

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

OUTPUT VOLTAGE/CURRENT RATING CHART

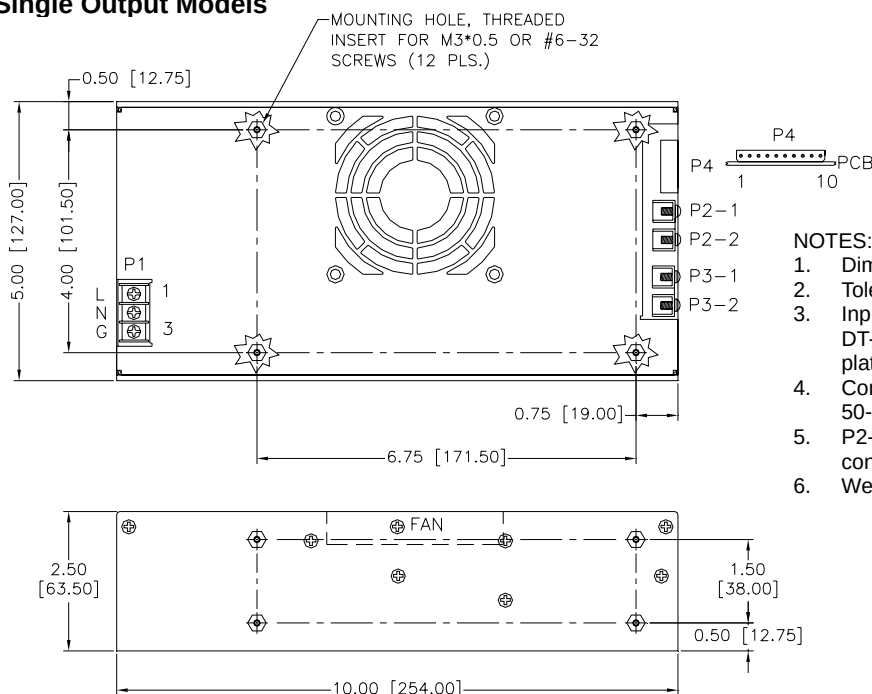
Product No.	Output # 1				Output # 2				Output # 3				Maximum Output
	Vnom.	Imin.	I _{max} .	Tol.	Vnom.	Imin.	I _{max} .	Tol.	Vnom.	Imin.	I _{max} .	Tol.	Power
TM450-S12	12V	0A	37.5A	2%									450W
TM450-S15	15V	0A	30A	2%									450W
TM450-S24	24V	0A	18.75A	2%									450W
TM450-S27	27V	0A	16.7A	2%									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

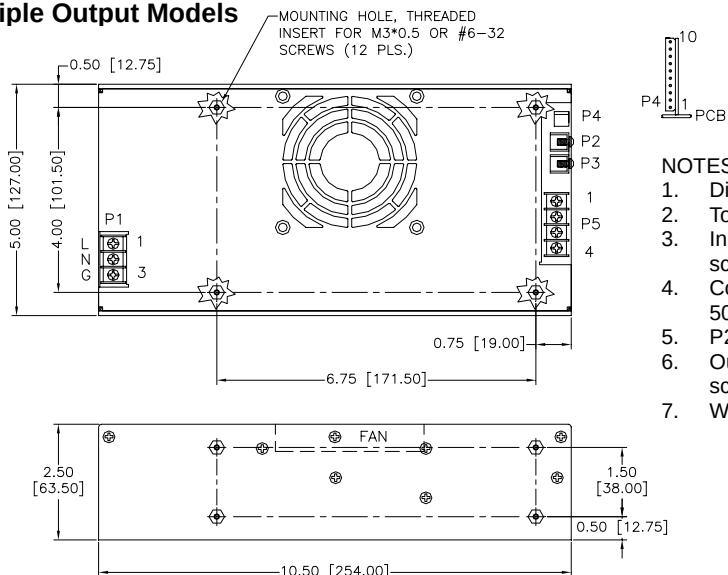
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MECHANICAL SPECIFICATIONS

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										

CONN PIN MODEL		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										