250W, Opto-less, Long Life, AC-DC Power Supply with PFC Universal Input
PHR 250-F3

- No optocouplers, low component count
- Electronic power factor correction
- Rugged industrial quality construction
- Conformal coating
- Excellent EMI performance
- High input/output isolation
- No derating at +70°C
- Conduction/convection cooled
- Full electronic protection
- Customized versions available

This rugged, industrial quality AC-DC power supply with PFC input is designed for an operating life extending to 30 years. By eliminating optocouplers in the feedback loop and significantly reducing the component count, the MTBF of the unit is greatly improved over conventional designs. Cooling is by conduction via baseplate. Additional cooling is achieved by natural convection through the cooling slots. All heat generating components are installed on aluminum heatsink blocks which are thermally connected to the base plate. This also provides exceptional mechanical ruggedness. Conformal coating provides additional environmental protection. Large design headroom and the use of components with established reliability also contribute to the long operating life of the unit. The unit is manufactured at our plant under strict quality control.

**SPECIFICATIONS**

**Input Voltage**
- 90-264Vac, 47... 63Hz
- Input current 3.3A max at 90V
- Power Factor is better than 0.97 at full load for the entire input range.
- Meets EN61000-3-2

**Input Protection**
- Inrush current limiting
- Varistor
- Internal safety fuse
- Lower voltage than the specified minimum input will not damage the unit

**Isolation**
- 2250VDC input to chassis
- 5000VDC input to output
- 10mm spacing
- 500VDC output to chassis

**Standards**
- Designed to meet EN 60950-1 and corresponding UL and CSA standards

**EMI**
- EN55022 Class A with margins

**Switching Frequency**
- 40-150kHz, load and input voltage dependent

**Hold Up Time**
- Minimum 5ms at full load for 5% drop of output voltage for the entire input voltage range

**Output Voltages**
- 24V, 48V or 125Vdc
- 250W continuous

**Redundancy Diode**
- Not installed
- Available as option

**Line/Load Regulation**
- Typically 2% from 5% to full load

**Dynamic Response**
- Max 5% voltage deviation for 10% to 50% load step, with better than 5msec recovery time

**Output Ripple/Noise**
- Line frequency ripple is less than 200mVrms
- Switching frequency ripple is 0.4%Vrms, 1.5%mVpp
  (20MHz BW)

**Output Overload Protection**
- Rectangular current limiting with short-circuit protection

**Output Overvoltage Protection**
- Transzorb clamp on the output

**Efficiency**
- Over 85% at full load on the 24V output model

**Operating Temperature Range**
- -20°C to 70°C for full specification
- Extended temperature ranges available on request

**Temperature Drift**
- 0.03% per °C, over operating temperature range

**Cooling**
- Conduction to customer heat-sink or chassis and natural convection

**Environmental Protection**
- Ruggedizing
- Conformal coating

**Humidity**
- 5 – 95% non-condensing

**MTBF**
- 170,000 hours @ 45°C
- Demonstrated MTBF is significantly higher

**Indicators**
- Green “Output ON” LED visible through the cooling slots

**Control Input**
- None

**Alarm Output**
- Not installed on standard version

**Package/Dimensions (W x H x L)**
- F3: 132 x 64 x 300 mm
- 5.2” x 2.5” x 11.8” including terminal block and flanges
- Mounting holes are clear

**Weight**
- 2 kg (4.4 lbs)

**Connections**
- 12-pole barrier-type terminal block, with 3/8” spacing

**RoHS Compliance**
- Compliant

**Warranty**
- Two years subject to application within good engineering practice

**Terminal Block Pin-out**

The specifications on this data sheet are generic and are subject to change. Enhancements to these specifications can be provided upon request.

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