



# 450-480 WATT MEDICAL SWITCHING POWER SUPPLIES

## DESCRIPTION

The PM450 series comprising single and multiple output models for 450-480 watts of continuous output power is specially designed for medical applications not for life support. They operate at 90 to 264VAC input voltage without the need of a selector strap. The units are constructed on a printed circuit board with a U-bracket for mechanical support and heat sinking. A cover-and-fan assembly can be added during manufacturing.

## PM450 SERIES



## FEATURES

- EN61000-3-2 class A and D compliant
- Power Factor 0.98 typical
- Overvoltage protection
- Short-circuit protection
- Thermal protection
- Power Fail Detect (PFD)
- 100% burn-in at full rated load
- Remote sense on output #1 and output #2
- Remote inhibit – TTL high disables output
- Compliant with RoHS requirements

*New!!*

## Safety Standard Approvals :



UL60601-1, CSA C22.2 No. 601.1  
File No. E178020



TÜV EN60601-1

## INPUT SPECIFICATIONS

Input voltage : 90 to 264VAC  
 Input frequency: 47 to 63Hz  
 Input current : 7.1A (rms) for 115VAC  
 3.5A (rms) for 230VAC

Earth leakage current : 100uA max. @115VAC, 60Hz  
 165uA max. @ 230VAC, 50Hz

## ENVIRONMENTAL SPECIFICATIONS

Operating temperature : 0°C to +70°C  
 Storage temperature : -40°C to +85°C  
 Relative humidity : 5% to 95% non-condensing  
 Derating : Derate from 100% at +50°C  
 linearly to 50% at +70°C

## OUTPUT SPECIFICATIONS

Output voltage/current : See rating chart  
 Total output power : See rating chart  
 Ripple and Noise : 2% peak to peak maximum  
 Overvoltage protection : Provided on output #1 only; set at 115 – 140% of its nominal output voltage  
 Overcurrent protection : All outputs protected to short circuit conditions  
 Temperature coefficient : All outputs  $\pm 0.04\%$  /°C maximum  
 Transient response : Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500us after a 25% step load change  
 PFD signal : TTL logic high for normal Operation and TTL logic low upon loss of input power. This signal appears at least 1ms prior to master output dropping 5% below its nominal value. This signal also provides a minimum delay of 100ms after master output is within regulation.  
 Remote inhibit : Requires an external TTL high level signal to inhibit outputs for standard models.

## GENERAL SPECIFICATIONS

Switching frequency : 60KHz  $\pm 10$ KHz  
 Power factor : 0.98 typical  
 Efficiency : 80% minimum on all models  
 Hold-up time : 12 msec minimum at 110VAC  
 Line regulation :  $\pm 0.2\%$  maximum at full load  
 Inrush current : 40 amps @ 115VAC or 80 amps @ 230VAC, at 25°C cold start  
 Withstand voltage : 4000VAC from input to output  
 1500VAC from input to ground  
 500VAC from output to ground  
 MTBF : 300,000 hours minimum at full load at 25°C ambient, calculated per MIL-HDBK- 217F

**EMC Performance (EN60601-1-2)**  
 EN55011: Class B conducted, Class A radiated  
 EN61000-3-2: Harmonic distortion, Class A and D  
 EN61000-3-3: Line flicker  
 EN61000-4-2: ESD,  $\pm 8$ KV air and  $\pm 6$ KV contact  
 EN61000-4-3: Radiated immunity, 3V/m  
 EN61000-4-4: Fast transient/burst,  $\pm 2$ KV  
 EN61000-4-5: Surge,  $\pm 1$ KV diff.,  $\pm 2$ KV com.  
 EN61000-4-6: Conducted immunity, 3Vrms  
 EN61000-4-8: Magnetic field immunity, 3A/m  
 EN61000-4-11: Voltage dips, 30% reduction for 500ms, 60% reduction for 100ms and >95% reduction for 10ms

## OUTPUT VOLTAGE/CURRENT RATING CHART

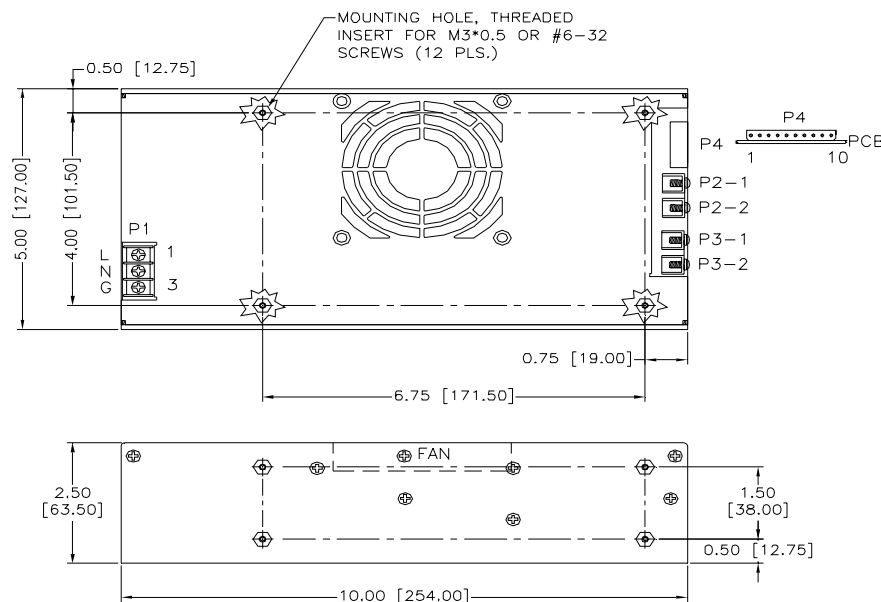
MODEL	Output # 1				Output # 2				Output # 3				Maximum Output Power
	Vnom.	Imin.	Imax.	Tol.	Vnom.	Imin.	Imax.	Tol.	Vnom.	Imin.	Imax.	Tol.	
PM450-12	12V	0A	37.5A	2%									450W
PM450-13	15V	0A	30A	2%									450W
PM450-14	24V	0A	18.75A	2%									450W
PM450-15	27V	0A	16.7A	2%									450W
PM450-16	30V	0A	15A	2%									450W
PM450-17-1	40V	0A	12A	2%									480W
PM450-18	48V	0A	10A	2%									480W
PM450-19	55V	0A	8.73A	2%									480W
PM450-20	24V	1.0A	12A	2%	12V	1.0A	17A	5%					450W
PM450-21	24V	1.0A	12A	2%	15V	0.75A	15A	5%					450W
PM450-22	48V	0.5A	6A	2%	24V	0.5A	10A	5%					450W
PM450-23	48V	0.5A	6A	2%	12V	1.0A	17A	5%					450W
PM450-24	48V	0.5A	6A	2%	15V	0.75A	15A	5%					450W
PM450-30	24V	1.0A	12A	2%	12V	1.0A	17A	5%	3.3V	0A	8A	3%	450W
PM450-31	24V	1.0A	12A	2%	15V	0.75A	15A	5%	3.3V	0A	8A	3%	450W
PM450-32	24V	1.0A	12A	2%	12V	1.0A	17A	5%	5.1V	0A	8A	3%	450W
PM450-33	24V	1.0A	12A	2%	15V	0.75A	15A	5%	5.1V	0A	8A	3%	450W
PM450-34	48V	0.5A	6A	2%	12V	1.0A	17A	5%	3.3V	0A	8A	3%	450W
PM450-35	48V	0.5A	6A	2%	15V	0.75A	15A	5%	3.3V	0A	8A	3%	450W
PM450-36	48V	0.5A	6A	2%	12V	1.0A	17A	5%	5.1V	0A	8A	3%	450W
PM450-37	48V	0.5A	6A	2%	15V	0.75A	15A	5%	5.1V	0A	8A	3%	450W

### NOTES:

1. Add suffix "B" for U-bracket format or "C" for enclosed format with fan control function, e.g. PM450-14C.
2. All outputs are floating. It can be connected externally for positive or negative output.
3. Output #1 can be adjusted within  $\pm 5\%$  of their nominal voltage.
4. Output #3 can be adjusted within  $\pm 15\%$  of their nominal voltage.
5. 450~480 watts for "C" version with cover-and-fan assembly. 225~240 watts for "B" version without moving air (maximum current of output #1 & 2 derated to 50%), or 450 watts with 40 CFM forced air provided by user.
6. All models may operate at no-load. At no-load, output voltage tolerance increases to 10%.

## MECHANICAL SPECIFICATIONS

### Single Output Models



### NOTES:

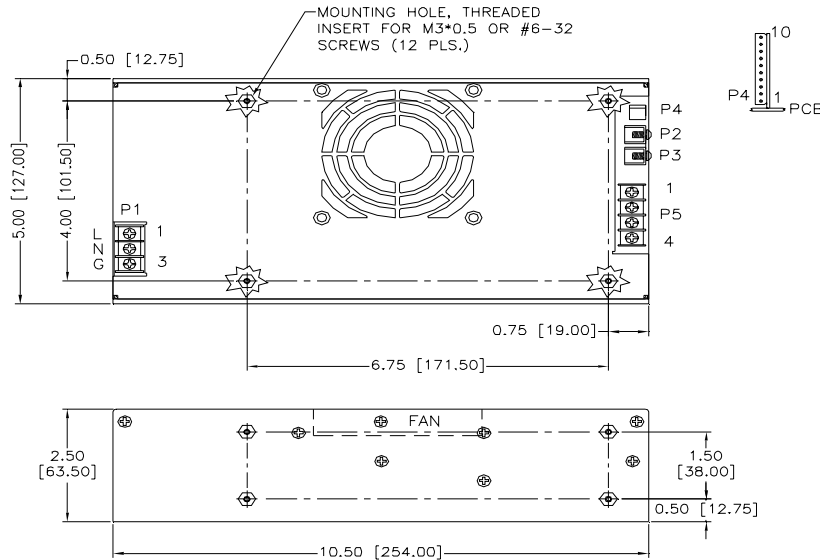
1. Dimensions shown in inch [mm].
2. Tolerance 0.02 [0.5] maximum.
3. Input connector P1 is Dinkle DT-35-B01W-03 screws are M3, Nickel plated.
4. Connector P4 mates with Molex housing 50-37-5103 and pins 5263.
5. P2-1, P2-2, P3-1 & P3-2: M3\*0.5 screw connections.
6. Weight: 1,800 grams

# UNIVERSAL INPUT

# PM450 SERIES

## MECHANICAL SPECIFICATIONS

### Multiple Output Models



#### NOTES:

1. Dimensions shown in inch [mm].
2. Tolerance 0.02 [0.5] maximum.
3. Input connector P1 is Dinkle DT-35-B01W-03 screws are M3, Nickel plated.
4. Connector P4 mates with Molex housing 50-37-5103 and pins 5263.
5. P2, P3: M\*0.05 screw connections.
6. Output connector P5 is Dinkle DT-35-B01W-04 screws are M3, Nickel plated.
7. Weight: 1,900 grams

## PIN CHART

### Single Output Models

MODEL	CONN PIN	P1 (AC)			P2	P3	P4			
		1	2	3			1	2	3	4
PM450-12	PM450-13	LIVE	NEUTRAL	GROUND	+V	-V	SIGNAL GROUND (-V)	+S (V)	-S (V)	PFD
PM450-14	PM450-15									
PM450-16	PM450-17-1									
PM450-18	PM450-19									

MODEL	CONN PIN	P4					
		5	6	7	8	9	10
PM450-12	PM450-13	INHIBIT +Ve	INHIBIT -Ve	N.C.	N.C.	0V (FAN)	FAN
PM450-14	PM450-15						
PM450-16	PM450-17-1						
PM450-18	PM450-19						

### Multiple Output Models

MODEL	CONN PIN	P1 (AC)			P2	P3	P4			
		1	2	3			1	2	3	4
PM450-20	PM450-21	LIVE	NEUTRAL	GROUND	+V1	-V1	SIGNAL GROUND (-V)	+S (V1)	-S (V1)	PFD
PM450-22	PM450-23									
PM450-24	PM450-30									
PM450-31	PM450-32									
PM450-33	PM450-34									
PM450-35	PM450-36									
PM450-37	PM450-37									

MODEL	CONN PIN	P4						P5			
		5	6	7	8	9	10	1	2	3	4
PM450-20	PM450-21	INHIBIT +Ve	INHIBIT -Ve	+S (V2)	-S (V2)	0V (FAN)	FAN	+V2	-V2	N.C.	N.C.
PM450-22	PM450-23										
PM450-24	PM450-24										
PM450-30	PM450-31										
PM450-32	PM450-33										
PM450-34	PM450-35										
PM450-36	PM450-37										