

## DESCRIPTION

The PM202 series of AC-DC switching power supplies in a package of 3 x 5 x 1.5 inches are capable of delivering 200 watts of continuous power at 5.3 CFM forced air cooling or 150 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 200 watt output. They are specially designed for medical applications, but not for life-supporting equipment. The units are certified also to IEC /EN /UL /CSA 60950-1 and suitable for data networking, computer and telecommunication applications.

## FEATURES

- 3 x 5 inch footprint with 1.5 inch low profile
- 100-240 VAC input with active PFC
- Less than 220  $\mu$ A leakage current
- Meet EN55011 /55022 and FCC Class B
- Power Factor 0.98 typical
- Short-circuit protection
- Power Fail Detect (PFD) signal
- Inhibit - TTL high to disable output
- Compliant with RoHS requirements
- Efficiency greater than 87%

## INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	2.5 A (rms) for 115 VAC 1.25 A (rms) for 230 VAC
Earth leakage current:	220 $\mu$ A max. @ 264 VAC, 63 Hz
Touch current:	100 $\mu$ A max. @ 264 VAC, 63 Hz

## OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Total output power:	See rating chart.
Ripple and noise:	1% peak to peak maximum
Overvoltage protection:	set at 112-140% of its nominal output voltage
Overcurrent protection:	Output protected to short circuit conditions
Temperature coefficient:	All outputs $\pm 0.04\%$ / $^{\circ}$ C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 $\mu$ s after a 25% step load change
Fan power:	12 V at 250 mA maximum

## ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0 $^{\circ}$ C to +70 $^{\circ}$ C
Storage temperature:	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +50 $^{\circ}$ C linearly to 50% at +70 $^{\circ}$ C, applicable to convection and forced-air cooling conditions

## PM202 SERIES



**CE (LVD)**  
**RoHS**

## SAFETY STANDARD APPROVAL



UL 60601-1, CSA C22.2 No. 601.1  
File No. E178020



TÜV EN 60601-1



UL 60950-1, CSA C22.2 No. 60950-1



TÜV EN 60950-1

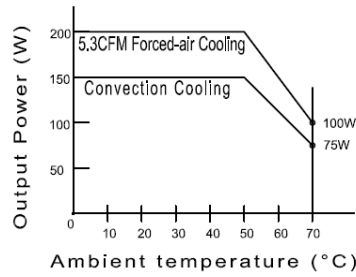
## GENERAL SPECIFICATIONS

Switching frequency:	100 KHz (typical)
Efficiency:	87% minimum on all models
Hold-up time:	10 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	20 A @ 115 VAC or 40 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output, 1500 VAC from input to ground, 500 VAC from output to ground
MTBF:	300,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011/EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, $\pm 8$ KV air and $\pm 6$ KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, $\pm 2$ KV
EN61000-4-5:	Surge, $\pm 1$ KV diff., $\pm 2$ KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, >95% reduction for 10 ms

## INTERFACE SIGNALS

- PFD: TTL high for normal operation, low upon loss of input power, turn-on delay time 100-1000 ms, turn-off delay time 1 ms minimum
- Inhibit: TTL high to turn off output

## OUTPUT POWER DERATING CURVE



## OUTPUT VOLTAGE/CURRENT RATING CHART

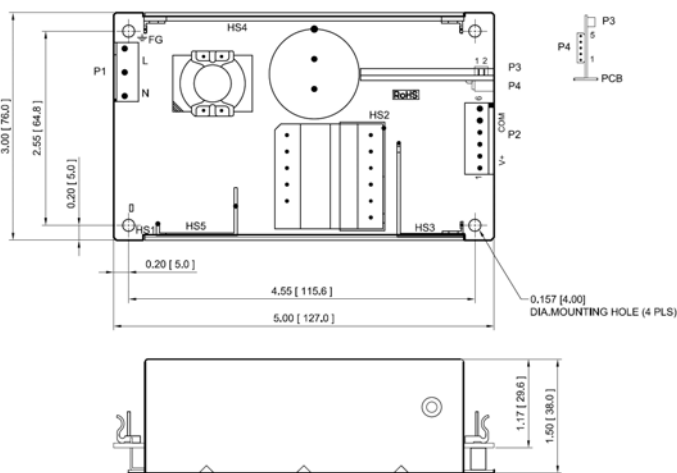
Model <sup>(1)</sup>	Output							Efficiency (typical)	
	Vnom.	Min. Current	Max. Current at convection	Max. Current at 5.3 CFM <sup>(3)</sup>	Tol.	Ripple & Noise <sup>(4)</sup>	Max. Power <sup>(2)</sup>	@ 150 W 115/230 Vac	@ 200 W 115/230 Vac
PM202-12B	12 V	0 A	12.50 A	16.67 A	±2%	120 mV	150 W/200 W	88/91%	88/90%
PM202-13B	15 V	0 A	10.00 A	13.34 A	±2%	150 mV	150 W/200 W	88/91%	88/91%
PM202-13-1B	18 V	0 A	8.34 A	11.12 A	±2%	180 mV	150 W/200 W	88/91%	88/91%
PM202-14B	24 V	0 A	6.25 A	8.34 A	±2%	240 mV	150 W/200 W	88/91%	88/91%
PM202-15B	28 V	0 A	5.36 A	7.15 A	±2%	280 mV	150 W/200 W	88/91%	88/91%
PM202-17B	36 V	0 A	4.17 A	5.56 A	±2%	360 mV	150 W/200 W	88/91%	88/91%
PM202-18B	48 V	0 A	3.13 A	4.17 A	±2%	480 mV	150 W/200 W	89/92%	89/92%

### NOTES:

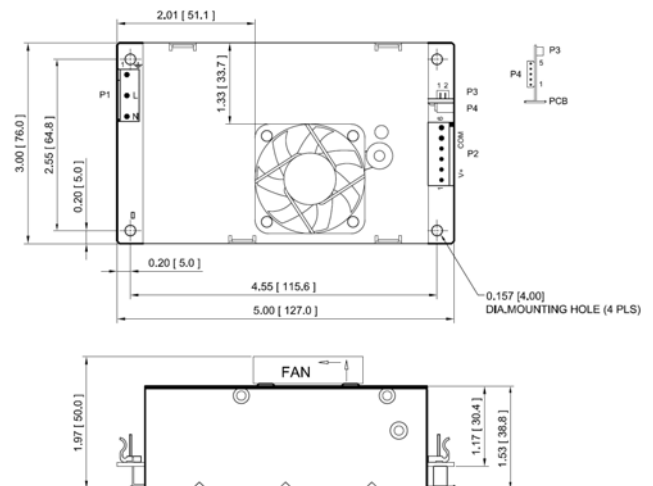
- Suffix "B" in model numbers denotes U-bracket form. Change suffix "B" to "C" for enclosed form with cover-and-fan assembly, e.g. PM202-14C
- 150 W without moving air or 200 W with 5.3 CFM forced air provided by user for "B" version, 200 W for "C" version with cover-and-fan assembly
- The adequacy of cooling air is judged by the measured core temperature of transformer T1 below 75°C at 25°C ambient, or below 100°C at 50°C ambient.
- 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.

## MECHANICAL SPECIFICATIONS

### U-bracket Form



### Enclosed Form



### NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1: Molex header 09-65-2058 or equivalent, mating with Molex housing 09-50-1051 or equivalent.
- Output connector P2: Molex header 09-65-2068 or equivalent, mating with Molex housing 09-50-1061 or equivalent.
- Connector P3: Molex header 22-05-7055 or equivalent, mating with Molex housing 50-37-5053 or equivalent.
- Fan connectors P4: Molex header 53048-0210 or equivalent, mating with Molex housing 51021-0200 or equivalent.
- Weight: 390 grams (0.86 lbs.) approx. for U-bracket form, 440 grams (0.97 lbs.) for enclosed form
- Fixing of units to end equipment is through standoffs and the four mounting holes in PCB.

## PIN CHART

CONN MODEL \ PIN		P1					P2					
		1	2	3	4	5	1	2	3	4	5	6
PM202-12B	PM202-15B	GROUND	VOID	LIVE	VOID	NEUTRAL	OUTPUT +V			RETURN		
PM202-13B	PM202-17B											
PM202-13-1B	PM202-18B											
PM202-14B												

CONN MODEL \ PIN		P3		P4				
		1	2	1	2	3	4	5
PM202-12B	PM202-15B	FAN +12V	RETURN	-SENSE	+SENSE	PFD	INHIBIT	RETURN
PM202-13B	PM202-17B							
PM202-13-1B	PM202-18B							
PM202-14B								