

90W CONVECTION COOLED



The 90W VES90 with Energy Efficiency Level VI and CoC Tier 2 these desktop/external AC-DC power supplies are designed for high volume/low cost applications.

With class I construction the VES90 are fitted with an IEC320-C14 inlet and have a voltage input range of 90 to 264VAC.

The DC lead is fitted with a 4 pin power mini DIN connector as standard, alternatively a $5.5 \times 2.5 \, \text{mm}$ barrel jack connector can be specified as an option.



Features

- Single outputs from 12V to 48VDC
- ► Energy efficiency level VI
- European CoC tier 2
- <0.15W standby power</p>
- ► China compulsory certification (CCC) qualified
- High power density
- Optional output connector
- ▶ 0°C to +60°C operation
- 1 year warranty

Applications







Industrial Instrumentation

Technology

Dimensions

139.0 x 58.0 x 31.0mm (5.47" x 2.28" x 1.223")

Documentation

For further information click the link or scan the code





Models & ratings

| Model number | Output voltage | Output current | Total regulation | Efficiency ⁽¹⁾ | Output power | |
|--------------|----------------|----------------|------------------|---------------------------|--------------|--|
| VES90US12 | 12.0VDC | 7.50A | | 89% | | |
| VES90US19 | 19.0VDC | 4.74A | 50/ | 89% | 00)4/ | |
| VES90US24 | 24.0VDC | 3.75A | ±5% | 89% | 90W | |
| VES90US48 | 48.0VDC | 1.875A | | 89% | | |

Notes:

- 1. Typical average of efficiencies measured at 25%, 50%, 75% and 100% load and 230VAC input.
- 2. For optional Barrel Jack Connector, 2.5mm inner positive, 5.5mm outer negative, 11mm length add suffix '-B' e.g. VES90PS24-B.

VES90 series



Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions | |
|-----------------------|--------------------------------------|---------------------|---------|-------|-----------------------------|--|
| Input voltage | 90 | | 264 | VAC | | |
| Input frequency | 47 | | 63 | Hz | | |
| Input current | | 1.5/0.6 | | Α | Measured at 115/230VAC | |
| Inrush current | | | 130 | | 230VAC, cold start at +25°C | |
| Power factor | EN61000-3- | EN61000-3-2 Class A | | | | |
| Earth leakage current | | | 3.5 | mA | 264 VAC, 60Hz | |
| No load input power | | | 0.15 | W | | |
| Input protection | T3.15A/250 VAC internal fuse in line | | | | | |

Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions | |
|--------------------------|----------------|---|---------|---------|---|--|
| Output Voltage | 12 | | 48 | VDC | See models & ratings | |
| Initial Set Accuracy | | | ±2 | % | At 50% load | |
| Minimum Load | No minimum lo | oad required | | | | |
| Start Up Delay | | | 3 | s | | |
| Start Up Rise Time | | | 50 | ms | | |
| Hold Up Time | 8/16 | | | ms | Full load and 115 VAC/230 VAC | |
| Line Regulation | | | ±0.5 | % | | |
| Total Regulation | | | ±5 | % | Including initial set accuracy | |
| Transient Response | | | 4 | % | Maximum deviation, recovering to less than 1% within 500µs for 25% step load change | |
| Ripple and Noise | | | 2/1 | % pk-pk | 2% for 12/19/24VDC,1% for 48VDC, 20MHz bandwidth, measured with 20MHz bandwidth and 10μF electrolytic in parallel with 0.1μF ceramic capacitor. | |
| Overshoot | | 5 | | % | At turn on / turn off | |
| Overload Protection | 120 | | 200 | % | | |
| Overvoltage Protection | | | 180 | % | Recycle mains to reset | |
| Short Circuit Protection | Trip and resta | Trip and restart (hiccup), auto resetting | | | | |
| Temperature Coefficient | | 0.04 | | %/°C | | |

General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|---------------------------|---------|-------------------|------------------|---------------|---|
| Efficiency | | 89 | | % | See models and ratings table and curves |
| | 3000 | | | VAC | Input to output |
| Isolation | 1500 | | | VAC | Input to ground |
| | Outpu | t return is conne | ected to input g | round | Output to ground |
| Switching frequency | | 55 | | kHz | At full load |
| Power density | | 96.68 (5.9) | | W/cm³ (W/in³) | |
| Mean time between failure | | >100 | | khrs | MIL-HDBK-217F, 25°C GB |
| Weight | | 370 (0.82) | | g (lb) | |



VES90 series



Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & conditions |
|-----------------------|--|---------|---------|-------|---|
| Operating temperature | 0 | | +60 | °C | Derate from 100% load at +40°C to 50% load at +60°C |
| Storage temperature | -40 | | +70 | °C | |
| Cooling | Natural convection | | | | |
| Operating humidity | 10 | | 90 | % | RH, non-condensing |
| Operating altitude | | | 5000 | m | |
| Shock | IEC68-2-27, 30g, 30ms half sine, 3 times in each of 6 axes | | | | |
| Vibration | IEC68-2-6, 10-500 Hz, 0.25 g 10 mins/sweep, 60 mins for each of 3 axes | | | | |

EMC: Emissions

| Phenomenon | Standard | Test Level | Notes & conditions |
|-------------------|-------------|------------|--------------------|
| Conducted | EN55032 | Level B | |
| Radiated | EN55032 | Level B | |
| Harmonic currents | EN61000-3-2 | Class A | |
| Voltage flicker | EN61000-3-3 | | |

EMC: Immunity

| Phenomenon | Standard | Test Level | Criteria | Notes & conditions |
|------------------------|--------------|-------------------------|----------|--------------------|
| ESD immunity | EN61000-4-2 | ±15kV Air, ±8kV contact | А | |
| Radiated immunity | EN61000-4-3 | 3 V/m | А | |
| EFT/burst | EN61000-4-4 | 2 | А | |
| Surge | EN61000-4-5 | Installation Class 3 | А | |
| Conducted | EN61000-4-6 | 3V | А | |
| Magnetic fields | EN61000-4-8 | 3A/m | А | |
| | | Dip: 30% 500ms | A/B | High line/low line |
| Dips and interruptions | EN61000-4-11 | Dip: 60% 200ms | A/B | High line/low line |
| | | Dip: 100% 5000ms | В | |
| | | Int: 100% 10ms | А | |

Safety approvals

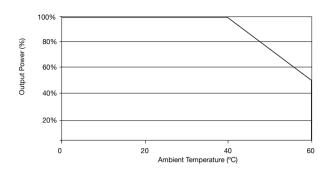
| Certification | Standard | Notes & conditions |
|---------------|--|--------------------|
| UL | UL60950-1, IEC62368-1 | |
| EN | EN60950-1, EN62368-1 | |
| СВ | IEC60950-1 | |
| AU/NZ | AU/NZ 60950.1 | |
| CCC | China Compulsory Certification, GB4943 | |
| CE | Meets all applicable directives | |
| UKCA | Meets all applicable legislation | |



VES90 series

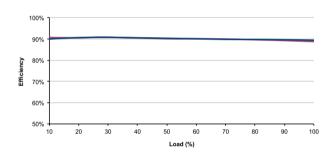


Derating curve

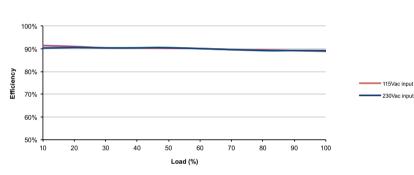


Efficiency curve

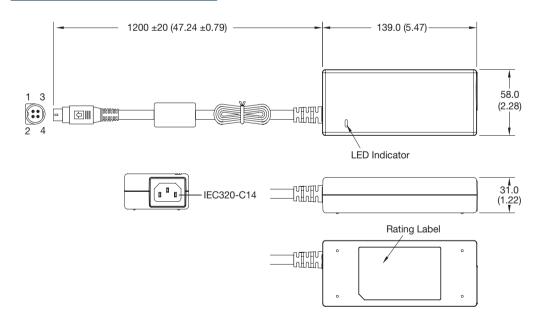
VES90US12



VES90US24



Mechanical details



| Pin | Function | | | | |
|-------|---|--|--|--|--|
| 1 | Output + | | | | |
| 2 | Output + | | | | |
| 3 | Return | | | | |
| 4 | Return | | | | |
| Shell | Connected to output return and input ground | | | | |

Notes:

- 1. All dimensions shown in mm (inches). Tolerance is 0.5 (0.02) maximum, except output cable length.
- 2. Output connector: Power Mini DIN, mates with Kycon KPJX-4S or equivalent.
- 3. Weight: 370g (0.82lbs) approx.