



**HITEK POWER® MSRF SERIES**  
MASS SPECTROMETRY POWER SUPPLY MODULES





The MSRF series consists of high-stability, reversible source modules that perform reliably even under short circuit or arc conditions. They offer fast reversible output voltage, medium ripple, and excellent repeatability.

## MODULAR DESIGNS, CUSTOM SOLUTIONS

The modular design of AE high voltage products for mass spectrometry enables an array of performance features and combinations. From simple options, such as cable length and connector type, to complete custom designs, we deliver solutions that precisely fulfill your specific requirements.

## FEATURES

- › Output power: 3.2 W
- › Output voltage:  $\pm 2.5$  to  $\pm 10$  kV
- › Ripple:  $< 400$  mV to  $< 1$  V
- › Temperature coefficient: 10 or 25 ppm per  $^{\circ}\text{C}$
- › High stability:  $< 0.01\%$  per hour
- › Reversible outputs
- › Fast switching:
  - $\pm 2.5$  kV  $< 20$  mS to 99%
  - $\pm 5$  kV  $< 20$  mS to 99%
  - $\pm 8$  kV  $< 30$  mS to 99%
  - $\pm 10$  kV  $< 30$  mS to 99%
- › Screened case for low magnetic radiation
- › High reliability
- › Differential programming input



## PROVEN POWER-CONVERSION TOPOLOGIES, CONTROL METHODS, AND MECHANICAL EXPERTISE



## PHYSICAL SPECIFICATIONS

<b>Output Power</b>	3.2 W, max
<b>Output Voltage</b>	±2.5 to ±10 kV, depending on model
<b>Output Current</b>	0.3 to 0.5 mA, depending on model
<b>Input Voltage</b>	+24 VDC, ±10%
<b>Input Current</b>	1 A max, depending on model
<b>Line Regulation</b>	< 10 ppm for a 1 V input voltage change
<b>Load Regulation</b>	< 10 ppm for a 10 to 100% load change
<b>Ripple</b>	< 400 mV to < 1 V, depending on model
<b>Voltage Control</b>	0 to 10 V = 0 to 100%, accuracy ±2%
<b>Current Control</b>	Fixed at approximately 110 to 130% of max
<b>Voltage Monitor</b>	±10 V = +100 to -100%, accuracy ±2%
<b>Current Monitor</b>	±10 V = +100 to -100%, accuracy ±2%
<b>Polarity Control</b>	Low < 0.8 V = Negative High > 3.5 V or open = Positive
<b>Inhibit</b>	Low < 0.8 V = Enabled High > 3.5 V or open = Inhibited
<b>Stability</b>	< 0.01% per hour, 0.05% in eight hours (after one hour warmup)
<b>Temperature Coefficient</b>	10 or 25 ppm per °C at max output voltage (tested with external voltage control)
<b>Cooling</b>	Convection cooled
<b>Protection</b>	The units are fully protected against over voltage, short circuit and intermittent arcs to ground.
<b>Operating Temperature</b>	10 to 50°C (50 to 122°F)
<b>Storage/Transport Temperature</b>	-20 to +85°C (-4 to 185°F)
<b>Operational Altitude</b>	Sea level to 2000 m (6500')
<b>Storage/Transport Altitude</b>	Sea level to 18,000 m (59,055')
<b>Reliability</b>	MTBF > 50,000 hours
<b>Humidity</b>	80% max relative humidity up to 31°C (88°F), reducing linearly to 50% at 40°C (104°F); non-condensing (ref. EN61010-1)
<b>Safety</b>	Meets the requirements of the Low Voltage Directive, 2006/95/EC by complying with BS EN61010-1:2010 when installed as a component part of compliant equipment. Units are CE marked accordingly.
<b>RoHS</b>	Meets the requirements of EU Directive 2011/65/EU on the Restriction of use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS).
<b>Construction</b>	A fabricated aluminum alloy case is used for good heat dissipation and screening.
<b>Options</b>	A control option can be supplied with a bipolar input voltage program of ±10 V without the polarity control signal. Please consult our sales team for part numbering for this option.
<b>Switching</b>	Settle to 99%, ±2.5 kV < 20 mS, ±5 kV < 20 mS, ±8 kV < 30 mS, ±10 kV < 30 mS



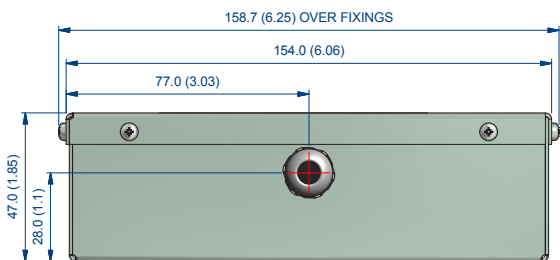
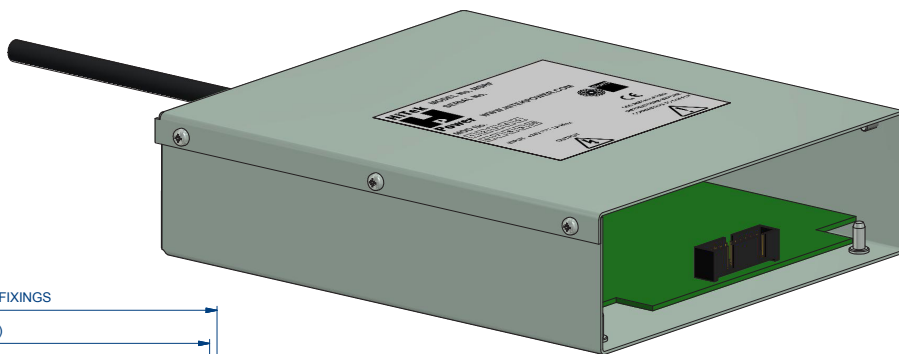
Mechanical Specifications	
<b>Dimensions</b>	159 mm x 182 mm x 47 mm (6.25" x 7.16" x 1.85")
<b>Weight</b>	1.5 kg (3.3 lb)
<b>Casing</b>	Aluminum, clear non-chrome passivate finish
<b>Output Cable</b>	Unterminated URM76; 1 m (3.3') of screened output cable
<b>Connectors</b>	Various options are available upon request.

## INTERFACE CONNECTIONS

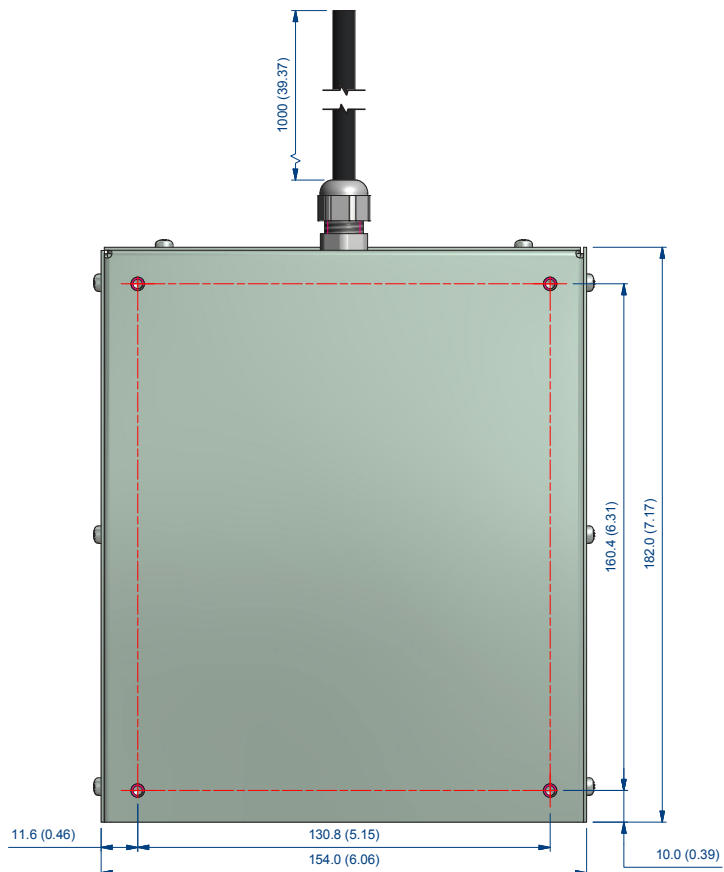
20-Way IDC Connector

+24 VDC INPUT SUPPLY	1
NOT CONNECTED	2
+24 VDC INPUT SUPPLY	3
VOLTAGE MONITOR	4
+24 VDC INPUT SUPPLY	5
CURRENT MONITOR	6
+24 VDC INPUT SUPPLY	7
POSITIVE INPUT VOLTAGE CONTROL	8
+24 VDC INPUT SUPPLY	9
NEGATIVE INPUT VOLTAGE CONTROL	10
0 V INPUT	11
0 V INPUT	12
0 V INPUT	13
SIGNAL GROUND	14
0 V INPUT	15
NOT CONNECTED	16
0 V INPUT	17
POLARITY SELECT	18
0 V INPUT	19
INHIBIT INPUT	20

Drawing dimensions are in mm (inches).  
 Design developments may result in specification changes.



MOUNTING: 4 OFF M3 BLIND FASTENERS; POSITION AS SHOWN  
 DIMENSIONS IN mm (in)



## OUTPUT AND ORDERING INFORMATION

Model	Output Voltage	Output Current	Ripple (pk to pk)	Full Scale Speed
<b>MSRF-252</b>	±2.5 kV	0.5 mA	< 400 mV	< 20 msec to 99%
<b>MSRF-502</b>	±5 kV	0.4 mA	< 700 mV	< 20 msec to 99%
<b>MSRF-802</b>	±8 kV	0.4 mA	< 800 mV	< 30 msec to 99%
<b>MSRF-103</b>	±10 kV	0.3 mA	< 1 V	< 30 msec to 99%



For international contact information, visit [advanced-energy.com](http://advanced-energy.com).