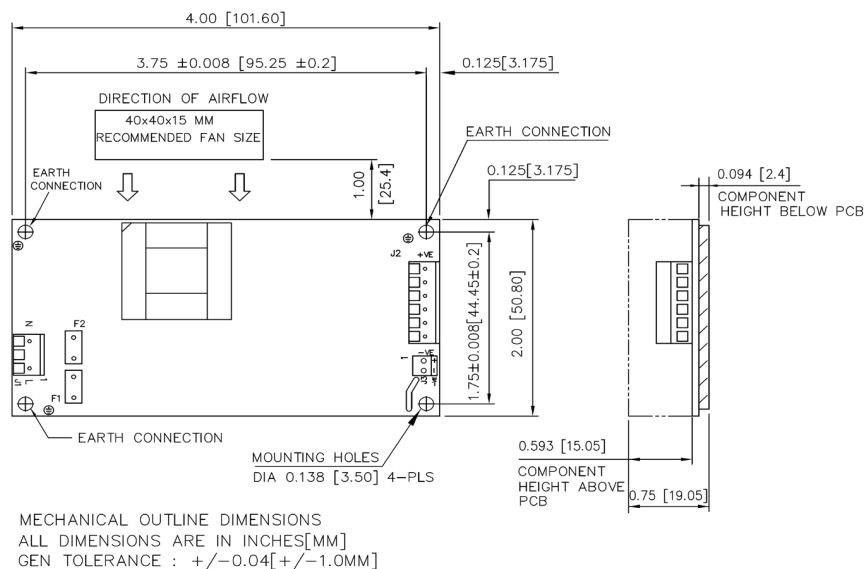
Connector	Pin	Function
J1	1	AC Line
	2	Not Provided
	3	AC Neutral
J2	1, 2, 3	+Vout
	4, 5, 6	-Vout
J3	1	Fan +Vout
	2	Fan -Vout
J4 (For PGPF Option Only)	1	Vs
	2	PGPF
	3	GND

#### 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. Class II means without Earth pin.
3. Combined output power of main output and 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 and 120W with natural convection cooling at 100 to 264VAC
7. -40 to 0°C startup is guaranteed with spec deviation in output ripple can be more than 10%.
8. Adjustment potentiometer is located on the SMT side of the PCB.

## Mechanical Outline

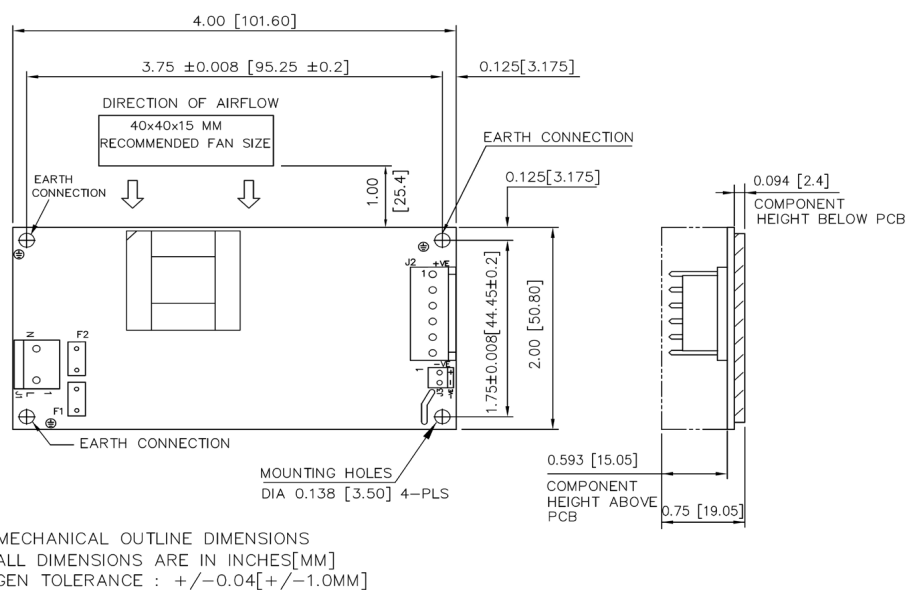
### Option 1 (Without PGPF)



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 5.4mm max.
2. Screws, used to fix PCB on stand off, have head dia of 6.0mm max.
3. Washer, if used, to have dia of 6.5mm max.

### Option 2 (Without PGPF)



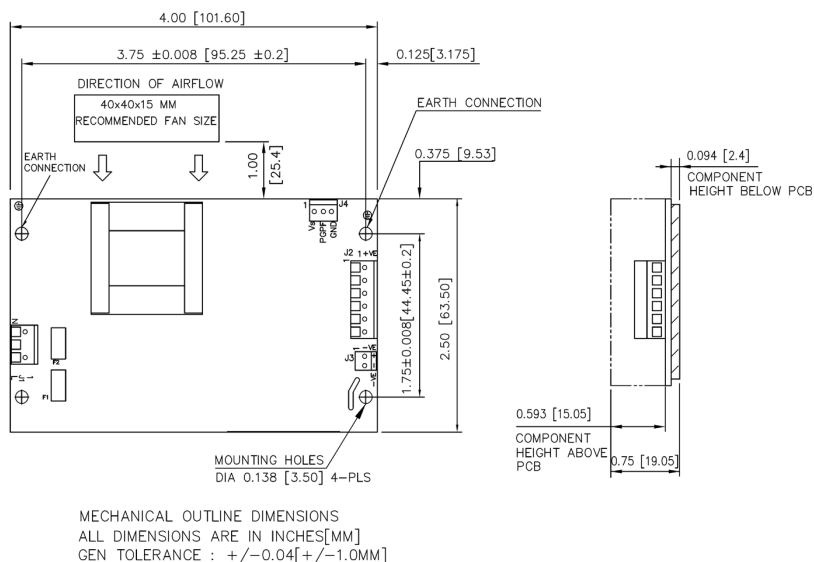
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## Mechanical Outline

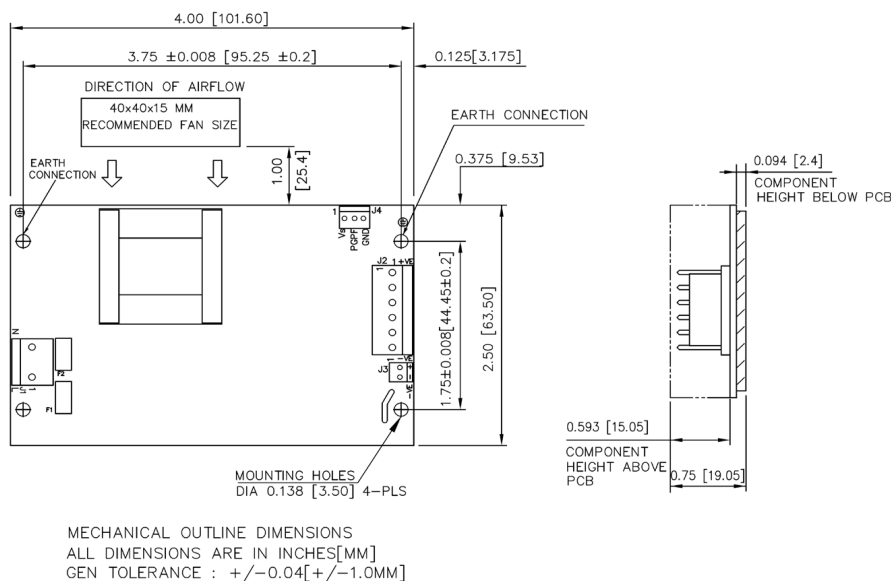
### Option 3 (With PGPF)



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 5.4mm max.
2. Screws, used to fix PCB on stand off, have head dia of 6.0mm max.
3. Washer, if used, to have dia of 6.5mm max.

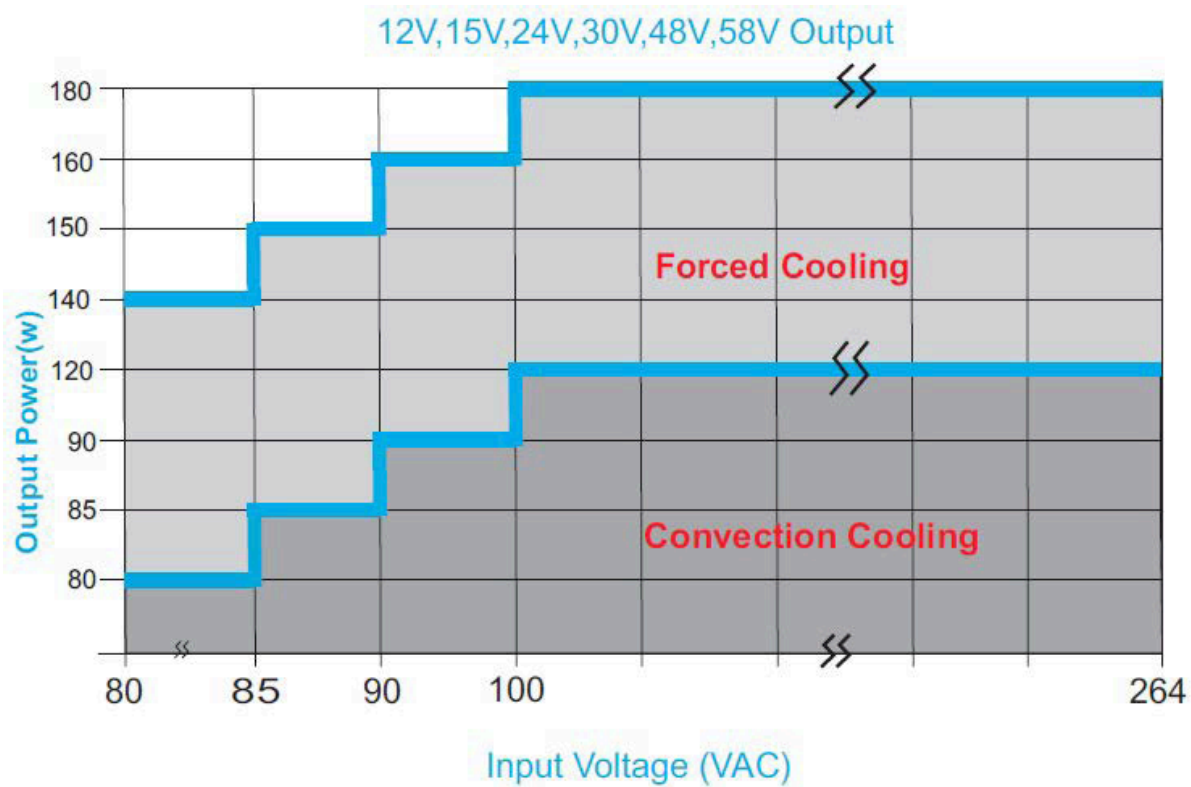
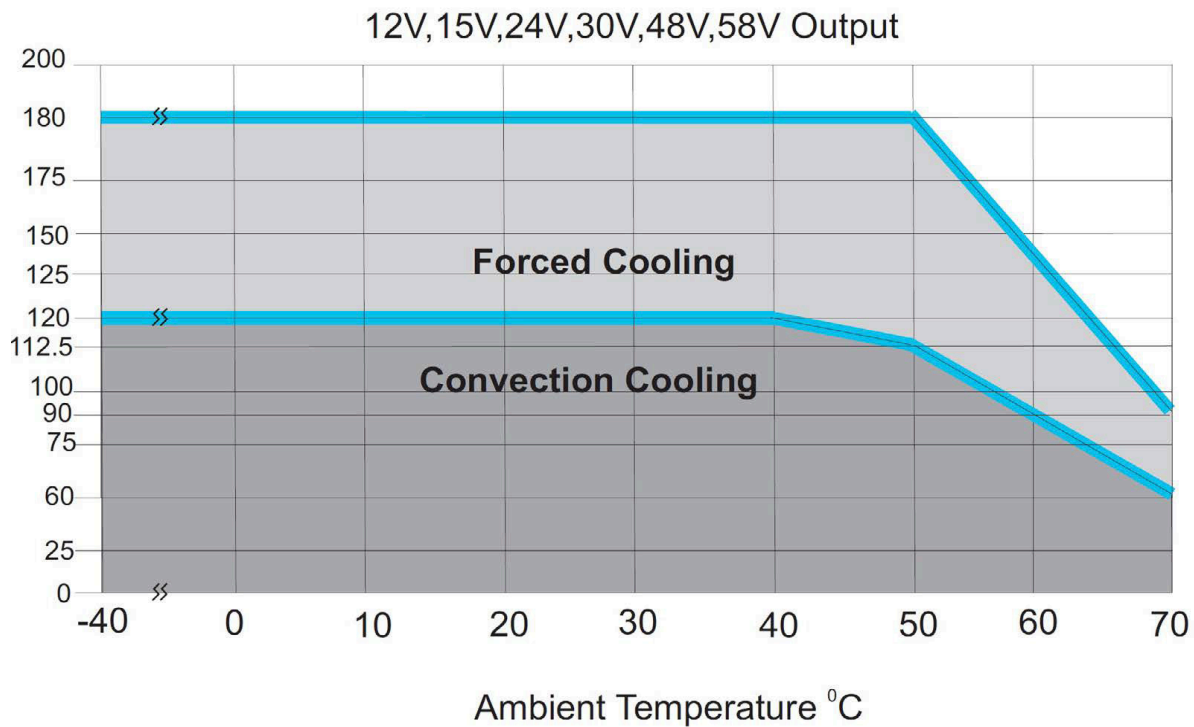
### Option 4 (With PGPF)



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 5.4mm max.
2. Screws, used to fix PCB on stand off, have head dia of 6.0mm max.
3. Washer, if used, to have dia of 6.5mm max.

## Derating Curve



## Key Product Features

- Noncorrosive
- Easy assembly
- Low weight
- Fully safe

# ULP180-CK Cover Kit

180 Watt AC/DC Power Supply



## Derating Guidelines

ULP180/MULP180: For Ambient > 50°C, derate by 50% to 70°C. 13CFM FAN recommended to circulate air

## Contents

Mounting Base, Cover, Insulator, Fixing Screws

## Mechanical Dimensions

Cover and Base Material	EG(Zintec)/CRCA/GI 1.0mm thick (Powder coating/ Passivation/ ED coating black)
Marked	A: PCB MTG; B: COVER MTG; C: SYSTEM MTG

All dimensions are in mm. General tolerance : +/-1.0

## Mechanical Outline

