

650-1200 Watts

MHP Series



- Rugged Construction
- Medical Safety Approvals
- Variable Fan Speed for Noise Reduction
- -20 °C to +70 °C Operation
- AC OK, Remote On/Off and Active Current Share
- 5 V Standby
- 3 Year Warranty

Specification

Input

Input Voltage	650 W: 80-264 VAC, derate output power 10% <90 VAC, and 20% <85 VAC, 1000 W: 85-264 VAC, derate output power 10% <90 VAC
Input Frequency	47-63 Hz
Input Current	650 W: 6.5 A at 115 VAC typical, 3.2 A at 230 VAC full load, 1000 W: 10.9 A at 115 VAC typical, 5.1 A at 230 VAC full load
Inrush Current	650 W: 40 A max at 264 VAC 1000 W: 60 A max at 264 VAC
Power Factor	>0.9
Earth Leakage Current	250 μA max at 264 VAC/60 Hz
Input Protection	650 W: T16 A/250 V, 1000 W: T20 A/250 V internal fuse in line and neutral

Output

Output Voltage	12-48 VDC (see tables)
Output Voltage Trim	$\pm 10\%$ V1
Initial Set Accuracy	650 W: $\pm 1\%$ V1, $\pm 5\%$ V3, 1000 W: $\pm 1\%$ V1, $\pm 5\%$ V2
Minimum Load	No minimum load required
Start Up Delay	500 ms max
Start Up Rise Time	50 ms typical
Hold Up Time	20 ms minimum
Drift	$\pm 0.2\%$ after 20 min warm up
Line Regulation	$\pm 0.5\%$
Load Regulation	650 W: $\pm 1\%$ V1, $\pm 5\%$ V3, 1000 W: $\pm 1\%$ V1, $\pm 5\%$ V2
Transient Response	4% max. deviation, recovery to within 1% in 500 μs for a 50-75-50% load change
Ripple & Noise	1% pk-pk V1, 20 MHz bandwidth
Overvoltage Protection	115-145% Vnom, recycle input to reset
Overload Protection	110-140%, V1 only
Overtemperature Protection	Auto reset
Short Circuit Protection	Constant current characteristic
Temp. Coefficient	0.05% / °C
Remote Sense	Compensates for 0.5 V total voltage drop
Remote On/Off	Uncommitted isolated optocoupler diode, powered diode inhibits V1 and fan supply⁽¹⁾
Current Share	Single wire current share⁽¹⁾

General

Efficiency	85% typical
Isolation	4000 VAC In to Out, 2 x MOPP, 1500 VAC In to Earth, 1 x MOPP, 500 VDC Out to Earth
Switching Frequency	PFC 70 kHz, main converter 200 kHz, standby 130 kHz typical
Power Density	650 W: 8.2 W/in³, 1000 W: 8.9 W/in³
Signals	AC OK, remote on/off, current share⁽¹⁾
MTBF	260 KHrs to MIL-HDBK-217F at 25 °C, GB

Environmental

Operating Temperature	-20 °C to +70 °C, derate linearly from +50 °C at 2.5% / °C to 50% at +70 °C, 1000 W: -40 °C start up
Cooling	650 W: Forced cooled, '-TF' & '-EF' models have integral dual voltage level fan, which is load dependant, U Channel requires 5.5 m/s minimum airflow, 1000 W: Forced cooled via integral quad voltage level fan which is load dependant⁽¹⁾
Operating Humidity	95% RH, non-condensing
Storage Temperature	-40 °C to +85 °C
Operating Altitude	3000 m
Shock	30 g pk, half sine, 6 axes
Vibration	2 g rms, 5 Hz to 500 kHz, 3 axes

EMC & Safety

Emissions	EN55022/EN55011 class B conducted EN55022/EN55011 class A radiated
Harmonic Currents	EN61000-3-2 class A, 650 W: class C for loads $\geq 20\%$ 1000 W: class C for loads $\geq 10\%$
Voltage Flicker	EN61000-3-3
ESD Immunity	EN61000-4-2, level 3 contact, level 3 air, 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. Consult longform for 115 VAC operation
Safety Approvals	IEC60601-1 CB report, CSA 22.2 No.60601-1, ANSI/AAMI ES60601-1, TUV, EN60601-1 Including Risk Management

⁽¹⁾ See longform datasheet for more information

Models and Ratings

MHP650 **XP**

Output Voltage V1	Output Current V1	Fan Supply V2 ⁽⁴⁾	Standby Supply V3	Output Power ⁽³⁾	Model Number ^(1,2)
12 V	50 A	12 V / 0.5 A	5 V / 0.2 A	607 W	MHP650PS12-EF
15 V	40 A	12 V / 0.5 A	5 V / 0.2 A	607 W	MHP650PS15-EF
24 V	27 A	12 V / 0.5 A	5 V / 0.2 A	655 W	MHP650PS24-EF
28 V	23 A	12 V / 0.5 A	5 V / 0.2 A	655 W	MHP650PS28-EF
36 V	18 A	12 V / 0.5 A	5 V / 0.2 A	655 W	MHP650PS36-EF
48 V	13.5 A	12 V / 0.5 A	5 V / 0.2 A	655 W	MHP650PS48-EF

Notes

1. For top fan version replace '-EF' in model number with '-TF', e.g.

MHP650PS12-TF

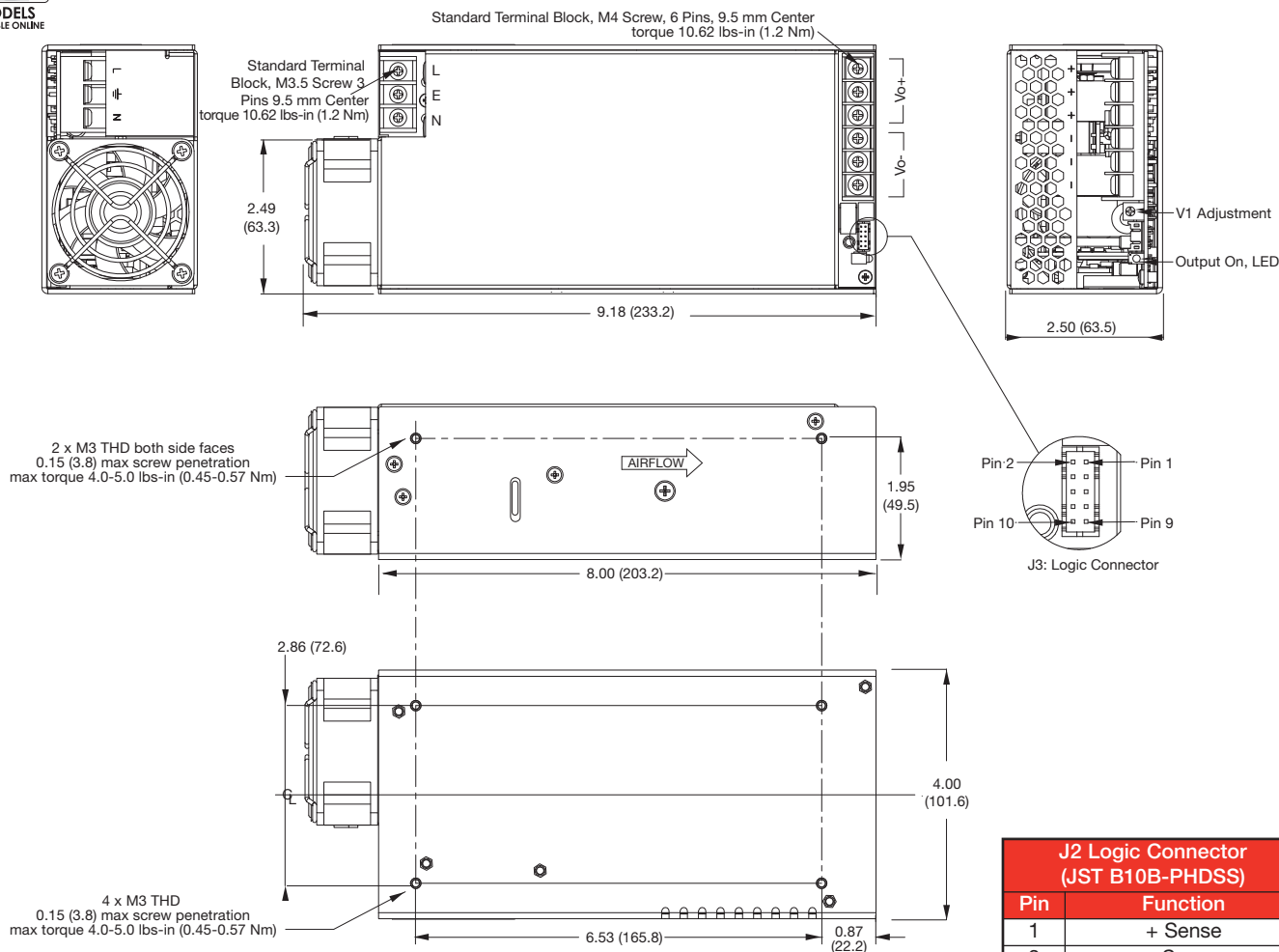
2. For U Channel version remove suffix.

3. U Channel models require a minimum of 5.5 m/s airflow from the system.

4. Not available for '-TF' and '-EF' models as used by integral fan.

Mechanical Details

End Fan (See Longform Datasheet for U-Channel Version)



Notes

1. Dimensions shown in inches (mm).

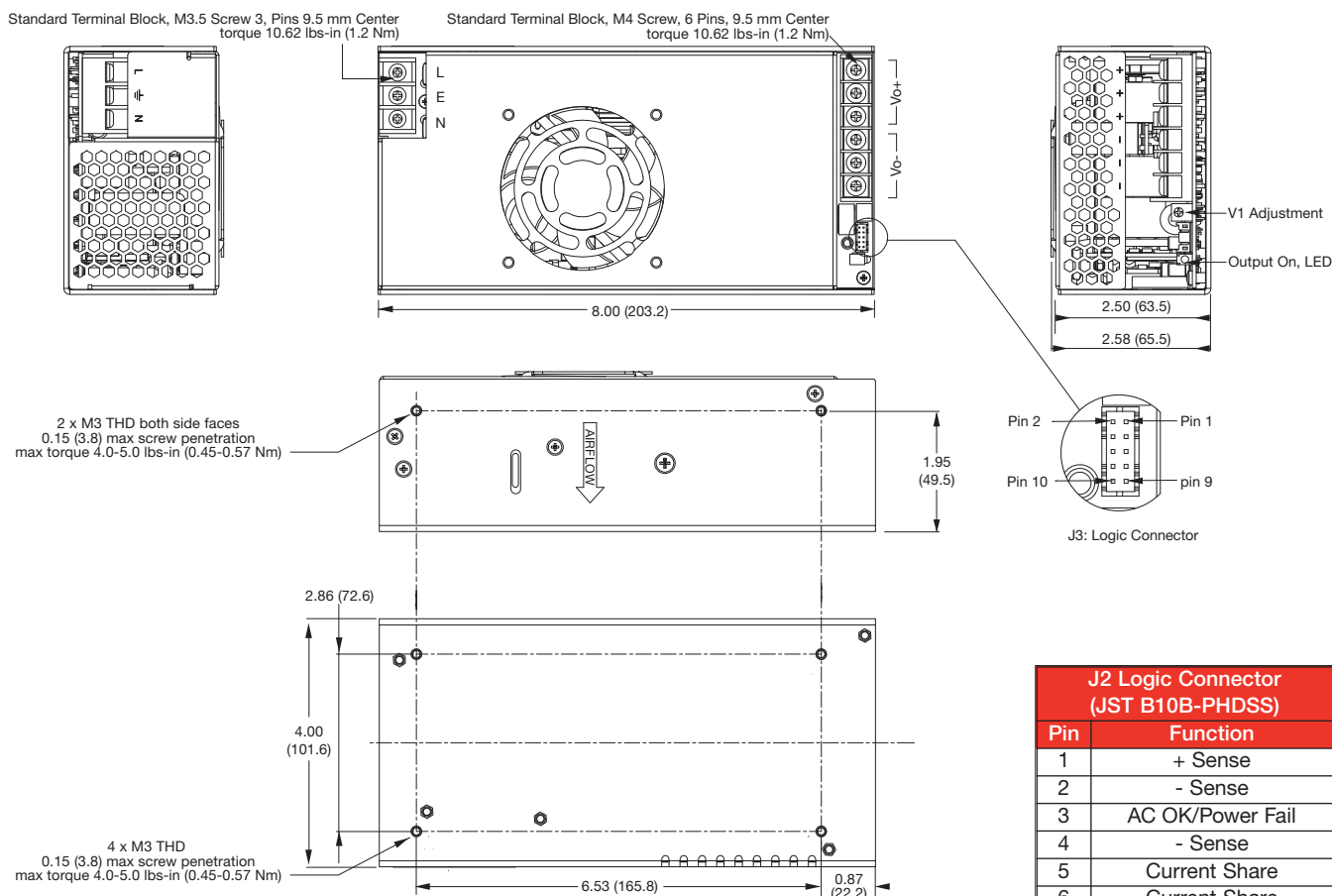
2. Weight: 2.8 lb (1.27 kg).

3. J2 Mating plug: JST part no. PHDR-10VS,
contact: 26-22 AWG JST part no. SPHD-001T-P0.5.



Mechanical Details

Top Fan (Suffix -TF)



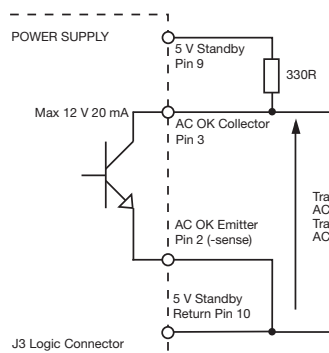
Notes

1. Dimensions shown in inches (mm).
2. Weight: 2.8 lb (1.27 kg).

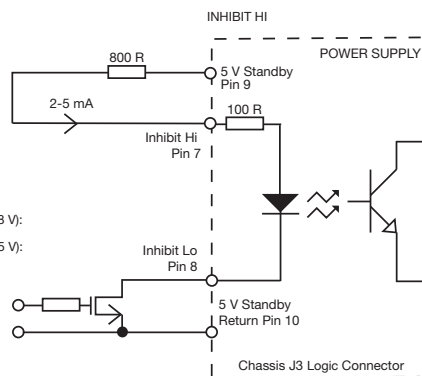
3. J2 Mating plug: JST part no. PHDR-10VS, contact: 26-22 AWG JST part no. SPHD-001T-P0.5.

Signals

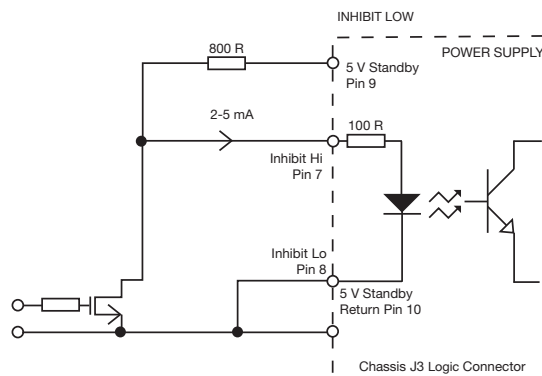
AC OK/Power Fail



Remote On/Off (Inhibit)



Signal High: Power Supply OFF
Low or Floating: Power Supply ON



Signal High: Power Supply ON
Low or Floating: Power Supply OFF

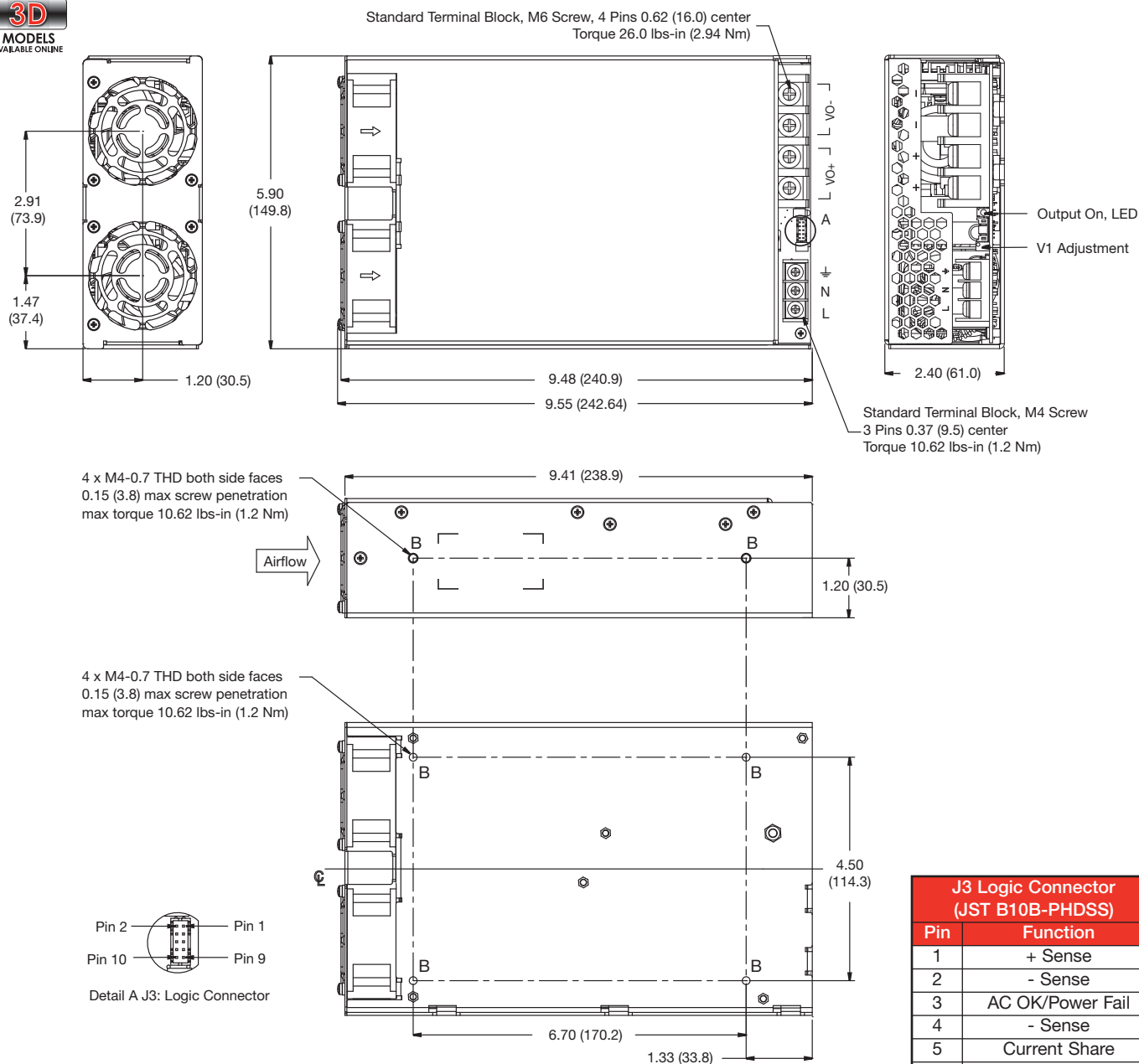
For U Channel and Thermal Considerations please see longform datasheet.

Models and Ratings

MHP1000 **XP**

Output Voltage V1	Output Current V1		Standby Supply V2	Output Power		Model Number
	<180 VAC	>180 VAC		<180 VAC	>180 VAC	
12 V	83.0 A		5 V / 1.0 A	1000 W		MHP1000PS12
15 V	67.0 A		5 V / 1.0 A	1010 W		MHP1000PS15
24 V	42.0 A	50.0 A	5 V / 1.0 A	1013 W	1200 W	MHP1000PS24
28 V	36.0 A	43.0 A	5 V / 1.0 A	1013 W	1200 W	MHP1000PS28
36 V	28.0 A	34.0 A	5 V / 1.0 A	1013 W	1200 W	MHP1000PS36
48 V	21.0 A	25.0 A	5 V / 1.0 A	1013 W	1200 W	MHP1000PS48

Mechanical Details



Notes

1. Dimensions shown in inches (mm).
2. Weight: 4.6 lb (2.08 kg)

3. J3 Mating plug: JST part no. PHDR-10VS, contact: 26-22 AWG JST part no. SPHD-001T-P0.5.