400 WATT MEDICAL & ITE POWER SUPPLIES

DESCRIPTION

The PM400 series of AC-DC switching power supplies in a package of 4 x 7 x 1.58 inches are capable of delivering 400 watts of continuous power at 7 CFM forced air cooling or 300 watts at convection cooling. 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 for 400 watt output without the change of any dimension. They are designed for medical applications. The units are certified also to IEC/EN/UL 62368-1 and suitable for data networking, industrial and telecommunication applications.

PM400 SERIES

CE

RoHS

FEATURES

- BF Class insulation
- Operation altitude up to 5000 meters
- 100-240 VAC input with active PFC
- Less than 300 µA leakage current
- Standby output 5VDC at 100mA
- EN55011 / 55032 Class B conducted emissions
- Inhibit - TTL low to disable output
- Standard PS Off and DC OK signals
- High Efficiency 92% typical
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	4.2 A (rms) @115 VAC, 60 Hz 2.1 A (rms) @ 230 VAC, 50 Hz
Earth leakage current:	300 µA max. @ 264 VAC, 63 Hz
Touch current:	100 µA max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	1% peak to peak maximum
Remote sense:	Compensation for cable losses up to 0.5 V
Over voltage protection:	Set at 115-140% of nominal output voltage, automatic recovery
Short circuit protection:	Automatic recovery
Over temperature protection:	Latching by recycle input to reset
Temperature coefficient:	All outputs ±0.04% /℃ maximum
Transient response:	Maximum excursion of 4%, recovering to 1% of final value within 500 us after a 25% step load change
Standby power:	5 V at 100 mA maximum
Fan power:	12 V at 250 mA maximum

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	-10℃ to +70℃
Storage temperature:	-40℃ to +85℃
Relative humidity:	5% to 95% non-condensing
Temperature derating:	Derate from 100% at +50℃ linearly to 50% at +70℃, applicable to convection and forced-air cooling conditions

SAFETY STANDARD APPROVALS

UL ES 60601-1, CSA C22.2 No. 60601-1
File No. E178020

TÜV EN 60601-1

UL 62368-1, CSA C22.2 No. 62368-1

TÜV EN 62368-1

GENERAL SPECIFICATIONS

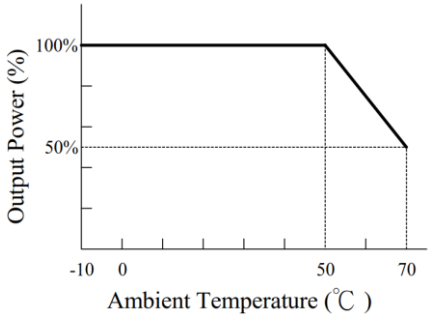
Switching frequency:	85 KHz (typical)
Efficiency:	Typical 89% @ 115 VAC, 92% @ 230 VAC
Hold-up time:	12 ms minimum at 110 VAC & 400 W
Line regulation:	±0.5% maximum at full load
Inrush current:	20 A @ 115 VAC, or 40 A @ 230 VAC, at 25℃ cold start
Withstand voltage:	4000 VAC from input to output (2 MOPP) 1500 VAC from input to ground (1 MOPP) 1500 VAC from output to ground
MTBF:	250,000 hours at full load at 25℃ ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011/ EN55032:	Class B conducted, class A radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN60601-1-2, EN55024	
EN61000-4-2:	ESD, ±15 KV air and ±8 KV contact
EN61000-4-3:	Radiated immunity, 9-28 V/m
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±2 KV com
EN61000-4-6:	Conducted immunity, 10 Vrms
EN61000-4-8:	Magnetic field immunity, 30 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 100% reduction for 10 ms

INTERFACE SIGNALS

PFD: TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1 ms prior to master output dropping 5% below its nominal value. This signal also provides a minimum delay of 100 ms after master output is within regulation.

Inhibit: TTL low to turn off output
DC OK: TTL high when output voltage >95%
PS OFF: TTL high to turn off output

OUTPUT POWER DERATING CURVE



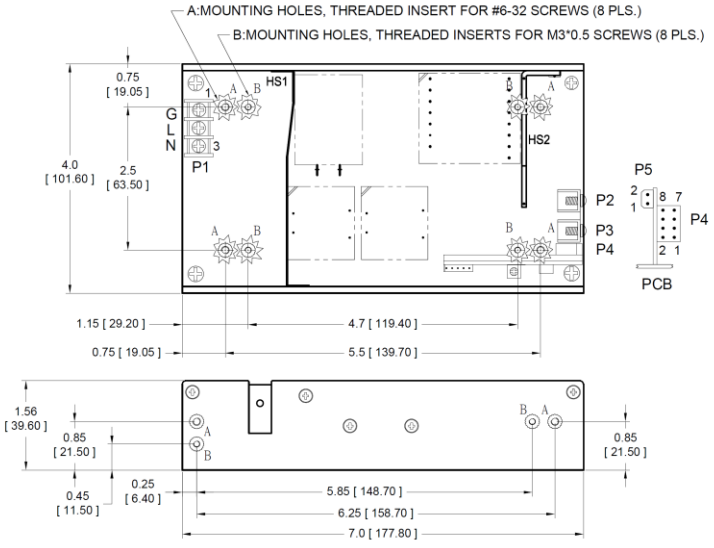
OUTPUT VOLTAGE/CURRENT RATING CHART

Model[1]	Output							Efficiency (typical) 115/230 Vac
	V1	Min. Current[4]	Max. Current at convection	Max. Current at 7 CFM[2]	Tol.	Ripple & Noise[3]	Max. Output Power	
PM400-12B	12 V	0.1 A	25.00 A	33.34 A	±2%	120 mV	300 W /400 W	90 /92%
PM400-13B	15 V	0.1 A	20.00 A	26.67 A	±2%	150 mV	300 W /400 W	90 /92%
PM400-13-1B	18 V	0.1 A	16.67 A	22.23 A	±2%	180 mV	300 W /400 W	91 /92%
PM400-14B	24 V	0.1 A	12.50 A	16.67 A	±2%	240 mV	300 W /400 W	89 /91%
PM400-15B	28 V	0.1 A	10.72 A	14.29 A	±2%	280 mV	300 W /400 W	89 /91%
PM400-17B	36 V	0.1 A	8.34 A	11.12 A	±2%	360 mV	300 W /400 W	90 /92%
PM400-18B	48 V	0.1 A	6.25 A	8.34 A	±2%	480 mV	300 W /400 W	90 /93%

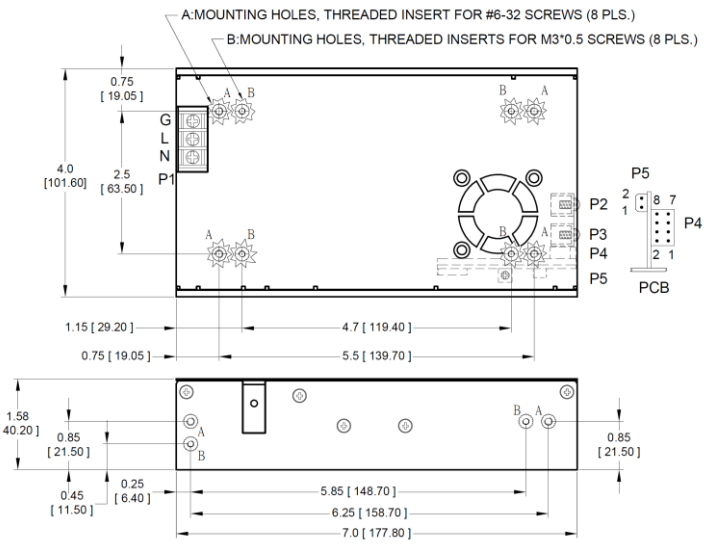
NOTES:
1. Change suffix “B” for U-Bracket form to “C” for enclosed form with cover and fan assembly, e.g. PM400-14C.
2. 300 W without moving air or 400 W with 7 CFM forced air provided by user for “B” version, 400 W for “C” version with cover and fan assembly
3. Ripple and noise is maximum peak to peak voltage value measured at output within 20 MHz bandwidth, at rated line voltage and output load ranges, and with a 10 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor across the output.
4. All models may be operated at no-load without damage. At no load, output voltage fluctuates beyond 5% due to the burst-mode operation of the control IC in them for energy saving.

MECHANICAL SPECIFICATIONS

U-bracket Form



Enclosed Form



NOTES:
1. Dimensions shown in inches [mm]; tolerance 0.02 [0.5] maximum.
2. Input connector P1 is Dinkle terminal P/N DT-35-B01W-03, with nickel plated M3 screws.
3. P2, P3: M4 x 0.7 screw connectors
4. Connector P4: Molex header 87833-08 or equivalent, mating with Molex housing 51110-0851 or equivalent.
5. Fan connector P5: JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
6. Weight: 1.0 Kg (2.23 lbs.) approx. for U-bracket form, 1.14 Kgs. (2.52 lbs.) approx. for enclosed form
7. Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis.

PIN CHART

Connector	P1 (AC)			P2	P3	P5	
PIN NO.	1	2	3			1	2
Polarity	Ground	Live	Neutral	+V1	Common Return	+12V Fan	Common Return

Connector	P4							
PIN NO.	1	2	3	4	5	6	7	8
Polarity	Common Return	Inhibit	+V1 Sense	+5V Standby	-V1 Sense	DC OK	PFD	PS OFF

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