1500 Watts
HPU1K5 Series



- Medical Safety Approvals (–M Versions)
- Variable Fan Speed To Reduce Audible Noise
- –20 °C to +70 °C Operation
- AC OK, DC OK, Inhibit & 5 V Standby Supply
- Fan Fail & Overtemperature Signals
- SEMI F47 Compliant
- 3 Year Warranty

Specification

Input

Input Voltage	• 85-264 VAC, see derating curve
Input Frequency	• 47-63 Hz
Input Current	• 13 A/6.5 A typical at 115/230 VAC
Inrush Current	• 35 A maximum at 264 VAC
Power Factor	• >0.9
Earth Leakage Current	• 1.1 mA max at 264 VAC 60Hz, <500 µA at 264 VAC max, <300 µA at 130 VAC (-M)
Input Protection	• Internal T20 A/250 VAC fuse in line and neutral

Output

Output Voltage	• See model table
Output Voltage Trim	• Via potentiometer or external voltage, see model tables
Initial Set Accuracy	• ±1% of nominal with 50% load
Minimum Load	• No minimum load required
Line Regulation	• ±0.5% maximum
Load Regulation	• V1: ±0.5%, V2: ±5%
Start Up Delay	• 1 s typical
Over/Undershoot	• 0.5% typical
Transient Response	• 4% deviation, recovery to within 2% in 500 µs for 50-75-50% load change
Ripple & Noise	• 24-48 V models: 1% max pk-pk 12 V models: 2% max pk-pk V Standby: 3% max pk-pk, 20 MHz bandwidth
Overvoltage Protection	• 115-140% of V1 nominal, recycle input AC to reset
Overtemperature Protection	• Protects the unit against overtemperature. Auto restart
Overcurrent Protection	• 110 - 140% V1, V Standby power limited
Short Circuit Protection	• Continuous, trip and restart (hiccup mode)
Temperature Coefficient	• 0.02%/°C (after 20 minute warm up)
Remote Sense	• Compensates for 0.5 V total drop
Current Share	• Share upto 8 units maximum, units share current within 10% of each other at full load.

General

Efficiency	• 90% typical
Isolation	• 4000 VAC Input to Output, 1500 VAC Input to Ground, 500 VDC Output to Ground
Switching Frequency	• 70 kHz (PFC), 130 kHz (main converter) typical
Power Density	• 18 W/in^3
Signals	• AC OK, DC OK, Inhibit, Fault (see Signals page)
MTBF	• 470 kHrs to Telecordia SR-332 at 25 °C, GB

Environmental

Operating Temperature	• -20 °C to +70 °C, derate linearly from +50 °C at 2.5 %/°C to 50% load at +70°C
Cooling	• Internal load dependant variable speed fans
Operating Humidity	• 95% RH, non-condensing
Storage Temperature	• -40 °C to +85 °C
Operating Altitude	• 3000 m
Shock	• ±3 shocks in each axis (total 18 shocks) 30 g 11 ms (half sine). Compliant with EN60068-2-27.
Vibration	• 2 g 10-500 Hz 10 sweeps. Compliant with EN60068-2-6.

EMC & Safety

Emissions	• EN55011 level A conducted & radiated, EN55022 level A conducted & radiated
Immunity	• Compliant with EN61204-3:2000 high severity levels
Harmonic Currents	• EN61000-3-2 class A, EN61000-3-2 class C for loads ≥10%
Voltage Flicker	• EN61000-3-3
ESD Immunity	• EN61000-4-2, level 3, Perf Criteria A
Radiated Immunity	• EN61000-4-3, level 3, 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 3, Perf Criteria A
Dips & Interruptions	• EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms, Perf Criteria A, B, B, EN60601-1-2, 30% 500 ms, 60% 100 ms, 100% 10 ms, 100% 5000 ms, Perf Criteria A, A, A, B
Safety Approvals	• IEC60950-1 CB Report, CSA-C22.2, No. 60950-1-07, UL60950-1, TUV EN60950-1, SEMI F47 IEC60601-1 CB Report, UL60601-1, TUV EN60601-1 (-M)

Models and Ratings

HPU1K5

Output Power[1]	Output Voltage V1	Voltage Adj V1	Output Current V1		Standby Supply V2	Model Number
			<180 VAC	>180 VAC		
1200 W	12.0 VDC	11-14 V	100 A	100 A	5 V/1 A	HPU1K5PS12†^
1500 W	24.0 VDC	22-28 V	50 A	63 A	5 V/1 A	HPU1K5PS24†^
1500 W	48.0 VDC	45-52 V	25 A	31 A	5 V/1 A	HPU1K5PS48†^

Notes

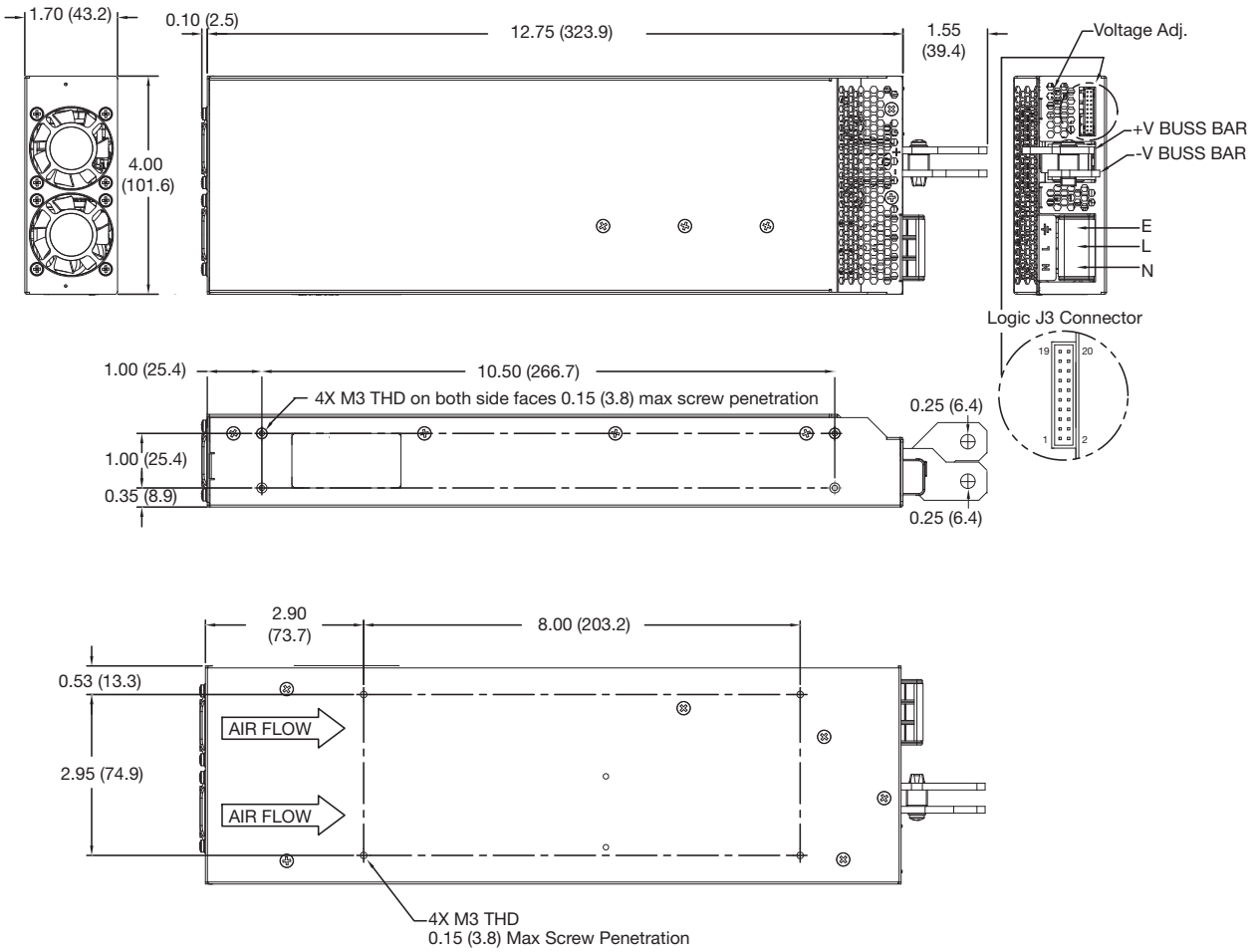
1. See derating curves.

2. For medical version, add suffix '-M' to model number.

† Available from Farnell & element14. See pages 284-290.

^ Available from Newark. See pages 291-296.

Mechanical Details



Logic Connector: J3, JST, PN S20B-PHDSS (LF) SN)					
Pin	Function	Pin	Function	Pin	Function
1	+ Sense	8	NC	15	DC OK
2	+ Sense	9	Inhibit	16	NC
3	- Sense	10	NC	17	Signal GND
4	- Sense	11	Fault	18	NC
5	Current Share	12	NC	19	5 V Standby Rtn (V2)
6	Current Share	13	AC OK	20	5 V Standby (V2)
7	V Trim	14	NC		

Mates with JST PN PHDR-20VS, Crimp contacts JST PN SPHD-00IT-P0.5

Notes

1. All dimensions are in inches (mm).

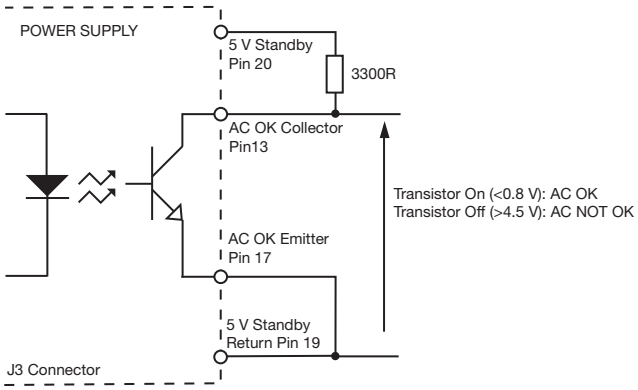
2. Weight 5.2 lb (2.35 kg)

Signals

AC OK/Power Fail

AC OK is an isolated signal providing a minimum of 3 ms warning of loss of output regulation. The signal is fully isolated and the collector and emitter must be connected externally.

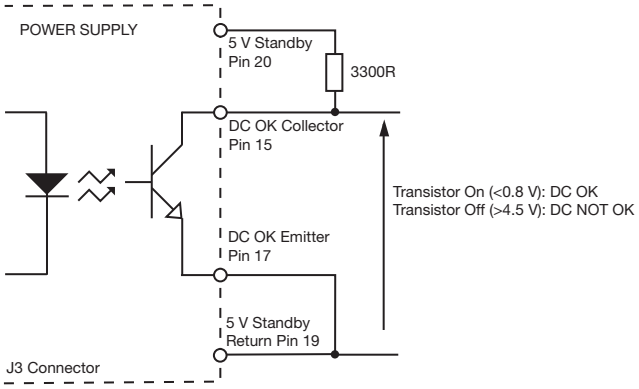
Maximum sink current 2 mA, maximum voltage 20 V.



DC OK

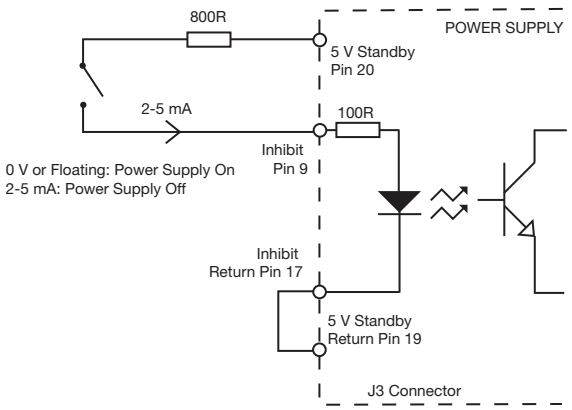
DC OK is an isolated signal providing warning that the output voltage has fallen below 90% of nominal. The signal is fully isolated and the collector and emitter must be connected externally.

Maximum sink current 2 mA, maximum voltage 20 V.



Inhibit

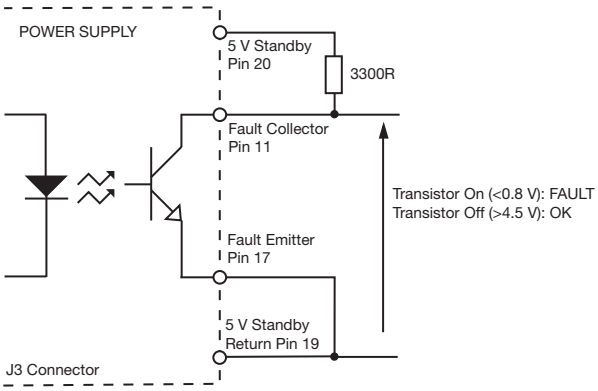
Inhibit is an isolated control signal which can turn the power supply and fans off by supplying 2 to 5 mA into the pin.



Fault

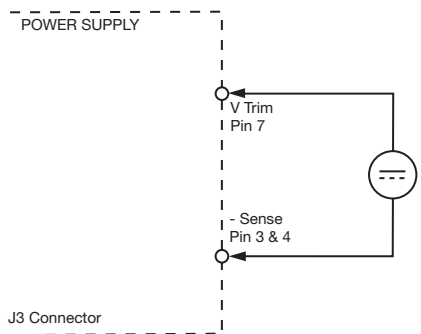
Fault is an isolated signal providing warning of output voltage below 90% of nominal, fan fault or overtemperature. The signal is fully isolated and the collector and emitter must be connected externally.

Maximum sink current 2 mA, maximum voltage 20 V.



V Program

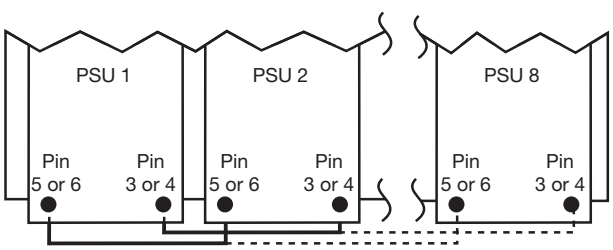
V Program allows remote voltage adjustment within the range ±10%



V Program	V Output
0 V	-10%
5 V	+10%
Open Circuit	Factory Set Voltage

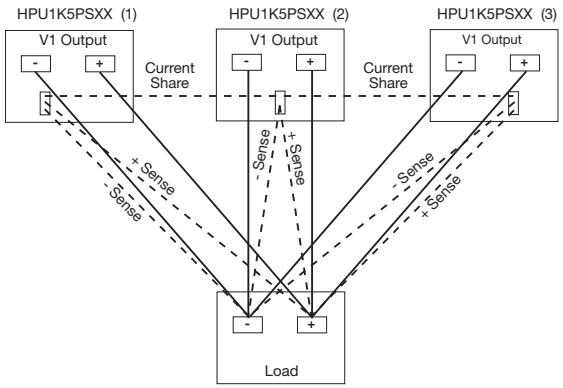
Current Share

Connecting pins 5 or 6 and 3 or 4 of like voltage units (8 maximum) will force the current to share between the outputs. Units share current within 10% of each other at full load. Derate output to 90% of total combined load.

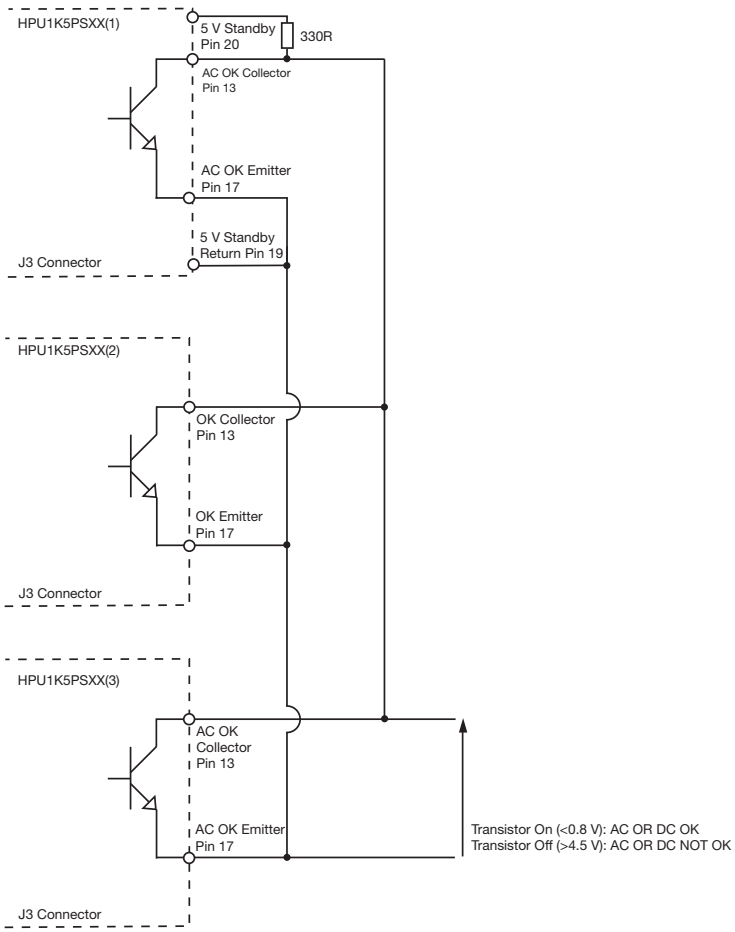


Signals

Parallel Load & Current Share Connections

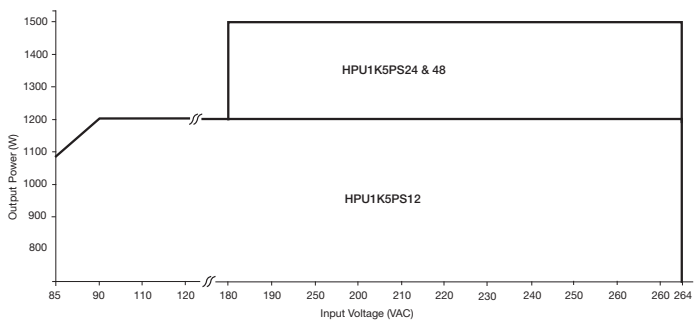


Parallel AC OK Connection
(DC OK follows same format)



Derating Curves

Input Derating Curve



Thermal Derating Curve

