

## 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

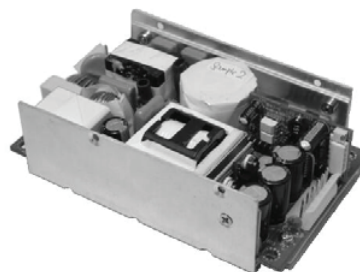
## OUTPUT SPECIFICATIONS

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



TÜV EN 60601-1



UL 60950-1, CSA C22.2 No. 60950-1  
 (except PM202-16-1B and PM202-16-1C)



TÜV EN 60950-1  
 (except PM202-16-1B and PM202-16-1C)

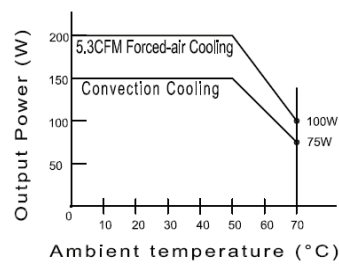
## GENERAL SPECIFICATIONS

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:	5600 VDC from input to output, 2100 VDC from input to ground, 700 VDC from output to ground (To verify AC strength, get correct test method to avoid power supply damage.)
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 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

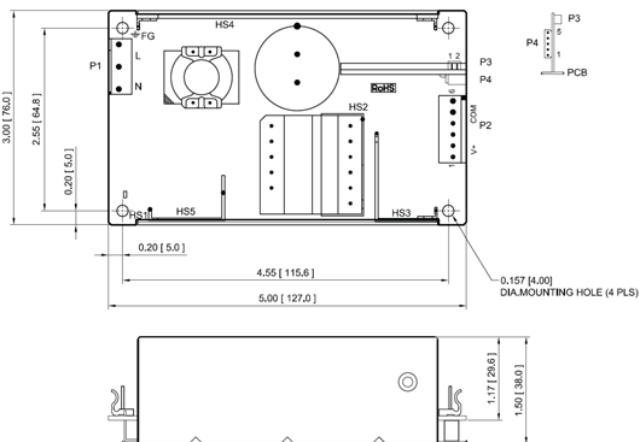
Model <sup>(1)</sup>	V1	Output					Efficiency (typical)		
		Min. Current	Max. Current at convection	Max. Current at 5.3 CFM <sup>(2)</sup>	Tol.	Ripple & Noise <sup>(3)</sup>	Max. Power <sup>(2)</sup>	@ 150 W 115/230 Vac	@ 200 W 115/230 Vac
PM202-12B	12 V	0 A	12.50 A	16.67 A	±2%	120 mV	150 W /200 W	88 /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%
PM202-16-1B	32 V	0 A	4.69 A	6.25 A	±2%	320 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:

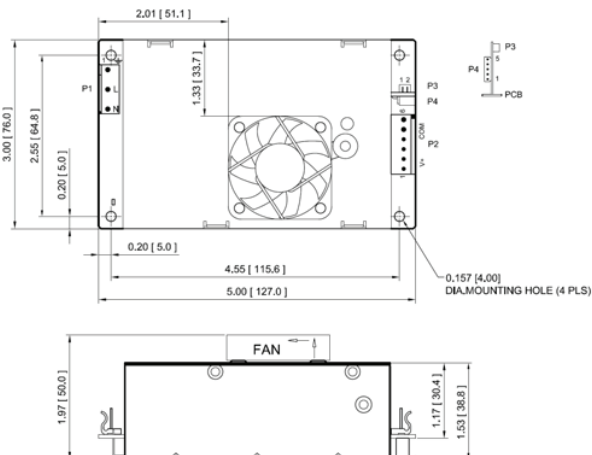
- Suffix "B" in model numbers denotes U-bracket form. Change suffix "B" to "C" for enclosed form with cover and fan assembly, e.g. PM202-14C
- 150 W without moving air or 200 W with 5.3 CFM forced air provided by user for "B" version, 200 W for "C" version with cover and fan assembly. The adequacy of 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.
- Fan connector P3: JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
- Connectors P4: Molex header 22-05-7055 or equivalent, mating with Molex housing 50-37-5053 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.
- Ground tab is 0.25 [6.35] x 0.022 [0.56] feet of copper

Specifications are subject to change without notice. It is responsibility of each customer to thoroughly test each product and part number under their unique parameters and environments to ensure a product will work properly and reliably.

Click below for more details, to buy on-line or request volume pricing:

<http://power.sager.com/protek-PM202C-power-supply.html>

**(866) 588-1750**  
 power@sager.com  
<http://power.sager.com>

### PIN CHART

CONN PIN		P1					P2					
		1	2	3	4	5	1	2	3	4	5	6
PM202-12B	PM202-15B	Ground	Void	Live	Void	Neutral	+V1			Common Return		
PM202-13B	PM202-17B											
PM202-13-1B	PM202-18B											
PM202-14B												

CONN PIN		P3		P4				
		1	2	1	2	3	4	5
PM202-12B	PM202-15B	+12V Fan	Common Return	-Sense	+Sense	PFD	Inhibit	Common Return
PM202-13B	PM202-17B							
PM202-13-1B	PM202-18B							
PM202-14B								