



E-Star Power Development Co., Ltd. (E-STAR)
 No.305, Sec. 2, Zhongshan Rd., Banciao City, Taipei County 22067, Taiwan
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202W Open Frame type Medical power supply < PM202

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 μ 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 μ A max. @ 264 VAC, 63 Hz |
| Touch current: | 100 μ 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 |
| Oversvoltage 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 μ 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, ± 8 KV air and ± 6 KV contact |
| EN61000-4-3: | Radiated immunity, 3 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, 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 |



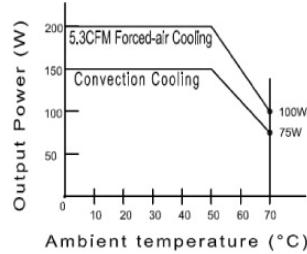
202W Open Frame type Medical power supply < PM202

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

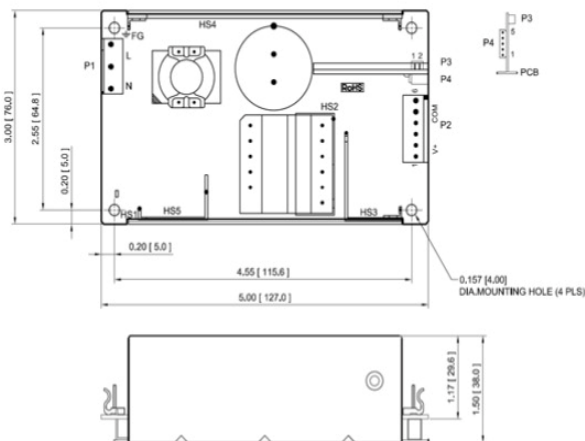
| Model ⁽¹⁾ | Output | | | | | | | Efficiency (typical) | |
|----------------------|--------|--------------|----------------------------|--|------|-------------------------------|---------------------------|----------------------|---------------------|
| | Vnom. | Min. Current | Max. Current at convection | Max. Current at 5.3 CFM ⁽³⁾ | Tol. | Ripple & Noise ⁽⁴⁾ | Max. Power ⁽²⁾ | @ 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:

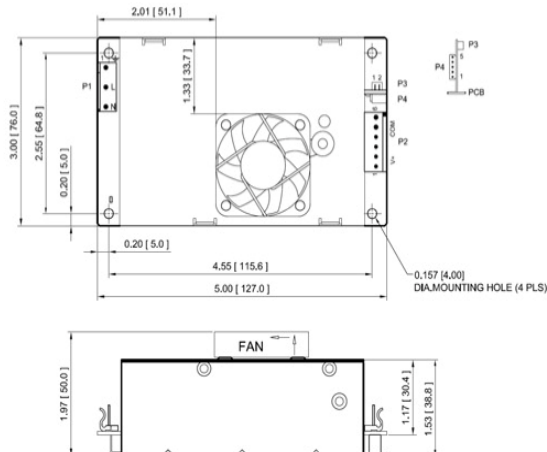
- Suffix "B" in model numbers denotes U-bracket form. Change suffix "B" to "C" for enclosed form with cover-and-fan assembly, e.g. PM202-14C
- 150 W without moving air or 200 W with 5.3 CFM forced air provided by user for "B" version, 200 W for "C" version with cover-and-fan assembly
- The adequacy of 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.



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PIN CHART

| CONN | | P1 | | | | | P2 | | | | | |
|-------------|-----------|--------|------|------|------|---------|-----------|---|---|--------|---|---|
| MODEL | PIN | 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 | | P3 | | P4 | | | | |
|-------------|-----------|-------------|--------|--------|--------|-----|---------|--------|
| MODEL | PIN | 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 | | | | | | | | |