

1000 Watts

HCP1000 Series



- High Efficiency up to 90%
- 1U Profile, High Power Density 11.1 W/in³
- Programmable Output Voltage (30%–105%)
- Programmable Output Current (40%–105%)
- Parallel Operation
- Fully Featured Signals & Controls
- 3 Year Warranty

Specification

Input

Input Voltage	• 90-264 VAC (127-370 VDC), see derating curve
Input Frequency	• 47-63 Hz
Input Current	• 12.0 A/5.0 A typical at 115/230 VAC
Inrush Current	• 27.0 A/54.0 A typical at 115/230 VAC
Power Factor	• 0.99/0.98, typical at 115/230 VAC full load
Earth Leakage Current	• <1.0 mA at 240 VAC/60 Hz

Output

Output Voltage	• See model table
Output Trim	• $\pm 5.0\%$ by potentiometer
Output Voltage Program	• 30-105% of rated output
Output Current Program	• 40-105% of rated output
Initial Set Accuracy	• $\pm 1\%$
Minimum Load	• No minimum load required
Start Up Delay	• 800 ms maximum
Start Up Rise Time	• 100 ms maximum at full load
Hold Up Time	• 16 ms typical at 230 VAC and full load
Line Regulation	• $\pm 0.5\%$
Load Regulation	• V1: $\pm 0.5\%$, 5 V standby output: $\pm 3\%$
Transient Response	• 1% max deviation for a 25% step load change
Ripple & Noise	• 150 mV pk-pk all voltages, see note 1
Overvoltage Protection	• Tracks output voltage. 115-135% of set voltage. Recycle AC to reset
Overtemperature Protection	• Primary and secondary heatsinks monitored. Output shuts down, auto recovers
Overload Protection	• 105-125% output shuts down, recycle AC to reset
Short Circuit Protection	• Output latches off, recycle input AC to reset
Temperature Coefficient	• $\pm 0.02\%/^{\circ}\text{C}$ (0-50 $^{\circ}\text{C}$)
Remote Sense	• Compensates for 0.5 V max voltage drop, If remote sense is not required, local sense must be used
Enable	• Output must be enabled. See application notes. Power supply is shipped with enable links fitted.
Current Share	• 5 supplies can share within 5%
Standby Output	• 5 V at 0.5 A, present whenever AC is applied

General

Efficiency	• See model table
Isolation	• 3000 VAC Input to Output, 1500 VAC Input to Ground, 500 VDC Output to Ground
Isolation Resistance	• 100 M Ω /500 VDC
Switching Frequency	• PFC 100 kHz typical, PWM 65 kHz typical
Power Density	• 11.1 W/in ³
Signals & Controls	• Enable, Current Share, V Program, I Program, 5 V Standby, PWM Switching
MTBF	• 140 kHrs to MIL-HDBK-217F at 25 $^{\circ}\text{C}$

Environmental

Operating Temperature	• -25 $^{\circ}\text{C}$ to 60 $^{\circ}\text{C}$, see derating curve
Cooling	• Internal fan fitted. Speed increases with load and internal temperature
Operating Humidity	• 20-90% R.H. non-condensing
Storage Temperature	• -40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
Storage Humidity	• 10-95% R.H.
Vibration	• 10-500 Hz, 5g 10 min/cycle, 60 min period for each axis. Compliant to IEC68-2-16, IEC 68-2-64

EMC & Safety

Emissions	• EN55022 class B conducted & radiated
Harmonic Currents	• EN61000-3-2 class A
Voltage Flicker	• EN61000-3-3
ESD Immunity	• EN61000-4-2, ± 4 kV contact, ± 8 kV air discharge, Perf Criteria A
Radiated Immunity	• EN61000-4-3, 3 V/m, Perf Criteria A
EFT/Burst	• EN61000-4-4, level 2, Perf Criteria A
Surge	• EN61000-4-5, installation class 3, Perf Criteria A
Conducted Immunity	• EN61000-4-6, 3 V, Perf Criteria A
Magnetic Field	• EN61000-4-8, 1 A/m, Perf Criteria A
Dips & Interruptions	• EN61000-4-11, 30% 10 ms, 60% 100 ms, >95% 5000 ms, Perf Criteria A, B, B
Safety Approvals	• UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

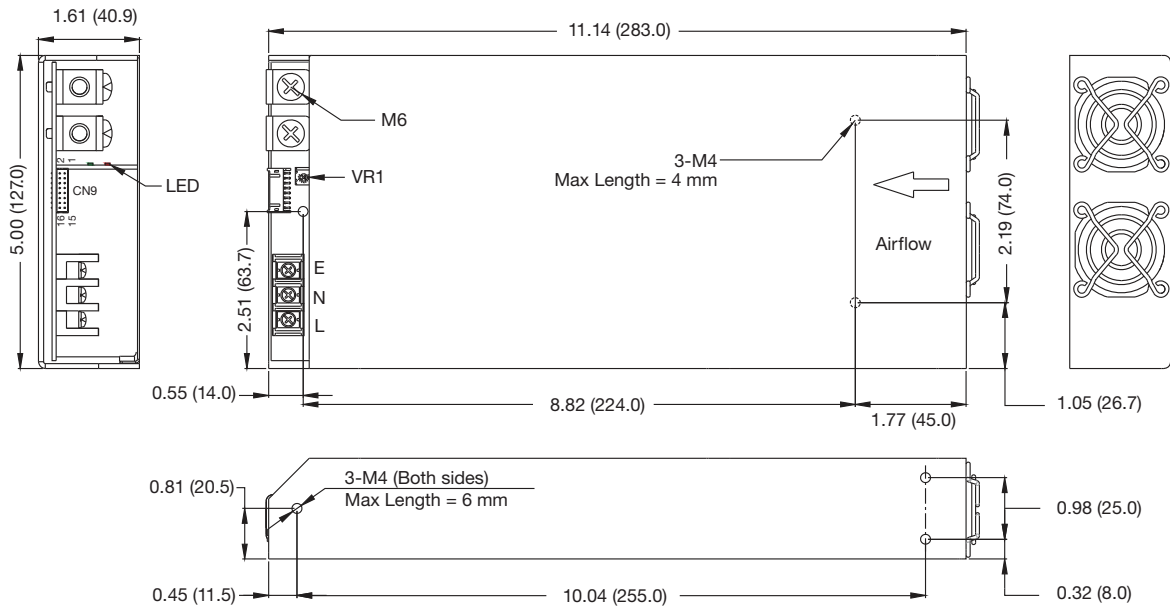
Models and Ratings

Output Power	Output Voltage V1	OVP Range V1 ⁽²⁾	Output Current		Standby Output	Efficiency ⁽³⁾	Model Number
			Min	Max			
750 W	12.0 VDC	13.80-16.20 V	0.0 A	62.0 A	5 V/0.5 A	87%	HCP1000PS12
750 W	15.0 VDC	17.25-20.25 V	0.0 A	50.0 A	5 V/0.5 A	88%	HCP1000PS15
960 W	24.0 VDC	27.60-32.40 V	0.0 A	40.0 A	5 V/0.5 A	89%	HCP1000PS24
1000 W	27.0 VDC	31.05-36.45 V	0.0 A	37.0 A	5 V/0.5 A	89%	HCP1000PS27
1000 W	48.0 VDC	55.20-64.80 V	0.0 A	21.0 A	5 V/0.5 A	90%	HCP1000PS48

Notes

1. Ripple & noise are measured with 20 MHz bandwidth and using 12" twisted pair-wire terminated with 0.1 μF & 47 μF capacitors in parallel.
2. Range given for nominal output voltage. OVP setting will track programmed output voltage.
3. Measured with 230 VAC input and full load.

Mechanical Details



Mating connector CN9: PHDR-16VS housing, PHD-002T-P05 contacts

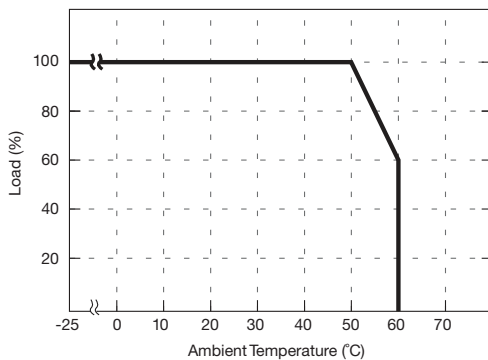
Notes

1. All dimensions are in inches (mm).
2. Weight 4.1 lb (1.9 kg)

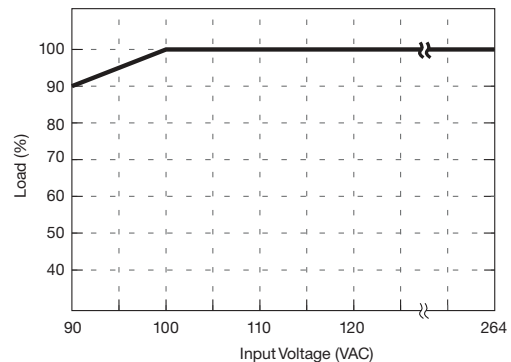
CN9 (JST S16B-PHDSS or equivalent) Control Pin Connections					
Pin	Function	Description	Pin	Function	Description
1	VS+	Remote Sense (+)	9	EN-	Enable ON/OFF (-)
2	VO+	Local Sense (+)	10	GND	Signal Ground
3	VS-	Remote Sense (-)	11	PWM	PWM is Switching
4	VO-	Local Sense (-)	12	GND	Signal Ground
5	5 V SB	5 V Standby Output (+)	13	VCI	V Program
6	5 V SB	5 V Standby Output (+)	14	GND	Signal Ground
7	EN+	Enable ON/OFF (+)	15	ACI	I Program
8	GND	Signal Ground	16	CS	Current Share

Derating Curve

Thermal Derating Curve



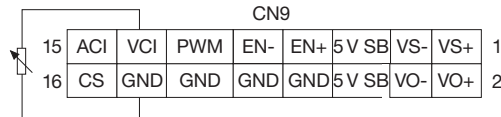
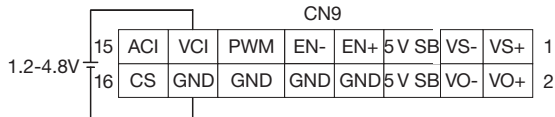
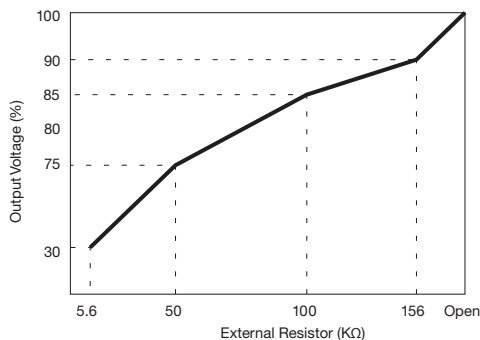
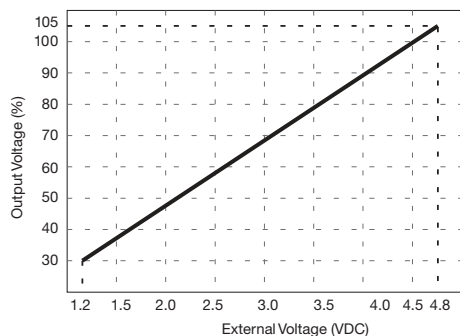
Input Derating Curve



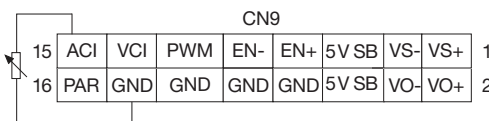
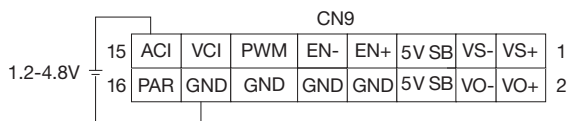
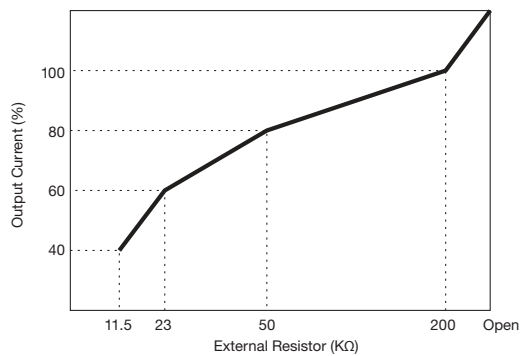
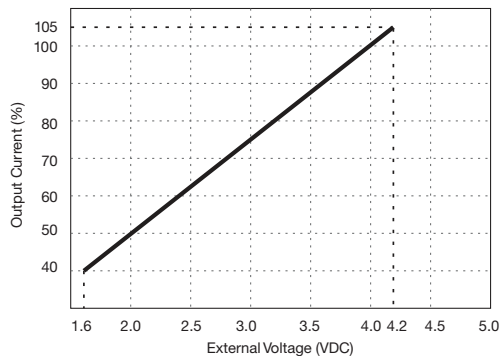
LED Status

LED Status	Output Status
Solid (Green)	DC Output OK
Slow Blink (Green)	Output Not Enabled
Fast Blink (Red)	Over Voltage
Solid (Red)	Over Loaded
	Short Circuited
	Under Voltage (<70% of output voltage)
Slow Blink (Red)	Over Temperature
Intermittent Blink (Red)	Fan Fail
Short & Long Blink (Red)	5 V Standby Failure

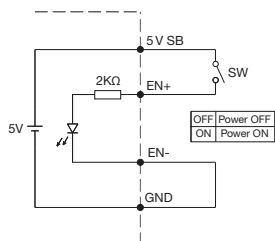
Output Voltage Program



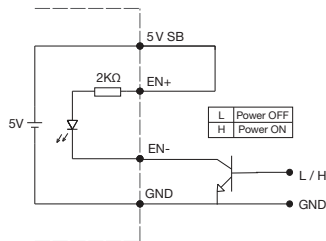
Output Current Program



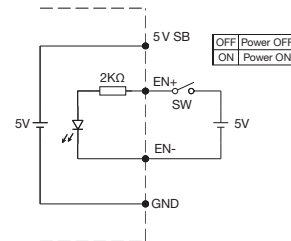
Remote Enable



(A) Using internal 5V standby

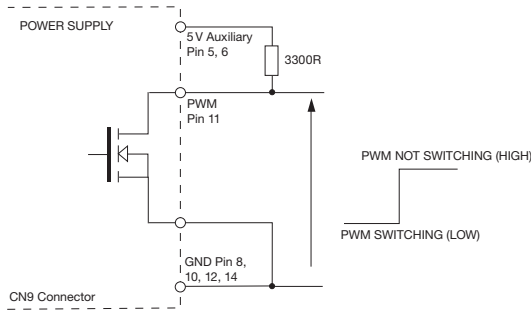


(B) Using external transistor



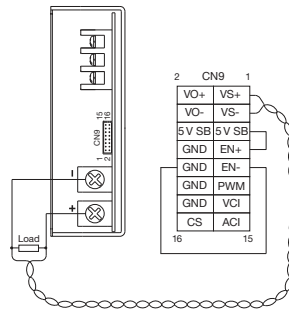
(C) Using external voltage source

PWM Signal

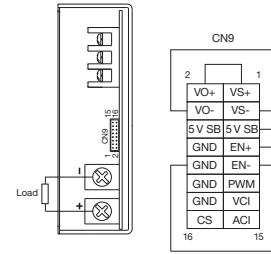


Open drain signal, low when PSU turns on
 Maximum sink current: 20 mA
 Maximum drain voltage: 40 V

Remote Sense

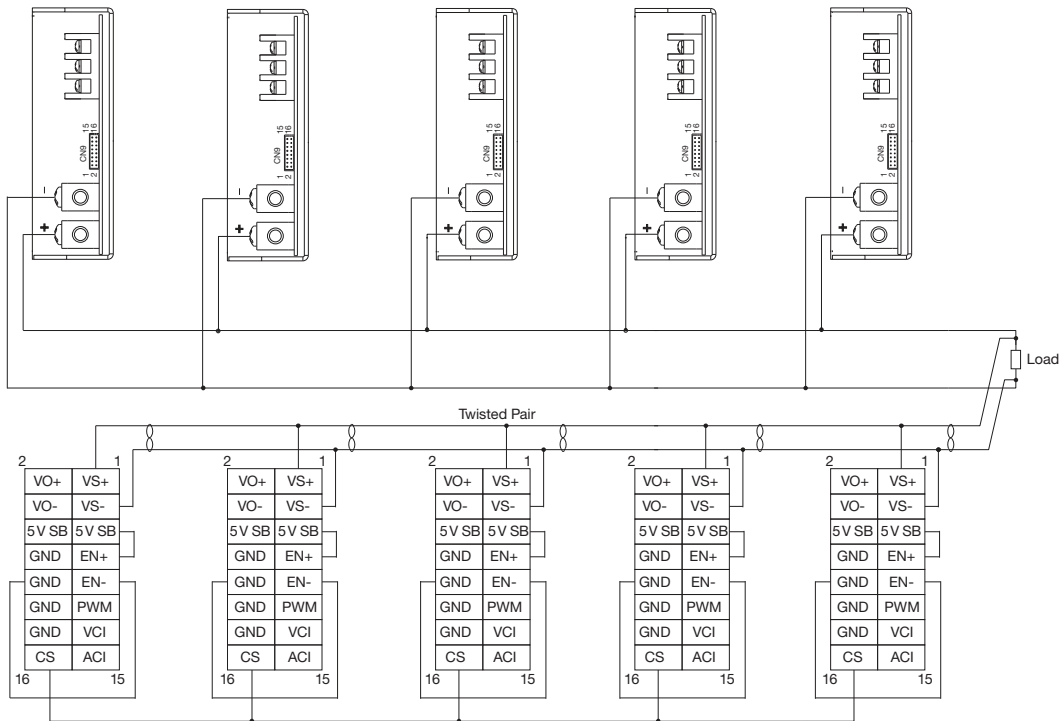


Local Sense

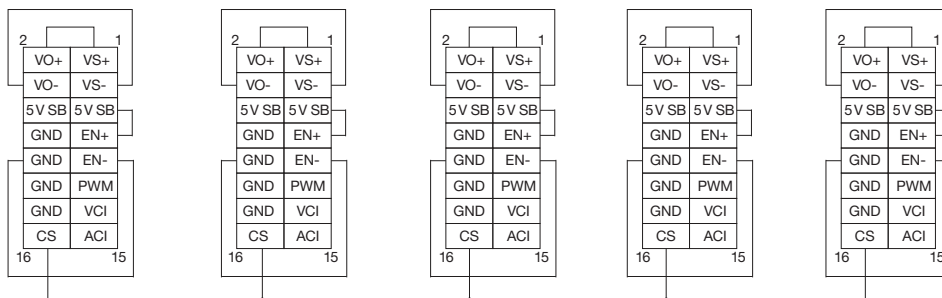


Must be used if remote sense is not required.

Current Share



Current Sharing with Remote Sensing



Current Sharing with Local Sensing

Notes

In parallel operation, it is possible that only one unit will operate if the load is less than 5% of the combined rated output load. It is possible to have more than five units in parallel, contact sales for details.