

### DESCRIPTION

The TM450 series comprising single and multiple output models for 450-480 watts of continuous output power is specially designed for medical applications. 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.

### 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

### 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 : 100µA max. @ 115VAC, 60Hz  
165µA max. @ 230VAC, 50Hz

### 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  $\pm 0.04\%/^{\circ}\text{C}$  maximum  
Transient response : Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500µs 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.

### TM450 SERIES

CE (LVD)  
RoHS



### Safety Standard Approvals :



UL 60601-1  
CSA C22.2 No. 601.1



TÜV EN60601-1

### 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

### GENERAL SPECIFICATIONS

Switching frequency : 60KHz  $\pm 10\text{KHz}$   
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,  $\pm 8\text{KV}$  air and  $\pm 6\text{KV}$  contact  
EN61000-4-3 : Radiated immunity, 3V/m  
EN61000-4-4 : Fast transient/burst,  $\pm 2\text{KV}$   
EN61000-4-5 : Surge,  $\pm 1\text{KV}$  diff,  $\pm 2\text{KV}$  com.  
EN61000-4-6 : Conducted immunity, 3Vrms  
EN61000-4-8 : Magnetic field immunity, 3A/m  
Voltage dips, 30% reduction for 500ms, 60% reduction for 100ms and >95% reduction for 10ms

Tumbler Technologies + TRUMPower

3350 Scott Blvd., Bldg. 13, Santa Clara, California 95054, USA

Phone: 408-988-6616 • Fax: 408-988-6622 • email: sales@trumpower.com • Website: www.TRUMPower.com

## OUTPUT VOLTAGE/CURRENT RATING CHART

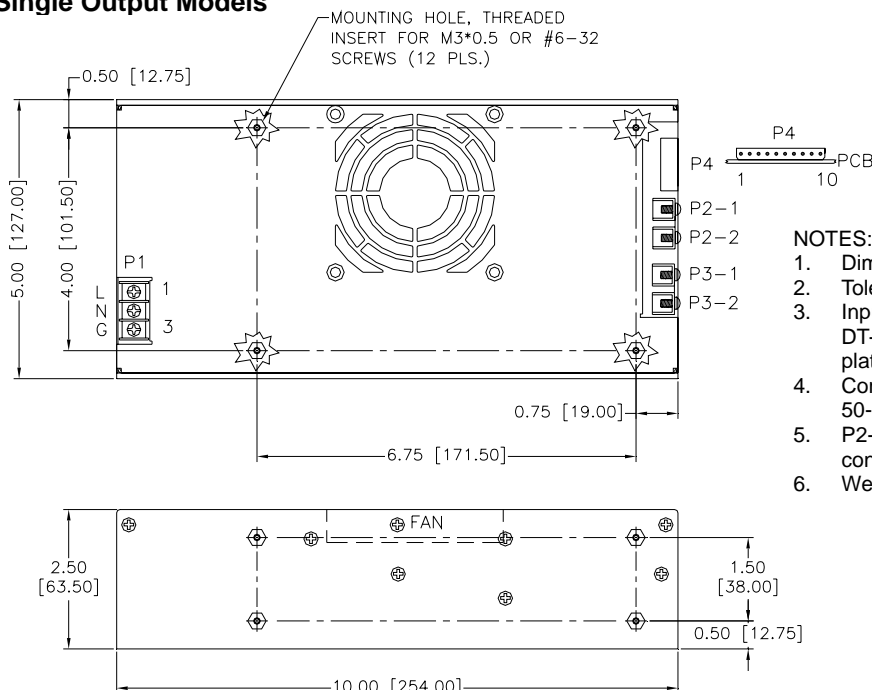
Product No.	Output # 1				Output # 2				Output # 3				Maximum Output
	Vnom.	Imin.	Imax.	Tol.	Vnom.	Imin.	Imax.	Tol.	Vnom.	Imin.	Imax.	Tol.	Power
TM450-S12	12V	0A	37.5A	2%									450W
TM450-S15	15V	0A	30A	2%									450W
TM450-S24	24V	0A	18.75A	2%									450W
TM450-S27	27V	0A	16.7A	2%									450W
TM450-S30	30V	0A	15A	2%									450W
TM450-S40	40V	0A	12A	2%									480W
TM450-S48	48V	0A	10A	2%									480W
TM450-S55	55V	0A	8.73A	2%									480W
TM450-D20	24V	1.0A	12A	2%	12V	1.0A	17A	5%					450W
TM450-D21	24V	1.0A	12A	2%	15V	0.75A	15A	5%					450W
TM450-D22	48V	0.5A	6A	2%	24V	0.5A	10A	5%					450W
TM450-D23	48V	0.5A	6A	2%	12V	1.0A	17A	5%					450W
TM450-D24	48V	0.5A	6A	2%	15V	0.75A	15A	5%					450W
TM450-T30	24V	1.0A	12A	2%	12V	1.0A	17A	5%	3.3V	0A	8A	3%	450W
TM450-T31	24V	1.0A	12A	2%	15V	0.75A	15A	5%	3.3V	0A	8A	3%	450W
TM450-T32	24V	1.0A	12A	2%	12V	1.0A	17A	5%	5.1V	0A	8A	3%	450W
TM450-T33	24V	1.0A	12A	2%	15V	0.75A	15A	5%	5.1V	0A	8A	3%	450W
TM450-T34	48V	0.5A	6A	2%	12V	1.0A	17A	5%	3.3V	0A	8A	3%	450W
TM450-T35	48V	0.5A	6A	2%	15V	0.75A	15A	5%	3.3V	0A	8A	3%	450W
TM450-T36	48V	0.5A	6A	2%	12V	1.0A	17A	5%	5.1V	0A	8A	3%	450W
TM450-T37	48V	0.5A	6A	2%	15V	0.75A	15A	5%	5.1V	0A	8A	3%	450W

### NOTES:

- Add suffix "C" for enclosed format with fan control function, e.g. TM450-S24C.
- All outputs are floating. It can be connected externally for positive or negative output.
- Output #1 can be adjusted within  $\pm 5\%$  of their nominal voltage.
- Output #3 can be adjusted within  $\pm 15\%$  of their nominal voltage.
- 450~480 watts for "C" version with cover-and-fan assembly. 225~240 watts for U-bracket version without moving air (maximum current of output #1 & 2 derated to 50%), or 450 watts with 40 CFM forced air provided by user.
- All models may operate at no-load. At no-load, output voltage tolerance increases to 10%.

## MECHANICAL SPECIFICATIONS

### Single Output Models



### NOTES:

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

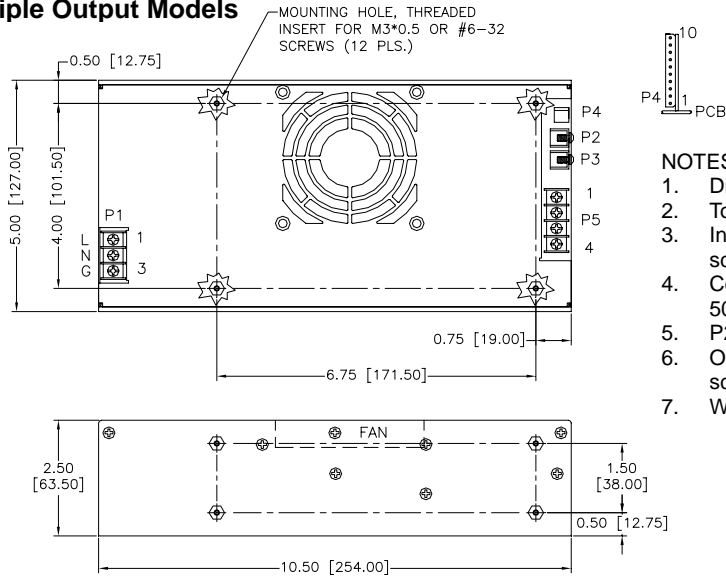
Tumbler Technologies + TRUMPower

3350 Scott Blvd., Bldg. 13, Santa Clara, California 95054, USA

Phone: 408-988-6616 • Fax: 408-988-6622 • email: sales@trumpower.com • Website: www.TRUMPower.com

## 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
TM450-S12	TM450-S15	LIVE	NEUTRAL	GROUND	+V	-V	SIGNAL GROUND (-V)	+S (V)	-S (V)	PFD
TM450-S24	TM450-S27									
TM450-S30	TM450-S40									
TM450-S48	TM450-S55									

MODEL	CONN PIN	P4					
		5	6	7	8	9	10
TM450-S12	TM450-S15	INHIBIT +Ve	INHIBIT -Ve	N.C.	N.C.	0V (FAN)	FAN
TM450-S24	TM450-S27						
TM450-S30	TM450-S40						
TM450-S48	TM450-S55						

### Multiple Output Models

MODEL	CONN PIN	P1 (AC)			P2	P3	P4			
		1	2	3			1	2	3	4
TM450-D20	TM450-D21	LIVE	NEUTRAL	GROUND	+V1	-V1	SIGNAL GROUND (-V)	+S (V1)	-S (V1)	PFD
TM450-D22	TM450-D23									
TM450-D24	TM450-T30									
TM450-T31	TM450-T32									
TM450-T33	TM450-T34									
TM450-T35	TM450-T36									
TM450-T37	TM450-T37									

MODEL	CONN PIN	P4						P5			
		5	6	7	8	9	10	1	2	3	4
TM450-D20	TM450-D21	INHIBIT +Ve	INHIBIT -Ve	+S (V2)	-S (V2)	0V (FAN)	FAN	+V2	-V2	N.C.	N.C.
TM450-D22	TM450-D23										
TM450-D24											
TM450-T30	TM450-T31										
TM450-T32	TM450-T33										
TM450-T34	TM450-T35										
TM450-T36	TM450-T37										

Tumbler Technologies + TRUMPower

3350 Scott Blvd., Bldg. 13, Santa Clara, California 95054, USA

Phone: 408-988-6616 • Fax: 408-988-6622 • email: sales@trumpower.com • Website: www.TRUMPower.com