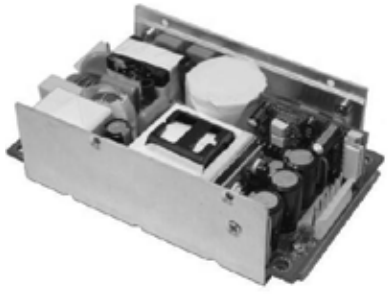
DESCRIPTION

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. The units are certified also to IEC /EN /UL /CSA 60950-1 and suitable for data networking, industrial and telecommunication applications.

PM202 SERIES



CE

RoHS

FEATURES

- BF Class insulation
- Operation altitude up to 5000 meters
- 3 x 5 inch footprint with 1.5 inch low profile
- Less than 220 µA 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
- High Efficiency 92% typical

SAFETY STANDARD APPROVAL

c UL us	UL ES 60601-1, CSA C22.2 No. 60601-1 File No. E178020
IEC 60601-1	TÜV EN 60601-1
	UL 60950-1, CSA C22.2 No. 60950-1 (except PM202-16-1BN1 and PM202-16-1CN1)
	TÜV EN 60950-1 (except PM202-16-1BN1 and PM202-16-1CN1)

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 µA max. @ 264 VAC, 63 Hz
Touch current:	100 µA 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
Remote sense	Compensation for cable losses up to 0.5 V
Overvoltage protection:	Set at 112-140% of its nominal output voltage
Overcurrent protection:	Output protected to short circuit conditions
Temperature coefficient:	All outputs ±0.04% /℃ maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step load change
Fan power:	12 V at 250 mA maximum

ENVIRONMENTAL SPECIFICATIONS

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

GENERAL SPECIFICATIONS

Switching frequency:	100 KHz (typical)
Efficiency:	87% minimum on all models
Hold-up time:	10 ms minimum at 110 VAC
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 (2MOPP) 1500 VAC from input to ground (1MOPP) 1500 VAC from output to ground
MTBF:	300,000 hours at full load at 25℃ ambient, calculated per MIL-HDBK-217F

EMC Performance (IEC60601-1-2:2014)

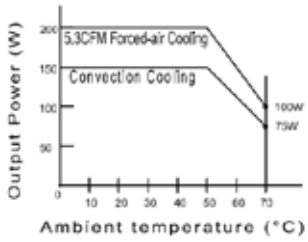
EN55011/EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ±15 KV air and ±8 KV contact
EN61000-4-3:	Radiated immunity, 10 V/m
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±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 1ms prior to V1 output dropping 5% below its nominal value. This signal also provides a minimum delay of 100 ms after V1 is within regulation.

Inhibit: Requires an external TTL high level signal to inhibit outputs for standard models

OUTPUT POWER DERATING CURVE



OUTPUT VOLTAGE/CURRENT RATING CHART

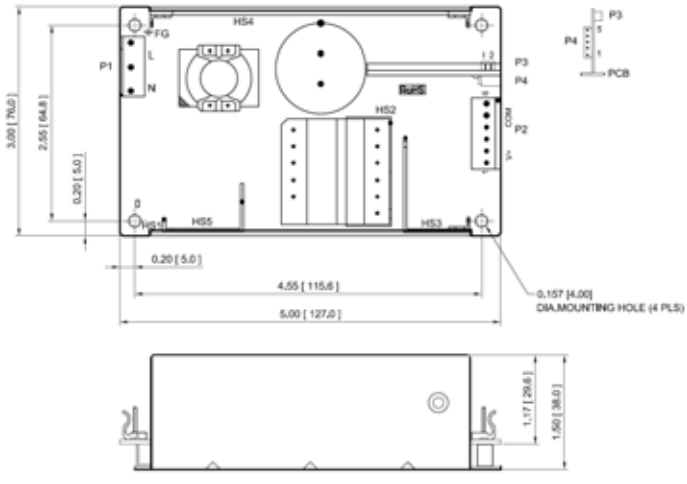
Model[1]	Output							Efficiency (typical) 115/230 Vac
	V1	Min. Current[4]	Max. Current at convection	Max. Current at 5.3 CFM [2]	Tol.	Ripple & Noise[3]	Max. Power[2]	
PM202-12BN1	12 V	0.1 A	12.50 A	16.67 A	±2%	120 mV	150 W /200 W	88 /91%
PM202-13BN1	15 V	0.1 A	10.00 A	13.34 A	±2%	150 mV	150 W /200 W	88 /91%
PM202-13-1BN1	18 V	0.1 A	8.34 A	11.12 A	±2%	180 mV	150 W /200 W	88 /91%
PM202-14BN1	24 V	0.1 A	6.25 A	8.34 A	±2%	240 mV	150 W /200 W	88 /91%
PM202-15BN1	28 V	0.1 A	5.36 A	7.15 A	±2%	280 mV	150 W /200 W	88 /91%
PM202-16-1BN1	32 V	0.1 A	4.69 A	6.25 A	±2%	320 mV	150 W /200 W	88 /91%
PM202-17BN1	36 V	0.1 A	4.17 A	5.56 A	±2%	360 mV	150 W /200 W	88 /92%
PM202-18BN1	48 V	0.1 A	3.13 A	4.17 A	±2%	480 mV	150 W /200 W	89 /92%

NOTES:

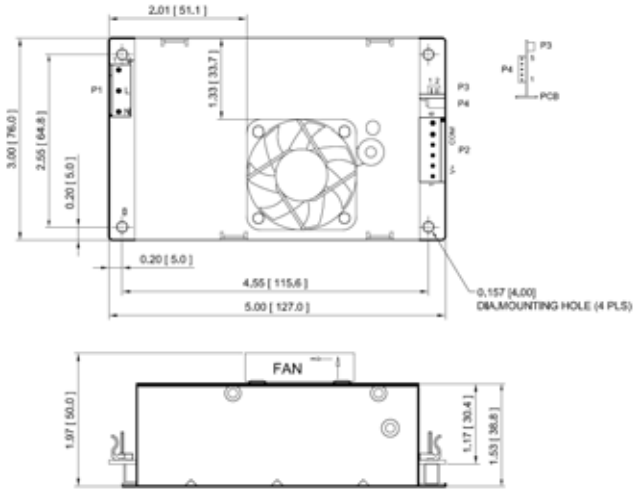
1. Suffix “BN1” in model numbers denotes U-bracket form. Change suffix “BN1” to “CN1” for enclosed form with cover and fan assembly, e.g. PM202-14CN1
2. 150 W without moving air or 200 W with 5.3 CFM forced air provided by user for “BN1” version, 200 W for “CN1” version with cover and fan assembly. The adequacy of cooling air is judged by the measured core temperature of transformer T1 below 75℃ at 25℃ ambient, or below 100℃ at 50℃ ambient.
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]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1: Molex header 09-65-2058 or equivalent, mating with Molex housing 09-50-1051 or equivalent.
4. Output connector P2: Molex header 09-65-2068 or equivalent, mating with Molex housing 09-50-1061 or equivalent.
5. Fan connector P3: JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
6. Connectors P4: Molex header 22-05-7055 or equivalent, mating with Molex housing 50-37-5053 or equivalent.
7. Weight: 390 grams (0.86 lbs.) approx. for U-bracket form, 440 grams (0.97 lbs.) for enclosed form
8. Fixing of units to end equipment is through standoffs and the four mounting holes in PCB.
9. Ground tab is 0.25 [6.35] × 0.032 [0.8] fast-on connector.

PIN CHART

Connector	P1					P2					
PIN NO.	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
Polarity	Ground	Void	Live	Void	Neutral	+V1			Common Return		

Connector	P3		P4				
PIN NO.	**1**	**2**	**1**	**2**	**3**	**4**	**5**
Polarity	+12V Fan	Common Return	-Sense	+Sense	PFD	Inhibit	Common Return