

PRODUCT SPECIFICATION

The APC-MS series provides single and multiple output solutions for the communications, industrial, transportation, instrumentation and test & measurement market as well as medical applications (see the APC-MM series).

With 46,656 possible output configurations and up to 12 isolated and adjustable outputs, the APC-MS series is a flexible, cost effective solution to your exact power architecture requirements.

The APC-MS series is offered in 2 mechanical formats, the APC-MS4 (270 x 127 x 65mm) supplies 4 slots of up to 600 watts and the APC-MS6 (270 x 187 x 65mm) provides up to 1000 watts in 6 slots. With high quality screw terminal connections for AC input and DC output modules, it is possible to individually margin, enable, parallel or stack the outputs to provide literally millions of power solutions.

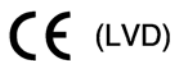
The topology couples a double-ended forward converter via a planar magnetic conversion stage into modular magnetic amplifier output stages. This allows rapid mainstream production turnaround of configured units, CE marked, complete with safety approvals and fully compliant to EN61000-3-2



3 YEAR WARRANTY

FEATURES

- ❑ 1 to 8 or 1 to 12 isolated outputs with full user configurability
- ❑ 1.45V to 28V standard output voltages
- ❑ Bias Supply Voltage 5V @ 50mA
- ❑ Class B Conducted Emissions
- ❑ 1000W, 600 W & 400W of output power
- ❑ Series and Parallel capability
- ❑ Zero load operation
- ❑ EN61000-3-2 compliant
- ❑ Universal input
- ❑ Fully floating outputs
- ❑ Individual control signals on each module
- ❑ Modular construction
- ❑ Industry standard footprint



Single Output Modules		Nominal	Range	I _{max}
Module 1	1 slot	5V	(3 - 5.6V)	30A
Module 2	1 slot	12V	(5 - 13V)	20A
Module 3	1 slot	18V	(8 - 20V)	15A
Module 4	1 slot	24V	(12 - 28V)	12A
Module 70	2 slots	5V	(1.45 - 5.6V)	80A
Dual Output Modules		Nominal	Range	I _{max}
Module 5	1 slot	24V 24V	(10-28V)	3A 3A
Module 6	1 slot	5V 24V	(3 - 5.6V) (10-28V)	10A 3A

PRODUCT SPECIFICATION

1000W/600W/400W configurable Switched Mode Power Supply - 4 & 6 slot package size

Specification All specifications are typical at nominal input, full load at 25°C unless otherwise stated

Output Specifications

Maximum power	Input module C	400W
	Input module E	600W
	Input module M (Note 1)	1000W
Output adjustment	(Note 2)	Multi-turn potentiometer
Line regulation		±0.1%
Load regulation	50% load change	±0.2%
Cross regulation		±0.2% typ.
Transient response	(Note 3)	<10%, <0.5ms
Temperature coefficient		±0.02%/°C
Ripple and noise	(Note 4)	1.0% or 100mV pk-pk
Overvoltage protection		Standard on all outputs
Overcurrent protection	(Note 5)	Individual current limit
Thermal protection		Standard
Mains failure signal	Option 03, 05,06 or 07	5ms warning
Output isolation	(Note 6)	Each single and dual output fully floating
Margin	See APC for individual module margin capabilities	
Minimum load	(Note 7)	Zero
Turn-on delay		500ms
Remote sense	Single outputs only	0.5V drop

Input Specifications

Input voltage range	Universal input	88 to 264VAC 125 to 370VDC
Input frequency range	(Note 8)	47Hz to 63Hz
Inrush current	230VAC @ 25°C	50A max.
Harmonic distortion	(Power factor)	EN61000-3-2

NOTES

- 1000W peak power for 10s at low line. 800W average power for input voltage less than 180VAC.
- Outputs are user adjustable or factory set to your requested voltage.
- 25% to 75% load change.
- Whichever is greater. 20MHz bandwidth. (See APC notes for specification below 0°C).
- Straight line on all outputs. On Module 70 current limit adjustable from 50% to 110%. Optional foldback on Module 70. Contact factory for details.
- 100V isolation between each output and 500V to chassis.
- All outputs except Module 70, which has 5.0% minimum load for full specification.
- Contact APC for 400Hz operation.
- For nominal output voltages and full load.
- The specifications contained in this data sheet are believed to be correct at time of publication. Specifications are subject to change without notice.
- This product is not intended for use as a stand alone unit and must be installed by authorised personnel in order to maintain approvals.

EMC Characteristics

Emissions:		
Conducted	EN55022, FCC	Level B
Immunity:		
Electrostatic discharge	EN61000-4-2	Level 4
Radiated RFI	EN61000-4-3	Level 3
Fast transients - burst	EN61000-4-4	Level 3
Input line surges	EN61000-4-5	Class 3
Conducted RFI	EN61000-4-6	Level 3
Voltage dips	EN61000-4-11	Compliant

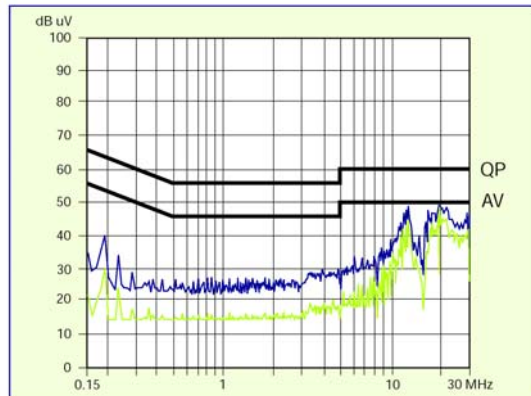
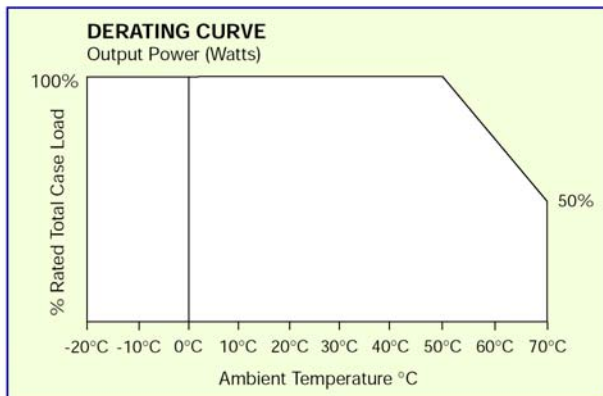
General Specifications

Hold-up time	(Note 9)	20ms typ after loss of AC power
Efficiency	APC-MS4	82% typ.
	APC-MS6	80% typ.
Isolation voltage	Input/output	3000VAC
	Input/chassis	1500VAC
Switching frequency		200kHz
Approvals and standards	(Note 11)	IEC60950, UL1950 CSA22.2 No. 950
Leakage current	(APC-MS4)	1.25mA, 250VAC, 60Hz
	(APC-MS6)	1.75mA, 250VAC, 60Hz
Weight	(APC-MS4)	2.5kg
	(APC-MS6)	3.5kg
Size LxWxH	(APC-MS4)	270 x 127 x 65 mm
	(APC-MS6)	270 x 187 x 65 mm
MTBF	See APC	400,000 hours

Environmental Specification

Operating temperature	See APC	-20°C to +50°C
(See derating curve)		Derate 2.5% per °C up to +70°C
Storage temperature		-40°C to +85°C
Relative humidity	Non-condensing	5% to 95% RH
Shock	3000 bumps, 10G (16ms) half sine	
Vibration		10-200Hz, 1.5G

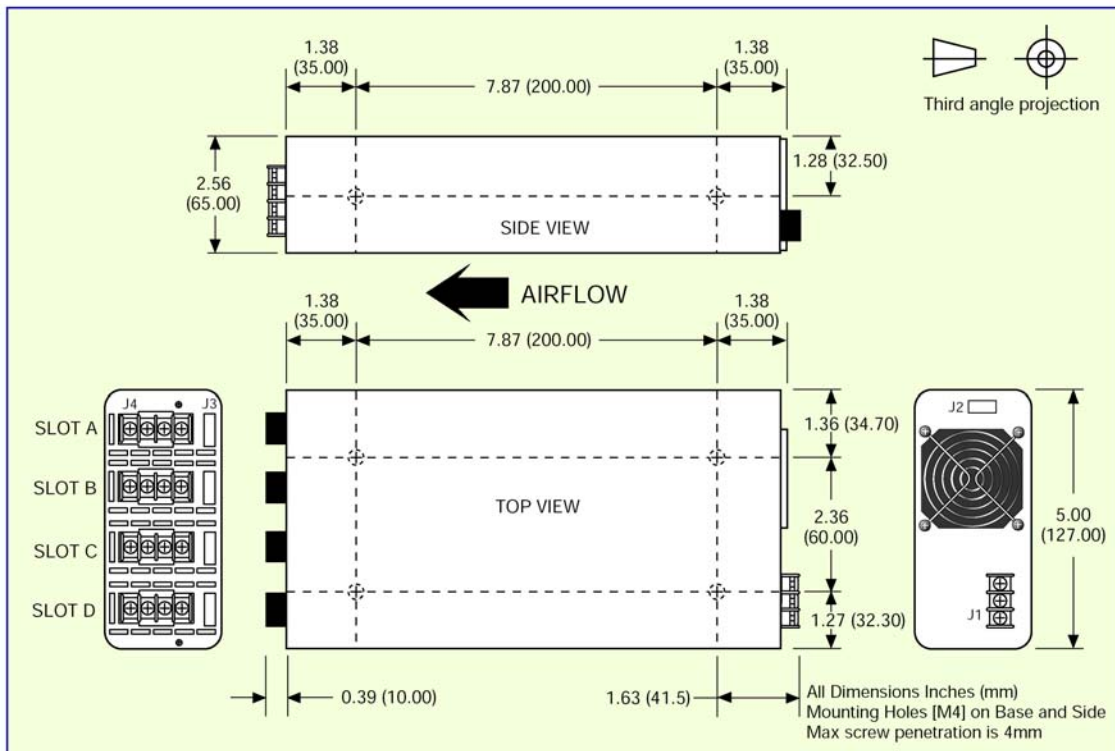
TYPICAL EMISSIONS TO EN55022 LEVEL B



PRODUCT SPECIFICATION

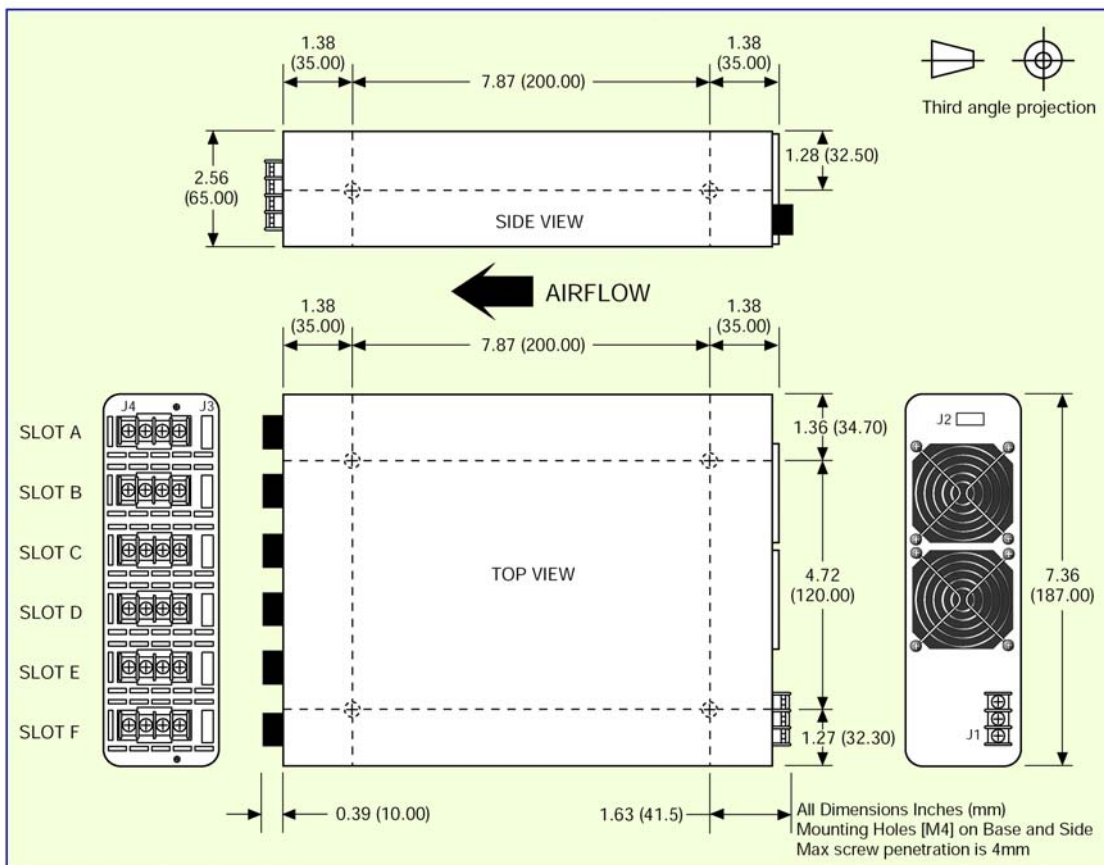
1000W/600W/400W configurable Switched Mode Power Supply - 4 & 6 slot package size

Mechanical Specification



APC-MS4 mechanical Outline

APC-MS6 mechanical Outline



Connectors:

- J1** Line Input Connector
- J2** Options
See APC Notes for Pinout
- J3** Output Signals
See APC Notes for Pinout
- J4** Output Connector

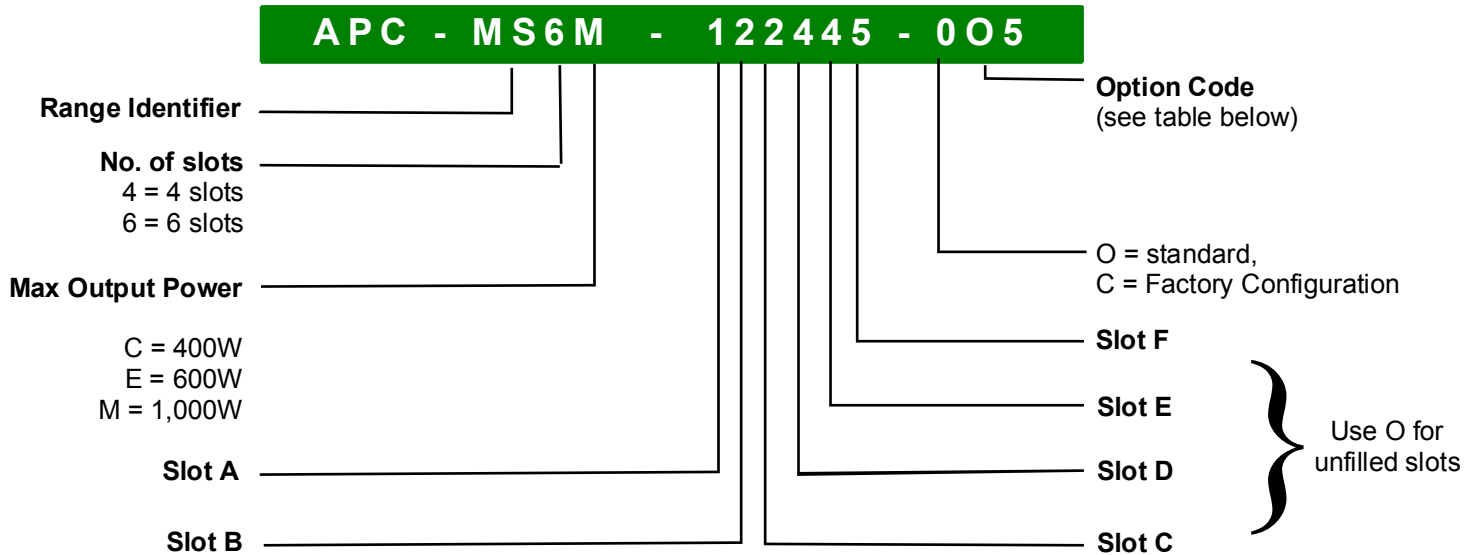
Accessories:

- Parallel Link
- Series Link
- "U" Link
- Mating Connector for options + Module 1-6 signals
- Mating Connector for Module 70 signals

PRODUCT SPECIFICATION

1000W/600W/400W configurable Switched Mode Power Supply - 4 & 6 slot package size

How to Order



Eg; Product ref: APC-MS6M-122445-O05

APC MS series, 6 slots, 1,000W max output power, 5V @ 30A, 12V @ 20A, 12V @ 20A, 24V @ 12A, 24V @ 12A, and 24V @ 3A, standard configuration with Mains power fail + logic inhibit

Production configuration:

Units are shipped with nominal output voltages unless production configuration is specified. APC can configure to your exact requirements, through use of appropriate parallel and series busbars and through voltage adjustment to specific set points. Please contact APC for configuration details and for part number assignment.

4 & 6 Slot Standard Option Codes

- 03 = Mains power fail + logic enable
- 05 = Mains power fail + logic inhibit
- 06 = Mains power fail + logic enable + Bias Supply Voltage
- 07 = Mains power fail + logic Inhibit + Bias Supply Voltage

Options: Mutually exclusive

NB: When any of the multi output units are ordered with an empty slot space, the factory automatically fit a blanking plate to the spare slot.

Output Signals

Output control signals are available on all output modules.

Modules 1 to 6

- Power good signal
- Output inhibit signal
- Remote adjust (margin)

Module 70 Additional Features (See APC Notes)

- Adjustable Current Limit
- Foldback or Straight Line Current limiting
- Bias Voltage
- Selectable Output Inhibit or Enable

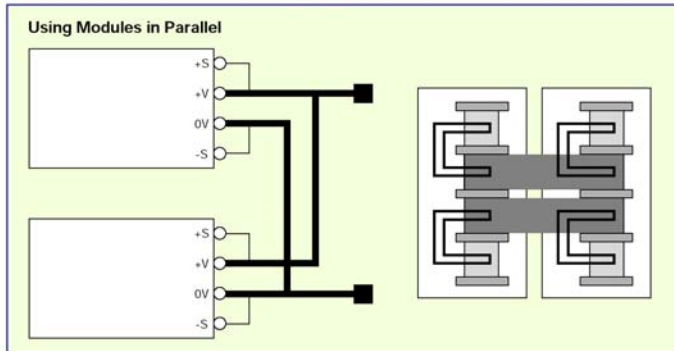
(Dual output modules: output signals available on first [top] output only).



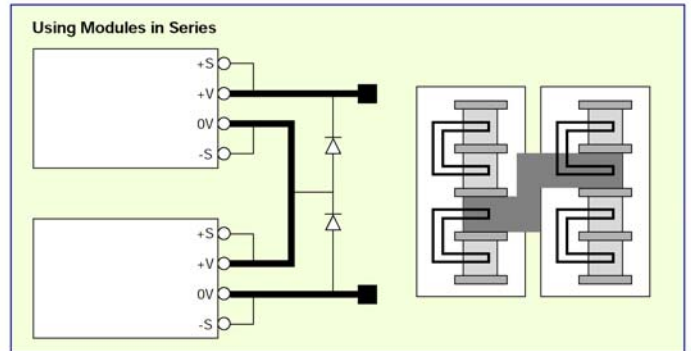
PROVISIONAL SPECIFICATION

1000W/600W /400W configurable Switched Mode Power Supply - 4 & 6 slot package size

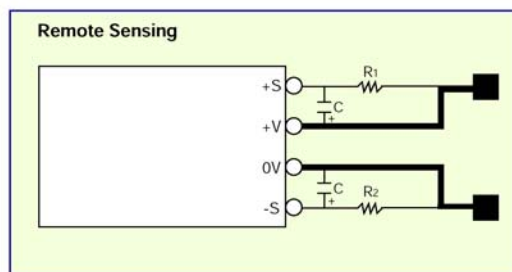
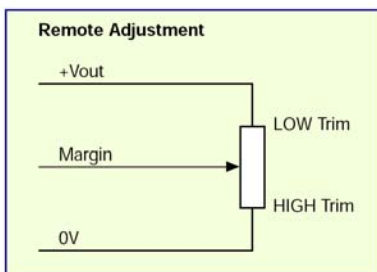
APC range flexibility



Notes:
 Maximum current = $(I_1 + I_2) \times .9$
 Use two parallel links

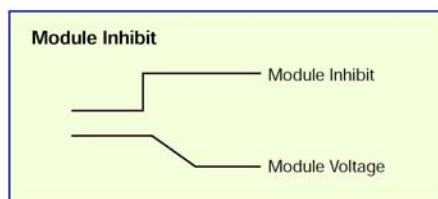
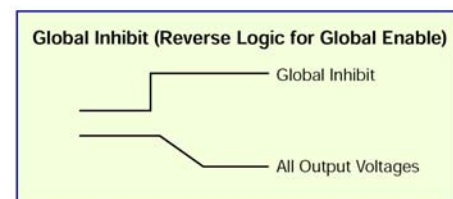
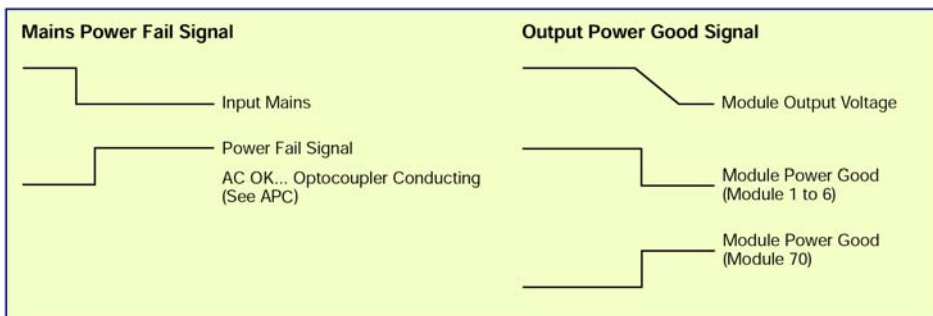


Notes:
 Maximum voltage to chassis is 500V
 Use series link
 Reverse bias diodes may be required for certain applications, eg. large capacitive loads

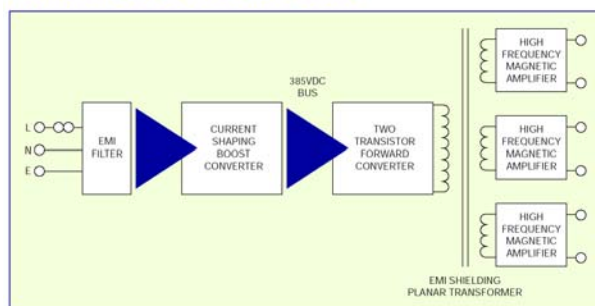


Notes:
 Where the sensing point is remote from the output of the power supply, to avoid spurious noise pick-up it may be necessary to:

- 1 Use twisted pair sense wires.
- 2 Use R C as shown (R1 = 100Ω) (R2 = 10Ω) (C = 22μF).



PRINCIPLE OF OPERATION



Information & specifications contained in this data sheet are believed to be correct at the time of publication. However, APC accept no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice