



Installation & Application Notes

MVP 4/6 Series 400 to 800 Watts

69-825-358 Rev M 6.04.03



Input

Input voltage 85 to 264 VAC
 120 to 350 VDC
 Frequency 47 to 440 Hz
 Inrush current 40 A peak max
 Efficiency 70% - 80% @ full case load 115VAC
 Power factor 0.99 typical meets EN61000-3-2
 Turn-on time AC on 1.5 sec typical, Inhibit / Enable
 150 ms typical
 EMI-filter standard CISPR 22, EN55022 Level "B"
 EMI filter CISPR 22,
 (low leakage option) EN55022 Level "A"
 Leakage current std. 2.0 mA max @ 240 VAC
 Leakage current 300mA max @ 240 VAC
 (low leakage option)
 Radiated EMI CISPR 22, EN55022 Level "B"
 Holdover storage 20ms minimum at Max Output Power
 for Full AC Range
 8ms minimum at Max Output Power
 for High Line AC Input
 (independent of input VAC)
 AC OK >5 ms early warning min. before
 outputs lose regulation
 Full cycle ride thru (50 Hz)
 Harmonic distortion Meets EN61000-3-2
 Isolation Meets EN60950
 Global Inhibit/Enable TTL, Logic "1" and Logic "0"
 Input fuse (internal) 15A

Output

Adjustment range $\pm 10\%$ minimum
 Margining $\pm 4-6\%$ nominal*
 Overall reg 0.4% or 20 mV max
 (36W modules 4% max)
 Ripple RMS: 0.1% or 10 mV whichever is greater
 Pk-Pk: 1.0% or 50 mV whichever is greater
 Bandwidth limited to 20 MHz
 Dynamic response <2% or 100 mV with 25% load step.
 Recovery time To within 1% in < 300 μ sec
 Overcurrent protection *Single, main of dual output module*
 105-120% of rated output current
Aux output of dual output module
 105-140% of rated output current
Triple output module
 Internally protected

Short circuit protection Protected for continuous short circuit.
 Recovery is automatic upon removal of short
 Overvoltage protection *Single output modules*
 2-5.5V 122-134% 6-60V 110-120%
Dual output module
 2-6V 122-134% 8-28V 110-120%
Triple output module
 No overvoltage protection provided. Recycle the AC input voltage to reset
 Reverse voltage protection 100% of rated output current
 Thermal protection All outputs disabled when internal temp exceeds safe operating range.
 >5mSec warning (AC OK signal) before shutdown
 Remote sense Up to 0.5 V-total drop
 Single wire parallel Current share to within 2% of total rated current**
 DC OK Single and main of dual outputs
 -2% to - 8% of nominal of any monitored output
 Minimum load Not required on single or triple output modules. 10% required on main of dual output modules
 Bias voltage 5VDC @1A max present whenever AC input is applied
 Module inhibit TTL, isolated, singles and dual (both outputs) only
 Switching frequency 250k Hz
 Output/Output isolation >1 meg ohm

*Single output modules only

** Single and main of dual output modules only

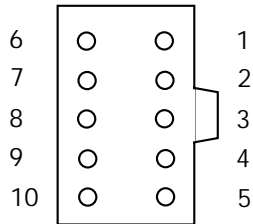
CAUTION

- 1) Connect the power supply correctly. 115/230 VAC 60 Hz line voltages can be lethal. To avoid shock, always use correct size and style lugs.
- 2) Install power supply correctly. Use correct screw sizes for mounting. Screws must not penetrate the interior of the supply excessively to avoid shorting of internal components. Always use the ground connection provided to protect against shock hazard due to power line capacitive leakage.
- 3) Operate the power supply safely. Power supplies generate heat; keep them away from combustible materials or atmosphere. Make sure liquid or metal shavings do not enter the supply to cause internal arcing, which can be a fire hazard.
- 4) Maintain power supply safely. Only qualified personnel should service or repair. Beware of possible internal lethal voltages due to charged capacitors, even after AC power is disconnected.

Control Connector Pin Out
J1 Control Connector

Pin #	Function
J1-1	Input AC OK - "Emitter"
J1-2	Input AC OK - "Collector"
J1-3	Global DC OK - "Emitter"
J1-4	Global DC OK - "Collector"
J1-5	Spare
J1-6	Global Inhibit/Optional Enable Logic "0"
J1-7	Global Inhibit/Optional Enable Logic "1"
J1-8	Global Inhibit/Optional Enable Return
J1-9	SELV 5V Housekeeping
J1-10	SELV 5V Housekeeping Return

Ten (10) position Molex 90130-3210 housing with select gold plated contacts.



UNIT CONNECTOR

MATING HOUSING

90142-0010 (Molex)
 87977-3 (Amp)

PINS

90119-2110 gold plated (Molex)
 87309-8 (Amp)

CRIMP TOOL

69008-0005 (Molex)

ACCESSORIES

CONNECTOR KIT

Astec P/N 70-841-004

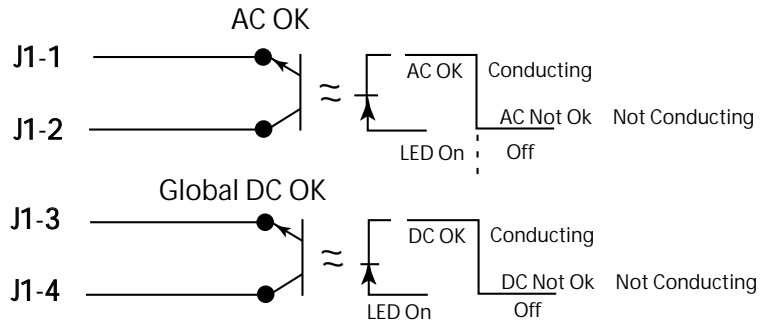
***FIELD REPLACEABLE FAN ASSEMBLY**

Astec P/N 73-688-0001

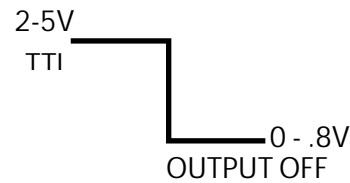
INPUT TERMINAL

BARRIER TYPE THREE NO. 6-32 B.H.
SCREWS (0.375" centers)

*Fan replacement by authorized repair technician.

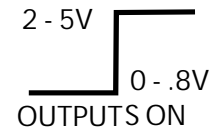


J1-6 Global Inhibit Logic "0"



All outputs "ON" with high or open

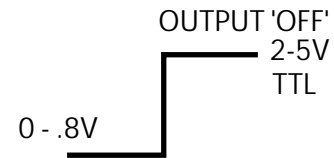
J1-6 Global Enable Logic "0" (Option 3)



All outputs "OFF" with high or open

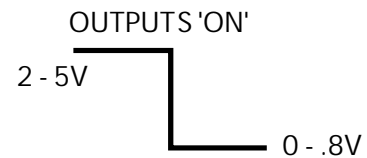
Note: If an external source is not available, short pin 6 to pin 8 to enable outputs "ON"

J1-7 Global Inhibit Logic "1"



All outputs "ON" with low or open

J1-7 Global Enable Logic "1" (Option 3)



All outputs "OFF" with low or open

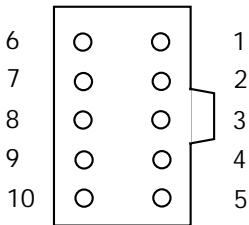
J1-8 Global Inhibit/Enable Return

Control Signal Information

J1 Control Connector

Pin No. Function

1	+Remote Sense	single or dual o/p main
2	Remote Margin / V. Program	single o/p
3	Margin High	single o/p
4	-Remote Sense / Margin Low	single or dual o/p main
5	Spare	
6	Module, Isolated Inhibit	single or dual o/p
7	Module Inhibit return	single or dual o/p
8	Current Share (SWP)	single or dual o/p main
9	+ Remote Sense V2	dual o/p, single is spare
10	- Remote Sense V2	dual o/p, single is spare



UNIT CONNECTOR

MATING HOUSING

90142-0010 (Molex)
87977-3 (Amp)

PINS

90119-2110 gold plated (Molex)
87309-8 (Amp)

CRIMP TOOL

69008-0005 (Molex)

ACCESSORIES

CONNECTOR KIT

Astec P/N 70-841-004

I SHARE HARNESS

2 slot Astec P/N 73-524-012
3 slot Astec P/N 73-524-013

Remote Sense V1

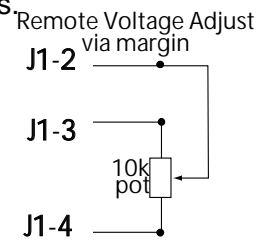
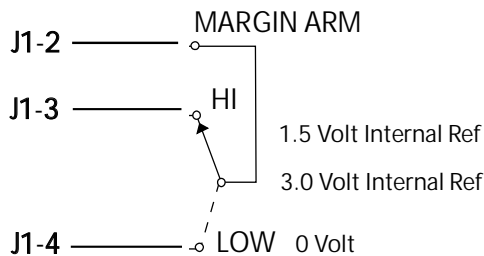
J1-1	+Remote Sense
J1-4	-Remote Sense

Compensates for up to 0.5V drop. Recommend shielded twisted pair wire.

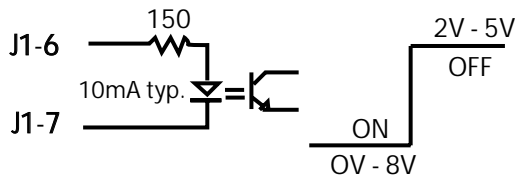
J1-9	+Remote Sense V2
J1-10	-Remote Sense V2

Remote Margining, Single Output Modules

±4-6% of nominal output voltage. Margin will track the output voltage when V out is adjusted via accessible panel pot or pots.

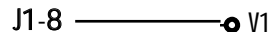


Module Isolated Inhibit



Output is "ON" with low or open

Can be used for external output sequencing in multi-output units.

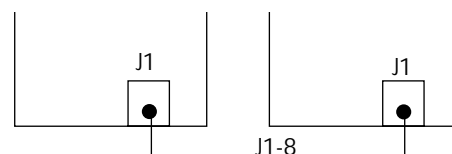


Single Wire Parallel

Singles or main of dual output. Can also be used as a relative current monitor using proportional voltage: 2-6V, high impedance, do not load this pin, use buffer. When individual unit outputs are in parallel the SWP's lines are tied together. This provides forced current sharing of the outputs.

I SHARE HARNESS

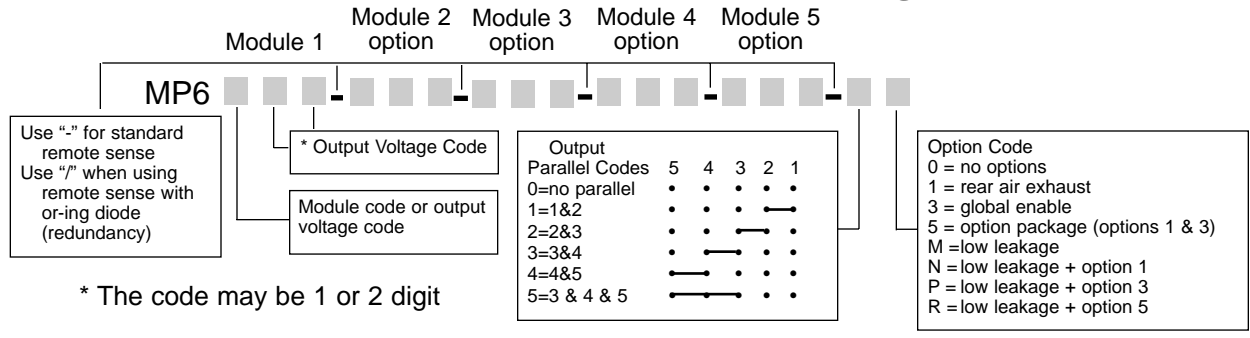
2 slot Astec P/N 73-524-012
3 slot Astec P/N 73-524-013



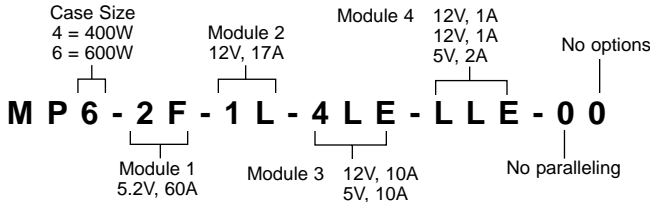
Special Application Notes For Dual Output Modules

An OVP condition on V2 will "latch" off the entire module.

Recycle the AC input to reset. V1 is main output forward converter
V2 is Sub regulated current mode magamp output.



Examples:



- V M E -

*VME/DC OK timing and system DC OK module (Always in last slot)
Consult Factory

Output Voltage Code

1. Example: 5V, 60A; Module Code - 2 E

Output Voltage Code

2. Example: 5V, 10A; Module Code - 4 E L
(always)

**Output Voltage Code

**No Module Code required

3. Example: 12V, 1A;
20V, 0.5A;
5V, 2A*

L P E

Single Output 3-digit Code Selection Chart

Voltage Code	Voltage ±10%	Module Code		
		1 Takes up 1 Slot Current Max. (A)	2 Takes up 2 Slot Current Max. (A)	3 Takes up 3 Slot Current Max. (A)
A	2 V	35	60	120
B	2.2 V	35	60	120
C	3 V	35	60	120
D	3.3 V	35	60	120
E	5 V	35	60	120
F	5.2 V	35	60	115
G	5.5 V	34	58	109
H	6.0 V	23	42	78
I	8.0 V	20	36	68
J	10 V	18	32	60
K	11 V	17	31	54.5
L	12 V	17	30	50
M	14 V	14	21	40.5
N	15 V	14	20	39
O	18 V	11	19	33.3
P	20 V	10.5	18	30
Q	24 V	8.5	15	23.5
R	28 V	6.7	11	21.4
S	30 V	6.5	11	20
T	33 V	6.2	10.9	18.2
U	36 V	5.8	10	16.6
V	42 V	4.2	7.5	12.5
W	48 V	4.0	7.5	12.5
X	54 V	3.7	6.0	11
Y	60 V	3.5	6.0	10

Dual Output 3-digit Code Selection Chart

Voltage Code	Voltage ±10%	Takes up 1 slot Current Max. (A)	
		V1	V2
A	2 V	-	10
B	2.2 V	-	10
C	3 V	-	10
D	3.3 V	-	10
E	5 V	10	10
F	5.2 V	-	10
G	5.5 V	-	10
H	6.0 V	-	10
I	8.0 V	10	4
J	10 V	10	4
K	11 V	10	4
L	12 V	10	4
M	14 V	9	4
N	15 V	8	4
O	16 V	-	-
P	20 V	-	-
Q	24 V	4	2
R	28 V	3	2

* Note: Total loading not to exceed 144 watts.

Triple Output 3-digit Code Selection Chart

Voltage Code	Voltage ±10%	Takes up 1 slot Current Max. (A)		
		V1	V2	V3
A	2 V	-	-	2
B	2.2 V	-	-	2
C	3 V	-	-	2
D	3.3 V	-	-	2
E	5 V	-	-	2
F	5.2 V	-	-	2
G	5.5 V	-	-	2
H	6.0 V	-	-	2
I	8.0 V	1	1	1
J	10 V	1	1	1
K	11 V	1	1	1
L	12 V	1	1	1
M	14 V	1	1	1
N	15 V	1	1	1
O	18 V	1	1	1
P	20 V	-	0.5	0.5
Q	24 V	-	0.5	0.5
R	28 V	-	0.5	0.5

* Note: Total loading not to exceed 36 watts.

Voltage Code	Voltage Range	SINGLE OUTPUT MODULE MAXIMUM (A)			DUAL OUTPUT MODULE MAXIMUM (A)		TRIPLE OUTPUT MODULE MAXIMUM (A)		
		1	2	3	V1	V2	V1	V2	V3
*Z	1.35 - 1.8	35	60	120	-	-	-	-	-
	2.4 - 2.7	35	60	120	-	10	-	-	2
	3.6 - 4.5	35	60	120	-	10	-	-	2
	6.6 - 7.2	20	36	68	10	4	-	-	1
	8.8 - 9.0	18	32	60	10	4	-	-	1

* One Z will represent one voltage range only within the module.



Installation and Operating Instructions

MVP 4/6 Series 400/600 Watts & 600/800 Watts

BEDIENUNGSANLEITUNG



To comply with the published safety standards, the following must be observed when using this power supply.

Um den zur Zeit gültigen Sicherheitsbestimmungen zu genügen, müssen die nachstehenden Maßnahmen beim Einsatz dieser Netzgeräte berücksichtigt werden.

1. Follow below table for maximum ambient temperature around power supply.
Die Tabelle unter bigt die Ausgangsleistung beim maximum Umgebungstemperature.

PSU	Maximum Ambient	AC-Input	Maximum Output	PSU	Maximum Ambient	AC-Input	Maximum Output
MP4	50degC (Standard air flow)	100-240Vac	400W	MP6	50degC (Standard air flow)	100-240Vac	600W
		200-240Vac	600W			200-240Vac	800W
	70degC (Standard Air Flow)	100-240Vac	200W		70degC (Standard Air Flow)	100-240Vac	300W
		200-240Vac	300W			200-240Vac	400W
	40degC (rear Air Exhaust)	100-240Vac	400W		40degC (rear Air Exhaust)	100-240Vac	600W
		200-240Vac	600W			200-240Vac	800W

2. The power supply is intended for use as a component part of other equipment. When installing the power supply and making input and output connections, the relevant safety standards e.g. IEC950/VDE 0805; EN 60950; CSA C22.2 No. 950; CSA Standard C22.2 No. 234; UL 1950 must be complied with, especially the requirements for creepage distances, clearances and distance through insulation between primary wiring and earth or secondary (SELV) wiring.

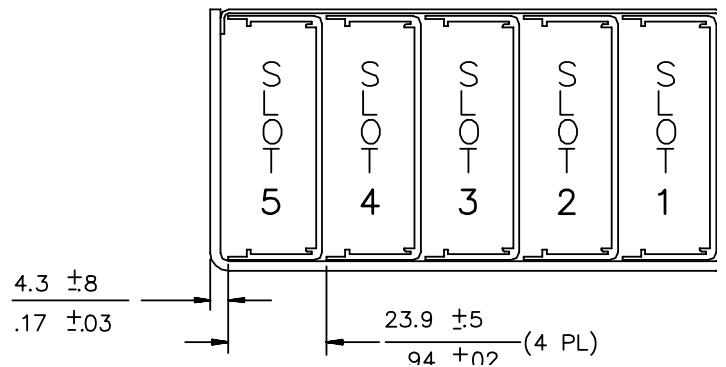
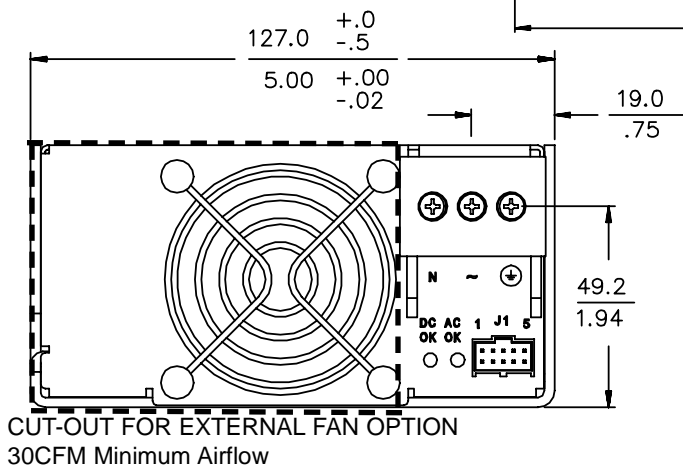
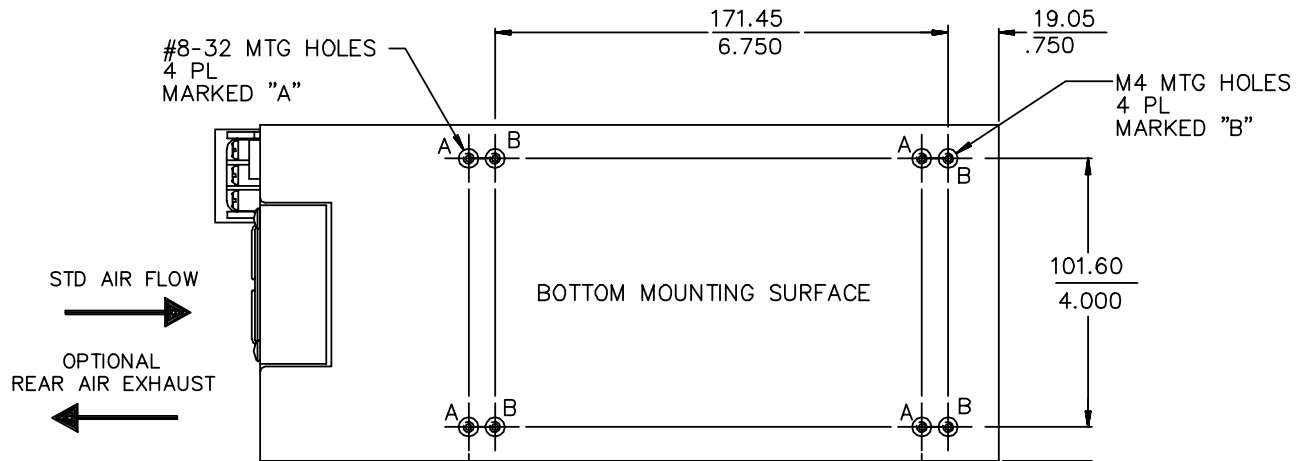
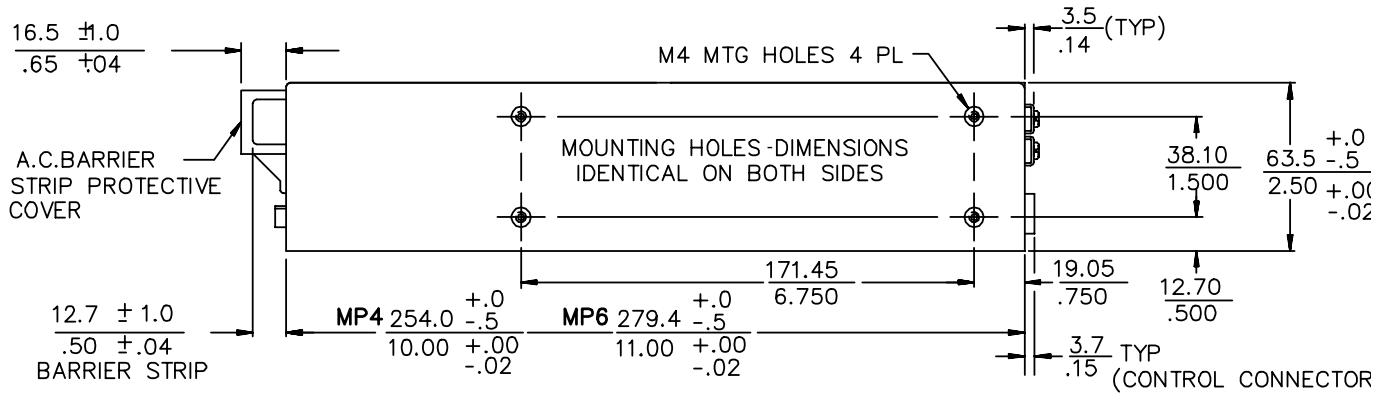
Ein Netzgerät ist ein Einbauteil in ein entsprechendes Gerät und bei Herstellung der elektrischen Verbindungen im und am Gerät sind die einschlägigen Bestimmungen wie z.B. IEC950/VDE 0805; EN60950; CSA C22.2; No. 950; CSA Standard C22.2 No. 234; UL 1950 zu beachten und einzuhalten, insbesondere die Anforderungen für Kriech und Luftstrecken und Dicke der Isolation zwischen Primär- und Schutzleiter- Kreis und Primär-zum Sekundärstromkreis (SELV-Kreis).

3. The output power taken from the supply must not exceed the rating given on the "Power Supply"
Die Ausgangsleistung darf die auf dem Netzgerät angegebenen Werte nicht übersteigen.
4. The circuit wiring of the power supply is made in such a way that components like capacitors are positioned in front of the power supply fuse. Therefore the unit must be protected by a fuse in the installation system.
Die Schaltung des Netzgerätes ist so ausgelegt, daß Bauteile wie Kondensatoren vor der Sicherung des Netzgerätes liegen. Aus diesem Grunde muß unbedingt darauf geachtet werden, daß das Gerät durch eine Sicherung in der Installation abgesichert ist.
5. This power supply is suitable for different rated voltages. The switch over to the corresponding rated voltage which belongs to the specific appliance is done automatically in the appliance.
Dieses Netzgerät ist für verschiedene Nennspannung geeignet. Die Anpassung an die jeweilige Netzspannung, an die das Gerät angeschlossen ist, erfolgt automatisch im Gerät.
6. For MP4, the fuse F401 should only be replaced by Type ABC, 10A, 250V, Manufacturer Bussman or Type 314, 10A, 250V, Manufacturer Littelfuse. For MP6, the fuse F401 should only be replaced by Type ABC 15A, 250V, Manufacturer Bussmann or Type 314, 15A, 250V, Manufacturer Littelfuse.
Für MP4, die Sicherung F401 darf nur durch den Typ ABC, 10 A, 250V, Hersteller Bussmann ersetzt werden, oder Typ 314, 10A, 250V Hersteller Littelfuse. Für MP6, die Sicherung F401 darf nur durch den Typ ABC, 15 A, 250V, Hersteller Bussmann ersetzt werden, oder Typ 314, 15A, 250V Hersteller Littelfuse.
7. The earth wire must be connected only to the earthing point which is marked with the earth symbol. If the earth wire is connected by a screw, the wire must have an annular eyelet and has to be adequately locked against accidental loosening.
Der Schutzleiter muß an der mit dem Schutzleitersymbol bezeichneten Stelle angeschlossen werden. Bei Schraubanschluß ist der Schutzleiter mit einer Ringöse zu versehen und muß gegen Lockern gesichert sein.
8. There is an Energy Hazard on this built-in Power Supply During operation the operator must not touch this voltage.
In dem Einbau-Schaltnetzteil besteht Energiegefahr. Beim Einbau ist darauf zu achten, daß der Benutzer diese Spannung nicht berühren kann.
9. In case of failure, this power supply must be returned to Astec Authorized Service Station for Servicing to ensure compliance with safety requirements.
Im Fehlerfall muß dieses Gerät an eine von Astec Autorisierte Servicestation zurückgesendet werden, um Sicher zu gehen das alle Sicherheitsbestimmungen eingehalten sind.
10. The disconnection from the line must be in the end system.
Die Trennung vom Netz muß im Endgerät durchgeführt werden.
11. Total loading of each dual output modules not to exceed 144W and total loading of each triple output modules not to exceed 36W.
Die Gesamtladung einer doppelten ertrag Modul darf nicht mehr wie 144W sein, einer dreifachen ertrag Modul nicht mehr wie 36W.

Drawings • MVP Series MP4 (600 Watts Max) & MP6 (800 Watts Max)

MP4 • 5-inch Case Size 63.5mm x 127mm x 254mm / 2.5" x 5" x 10"

MP6 • 5-inch Case Size 63.5mm x 127mm x 279.4mm / 2.5" x 5" x 11"



Notes

1. Input: Barrier type. Three No. 6-32 B.H. screws (0.375" centers). Max torque: 7 in-lbs (0.79 N-m).
2. Control connectors: (J1 and J2) 10 position housing, gold plated contacts. Mates with Molex 90153-0210 (IDT) housing, or 90142-0010 housing with 90119-2110 crimp contacts (Molex C - Grid III Series) or AMP Model number 87977-3 with 87309-8 pins. Connector kit includes mating connector and 10 pins. Astec part #70-841-004.
3. Chassis material: aluminum with chemical film coating. (Conductive)
4. All dimensions are in millimeters and inches and are typical.
5. Customer mounting -3 sides M4, bottom also includes 8-32 mounting holes. Maximum penetration is 0.150" (3.8mm). (Max torque 5in-lbs)
6. Output module connections: All single O/P modules are M4 x 8mm screws (Max torque 10in-lbs).
Dual O/P module is M3 x 8mm screws (Max torque 5 in-lbs).
Triple O/P module is .045" square pins on .156 centers. (Mates with Molex 09-50-8063 or equivalent.)