

# 90 Watts

## VEH Series



- Energy Efficiency Level V
- CEC 2008 & EISA 2007 Compliant
- High Power Density
- Single Outputs from 12 V to 24 V
- No Load Input Power <0.5 W
- Optional Output Connector
- Low Cost

### Specification

#### Input

Input Voltage	• 90-264 VAC
Input Frequency	• 47-63 Hz
Input Current	• 1.5 A max at 90 VAC
Inrush Current	• 110 A max at 230 VAC, cold start at 25 °C
Earth Leakage Current	• <1 mA at 230 VAC/50 Hz
Power Factor	• >0.95 at 230 VAC and full load
No Load Input Power	• <0.5 W
Input Protection	• Internal T2.0A/250 V fuse in line

#### Output

Output Voltage	• See table
Initial Set Accuracy	• ±5% at 50% load
Minimum Load	• No minimum load requirement
Hold Up Time	• 10 ms min at 115 VAC, full load
Start Up Delay	• 3 s max
Start Up Rise Time	• 8 ms typical
Transient Response	• 4% maximum deviation, recovering to less than 1% within 500 µs for a 50% step load change
Line Regulation	• ±0.5% max
Load Regulation	• ±5% max
Ripple & Noise	• 1% pk-pk max, 20 MHz bandwidth (see note 1)
Oversvoltage Protection	• See table
Overload Protection	• 120 -180%
Short Circuit Protection	• Continuous (hiccup/trip & restart mode with auto recovery)
Temperature Coefficient	• ±0.04%/°C

#### General

Efficiency	• See table
Energy Efficiency	• Level V
Isolation	• 3000 VAC Input to Output, 1500 VAC Input to Ground, PS12: 500 VDC Output to Ground, PS19/24: Negative output is connected to Ground
Switching Frequency	• PFC: 25-125 kHz, PWM: 60 kHz typical
MTBF	• >160 kHrs to Bell Core iss. 6

#### Environmental

Operating Temperature	• 0 °C to +60 °C derate linearly from 100% load at +40 °C to 50% load at +60 °C,
Storage Temperature	• -10 °C to +85 °C
Operating Humidity	• 5% to 90% RH non-condensing
Storage Humidity	• 5% to 95% RH non-condensing
Shock	• 6 Random drops from 0.7 m with no damage, 50 g for 20 ms in each of 3 axes
Vibration	• 2 g variable frequency from 20 Hz to 30 Hz

#### EMC & Safety

Emissions	• EN55022, level B conducted & radiated
Harmonic Currents	• EN61000-3-2 class A, EN61000-3-2 class C >60% load
Voltage Flicker	• EN61000-3-3
ESD Immunity	• EN61000-4-2, level 3 Perf Criteria A
Radiated Immunity	• EN61000-4-3, 3 V/m Perf Criteria A
EFT/Burst	• EN61000-4-4, level 3 Perf Criteria A
Surge	• EN61000-4-5, installation class 3, Perf Criteria A
Conducted Immunity	• EN61000-4-6, level 2 Perf Criteria A
Magnetic Field	• EN61000-4-8, 3 A/m Perf Criteria A
Dips & Interruptions	• EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms, Perf Criteria A, B, B
Safety Approvals	• EN60950-1:2001, UL/cUL60950-1

Models and Ratings

Output Power	Output Voltage	Output Current	OVP Setting <sup>(2)</sup>	Effeciency <sup>(3)</sup>	Model Number <sup>(4)</sup>
90 W	12.0 V	7.50 A	16.0 V	88%	VEH90PS12†^
90 W	19.0 V	4.74 A	25.0 V	88%	VEH90PS19†^
90 W	24.0 V	3.75 A	32.0 V	89%	VEH90PS24†^

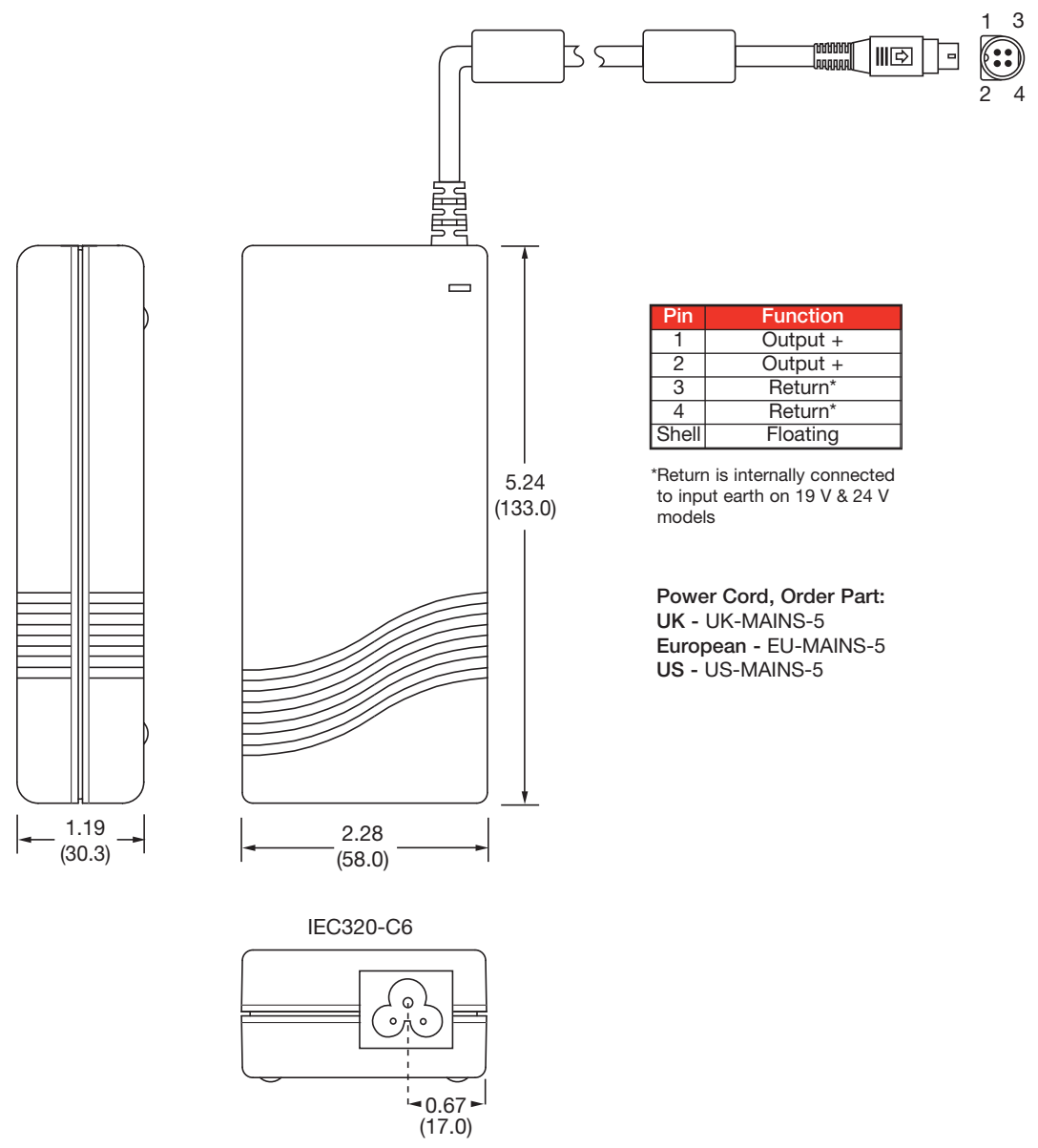
Notes

1. Measured at the output connector with a 0.1 μF ceramic capacitor and a 10 μF electrolytic capacitor.
2. Typical values.
3. Average of efficiencies measured at 25%, 50%, 75% and 100% load and 230 VAC input.
4. For optional barrel jack connector, 2.5 mm inner positive, 5.5 mm outer negative, 11 mm length add suffix '-B' e.g. VEH90PS24-B

† Available from Farnell & element14. See page 28.

^ Available from Newark. See page 28.

Mechanical Details



Notes

1. All dimensions shown in inches (mm). Tolerance is 0.02 (0.5) maximum, except output cable length.
2. Weight 0.82 lbs (370 g) approx.
3. Cable length is 48"±2"(1220 ±50 mm) approx.
4. Output connector (Power Mini Din) mates with Kycon KPJ-4S or equivalent.