MQ Series 300W Regulated High Voltage DC Modules

1 kV to 60 kV Laboratory Performance…

CE and Semi S2-93 Compliant

Fully RoHS Compliant

Models from 0 to 1 kV through 0 to 60 kV; Weight <20 lbs.

The MQ Series is a family of sophisticated, medium power, high voltage power supplies that complies with current international safety and EMI directives. We have packaged this series as a space saving module to avoid the expense of front panels and displays. However, no compromises in performance and/or operating features have been made. The result is a power supply that offers outstanding value for a wide range of demanding applications.

The MQ Series of 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

Please refer to Technology > Applications page onour web site for typical applications.

The MQ Series with F22 option, are fully compliant with the Following European Directives:
EN61000-3-2, Line Harmonics.
EN61010/ IEC61010, Safety
EN61000-6-4, Conducted and Radiated Emissions
EN61000-6-2:2005, Conducted and Radiated Immunity
2011/65/EU, Restriction of the use of Hazardous Substances (RoHS)

CE (Meets all applicable directives), UKCA (Meets all applicable legislation)

Features:

Arc Quench. The HV output is inhibited for a short period after each load arc to help extinguish the arc.

Arc Count. Internal circuitry constantly senses and integrates arcs that occur over a given time. In the event a system or load arcing problem develops and exceeds factory-set parameters, the power supply will cycle off in an attempt to clear the fault and then automatically restart after a preset "off dwell time".

Embedded Microcontroller control. Integral RS-232, USB and optional ethernet communications provide remote control program and monitor.

Air Insulated. The MQ Series features "air" as the primary dielectric medium. No oil or encapsulation is used to impede serviceability or increase weight.

Constant Voltage/Constant Current Operation. Automatic crossover from constant-voltage to constant-current regulation provides protection against overloads, arcs, and short circuits.

Low Ripple. Typically, ripple is less than 0.025% RMS of rated voltage at full load.

Tight Regulation. Voltage regulation is better than 0.005% for allowable line and load variations. Current regulation is better than 0.1% from short circuit to rated voltage.

Constant Current/Current Trip. A connection made on the interface connector, allows selection of either current mode.

Warranty. All power supplies are warranted for three years. A formal warranty statement is available.

Specifications

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

Input: User selectable via front panel switch, 102 - 132 V RMS or 198 to 264 VRMS single-phase, 48-63 Hz, 600 VA maximum at full load. C14 connector per IEC 60320 with mating line cords **SHIPPED SET FOR 198 to 264**.

Efficiency: Typically greater than 85% at full load.

Output: 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 10V signals is provided. Voltage accuracy is 0.2% of rated + 0.5% of setting. Repeatability is < 0.1% of rated.

Static Voltage Regulation: Better than ±0.005% for specified line variations and 0.005% + 0.5 mV/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 1 ms.

Ripple: Better than 0.025% of rated voltage + 0.5 V RMS at full load.

Current Regulation: When in current regulation mode, better than 0.1% from short circuit to rated voltage at any load condition.

Voltage Monitor: 0 to +10 V equivalent to 0 to rated voltage. Accuracy: 0.5% of reading + 0.2% of rated. Impedance is 10 KΩ.

Current Monitor: 0 to +10 V equivalent to 0 to rated current. Accuracy: 1% of reading + 0.1% of rated. Impedance is 10 KΩ.

Stability: 0.01% per hour after 1/2 hour warm-up, 0.05% per 8 hours.

Voltage Rise/Decay Time Constant: The voltage rise time constant is 50 ms typical for all models using either HV enable or remote programming control. The voltage decay time constant is 50 ms with a 50% resistive load for 12 kV to 60 kV models and 50 ms with a 10% resistive load for 1 kV to 6 kV models.

Temperature Coefficient: 0.01% /°C.

Ambient Temperature: -20 to +40° C, operating; -40 to +85° C, storage.

Polarity: Available with either positive or negative polarity with respect to chassis ground.

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.

Arc Quench: An arc quench feature provides sensing of each load arc and quickly inhibits the HV output for approximately 20 ms after each arc. Standard on 8 - 60 kV models; optional on 1- 6 kV models.

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 - 60 kV models; optional on 1- 6 kV models.

External Interlock: Open = off, closed = on. Non-latching.

Remote HV Enable/Disable: 0 - 1.5 V = OFF, 2.5 - 15 V = ON.

RS232/USB/Ethernet Programming and 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.

Front Panel Elements.

AC power entry connector, power on indicator, 10-turn potentiometer, ground stud, HV output connector, remote interface connector, RS232/USB connectors, and input voltage selector switch.

The signals provided on the remote interface connector are as follows:

Inputs: Safety interlock, output voltage and current program signals, and high voltage enable.

Outputs: Output voltage and current monitor signals, HV status, fault status, I/V mode status, a +10 V reference source, and local control.

Signal common and ground reference terminals are also provided.

Accessories: Detachable, 8 foot, shielded high voltage coaxial cable (see models chart for cable type), 6 foot NEMA 5-15 line cord, 6 foot NEMA 6-15 line cord, 10 foot null modem cable and 10 foot USB cable are provided.

Weight: Approximately 20 lbs.

Options

Symbol	Description
A	100/200 VAC ± 10%, 48 - 63 Hz, Selectable. Shipped set for 200 VAC.
F22	Required for CE Compliance - 230 VAC Power Factor Corrected. AC Input line rated for 198 - 264 VAC, 48 - 63 Hz, 400 VA 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 1-30 seconds, ±10%.
ZR	Zero start interlock. Voltage control, local or remote, must be at zero before the HV will enable.
5VC	0-5 V voltage and current program/monitor.
ARC	Arc count and quench as described in the specifications for 1 - 6 kV 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).

Models

Positive Polarity	Negative Polarity	Output Voltage	Output Current	Max Stored Energy	Output Cable
MQ1P300	MQ1N300	0-1kV	0-300mA	0.35J	RG-58U
MQ1.5P200	MQ1.5N200	0-1.5kV	0-200mA	0.5J	RG-58U
MQ2P150	MQ2N150	0-2kV	0-150mA	0.3J	RG-58U
MQ3P100	MQ3N100	0-3kV	0-100mA	0.7J	RG-58U
MQ5P60	MQ5N60	0-5kV	0-60mA	0.4J	RG-58U
MQ6P50	MQ6N50	0-6kV	0-50mA	0.55J	RG-8U
MQ8P37	MQ8N37	0-8kV	0-37mA	0.4J	RG-8U
MQ10P30	MQ10N30	0-10kV	0-30mA	0.6J	RG-8U
MQ12P25	MQ12N25	0-12kV	0-25mA	0.85J	RG-8U
MQ15P20	MQ15N20	0-15kV	0-20mA	0.75J	RG-8U
MQ20P15	MQ20N15	0-20kV	0-15mA	1.2J	RG-8U
MQ25P12	MQ25N12	0-25kV	0-12mA	1.3J	RG-8U
MQ30P10	MQ30N10	0-30kV	0-10mA	1.8J	RG-8U
MQ40P7.5	MQ40N7.5	0-40kV	0-7.5mA	2.4J	RG-8U
MQ50P6	MQ50N6	0-50kV	0-6mA	3.0J	RG-8U
MQ60P5	MQ60N5	0-60kV	0-5mA	3.5J	RG-8U