



PROTEK POWER

PM651 Medical Power Supplies (600-650W)

Features:

- BF class insulation
- Operation altitude up to 5000 meters
- 100-240 VAC input with active PFC
- Less than 300 μ A leakage current
- Standby output 5VDC at 200mA
- EN55011 Class B conducted emissions
- Inhibit– TTL high to disable output
- Compliant with RoHS requirements



CE
RoHS



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 meters

Model ¹	Output							Efficiency (typical) 115/230VAC
	V1	Min. Current ⁴	Max. Current at convection	Max. Current At 30 CFM	Tol.	Ripple & Noise ³	Max. Output Power ²	
PM651-12B	12V	0.1A	50A	55A	±2%	120mV	600W	88/90%
PM651-13B	15V	0.1A	40A	44A	±2%	150mV	600W	88/90%
PM651-13-1B	18V	0.1A	36.12A	40A	±2%	180mV	650W	88/90%
PM651-14B	24V	0.1A	27.09A	30A	±2%	240mV	650W	88/90%
PM651-15B	28V	0.1A	23.22A	25.5A	±2%	280mV	650W	89/91%
PM4651-16B	30V	0.1A	21.67A	23.8A	±2%	300mV	650W	89/91%
PM651-16-1B	32V	0.1A	20.32A	22.4A	±2%	320mV	650W	89/91%
PM651-17-1B	34V	0.1A	19.12A	21A	±2%	340mV	650W	89/91%
PM651-17B	36V	0.1A	18.06A	20A	±2%	360mV	650W	89/91%
PM651-18B	48V	0.1A	13.55A	15A	±2%	480mV	650W	89/91%
PM651-19B	57V	0.1A	11.41A	12.5A	±2%	570mV	650W	89/91%
PM651-19-1B	58V	0.1A	11.21A	12.3A	±2%	580mV	650W	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 μ F tantalum capacitor in parallel with a 0.1 μ F 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.



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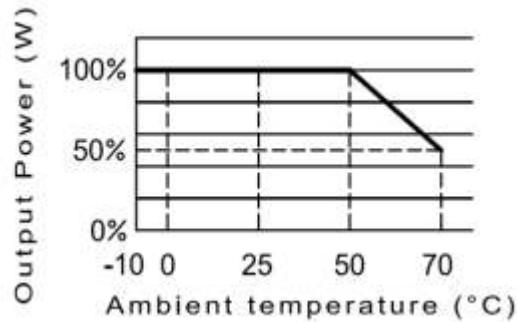
Specifications	
Safety Standards & EMC Specifications	
Safety Standard Approvals	UL ES 60601-1, CSA C22.2 No. 60601-1 File No. E178020 TÜV EN 60601-1 CSA C22.2 No. 62368-1, CSA C22.2 No. 62368-1 TÜV EN 62368-1
EMI Standard	EN55011, FCC and VCCI Class B Conducted, class B radiated
EMC Performance	EN61000-3-2: Harmonic Distortion, class A and D EN61000-3-3: Line Flicker EN61000-4-2: ESDN, ± 15KV air and ±8 KV contact EN61000-4-3: Radiated immunity, 10 V/m EN61000-4-4: Fast transient/ burst, ± 2 KV EN61000-4-5: Surge, ±1 KV diff, ± 2KV com EN61000-4-6: Conducted Immunity, 10 Vms EN61000-4-8: Magnetic Field immunity, 30 A/m EN61000-4-11: Voltage dip immunity, 30% reduction for 500 ms, 1005 reduction for 10 ms
*Consult with TT Electronics for information on additional country safety approvals	
Input Specifications	
Input Voltage Range	90-264 VAC
Input Frequency Range	47-63Hz
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	
Ripple and noise	1% peak to peak maximum
Remote Sense	Compensation for cable losses up to 0.5V
Overvoltage 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
Thermal Shutdown	Protected to over temperature conditions
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	5V at 200mA maximum
Fan Power	12 V at 500 mA maximum
Environmental Specifications	
Operating Temperature	-10 ° C to +70°C
Storage Temperature	-40 ° C to + 85° C
Relative Humidity	5% to 95% condensing
Temperature Derating	Derate from 100% at +50°C linearly to 50% at +70°C, applicable to convection and forced-air cooling conditions
General Specifications	
Switching Frequency	55-300KHz
Power Factor	>0.9
Efficiency	Typical 90%
Hold-up time	20 ms minimum at 100 VAC & 650 W
Line regulation	±0.5% maximum at full load
Inrush current	20A @ 115VAC, or 40A @ 230VAC, at 25°C cold start
Withstand Voltage	4000 VDC from input to output (2 MOPP) 1500 VDC from input to ground (1 MOPP) 1500 VDC from output to ground
MTBF	190,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F



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Diagrams

OUTPUT POWER DERATING CURVE

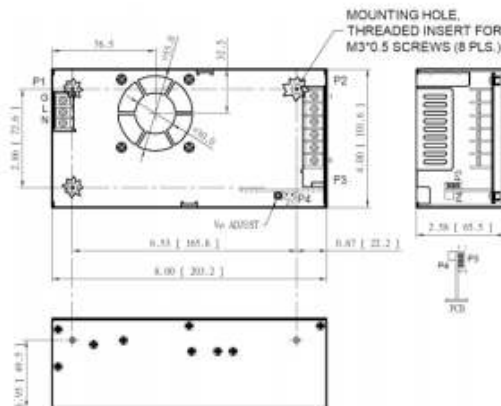


MECHANICAL SPECIFICATIONS

U-bracket Form



Enclosed Form



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle terminal P/N DT-35-B01W-03, with nickel plated M3 screws.
4. Output connector P2 is Dinkle terminal P/N DT-4N-B01W-06, with nickel plated M3.5 screws.
5. Output connector P3 is JST header S10B-PHDSS or equivalent, mating with JST housing PHDR-10VS or equivalent.
6. Fan connector P4 is JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
7. Weight: 1.8 Kgs (3.97 lbs.) approx. for U-bracket form, 2.0 Kgs. (4.41 lbs.) approx. for enclosed form.
8. Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.



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Diagrams

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	P3									
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