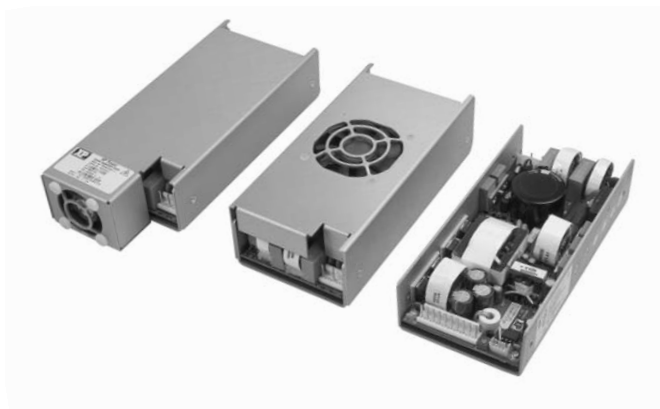


MFA350 Series



- Screw Terminals Available
- U-Channel, Cover Fan & Hotswap Formats
- High Power Density up to 11.1 W/in³
- -10 °C to +70 °C Operation
- Power Fail, DC OK & Active Current Share
- 5 V Standby & 12 V Fan Supply Outputs
- 48 VDC Input Versions Available (DFA350)

Specification

Input

Input Voltage	• 85-264 VAC (derate output power 10% below 90 VAC)
Input Frequency	• 47-63 Hz
Input Current	• Typically 3.6 A at 115 VAC & 1.8 A at 230 VAC
Inrush Current	• <60 A max at 230 VAC cold start
Power Factor	• >0.9 harmonics compliant with EN61000-3-2 Class A
Earth Leakage Current	• Typically 1 mA at 230 VAC/50 Hz, 0.5 mA at 115 VAC/60 Hz
Input Protection	• T6.3 A/250 V internal in line fuse

Output

Output Voltage	• See tables
Output Voltage Trim	• $\pm 10\%$
Initial Set Accuracy	• V1 $\pm 1\%$, V2 $\pm 5\%$, V3 $\pm 3\%$
Minimum Load	• No minimum load required
Start Up Delay	• 2 s maximum, typically 1 s
Hold Up Time	• 16 ms minimum at 90 VAC full load
Drift	• $\pm 0.2\%$ after 20 min warm-up
Line Regulation	• V1 $\pm 0.5\%$, V2 $\pm 3.0\%$, V3 $\pm 0.5\%$
Load Regulation	• V1 $\pm 1.0\%$, V2 $\pm 5.0\%$, V3 $\pm 1.0\%$, 0-100% load V1 & V3, 10-100% load V2
Over/Undershoot	• <1% maximum
Transient Response	• <4% max deviation, with 50-75-50% load step. Recovery to within 1% <500 μ s
Ripple & Noise	• V1 & V3: 1%, V2: 2% pk-pk, 20 MHz BW
Overvoltage Protection	• 115-140% Vnom (output V1 only)
Overtemperature Protection	• Thermal sensor under PCB shuts unit down typically $>+75\text{ }^{\circ}\text{C}$
Overload Protection	• 110-140%, I nom V1
Short Circuit Protection	• Continuous
Temperature Coefficient	• 0.05%/°C
Remote Sense	• Compensates for 0.5 V total voltage drop
Remote On/Off	• Short circuit or TTL Low turns PSU off, can also be configured as enable
Current Share	• Up to 3 supplies can be connected in parallel, derate total output current to 90%

General

Efficiency	• Typically 86%
Isolation	• 3000 VAC Input to Output 1500 VAC Input to Ground 100 VDC Output to Ground
Switching Frequency	• Typically PFC 62 kHz, main converter 157 kHz
Power Density	• 11.1 W/in ³
Signals	• Power Fail - open collector, transistor off for AC good, ≥ 5 ms warning of loss of output. DC OK - open collector, transistor off for DC good
MTBF	• Typically 460 kHrs to MIL-HDBK-217F, notice 2, +25 °C GB

Environmental

Operating Temperature	• Forced cooled: -10 °C to +70 °C, derate linearly from +50 °C at 2.5%/°C to +70 °C
Cooling	• >13 CFM forced airflow required for U Channel Versions, '-H', '-TF' & '-EF' versions have integral fan
Operating Humidity	• 5-95% RH
Storage Temperature	• -20 °C to +85 °C
Operating Altitude	• 3000 m
Shock	• 3 x 30 g/11 ms shocks in both +ve & -ve directions along the 3 orthogonal axes, total 18 shocks.
Vibration	• Single axis 10-500 Hz at 2 g x 10 sweeps

EMC & Safety

Emissions	• EN55022, Class B conducted EN55022, Class A radiated
Harmonic Currents	• EN61000-3-2, Class A
Voltage Flicker	• EN61000-3-3
Radiated Immunity	• EN61000-4-3, level 3 Perf Criteria A
EFT/Burst	• EN61000-4-4, level 3 Perf Criteria A
Surge	• EN61000-4-5, level 3 Perf Criteria A
Conducted Immunity	• EN61000-4-6, 10 V rms Perf Criteria A
Dips & Interruptions	• EN61000-4-11 Perf Criteria A, B, B
Safety Approvals	• CB Report, IEC60950-1:2001, CSA22.2 No. 60950-1-05, UL60950-1 (2003), TUV EN60950-1/A11:2004, CCC pending contact sales

Models and Ratings

MFA350 **XP**

AC-DC

Output Voltage V1	Max Output Current V1	Fan Output ⁽²⁾ V2	Standby Supply V3	Max Power 13 CFM Airflow	Model Number ⁽¹⁾
12 VDC	29.0 A	12 V/1 A	5 V/0.3 A	361 W	MFA350PS12 [†]
24 VDC	14.5 A	12 V/1 A	5 V/0.3 A	361 W	MFA350PS24 [†]
48 VDC	7.3 A	12 V/1 A	5 V/0.3 A	364 W	MFA350PS48 [†]

Notes

- Units supplied with Molex connections for J1 & J2 as standard. Add suffix '-S' to model number to replace with screw terminals. Add suffix '-TF' for covered version with top fan and suffix '-EF' for covered version with end fan. Example:- MFA350PS12-STF, 12 V unit fitted with screw terminals and top fan.
- Not available for -TF & -EF versions.

[†] Available from Farnell. See pages 204-206. [^] Available from Newark. See pages 207-208.

Mechanical Details

PIN CONNECTIONS AC INPUT J1 Molex 26-60-4050

1	GND
3	Neutral
5	Line

Mating Parts: Molex, Housing 43061-0005
Contact 08-70-1030, Option '-S' screw terminals
Phoenix Contact: MKDS 1/5-3.81 or similar
accepts 26-16 AWG wire (contacts 2 & 4 removed)

PIN CONNECTIONS DC OUTPUT J2 Molex 26-60-4100

PIN	FUNCTION	PIN	FUNCTION
1	+V1	6	-V1
2	+V1	7	-V1
3	+V1	8	-V1
4	+V1	9	-V1
5	+V1	10	-V1

Mating Parts: Molex, Housing 43061-0010
Contact 08-70-1030, Option '-S' screw terminals
2 x Phoenix Contact: MKDS 1/5-3.81 or similar
accepts 26-16 AWG wire

PIN CONNECTIONS FAN OUTPUT J4 Molex 22-04-1021

1	+V2
2	-V2

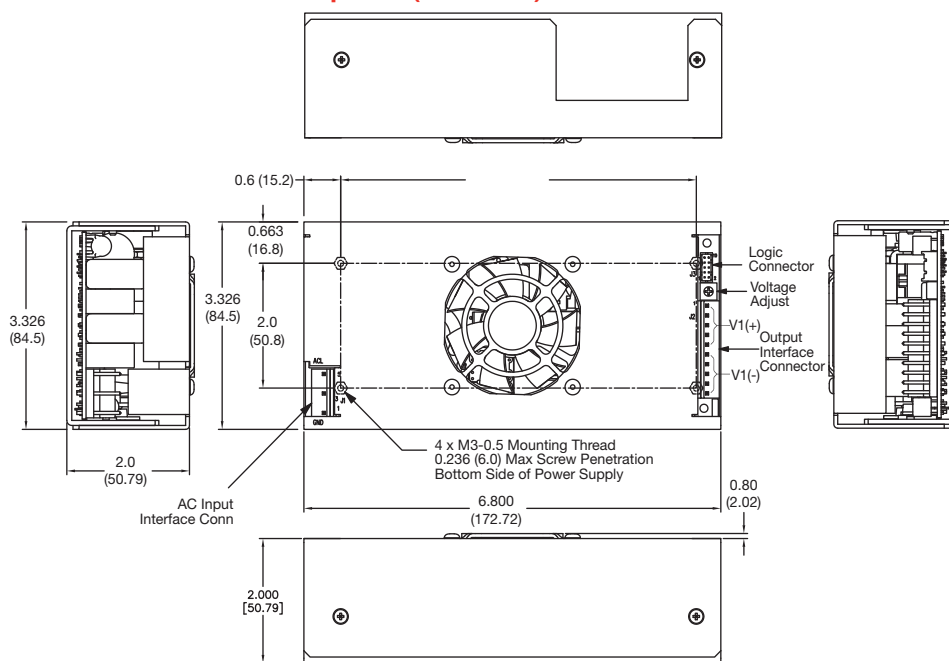
Mating Parts: Molex, Housing 22-01-1024
Contact 08-70-0057

PIN CONNECTIONS LOGIC CONNECTOR J3 JST B10B-PHDS (LF) (SN)

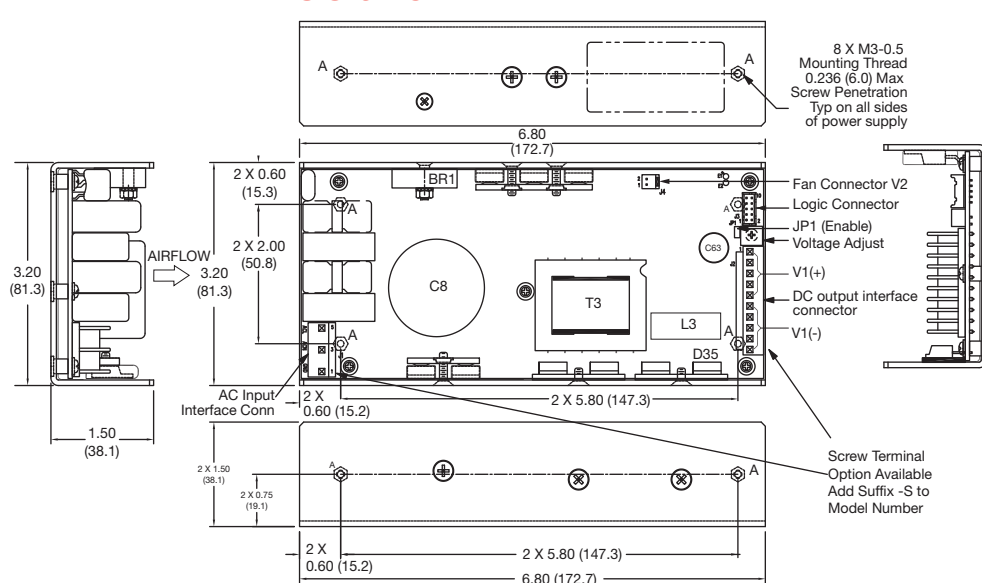
PIN	FUNCTION	PIN	FUNCTION
1	AC OK	6	+Sense
2	ROF (Inhibit/Enable)	7	-Sense
3	Current Share	8	Not Used
4	DC OK	9	5 V Standby V3
5	Not used	10	5 V Standby Return V3

Mating Parts: JST, Housing PHDR-10VS
Contact SPHD-001T-P0.5

Top Fan (Suffix TF)



U Channel



Notes 1. All dimensions in inches (mm).

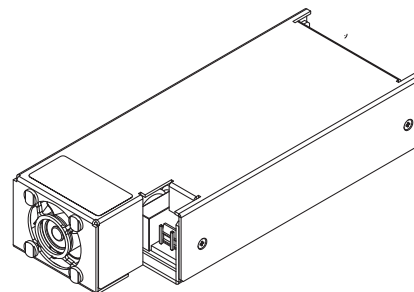
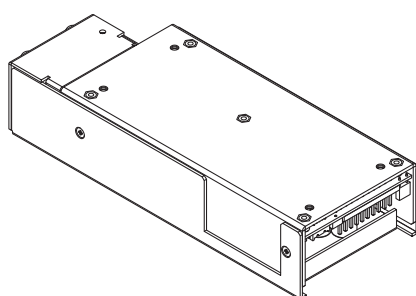
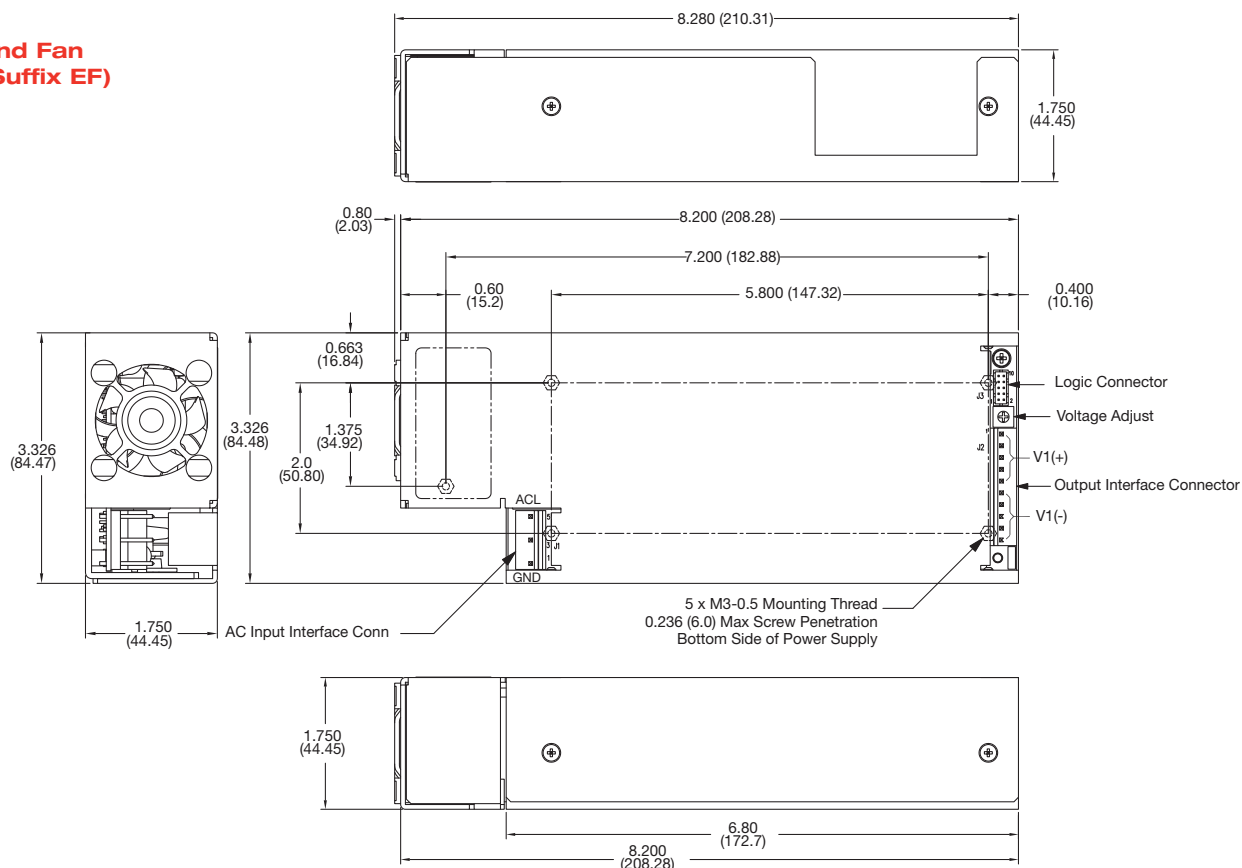


T H E X P E R T S I N P O W E R

Mechanical Details

MFA350 XP

End Fan (Suffix EF)



PIN CONNECTIONS FAN OUTPUT J4 Molex 22-04-1021	
1	+V2
2	-V2

Mating Parts: Molex Housing 22-01-1024, Contact 08-70-0057

PIN CONNECTIONS AC INPUT J1 Molex 26-60-4050	
1	GND
3	Neutral
5	Line

Mating Parts: Molex, Housing 43061-0005, Contact 08-70-1030, Option '-S' screw terminals, Phoenix Contact: MKDS 1/5-3.81 or similar accepts 26-16 AWG wire (contacts 2 & 4 removed)

PIN CONNECTIONS LOGIC CONNECTOR J3 JST B10B-PHDSS (LF) (SN)			
PIN	FUNCTION	PIN	FUNCTION
1	AC OK	6	+Sense
2	ROF (Inhibit/Enable)	7	-Sense
3	Current Share	8	Not Used
4	DC OK	9	5 V Standby V3
5	Not used	10	5 V Standby Return V3

Mating Parts: JST, Housing PHDR-10VS, Contact SPHD-001T-P0.5

PIN CONNECTIONS DC OUTPUT J2 Molex 26-60-4100			
PIN	FUNCTION	PIN	FUNCTION
1	+V1	6	-V1
2	+V1	7	-V1
3	+V1	8	-V1
4	+V1	9	-V1
5	+V1	10	-V1

Mating Parts: Molex Housing 43061-0010 Contact 08-70-1030 Option '-S' screw terminals 2 x Phoenix Contact: MKDS 1/5-3.81 or similar accepts 26-16 AWG wire

Notes 1. All dimensions in inches (mm).

Models and Ratings

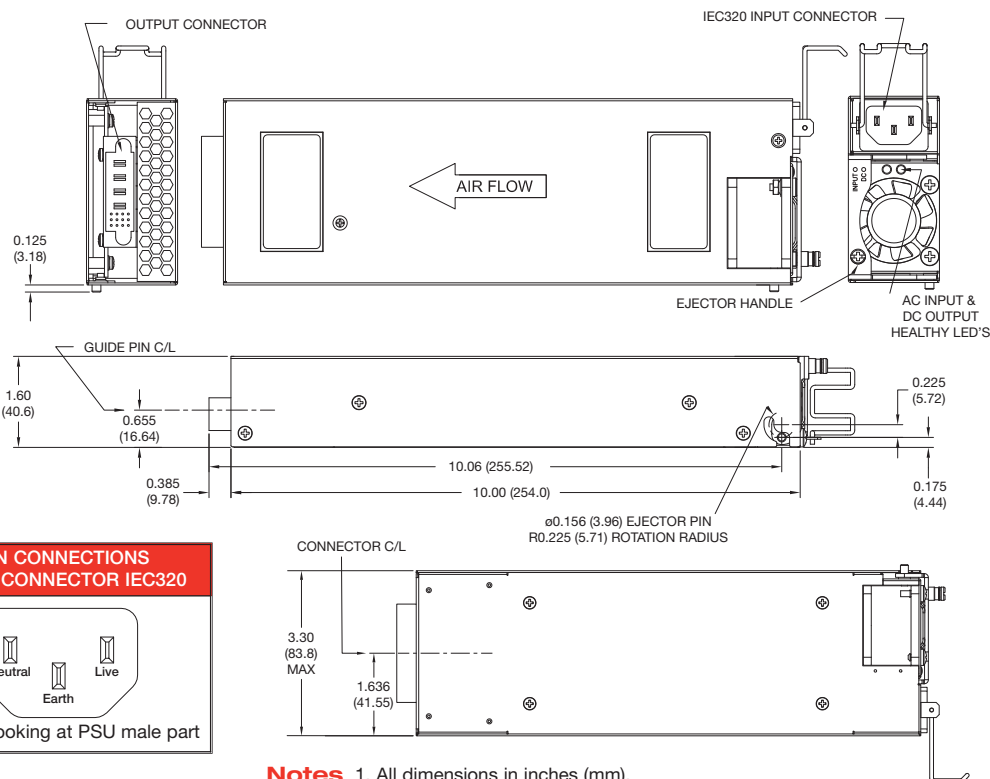
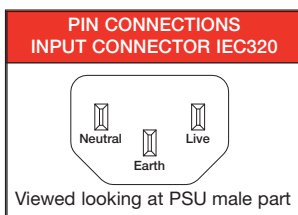
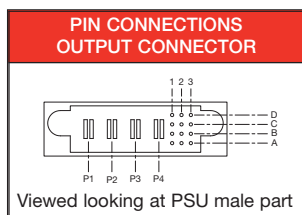
MFA350-H XP

Output Voltage V1	Maximum Output Current	Standby Supply V3	Max Power	Model Number
12.0 VDC	29.0 A	5 V/0.3 A	350 W	MFA350PS12-H
24.0 VDC	14.5 A	5 V/0.3 A	350 W	MFA350PS24-H
48.0 VDC	7.3 A	5 V/0.3 A	352 W	MFA350PS48-H

Mechanical Details

Pin Connections

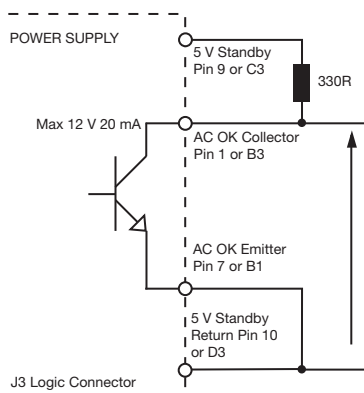
PIN CONNECTIONS OUTPUT CONNECTOR FCI 51732-035-LF	
A1	+Sense
A2	Not Used
A3	DC OK
B1	-Sense
B2	Not Used
B3	AC OK
C1	Current Share
C2	Not Used
C3	5 V Standby V3
D1	Not Used
D2	ROF (Inhibit/Enable)
D3	5 V Standby Return V3
P1	-V1
P2	-V1
P3	+V1
P4	+V1



Mating parts: FCI 51762-10401200AA-LF

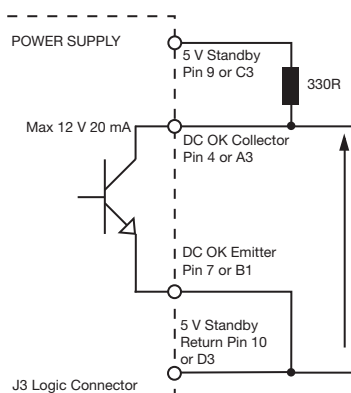
Signals MFA350 & MFA350-H

AC OK/Power Fail



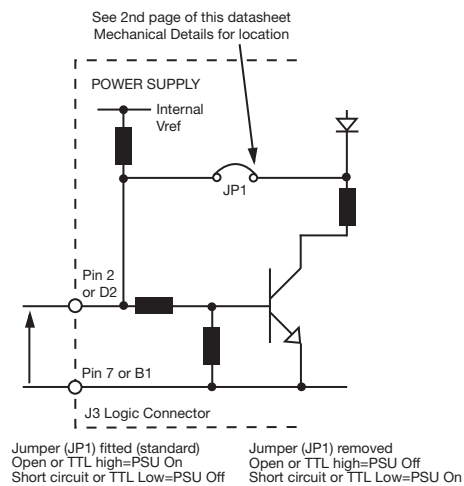
Transistor On (<0.8 V): AC NOT OK
Transistor Off (>4.5 V): AC OK

DC OK



Transistor On (<0.8 V): DC NOT OK
Transistor Off (>4.5 V): DC OK

Remote On/Off (Inhibit/Enable)



Thermal Considerations (U Channel)

Temperature Measurements (Ambient ≤50 °C)	
Component	Max Temperature °C
T3	90 °C
BR1	105 °C
D35	85 °C
L3	90 °C
C8	105 °C
C63	105 °C

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. See drawing on 2nd page of this datasheet for component locations. The temperature should be monitored using K type thermocouples placed on the hottest part of the component (out of any direct air flow). See longform datasheet for further information of service life.