

The MQ Series is a family of sophisticated, medium power, high voltage power supplies that complies with current international safety and EMI directives.

These 300 Watt high voltage supplies feature flexible embedded controls with low ripple and noise, they are air insulated, fast response units, with tight regulation and extremely low arc discharge currents.




Packaged as a space saving module to avoid the expense of front panels and displays, with no compromise in performance and/or operating features. The result is a power supply that offers outstanding value for a wide range of demanding applications.



Features

- ▶ Output voltages 0-1kVDC to 0-60kVDC
- ▶ Compact module
- ▶ RS232, USB, & optional Ethernet control
- ▶ Constant voltage/constant current operation
- ▶ Short circuit, overload & arc protection
- ▶ Tight regulation
- ▶ Low ripple
- ▶ Air insulated
- ▶ 3 year warranty

Applications

- 
- ▶ Ion implant
 - ▶ E-beam/Ion beam
 - ▶ Industrial technology
 - ▶ Capacitor charging
 - ▶ High voltage bias

Dimensions

120.7 x 203.2 x 520.7 mm (4.75" x 8.00" x 20.50")

More resources

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→ xppower.com



Models & ratings

Positive polarity	Negative polarity	Output voltage	Output current	Max stored energy	Output cable ⁽³⁾
MQ1P300	MQ1N300	0 to 1kVDC	0 to 300mA	0.35J	RG-58U
MQ1.5P200	MQ1.5N200	0 to 1.5kVDC	0 to 200mA	0.5J	RG-58U
MQ2P150	MQ2N150	0 to 2kVDC	0 to 150mA	0.3J	RG-58U
MQ3P100	MQ3N100	0 to 3kVDC	0 to 100mA	0.7J	RG-58U
MQ5P60	MQ5N60	0 to 5kVDC	0 to 60mA	0.4J	RG-58U
MQ6P50	MQ6N50	0 to 6kVDC	0 to 50mA	0.55J	RG-8U

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Notes:

1. Stored energy: <200mJ
2. Stored energy: <400mJ
3. Detachable, 2.4m (8ft) RG-8U shielded high voltage coaxial cable, 1.8m (6ft) NEMA 5-15 line cord, 1.8m (6ft) NEMA 6-15 line cord, 3m (10ft) null modem cable and 3m (10ft) USB cable are provided.

Models & ratings

Positive polarity	Negative polarity	Output voltage	Output current	Max stored energy	Output cable ⁽³⁾
MQ8P37	MQ8N37	0 to 8kVDC	0 to 37mA	0.4J	RG-8U
MQ10P30	MQ10N30	0 to 10kVDC	0 to 30mA	0.6J	RG-8U
MQ12P25	MQ12N25	0 to 12kVDC	0 to 25mA	0.85J	RG-8U
MQ15P20	MQ15N20	0 to 15kVDC	0 to 20mA	0.75J	RG-8U
MQ20P15	MQ20N15	0 to 20kVDC	0 to 15mA	1.2J	RG-8U
MQ25P12	MQ25N12	0 to 25kVDC	0 to 12mA	1.3J	RG-8U
MQ30P10	MQ30N10	0 to 30kVDC	0 to 10mA	1.8J	RG-8U
MQ40P7.5	MQ40N7.5	0 to 40kVDC	0 to 7.5mA	2.4J	RG-8U
MQ50P6	MQ50N6	0 to 50kVDC	0 to 6mA	3.0J	RG-8U
MQ60P5	MQ60N5	0 to 60kVDC	0 to 5mA	3.5J	RG-8U

Notes:

1. Stored energy: <200mJ
2. Stored energy: <400mJ
3. Detachable, 2.4m (8ft) RG-8U shielded high voltage coaxial cable, 1.8m (6ft) NEMA 5-15 line cord, 1.8m (6ft) NEMA 6-15 line cord, 3m (10ft) null modem cable and 3m (10ft) USB cable are provided.

Options

Symbol	Description
A	100/200 VAC $\pm 10\%$, 48 to 63 Hz. Selectable. Shipped set for 200VAC.
F22	Required for CE Compliance - 230VAC Power Factor Corrected. AC input line rated for 198 to 264VAC, 48 to 63Hz, 400VA maximum. Active correction circuitry achieves an input line current harmonic content well below the maximum specified in EN61000-3-2. (AC line voltage selector switch removed. One NEMA 6-15 cord provided.
SS	Slow start ramp. Specify time from 1 to 30 seconds, $\pm 10\%$
ZR	Zero start interlock. Voltage control, local or remote, must be at zero before the HV will enable.
5VC	0-5VDC voltage and current program/monitor.
ARC	Arc count and quench as described in the specifications for 1 to 6kVDC models.
AC	Arc Count Only
AQ	Arc Quench Only
ETH	Virtual RS-232 COM port over Ethernet network. (Requires compatible OS (eg Windows) for COM drivers)

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage	102		132	V RMS	Single phase. User selectable via front panel switch. Shipped set for 198 to 264.
	198		264	V RMS	
Input frequency	48		63	Hz	
Input connector	C14 connector per IEC 60320 with mating line cords.				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage range	0		60	kVDC	See models and ratings table.
Output current range	0		300	mA	See models and ratings table.
Polarity	Available with either positive or negative polarity with respect to chassis ground.				
Output control	Continuous, stable adjustment, from 0 to rated voltage or current by panel mounted 10-turn potentiometer with 0.05% resolution, or by external 0 to +10VDC signals is provided.				
Static voltage load regulation	±0.005			%	For specified line variations.
	0.005			%	+0.5mV/mA for no load to full load variations.
Dynamic voltage regulation	For load transients from 10% to 99% and 99% to 10%, typical deviation is less than 2% of rated output voltage with recovery to within 1% in 500 us and recovery to within 0.1% in 1ms.				
Stability		0.01		%	Per hour after 30 min. warm up.
		0.05		%	Per 8 hours.
Temperature coefficient		0.01		%/°C	
Voltage rise time constant		50		ms	For all models using either HV enable or remote programming control.
Voltage decay time constant		50		ms	With a 50% resistive load for 12kVDC to 60kVDC models.
		50		ms	With a 10% resistive load for 1kVDC to 6kVDC models.
Ripple	0.025			%	+0.5V RMS at full load.
Repeatability			0.1	%	
Current regulation	0.1			%	
Arc count	Internal circuitry senses the number of arcs caused by external load discharges. If the rate of consecutive arcs exceeds approximately one arc per second for five arcs, the supply will turn off for approximately 5 seconds to allow clearance of the fault. After this period the supply will automatically return to the programmed kV value with the rise time constant indicated. If the load fault still exists, the above cycle will repeat. Standard on 8 to 60kVDC models; optional on 1 to 6kVDC models.				
Arc quench	An arc quench feature provides sensing of each load arc and quickly inhibits the HV output for approximately 20ms after each arc. Standard on 8 to 60kVDC models; optional on 1 to 6kVDC models.				

Notes:

- Specifications apply from 5% to 100% rated voltage.
- Operation is guaranteed down to zero voltage with a slight degradation of performance.

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	85			%	At full load.
HV insulating medium	Outputs are air insulated.				
External interlock	Open = OFF, closed = ON. Non-latching				
Remote HV enable/disable	0 to 1.5VDC = OFF; 2.5 to 15VDC = ON				
Voltage accuracy	0.5% of setting +0.2% of rated				
Voltage monitor	0 to +10VDC, equals 0 to rated voltage, with an accuracy of 0.5% of reading +0.2% of rated. Output impedance is 10kΩ.				
Current monitor	0 to +10VDC, equals 0 to rated current, with an accuracy of 1% of reading +0.1% of rated. Output impedance is 10kΩ.				
RS232/USB/Ethernet programming & monitor accuracy	Resolution	0.025% of full scale for both the voltage and the current programs. 0.1% of full scale for both the voltage and the current monitors.			
	Remote setting accuracy	Voltage setting accuracy is better than 0.5% of setting +0.2% of rated.			
	Remote reading accuracy	Voltage reading accuracy is 0.5% of reading +0.2% of rated. Current reading accuracy is 1% of reading +0.1% of rated.			

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-20		+40	°C	
Storage temperature	-40		+85	°C	
Protection	Automatic current regulation protects against all overloads, including arcs and short circuits. Thermal switches and RPM sensing fans protect against thermal overload. Fuses, surge-limiting resistors, and low energy components provide ultimate protection.				
RoHS	Restriction of the use of Hazardous Substances				

EMC: emissions

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN61000-6-4		
Radiated	EN61000-6-4		

EMC: immunity

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN61000-6-2:2005		
Radiated	EN61000-6-2:2005		
Line harmonics	EN61000-3-2		

Safety approvals

Certification	Standard	Notes & conditions
EN	EN61010/IEC61010	Safety
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

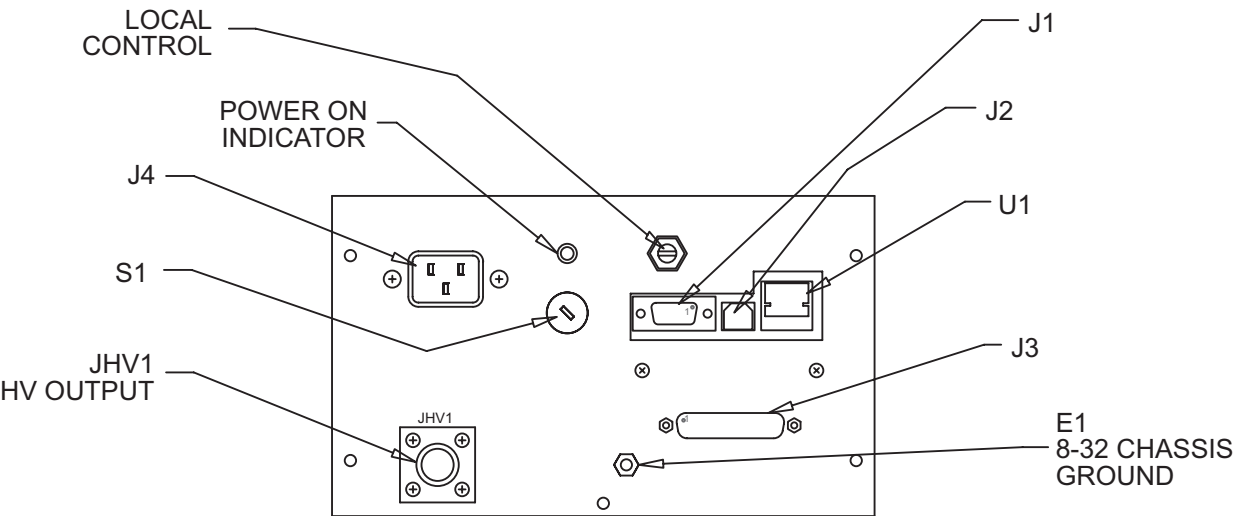
Notes:

1. Full compliance with European Directives for MQ Series with F22 option.
2. Specifications apply from 5% to 100% rated voltage.
3. Operation is guaranteed down to zero voltage with a slight degradation of performance.



Mechanical details

Front view



J1	
Pin	Function
1	DCD
2	RX
3	TX
4	DTR
5	COMMON
6	DSR
7	RTS
8	CTS

J2	
Pin	Function
1	+5V
2	D-
3	D+
4	COMMON

U1 Option	
Pin	Function
1	TXD+
2	TXD-
3	RXD+
4	E POWER+
5	E POWER+
6	RXD-
7	E POWER-
8	E POWER-

J4
Input receptacle C14 per: IEC60320

S1
115/230VAC Selector

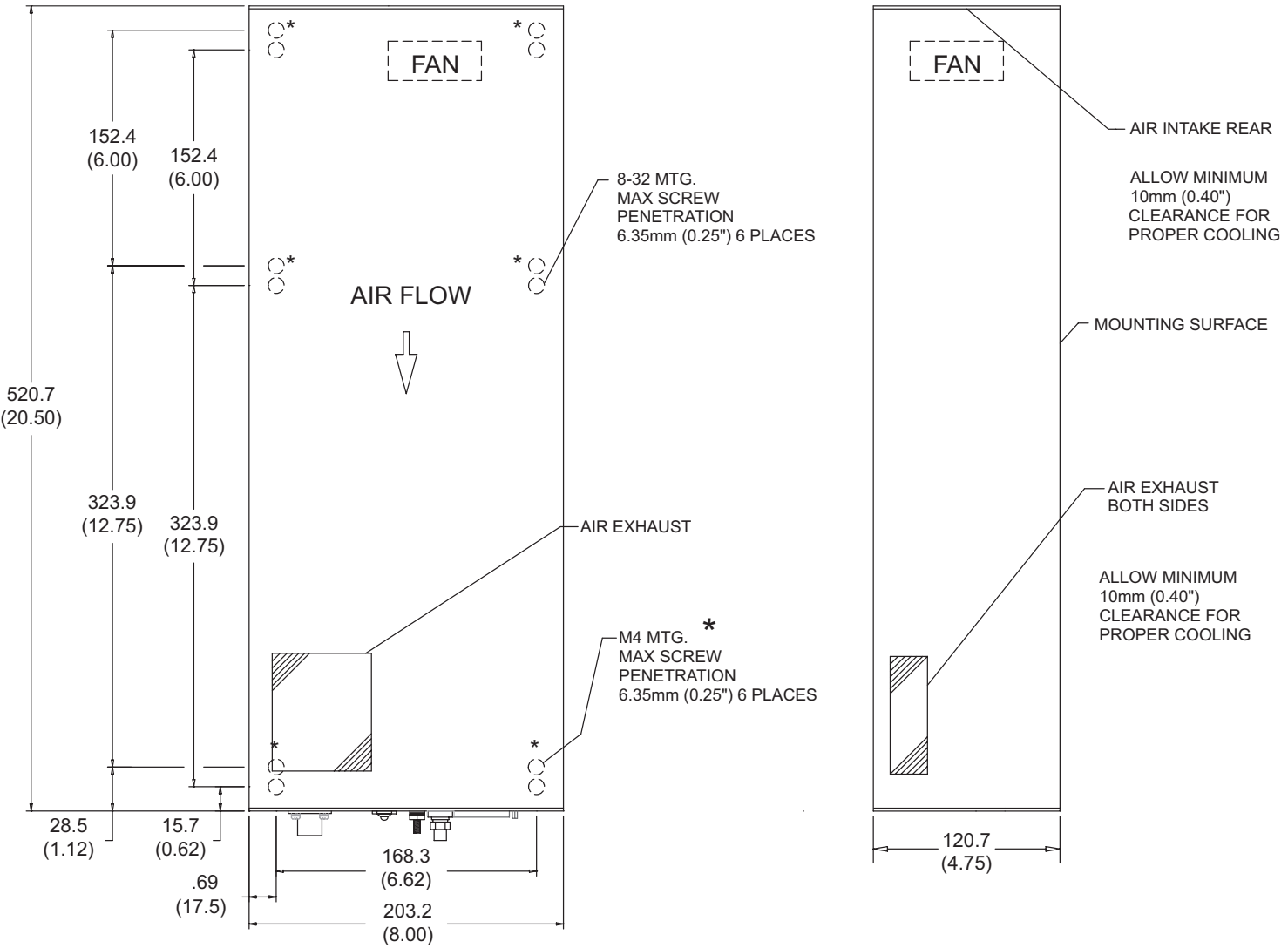
JHV1: HV output
1kV to 5kV KINGS SHV 1704-1 or equivalent
6kV to 60kV AMPHENOL 83-1R-RFX or equivalent

J3					
Pin	Function	Pin	Function	Pin	Function
1	GROUND	10	CURRENT MONITOR	19	RESERVED
2	COMMON	11	COMMON	20	HV ENABLE
3	INTERLOCK	12	REFERENCE	21	HV STATUS
4	RESERVED	13	LOCAL CONTROL	22	FAULT STATUS
5	RESERVED	14	RESERVED	23	MODE STATUS
6	VOLTAGE PROGRAM	15	RESERVED	24	ARC STATUS (optional)
7	CURRENT PROGRAM	16	RESERVED	25	GROUND
8	COMMON	17	CT/CL		
9	VOLTAGE MONITOR	18	CT/CL		



Mechanical details

Top & side view



- Notes:
- 1. All dimensions shown in mm (inches).
 - 2. Weight: 9kg (20lbs) approx.