

600-650 WATT MEDICAL POWER SUPPLIES

DESCRIPTION

The PM651 series of AC-DC switching power supplies in a package of 4 x 8 x 2.58 inches are capable of delivering 600-650 watts of continuous power at 30 CFM forced air 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. They are designed for medical applications including those needing BF rated insulation and/or an operation altitude up to $5000 \, \text{meters}$.

FEATURES

- BF Class insulation
- Operation altitude up to 5000 meters
- 100-240 VAC input with active PFC
- Less than 350 µA leakage current
- Standby output 5VDC at 200mA
- EN55011 Class B conducted emissions
- Inhibit TTL high to disable output
- Compliant with RoHS requirements

INPUT SPECIFICATIONS

Input voltage: 90-264 VAC Input frequency: 47-63 Hz

Input current: 8.4 A (rms) @115 VAC, 60 Hz

4.2 A (rms) @ 230 VAC, 50 Hz

Earth leakage current: 350 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

0.50

Over voltage protection: Set at 115-140% of nominal output

voltage, latching by recycle input to

reset

Short circuit protection: Automatic recovery

Over temperature protection: Latching by recycle input to reset Temperature coefficient: All outputs ±0.04% /°C 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 200 mA maximum
Fan power: 12 V at 500 mA maximum

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: -10° C to $+70^{\circ}$ C Storage temperature: -40° C to $+85^{\circ}$ C

Relative humidity: 5% to 95% non-condensing
Temperature derating: Derate from 100% at +50°C linearly

to 50% at +70 $^{\circ}\text{C}$, applicable to convection and forced-air cooling

conditions

PM651 SERIES



C € RoHS

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: 55-300 KHz Efficiency: Typical 90%

Hold-up time: 20 ms minimum at 110 VAC & 650 W

Line regulation: ±0.5% maximum at full load

Inrush current: 20 A @ 115 VAC, or 40 A @ 230 VAC, at

25°C 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: 190,000 hours at full load at 25°C ambient,

calculated per MIL-HDBK-217F

EMC Performance

EN55011/ EN55032: Class B conducted, class B 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

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INTERFACE SIGNALS

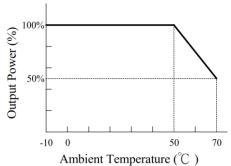
PFD: TTL high for normal operation, low upon loss of input power, turn-on delay time 100-750 ms

turn-on delay time 100-750 ms, turn-off delay time 1 ms minimum

Inhibit: Requires an external TTL high level signal to

inhibit outputs for standard models

OUTPUT POWER DERATING CURVE



OUTPUT VOLTAGE/CURRENT RATING CHART

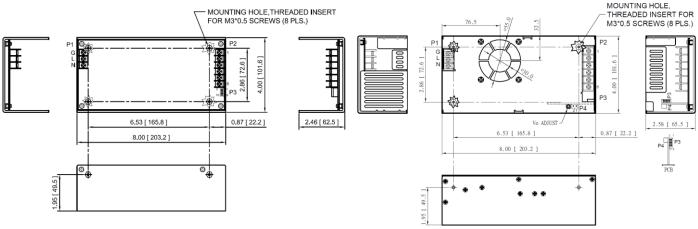
	Output								
Model ⁽¹⁾	V1	Min. Current ⁽²⁾	Max. Current at 30 CFM ⁽³⁾	Peak current ⁽⁵⁾	Tol.	Ripple & Noise ⁽⁴⁾	Max. Output Power ⁽³⁾	Efficiency (typical) 115/230 Vac	
PM651-12B	12 V	0.1 A	50.00 A	55.0 A	±2%	120 mV	600 W	88 /90%	
PM651-13B	15 V	0.1 A	40.00 A	44.0 A	±2%	150 mV	600 W	88 /90%	
PM651-13-1B	18 V	0.1 A	36.12 A	40.0 A	±2%	180 mV	650 W	88 /90%	
PM651-14B	24 V	0.1 A	27.09 A	30.0 A	±2%	240 mV	650 W	88 /90%	
PM651-15B	28 V	0.1 A	23.22 A	25.5 A	±2%	280 mV	650 W	89 /91%	
PM651-16B	30 V	0.1 A	21.67 A	23.8 A	±2%	300 mV	650 W	89 /91%	
PM651-16-1B	32 V	0.1 A	20.32 A	22.4 A	±2%	320 mV	650 W	89 /91%	
PM651-17-1B	34 V	0.1 A	19.12 A	21.0 A	±2%	340 mV	650 W	89 /91%	
PM651-17B	36 V	0.1 A	18.06 A	20.0 A	±2%	360 mV	650 W	89 /91%	
PM651-18B	48 V	0.1 A	13.55 A	15.0 A	±2%	480 mV	650 W	89 /91%	
PM651-19B	57 V	0.1 A	11.41 A	12.5 A	±2%	570 mV	650 W	89 /91%	
PM651-19-1B	58 V	0.1 A	11.21 A	12.3 A	±2%	580 mV	650 W	89 /91%	

NOTES:

- 1. Change suffix "B" for U-Bracket form to "C" for enclosed form with cover and fan assembly, e.g. PM651-14C.
- 2. 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.
- 3. 600-650 W for "C" version, or with 30 CFM forced air provided by user for "B" version
- 4. 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.
- 5. Peak output current with 10% duty cycle maximum for less than 15 seconds, average power not to exceed maximum power rating.

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. Output connector P2 is Dinkle terminal P/N DT-4N-B01W-06, with nickel plated M3.5 screws.
- 4. Output connector P3 is JST header S10B-PHDSS or equivalent, mating with JST housing PHDR-10VS or equivalent.
- 5. Fan connector P4 is JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
- 6. Weight: 1.8 Kgs (3.97 lbs.) approx. for U-bracket form, 2.0 Kgs. (4.41 lbs.) approx. for enclosed form.
- 7. Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.

UNIVERSAL INPUT

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PIN CHART

Connector	P1 (AC)			P2					P4		
PIN NO	1	2	3	1	2	3	4	5	6	1	2
Polarity	Ground	Live	Neutral	+V1			Common Return		+12V Fan	Common Return	

Connector	Р3										
PIN NO	1	2	3	4	5	6	7	8	9	10	
Polarity	+V1 Sense	-V1 Sense	PFD	Common Return	N.A.	N.A.	Inhibit	N.A.	+5V Standby	+5V Standby Return	