MS1U and MM1U MULTISTAX RANGE

AC-DC Plug & Play Power Supply Series 400W-1200W

INSTRUCTION MANUAL

Please read this instruction manual carefully before installation or use of this product, and keep it in a safe place for future reference. Follow all warnings and instructions marked on the product.

HIGH VOLTAGE WARNING

Dangerous voltages are present within these power supplies. These products should only be worked on by qualified personnel.

Family	Model	Power	Width
MS1U	6A, 6B, 6C. 6D, 4A, 4B, 4C	200W - 1,200W	Standard
MS1U	6H, 6J	400W - 600W	High Temp
MS1U	6L, 6M, 4L, 4M	200W - 900W	Low Acoustic
MM1U	6A, 6B, 6C. 6D, 4A, 4B, 4C	200W - 1,200W	Medical - Standard
MM1U	6L, 6M, 4L, 4M	200W - 900W	Medical Low Acoustic
PowerModules			
Mx1, Mx2, Mx3, Mx4, Mx5, Mx7, Mx8			1.5V to 58V

MS1U Series products are composed of:
PowerUnit Chassis Converters intended for use in MS1U & MM1U series ONLY. These must NOT be used for any other purposes and PowerModule Plug In Modules intended for use in MS1U & MM1U series ONLY These must NOT be used for any other purposes.

MS1U Series products are designed for use within other equipment or enclosures, which restrict access to **authorised competent personnel only**. The unit covers are designed only to protect skilled personnel from hazards. They must not be used as part of the external covers of any equipment where they may be accessible to operators, since under full load conditions part or parts of the unit may reach temperatures in excess of those considered safe for operator access.

IMPORTANT CONSIDERATIONS

The units should only be supplied by a power source of the type indicated on its label. An appropriate disconnect device must be made provided as part of the building installation. Connection should be made using an appropriate IEC320 type connector. When securing the product do not use screws which infringe the maximum penetration depth of 6mm. Customer fixings are provided on the base of the unit in addition to the Powerstax "fleximount" system which allows the unit to be mounted on either side of the PowerUnit chassis. The MS1U Series of power supplies have integral fans and may be mounted in any orientation provided that the air intake and air outlet areas are not impeded with particular regard paid to provide ventilation holes in any chassis on which or near which the unit is mounted. AFTER DISCONNECTING THE AC SOURCE ALLOW 4 MINUTES BEFORE DISASSEMBLY TO ALLOW CAPACITORS WITHIN THE UNIT TO DISCHARGE.

Input Specifications (PowerUnits only)
Input Voltage Range 100 to 240VoltsAC
Input Frequency 50/60 Hz
Earth Leakage Current 1.5mA MS1U Range
300mA MM1U Range

Input Fusing
WARNING To protect against risk of fire, replace only with fuses of same rating and type. Fuses must be replaced by qualified service personnel only.

Model	*Fuse*	*Type*	*Voltage*	*Size*
MS1U-4A	5A	F	250V	5.0 x 20mm
MS1U-4B	6.3A	F	250V	5.0 x 20mm
MS1U-4C	8A	F	250V	5.0 x 20mm
MS1U-4L	5A	F	250V	5.0 x 20mm
MS1U-4M	6.3A	F	250V	5.0 x 20mm
MS1U-6A	8A	F	250V	6.25 x 32mm
MS1U-6B	10A	F	250V	6.25 x 32mm
MS1U-6C	12A	F	250V	6.25 x 32mm
MS1U-6D	12A	F	250V	6.25 x 32mm
MM1U-4A	5A	F	250V	5.0 x 20mm
MM1U-4B	6.3A	F	250V	5.0 x 20mm
MM1U-4C	8A	F	250V	5.0 x 20mm
MM1U-4L	5A	F	250V	5.0 x 20mm
MM1U-4M	6.3A	F	250V	5.0 x 20mm
MM1U-6A	8A	F	250V	6.25 x 32mm
MM1U-6B	10A	F	250V	6.25 x 32mm
MM1U-6C	12A	F	250V	6.25 x 32mm
MM1U-6D	12A	F	250V	6.25 x 32mm
MS1U-6H	10A	F	250V	6.25 x 32mm
MS1U-6J	12A	F	250V	6.25 x 32mm
MS1U-6L	10A	F	250V	6.25 x 32mm
MS1U-6M	12A	F	250V	6.25 x 32mm
MM1U-6L	10A	F	250V	6.25 x 32mm
MM1U-6M	12A	F	250V	6.25 x 32mm

OUTPUT SPECIFICATIONS (PowerModule only)
See PowerModule table below with more detail in Designers' Manual. Each module may be adjusted over the full voltage range shown in the table **subject to not exceeding the maximum rated Voltage and Power shown on the table**

SAFETY.
The MS1U when correctly installed in a limited access environment are designed to comply with the following requirements:
MS1U series: IEC60950 EN60950, UL1950, CSA 22.2 No 234 and IEC61010
MM1U series: EN60601-1, UL2601-1 and CSA 22 2-601-1 and EN61010

For current approval status please contact Powerstax Sales. Equipment manufacturers must provide protection to service personnel against inadvertent contact with the module output terminals

Environmental Parameters
The MS1U & MM1U Series is designed for the following parameters:
Polution Degree 2
Installation Category 2
Class I
Indoor use (as part of another piece of equipment such that unit is accessible to service engineers only)
Altitude: -155 metres to +3050 metres from sea level.
Humidity 10 to 95% non-condensing.
Operating temperature -20ºC to 70ºC
Derate at 2.5% per ºC above 50ºC and up to 70ºC.

Approval Limitations
Use In North America
When this product is used on 180 to 253 Volts AC mains with no neutral, connect the two lives wires to L (live) and N (neutral) terminals on the input connector

Levels of Insulation
Subject to the limitations above
MS1U series
Primary mains circuits to earth. 2.5mm spacing
Primary mains circuits to secondary: 5mm spacing
Dielectric strength testing is carried out as follows
Primary mains circuits to chassis: 1500V AC
Primary mains circuits to secondary: 3000V AC

MM1U series
Primary mains circuits to earth. 4mm spacing
Primary mains circuits to secondary: 8mm spacing
Dielectric strength testing is carried out as follows
Primary mains circuits to chassis: 1500V AC
Primary mains circuits to secondary: 4000V AC

Earth Terminal Marking - IMPORTANT
If in the end use equipment the incoming mains cable earth wire connects directly to the "GND" connection MS1U series without being interrupted or junctioned on its way to that connection then this connection forms the main protective earth of the system To comply with IEC60950 EN60950 UL1950 requirements and to comply with EN60601-1 UL2601-1 CSA22 2-601-1 requirements then this must be marked with the symbol defined in the IEC417 No 5019a. The customer should therefore affix an adhesive label which will pass the 15 Second rub test (IEC60950 section 1.7.15) showing the symbol here adjacent to the earth connection. This symbol must only be used at the first interruption / connection of the incoming earth wire.

Health & Safety at Work Act (UK Only)
In order to protect service personnel and users of these power supplies and to comply with section 6 of the Health and Safety Acts, a clearly visible label should be fitted warning that surfaces of these units may be hot and must not be touched when the units are in operation.

Receipt and Unpacking
On receipt a unit should be unpacked carefully and checked for transit damage. If the unit is damaged do not apply power or install the unit SEEK SPECIALIST ADVICE!

Power Modules

Model	*Watts*	*Dimensions (L x W x H) mm*
MS1U-4A	200W	260 x 40.4 x 89
MS1U-4B	400W	260 x 40.4 x 89
MS1U-4C	600W*	260 x 40.4 x 89
MS1U-4L	200W	260 x 40.4 x 89
MS1U-4M	400W*	260 x 40.4 x 89
MS1U-6A	400W	260 x 40.4 x 127
MS1U-6B	700W	260 x 40.4 x 127
MS1U-6C	1000W***	260 x 40.4 x 127
MS1U-6D	1200W****	260 x 40.4 x 127
MM1U-4A	200W	260 x 40.4 x 89
MM1U-4B	400W	260 x 40.4 x 89
MM1U-4C	600W*	260 x 40.4 x 89
MM1U-4L	200W	260 x 40.4 x 89
MM1U-4M	400W**	260 x 40.4 x 89
MM1U-6A	400W	260 x 40.4 x 127
MM1U-6B	700W	260 x 40.4 x 127
MM1U-6C	1000W***	260 x 40.4 x 127
MM1U-6D	1200W****	260 x 40.4 x 127
MS1U-6H	400W	260 x 40.4 x 127
MS1U-6J	600W	260 x 40.4 x 127
MS1U-6L	400W	260 x 40.4 x 127
MS1U-6M	900W*****	260 x 40.4 x 127
MM1U-6L	400W	260 x 40.4 x 127
MM1U-6M	900W*****	260 x 40.4 x 127

* Derate linearly from 600W at 180Vac to 400W at 85Vac
** Derate linearly from 400W at 120Vac to 300W at 85Vac
*** Derate linearly from 1000W at 120Vac to 850W at 85Vac
**** Derate linearly from 1200W at 120Vac to 850W at 85Vac
***** Derate linearly from 900W at 120Vac to 600W at 85Vac

Options

Thermal Signals (option 1)
Temperature Alarm & Fan Fail
Open Collector signal Indicator

Reverse Fan (option 2)
Reverse direction of air flow through MS1U & MM1U series. Not available on 1200W models

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AC-DC Plug & Play Power Supply
MS1U & MM1U Series 400W-1200W

INSTRUCTION MANUAL

Power Modules

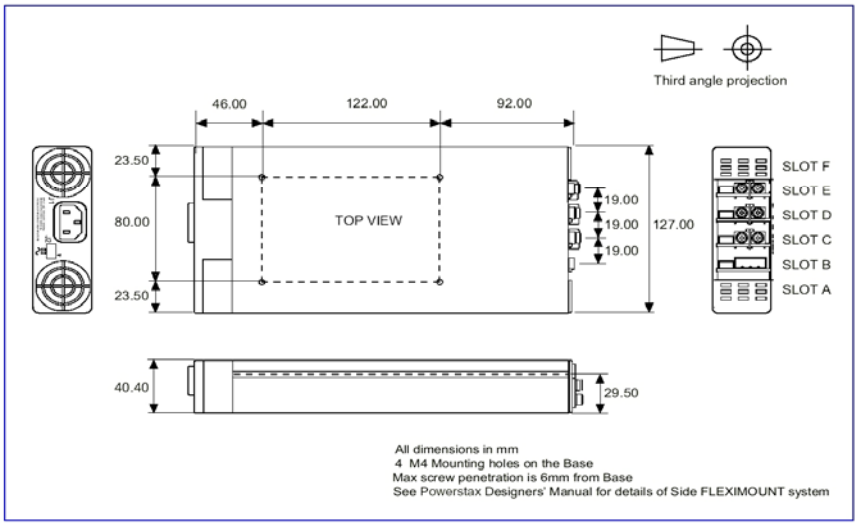
MODEL	Vmin	Vnom	Vmax	Imax	Watts*	Watts	Type
Mx1	1.5	2.5	3.6	50A	125W	100W	A
Mx2	3.2	5	6	40A	200W	150W	A
Mx3	6	12	15	20A	240W	180W	A
Mx4	12	24	30	10A	240W	180W	A
Mx5	28	48	58	6A	288W	215W	AB
Mx7	5	24	28	5A	120W	90W	B**
Mx8	5 / 5	24 / 24	28 / 28	3A / 3A	72W / 72W	55W / 55W	

**Reduced ratings when used with MS1U-6L/M, MM1U-6L/M, MS1U-4L/M & MM1U-4L/M power units. PowerModule maximum power ratings not to be exceeded.*

Permitted Power Ratings for Reliable Operation
When specifying an MS1U or MM1U in an application it is necessary to ensure that the PowerUnits and PowerModules are operating within their power ratings as listed above taking care to factor in the appropriate derating if the ambient temperature exceed 50ºC (except for High Temp Units MS1U-6H/J models)

Unused Slots
UNUSED SLOTS MUST ALWAYS BE FITTED WITH APPROPRIATE SLOT COVERS XB1 X82 or XB3 Units must NOT be operated with empty slots.

Connectors & Pin Outputs



J1 Input Mains Connector:
IEC320

J2: Power Unit Signal Connector

Pin	J2 Power Unit
1	common
2	+5V bias
3	Earth
4	ac fail
5	fan fail*
6	global enable
7	temp alarm*
8	global inhibit

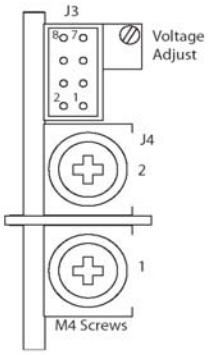
Mating Parts:
Housing: Molex p/n 51110 or equivalent
Crimp Terminal: Molex p/n 50394

J3: PowerModule Signal Connector

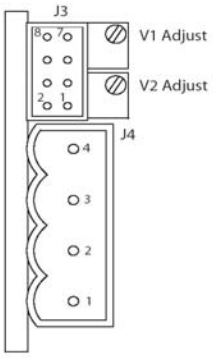
Pin	Type A (Mx1-5)	Type AB (Mx7)	Type B (Mx8)
1	+Sense	not used	-pg(V2)
2	-Sense	not used	+pg(V2)
3	V trim	not used	inhibit(V2)
4	I trim	common	common(V2)
5	+inhibit/enable	-pg	-pg(V1)
6	-inhibit/enable	+pg	+pg(V1)
7	+power good	inhibit	inhibit(V1)
8	-power good	common	common(V1)

J3 powerMod Signals Mating Connector:
Housing: Molex p/n 51110 or equivalent
Crimp Terminal: Molex p/n 50394

Type A Mx1-5



Type B Mx8

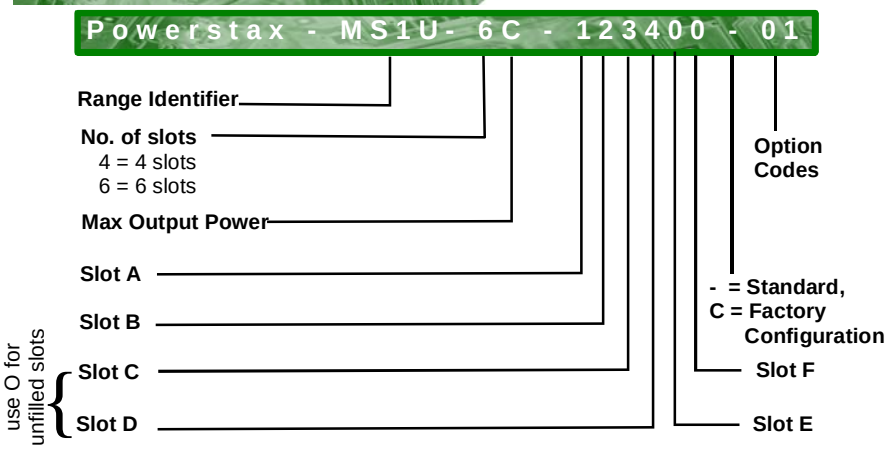


J4: PowerModule Output Connector

Pin	J3 (Type B)	J3 (Type A)
1	-Vout	-V2
2	+Vout	+V2
3		-V1
4		+V1

J4 Mating Connectors:
M4 Screw Terminals
Type B: Phoenix p/n MSTB2.5/4-ST-5.08

Labelling & Module Numbers



PowerModule:
PowerModule labels contain
Maximum, Nominal & Maximum voltage adjustment range
Maximum Current (Imax)
Maximum Power (Watts)
Model Number
Model Numbers are easily identified by the number marked on top of the signal connector J3.

PowerUnit:
PowerUnit labels contain
Input Frequency
Input Voltage
Fuse Rating
Serial Number
Maximum Line current under rated conditions
Model Number in the format (see left)

When the PowerUnit has no PowerModules inserted, its model number is simply MS1U-01

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