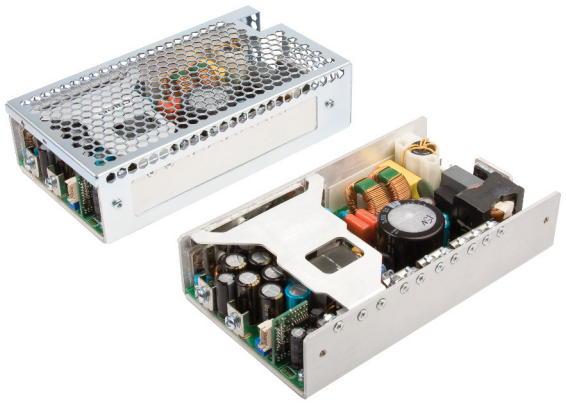
CMH250 Series

AC-DC Power Supplies

XP Power

250 Watts

- 250 W Convection-cooled
- Industry Standard 4"x 7"Package
- 80 VAC to 300 VAC Input
- 5V/2A Standby & Signals Set (optional)
- IT & Medical Safety Approvals
- 3 Year Warranty



The universal AC input CMH250 provides 250W of convection cooled output power in a 7" x 4" package, over the temperature range -40°C to +50°C with derating to +70°C. Approved for IT and Medical and with a feature set including a 5V/2 A standby output and a range of analog signals, the CMH250 is ideal for a wide range of applications where convection-cooling is desirable.

Dimensions:

CMH250:
7.00 x 4.00 x 1.57" (178 x 101.6 x 39.2 mm)
CMH250-C:
7.39 x 4.06 x 1.92" (187.8 x 103.1 x 48.9 mm)

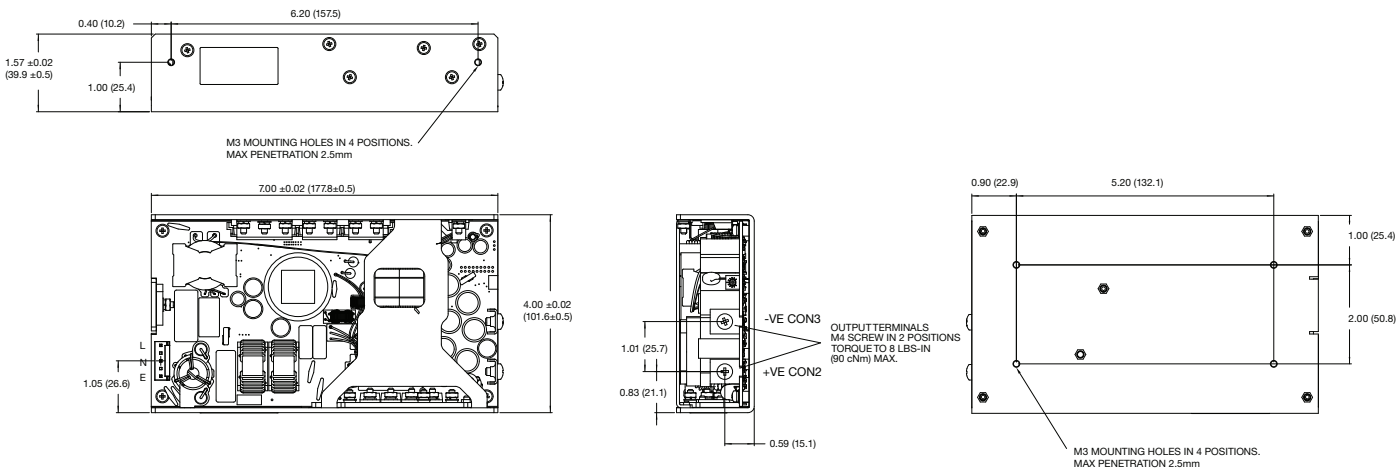
Models & Ratings

Output Voltage 1	Output Current V1	Standby Supply V2	Fan Supply V3 (optional)	Output Power	Model Number (1,2,3)
12 V	21.0 A	5.0 V / 2 A	12.0 V / 0.6 A	250 W	CMH250PS12
15 V	16.7 A	5.0 V / 2 A	12.0 V / 0.6 A	250 W	CMH250PS15
24 V	10.4 A	5.0 V / 2 A	12.0 V / 0.6 A	250 W	CMH250PS24
28 V	8.9 A	5.0 V / 2 A	12.0 V / 0.6 A	250 W	CMH250PS30
48 V	5.2 A	5.0 V / 2 A	12.0 V / 0.6 A	250 W	CMH250PS48

Notes

1. Add suffix '-01' for 5V/2A standby & analog signal set, e.g. CMH250PS12-01
2. Add suffix '-C' for covered version, e.g. CMH250PS12-C or for covered versions with 5V/2A standby & analog signals set add '-01C', e.g. CMH250PS12-01C (Derating will be applicable and is under evaluation)
3. Add suffix '-50' for 5V/2A standby & PMBus signal set, e.g. CMH250PS12-50

Mechanical Details



Input

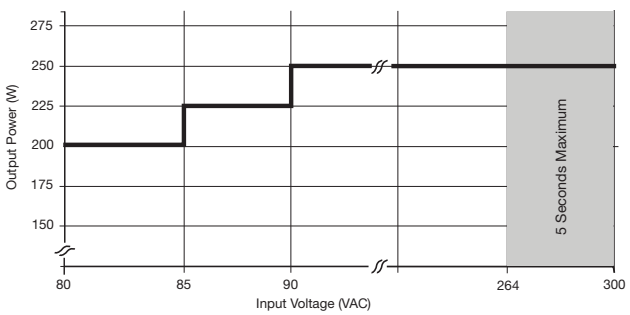
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage - Operating	80	115/230	264	VAC	Derate output power < 90 VAC. See fig. 1
Input Voltage - Fault Condition			300	VAC	5 seconds max
Input Frequency	47	50/60	63	Hz	Agency approval, 47-63 Hz
Power Factor		>0.95			EN61000-3-2 class A compliant
					EN61000-3-2 class C for loads ≥50%
Input Current - Full Load		2.6/1.3		A	115/230 VAC
No Load Input Power		1.3		W	All models, when optional inhibit activated
		3.7		W	CMH250PS12 - 115V AC
		4.2		W	CMH250PS12 - 230V AC
		4.0		W	CMH250PS24 - 115V AC
		4.8		W	CMH250PS24 - 230V AC
		3.5		W	CMH250PS48 - 115V AC
		3.0		W	CMH250PS48 - 230V AC
Inrush Current		30	40	A	230 VAC
Earth Leakage Current		100/200	250	µA	Typ. 115/230 VAC 50 Hz, Max 264 VAC 60 Hz
Input Protection	F10 A/250 V internal fuse in both AC lines				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	12		48	VDC	See Models and Ratings table
Initial Set Accuracy			±1	%	50% load, 115/230 VAC
Output Voltage Adjustment			±10	%	
Minimum Load	0			A	
Start Up Delay		1.0	2.0	s	115/230 VAC full load from input AC turn on
Hold Up Time	20	30		ms	90 VAC
Drift			±0.2	%	After 20 min warm up
Line Regulation			0.5	%	
Load Regulation			0.5	%	
Transient Response			<4	%	Recovery within 1% in less than 500 µs for a 50-75%-50% load change
Ripple & Noise			1	% pk-pk	20 MHz bandwidth
Overvoltage Protection	115		140	%	Vnom DC. Output 1, recycle input to reset
Overload Protection	110		150	%	Approx. constant current, see fig. 2 characteristic V1
Short Circuit Protection					Shutdown and auto recovery
Temperature Coefficient			0.05	%/°C	
Overtemperature Protection					Shut down & auto recovery

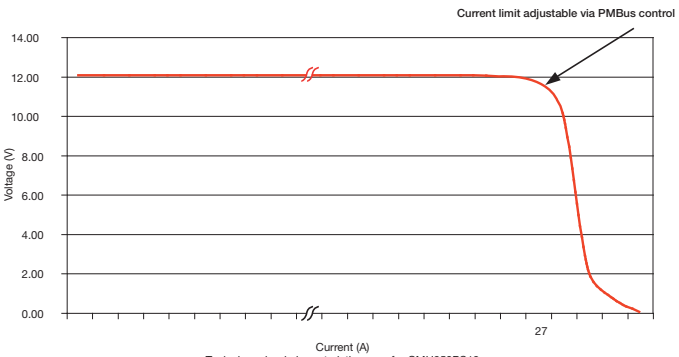
Input Voltage Derating

Figure 1



Overload Characteristics

Figure 2



Typical overload characteristic curve for CMH250PS12

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		89		%	230 VAC full load
Isolation: Input to Output	4000			VAC	2 x MOPP
Input to Ground	1500			VAC	1 X MOPP
Output to Ground	500			VDC	
Switching Frequency		62-560		kHz	PFC
		59		kHz	Main converter
		50-130		kHz	Standby
Power Density			5.7	W/in³	
Mean Time Between Failure		203		kHrs	MIL-HDBK-217F, Notice 2 +25 °C GB
Weight		2.02 (919)		lb (g)	CMH250PSxx
		2.36 (1072)			CMH250PSxx-C

Efficiency Vs Load

Figure 2
12 V Models

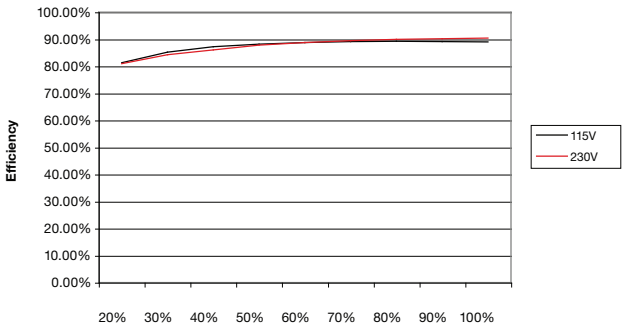


Figure 3
24 V Models

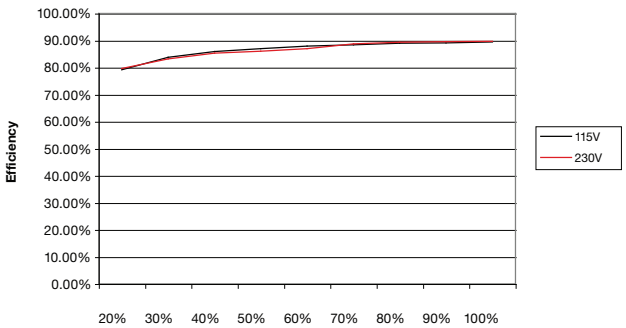
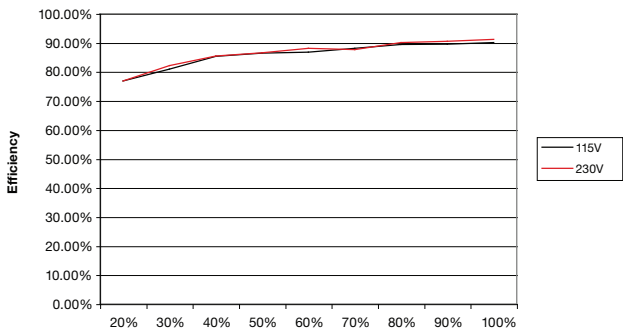


Figure 4
48 V Models



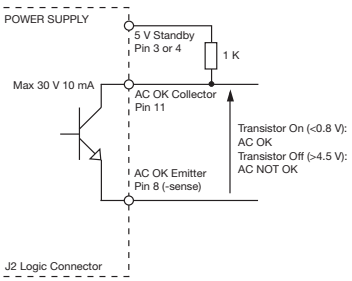
Signals & Controls - Optional

Characteristic	Notes & Conditions
Remote Sense	Compensates for 0.5 V total voltage drop. Also fitted to standard version.
5 V Standby Supply (V2)	5 V/2 A supply, always present when AC supplied
Optional 12 V Fan Supply (V3)	12 V/0.6 A supply, present when AC supplied, inhibit turns supply off. Also fitted to standard version.
AC OK/Power Fail	AC OK is an open collector transistor, referenced to negative sense, providing a minimum of 3 ms warning of loss of output regulation. The transistor is normally off when AC is healthy. See fig. 5.
Inhibit	The inhibit high pin should be pulled below 0.4 V to switch V1 & V Aux (V2) off. Open circuit or 2-8 V maximum to switch the output on. See fig. 6.
Current Share	Connecting pin 9 (-01 models) of like voltage units (3 maximum) will force the current to share between the outputs. Units share current within 10% of each other at full load. See fig. 7.
I²C	The I²C compatible interface can be added to the CMH250 and is used for monitoring the unit output voltage, current, internal temperature and other data points. Adjustment of the output voltage and current limit set point and identification of the unit model number and serial number are also possible. Contact sales for details.

Signal Options							
Model	Remote Sense	Aux Supply V2	5 V Standby V3	AC OK/Power Fail	Inhibit V1 & V Fan	Current Share	PMBus
CMH250PSXX	✓	✓					
CMH250PSXX-01	✓	✓	✓	✓	✓	✓	
CMH250PSXX-50	✓	✓	✓				✓

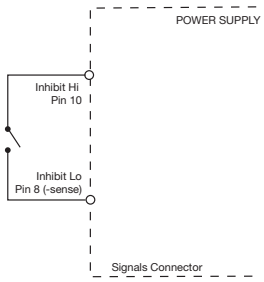
Power Fail

Figure 5



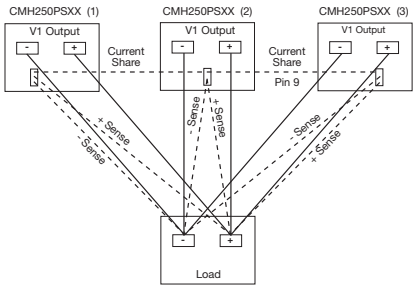
Inhibit (High)

Figure 6



Parallel & Current Share

Figure 7

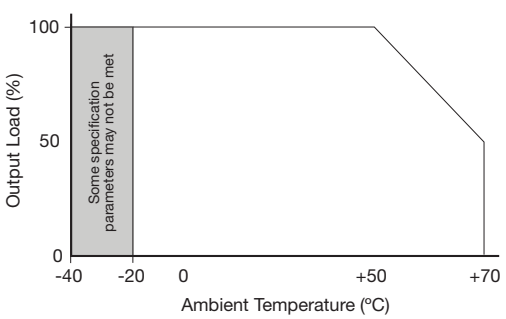


Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+70	°C	See derating curve, fig.8. and Thermal Considerations on page 8.
Storage Temperature	-40		+85	°C	
Cooling					Convection-cooled
Humidity			95	%RH	Non-condensing
Operating Altitude			5000	m	Information Technology
			4000		Medical
Shock	±3 x 30g shocks in each plane, total 18 shocks. 30g = 11ms (±0.5msec), half sine. Conforms to EN60068-2-27 & EN60068-2-47				
Vibration	Single axis 10 - 500 Hz at 2g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6				

Temperature Derating Curve

Figure 8



EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55022/11	Class B	
Radiated	EN55022/11	Class A	
		Class B	With 2 turns Wurth 742 700 56 core or similar on AC input cable
Harmonic Current	EN61000-3-2	Class A	All models
		Class C	≥50% load

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Low Voltage PSU EMC	EN61204-3	High severity level	as below	
Radiated	EN61000-4-3	3	A	
EFT	EN61000-4-4	3	A	
Surges	EN61000-4-5	Installation class 3	A	
Conducted	EN61000-4-6	3	A	
Dips and Interruptions	EN55024 (100 VAC)	Int >95% (0 VAC), 8.3ms	A	
		Dip 30% (70 VAC), 416ms	B	
		Int >95% (0 VAC), 4160ms	B	
	EN55024 (240 VAC)	Int >95% (0 VAC), 10.0ms	A	
		Dip 30% (168 VAC), 500ms	B	
		Int >95% (0 VAC), 5000ms	B	
	EN60601-1-2 (100 VAC)	Int >95% (0 VAC), 10.0ms	A	
		Dip 60% (40 VAC), 100ms	A	Derate output power to 85 W
		Dip 30% (70 VAC), 500ms	A	
		Int >95% (0 VAC), 5000ms	B	
	EN60601-1-2 (240 VAC)	Int >95% (0 VAC), 10.0ms	A	
		Dip 60% (96 VAC), 100ms	A	
		Dip 30% (168 VAC), 500ms	A	
		Int >95% (0 VAC), 5000ms	B	

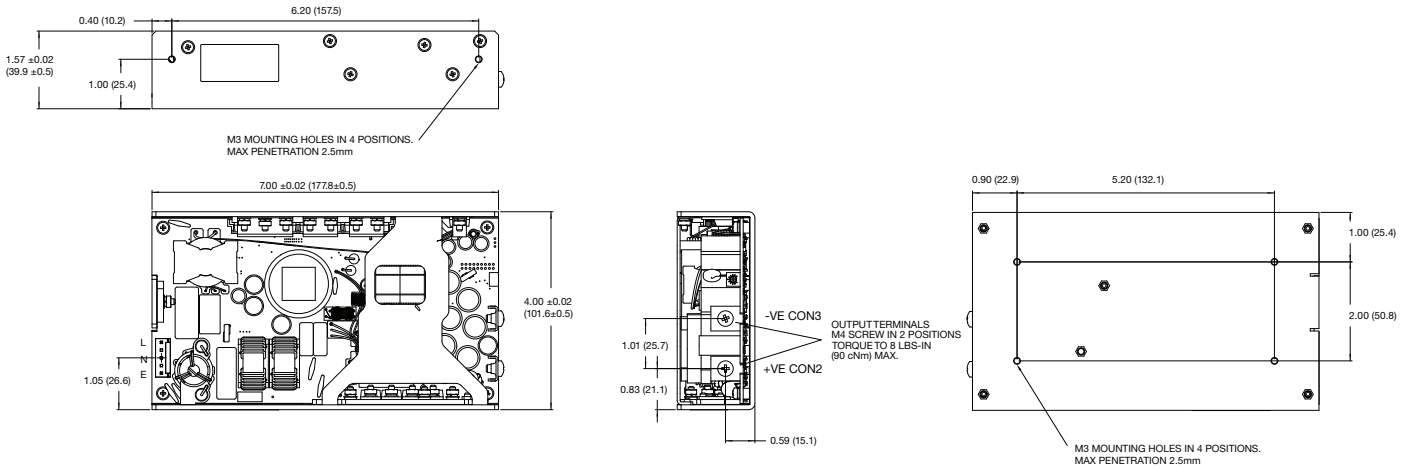
Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC60950-1 Ed 2	Information Technology
	IEC60601-1 Ed 3 Including Risk Management	Medical
UL	UL60950-1, CSA 22.2 No.60950-1-1:08	Information Technology
	ANSI/AAMI ES60601-1:2005 & CSA C22.2, No.60601-1:08	Medical
TUV	EN60950-1	Information Technology
	EN60601-1/A12:2006	Medical
CE	LVD & RoHS	
Equipment Protection Class	Class I	See safety agency conditions of acceptibility for details

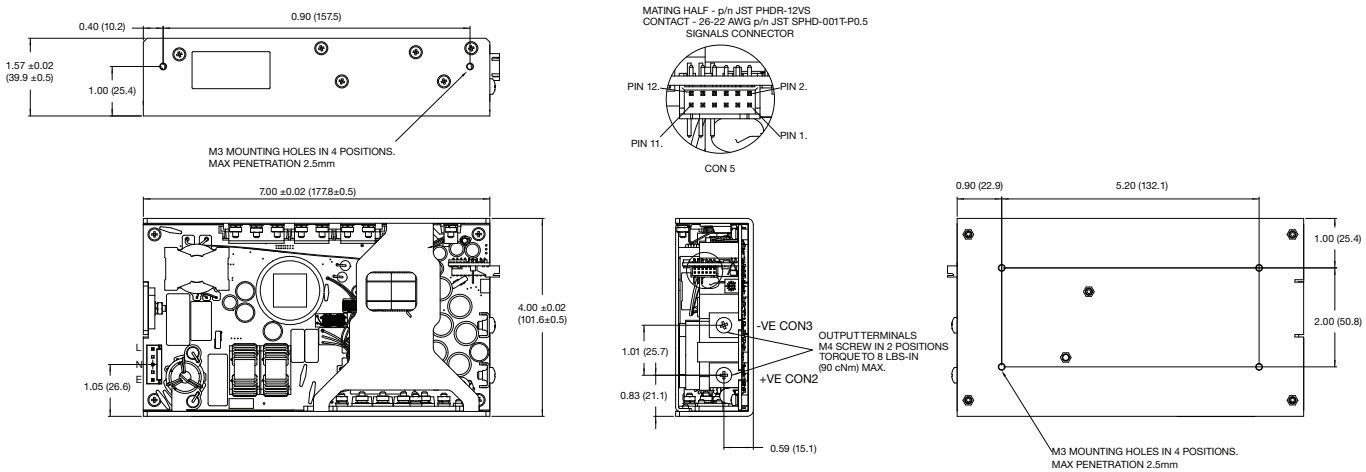
	Means of Protection	Category
Primary to Secondary	2 x MOPP (Means of Patient Protection)	IEC60601-1 Ed 3
Primary to Earth	1 x MOPP (Means of Patient Protection)	
Secondary to Earth	N/A	

Mechanical Details

CMH250PSxx



CMH250PSxx-01,-50 (Standby & Signals Option)



Input Connector CON1	
Pin	Function
1	Line
2	Neutral
3	Earth

Output Connector	
CON2	+V1
CON3	-V1

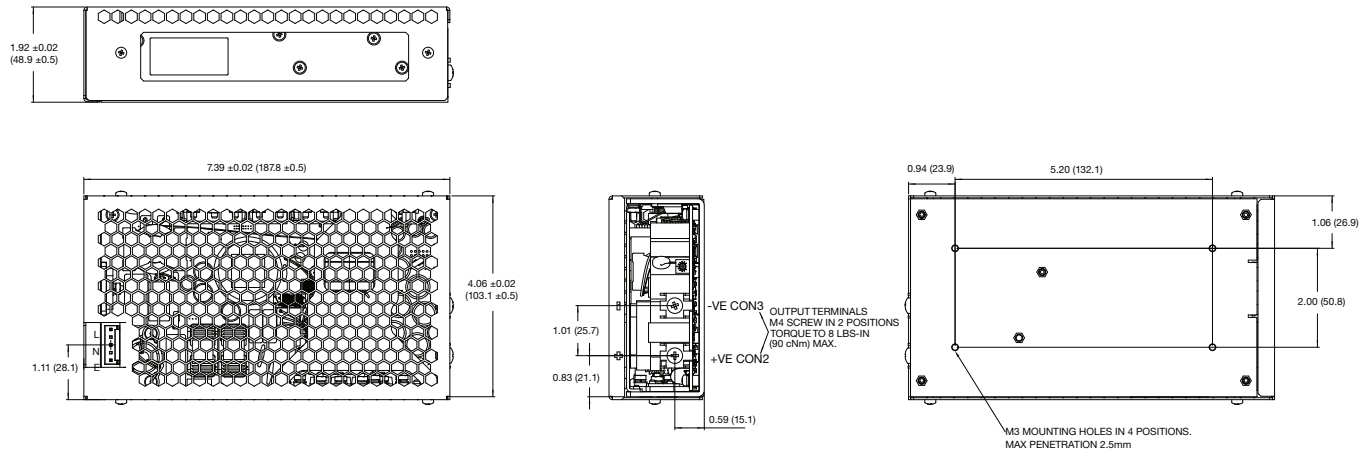
Signals Connector CON5	
1	-VE Standby V2
2	-VE Standby V2
3	+VE Standby V2
4	+VE Standby V2
5	+VE Fan Supply V3
6	-VE Fan Supply V3
7	+VE Sense
8	- VE Sense
9	Current Share
10	Inhibit
11	Power Fail
12	N/C

Notes

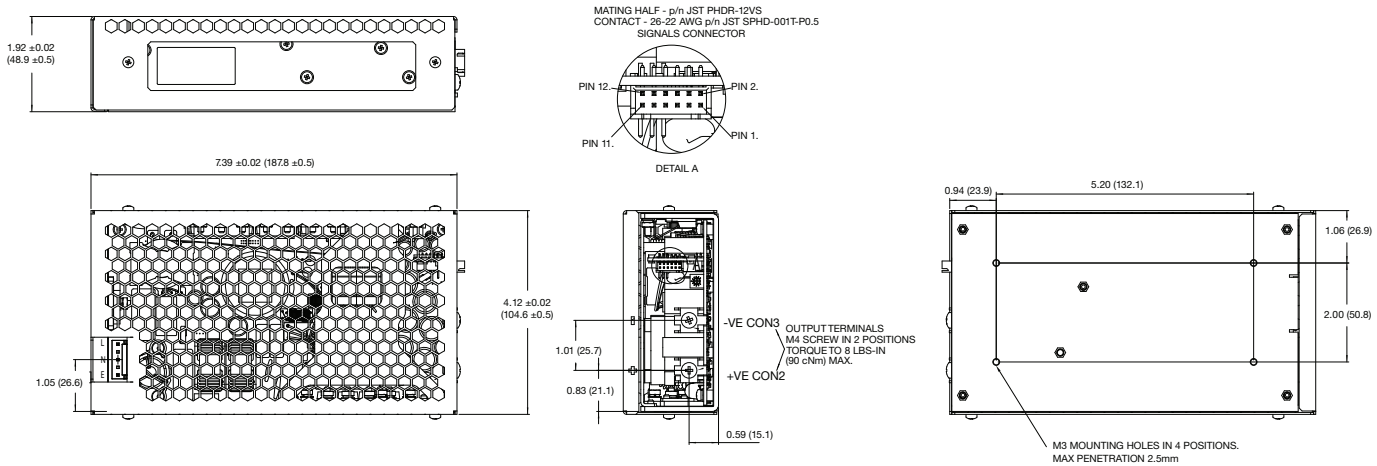
1. Dimensions shown in inches (mm).

Mechanical Details

CMH250PSxx-C (Covered)



CMH250PSxx-01C,-50C (Covered Standby Option)



Input Connector CON1	
Pin	Function
1	Line
2	Neutral
3	Earth

Output Connector	
CON2	+V1
CON3	-V1

Signals Connector CON5	
1	-VE Standby V3
2	-VE Standby V3
3	+VE Standby V3
4	+VE Standby V3
5	+VE Aux V2
6	-VE Aux V2
7	+VE Sense
8	- VE Sense
9	Current Share
10	Inhibit
11	Power Fail
12	N/C

Notes

1. Dimensions shown in inches (mm).

Thermal Considerations

In order to ensure safe operation of the PSU in the end-use equipment, the temperature of the components listed in the table below must not be exceeded. Temperature should be monitored using K type thermocouples placed on the hottest part of the component (out of direct air flow). See below for component locations.

Temperature Measurements (At Ambient 50 °C)	
Component	Max Temperature °C
PFC1 Coil	120 °C
T1 Coil	120 °C
C5	105 °C
C3	105 °C

Service Life

The estimated service life of the CMH250 Series is determined by the cooling arrangements and load conditions experienced in the end application. Due to the uncertain nature of the end application this estimated service life is based on the actual measured temperature of a key capacitors with in the product when installed by the end application. The worst case of the two figures should be taken as the indicative service life in 24/7 operation.

The graph below expresses the estimated lifetime of a given component temperature and assumes continuous operation at this temperature.

Estimated Service Life vs Component Temperature

