

## DESCRIPTION

The PMP90 series of AC/DC switching power supplies are for 60-90 watts of continuous output power. They are enclosed in a 94V-0 rated polyphenylene-oxide case with an IEC320/C14 or IEC320/C18 inlet to mate with interchangeable cord for world-wide use. All models meet EN55011 and FCC class B emission limits, and are designed for medical applications.

## FEATURES

- Low safety ground leakage current
- Wide input range 90 to 264 VAC
- Optional output connectors
- 100% burn-in
- Overvoltage protection
- Over-temperature protection
- Overcurrent protection
- Compliant with CEC and Energy Star Efficiency level IV requirements (except models PMP90-10, PMP90-10-1 and PMP90-11)
  - \* No load power consumption less than 0.5 W
  - \* Average active efficiency greater than 85%
- Compliant with RoHS requirements

## INPUT SPECIFICATIONS

|                        |  |
|------------------------|--|
| Input voltage:         | 90-264 VAC   |
| Input frequency:       | 47-63 Hz   |
| Input current:         | 1.20 A (rms) for 115 VAC<br>0.60 A (rms) for 230 VAC |
| Earth leakage current: | 180 $\mu$ A max. @ 264 VAC, 63 Hz                    |
| Touch current:         | 100 $\mu$ A max. @ 264 VAC, 63 Hz                    |

## OUTPUT SPECIFICATIONS

|                          |  |
|--------------------------|--|
| Output voltage /current: | See rating chart.  |
| Maximum output power:    | See rating chart.  |
| Ripple and noise:        | 100 mVp-p maximum on 5 V, 6 V and 9 V outputs, 1% maximum on other voltage outputs (12 V, 13.5 V ..., 48 V etc.)                 |
| Overvoltage protection:  | Provided and set at 112-140% of its nominal output voltage   |
| Overcurrent protection:  | Protected to short circuit conditions  |
| Temperature coefficient: | $\pm 0.04\%$ / $^{\circ}$ 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 |

## ENVIRONMENTAL SPECIFICATIONS

|                        |  |
|------------------------|--|
| Operating temperature: | 0 $^{\circ}$ C to +60 $^{\circ}$ C                                       |
| Storage temperature:   | -40 $^{\circ}$ C to +85 $^{\circ}$ C                                     |
| Relative humidity:     | 5% to 95% non-condensing   |
| Derating:              | Derate from 100% at +40 $^{\circ}$ C linearly to 50% at +60 $^{\circ}$ C |

## PMP90 SERIES



## SAFETY STANDARD APPROVALS



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



TÜV EN 60601-1

## GENERAL SPECIFICATIONS

|                      |   |
|----------------------|---|
| Switching frequency: | 50-110 KHz  |
| Power factor:        | 0.98 Typical  |
| Efficiency:          | 85% min. (except 77% min. for PMP90-10, PMP90-10-1, PMP90-11 and PMP90-12)  |
| Hold-up time:        | 15 ms minimum at 110 VAC  |
| Line regulation:     | $\pm 0.5\%$ maximum at full load  |
| Inrush current:      | 50 A @ 115 VAC or 100 A @ 230 VAC, at 25 $^{\circ}$ C cold start  |
| Withstand voltage:   | 5600 VDC from input to output (2 MOPP)<br>2100 VDC from input to ground (1 MOPP)<br>700 VDC from output to ground<br>(To verify AC strength, get correct test method to avoid power supply damage.)<br>For Class II models, 4000 VAC from input to output |
| MTBF:                | 150,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F   |

## EMC Performance (IEC60601-1-2)

|               |  |
|---------------|--|
| EN55011       | 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, $\pm 15$ KV air and $\pm 8$ KV contact                              |
| EN61000-4-3:  | Radiated immunity, 10 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, 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 |

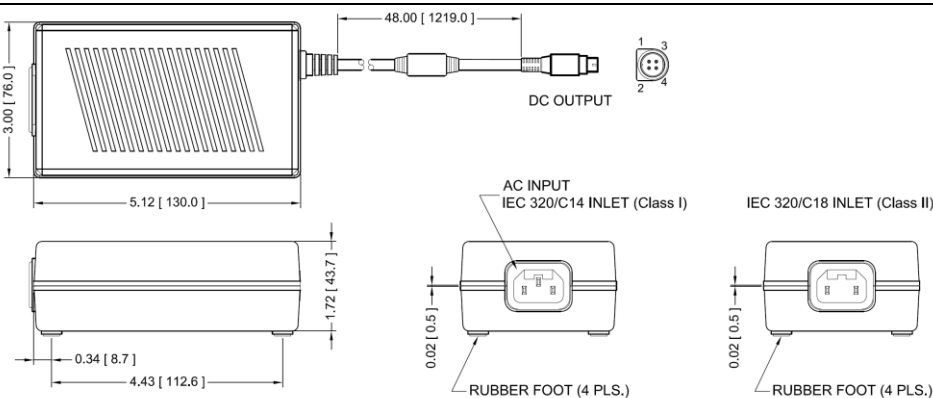
## OUTPUT VOLTAGE/CURRENT RATING CHART

| Model <sup>(1)</sup> |             | Output |              |              |      |                               |            | Average Active Efficiency (typical) @ 115 / 230 Vac |
|----------------------|-------------|--------|--------------|--------------|------|-------------------------------|------------|---|
| Class I              | Class II    | V1     | Min. Current | Max. Current | Tol. | Ripple & Noise <sup>(2)</sup> | Max. Power |   |
| PMP90-10             | PMP90F-10   | 5.0 V  | 0 A          | 12.0 A       | ±5%  | 100 mV                        | 60 W       | 78 /79%   |
| PMP90-10-1           | PMP90F-10-1 | 6.0 V  | 0 A          | 10.0 A       | ±5%  | 100 mV                        | 60 W       | 78 /79%   |
| PMP90-11             | PMP90F-11   | 9.0 V  | 0 A          | 7.78 A       | ±5%  | 100 mV                        | 70 W       | 81 /82%   |
| PMP90-12             | PMP90F-12   | 12.0 V | 0 A          | 6.67 A       | ±5%  | 120 mV                        | 80 W       | 86 /85%   |
| PMP90-12-1           | PMP90F-12-1 | 13.5 V | 0 A          | 6.30 A       | ±5%  | 135 mV                        | 85 W       | 86 /85%   |
| PMP90-13             | PMP90F-13   | 15.0 V | 0 A          | 5.67 A       | ±5%  | 150 mV                        | 85 W       | 86 /85%   |
| PMP90-13-1           | PMP90F-13-1 | 18.0 V | 0 A          | 5.00 A       | ±5%  | 180 mV                        | 90 W       | 86 /85%   |
| PMP90-13-2           | PMP90F-13-2 | 19.0 V | 0 A          | 4.74 A       | ±5%  | 190 mV                        | 90 W       | 86 /86%   |
| PMP90-14             | PMP90F-14   | 24.0 V | 0 A          | 3.75 A       | ±5%  | 240 mV                        | 90 W       | 87 /86%   |
| PMP90-16             | PMP90F-16   | 30.0 V | 0 A          | 3.00 A       | ±5%  | 300 mV                        | 90 W       | 87 /86%   |
| PMP90-18             | PMP90F-18   | 48.0 V | 0 A          | 1.87 A       | ±5%  | 480 mV                        | 90 W       | 88 /87%   |

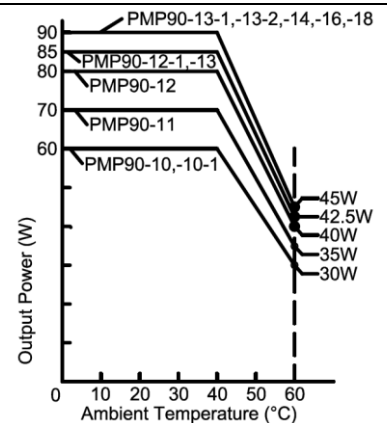
**NOTES:**

- Class I models are equipped with IEC320/C14 inlet, and class II models with IEC320/C18 inlet.
- 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



## OUTPUT POWER DERATING CURVE



**NOTES:**

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Weight: 658 grams (1.45 lbs.) approx.
- Output connector is 4 pin plug without lock, mating with Kycon P/N KPJX-4S-S socket or equivalent.
- Refer to Section titled "OPTIONAL OUTPUT CONNECTORS". Add the suffix assigned for a selected connector to a wanted model number, e.g. PMP90-14-B1, for ordering.

## PIN CHART

| MODEL      | PIN         | 1         | 2   | 3         | 4   |
|------------|-------------|-----------|-----|-----------|-----|
| PMP90-10   | PMP90F-10   | V1 Return | +V1 | V1 Return | +V1 |
| PMP90-10-1 | PMP90F-10-1 |           |     |           |     |
| PMP90-11   | PMP90F-11   |           |     |           |     |
| PMP90-12   | PMP90F-12   |           |     |           |     |
| PMP90-12-1 | PMP90F-12-1 |           |     |           |     |
| PMP90-13   | PMP90F-13   |           |     |           |     |
| PMP90-13-1 | PMP90F-13-1 |           |     |           |     |
| PMP90-13-2 | PMP90F-13-2 |           |     |           |     |
| PMP90-14   | PMP90F-14   |           |     |           |     |
| PMP90-16   | PMP90F-16   |           |     |           |     |
| PMP90-18   | PMP90F-18   |           |     |           |     |