

HITEK POWER® EG353 SERIES

HIGH-STABILITY 35 kV HIGH-VOLTAGE POWER SUPPLIES



PRODUCT OVERVIEW

Dependable, high-stability power supplies for scanning electron microscopes (SEM) with built-in flexibility to accommodate various Schottky emission electron gun configurations. The EG353 series comes standard with Advanced Energy's Direct Drive Digital Control (D³C), enabling wide range of operational and diagnostic capabilities through an intuitive GUI. D³C improves MTBF and reliability while using a smaller footprint.

FEATURES AND BENEFITS

- Lowest ripple and high-stability power supplies for resolutions to -1 nm
- Small footprint module or 19 in rack-mounted option provides greatest installation flexibility
- Market leading reliability and performance enabled by AE's Direct Drive Digital Control (D³C) technology
- Better efficiency, more consistent operation, low variance to component change, greater reliability, and easier testing
- Low ripple (< 1.6 ppm, accelerator), and high stability (< 10 ppm, accelerator)
- Additional grounded outputs may be added for greater flexibility
- Easy-to-use digital control and monitoring minimizes setup and configuration times (fiber-isolated RS-232)
- Customer defined derivatives and connection options available upon request

TYPICAL APPLICATIONS

- SEM and electron microscopy using Schottky emission electron guns with LaB6 or CeB6 cathodes
- Systems with resolutions normally from > 1 to < 20 nm

AT A GLANCE

Max Output Voltage

Accelerator -30 kV, 200 μ A
(-35 kV for conditioning)
Extractor +10 kV, 400 μ A
Suppressor -1 kV, 100 μ A
Heater +5 V, 3 A

Max Output Power

Accelerator: 6 W
Extractor: 4 W
Suppressor: 0.1 W
Heater: 15 W

Control

Digital

Type

Low-ripple electron beam power

Temp Coefficient

Accelerator: < 25 ppm/ $^{\circ}$ C
Extractor: < 25 ppm/ $^{\circ}$ C
Suppressor: < 20 ppm/ $^{\circ}$ C
Heater: < 100 ppm/ $^{\circ}$ C

ELECTRICAL SPECIFICATIONS

Voltage	23 to 25 VDC, 24 VDC nominal			
Current	2.3 ADC max at 23 VDC input			
Protection	5 A time delay internal PCB-mounted fuse			
Electrical Output	Accelerator	Suppressor	Extractor	Filament
Line Regulation	< 0.3 V for a 1 VDC input voltage change	< 0.1 V for a 1 VDC input voltage change	< 0.5 V for a 1 VDC input voltage change	1 mA max for a 10% change in input voltage
Load Regulation	< 0.3 V for a 100 μ A load change	< 0.1 V for a 10 μ A load change	< 0.5 V for a 400 μ A load change	2 mA max from 0.4 to 1 Ω load change at 3 A
Output	-30 kV, 200 μ A, -35 kV for conditioning only (ground referenced)	-1 kV, 100 μ A (accelerator referenced)	+10 kV, 400 μ A (accelerator referenced)	3 A at 5 V max (accelerator referenced)
Accuracy	\pm 20 V	\pm 5 V	\pm 15 V	N/A
Voltage Ripple	LF: 50 mV peak to peak max under specified conditions	LF: 30 mV peak to peak max under specified conditions	LF: 20 mV peak to peak max under all conditions	LF: 1 mA peak to peak max under all conditions*
	HF: 25 mV peak to peak max under specified conditions	HF: 20 mV peak to peak max under specified conditions	HF: 15 mV peak to peak max under all conditions	HF: 5 mV peak to peak max under all conditions*
Voltage Monitor	0 to -35 kV, accuracy \pm 0.5%	0 to -1 kV, accuracy \pm 0.5%	0 to +10 kV, accuracy \pm 0.5%	0 to +6 V, 16 bit resolution, accuracy \pm 1%
Current Monitor	0 to 250 μ A 16-bit resolution \pm 0.5% accuracy	0 to 150 μ A 16-bit resolution \pm 0.5% accuracy	0 to 500 μ A 16-bit resolution \pm 0.5% accuracy	0 to 3 A 16-bit resolution \pm 2 mA accuracy for 2 to 3A \pm 20 mA accuracy for all other values
Stability	< 0.3 V over a 15 min period (after warmup period)	< 0.2 V over a 15 min period (after warmup period)	< 0.3 V over a 15 min period (after warmup period)	0.5 mA over a 1 hour period (after warmup period)
Thermal Drift	25 ppm max/ $^{\circ}$ C over operating temperature	25 ppm max/ $^{\circ}$ C over operating temperature	25 ppm max/ $^{\circ}$ C over operating temperature	100 ppm max/ $^{\circ}$ C over operating temperature

Environmental

Operational Temperature	10 to 45 $^{\circ}$ C (50 to 113 $^{\circ}$ F)
Storage/Transport Temperature	-20 to +70 $^{\circ}$ C (-4 to 158 $^{\circ}$ F)
Altitude	Sea level to 2000 m (6562 ft)
Humidity	80% max relative humidity up to 31 $^{\circ}$ C, reducing linearly to 50% at 40 $^{\circ}$ C (140 $^{\circ}$ F), non-condensing (ref. EN61010-1)
Cooling	Free convection

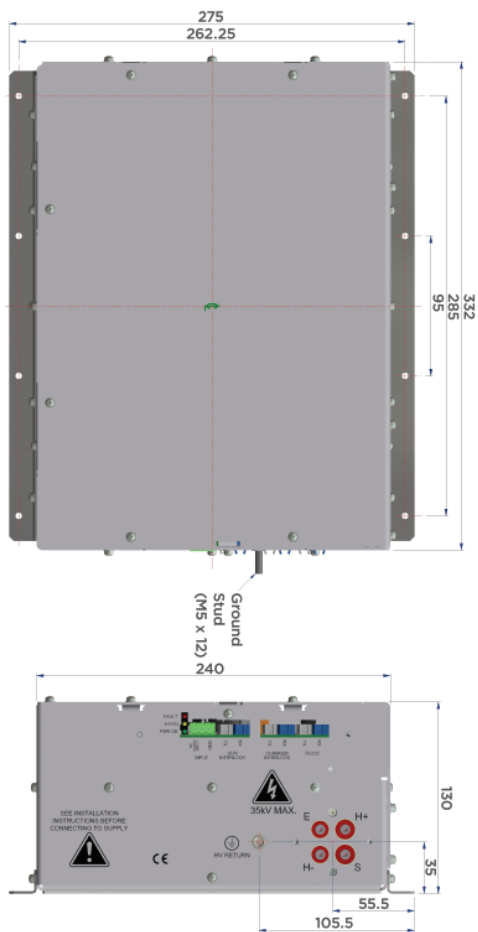
Regulatory

Certifications	RoHS compliant to EU Directive 2011/65/EU CE marked for EU LV Directive 2006/95/EC
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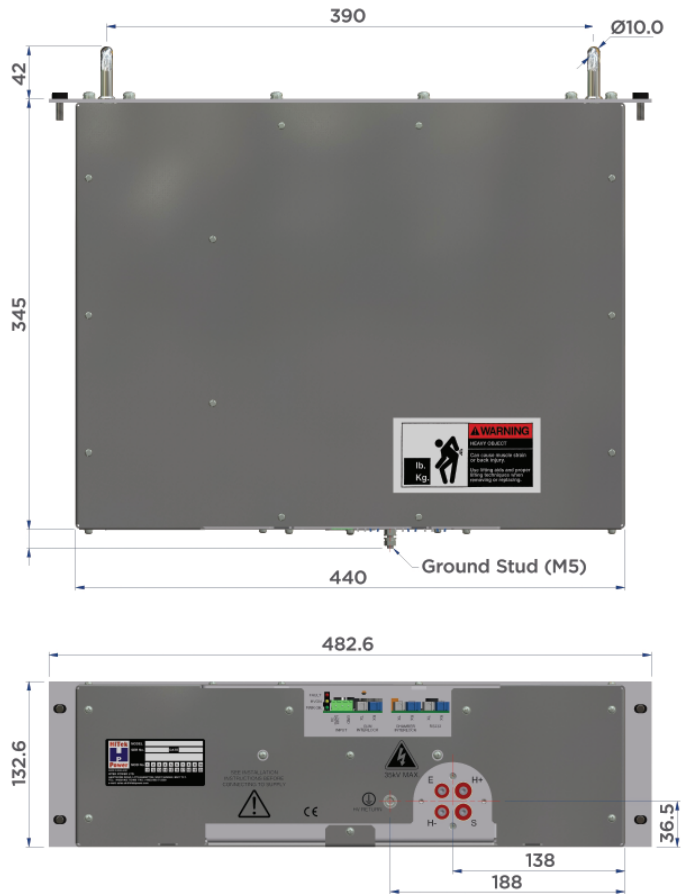
MECHANICAL SPECIFICATIONS

Physical	Module	19 in Rack
Dimensions (W x H x D)	See mechanical drawings	
Weight (Approx.)	10.2 kg (22.5 lb)	12 kg (26.5 lb)
Construction	Steel and aluminum with protective treatment	

MODULE FORMAT



RACK MOUNT FORMAT

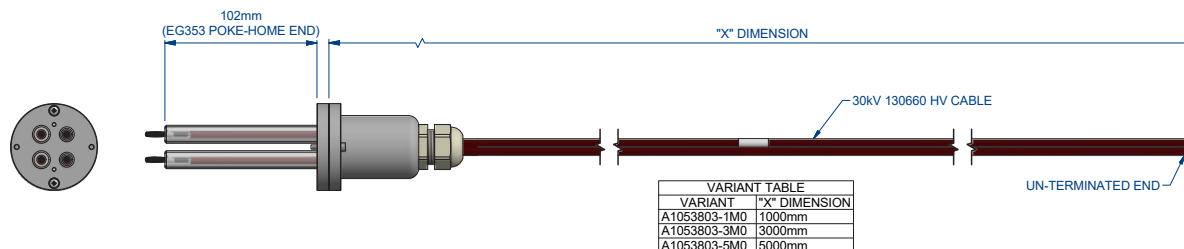


INTERFACE

Input Connector	2-way PTR/Phoenix STLZ950/2-G-5.08-green (pin 1 positive, pin 2 negative)
HV Output Connectors	Heater: 2 wires of customer 4-way HV connector Suppressor: 1 wire of customer 4-way HV connector Extractor: 1 wire of customer 4-way HV connector
Interlock Connector	HP versatile optical link: HP T-1521/HP R-2521 (rear-panel mounted)
Control Interface Connector	HP versatile optical link: HP T-1521/HP R-2521
Control Interface	RS-232; supplied by fully-isolated fiber optics (9-way female D-type connector)

STANDARD OPTIONS

Supply Connectors	Standard EG353 4-point connector
	Claymount CA12 connector
Installation Type	Compact module
	19 in rack mount



ACCESSORIES

A number of standard and custom accessories are available to simplify the installation, configuration and operation of the EG353 series. The list below identifies a number of the common accessories available. Contact Advanced Energy to request more information on any specific requirements.

- High-voltage cables with customized lengths, EG353 connectors, and SEM column connectors
- Fiber optic serial to USB adapter, supplied with 1 m long fiber optic cable with interlock switch
- Graphical User Interface (GUI) for installation, configuration and diagnostics



ORDERING INFORMATION

For ordering information, please contact your local Advanced Energy sales representative.

ABOUT ADVANCED ENERGY

Since 1981, Advanced Energy (AE) has perfected how power performs for its customers. For both end users and OEMs, AE's comprehensive portfolio of standard and custom high-voltage components precisely match system specifications to deliver unparalleled energy, quality, and performance. Through close customer collaboration, design expertise, application insight, and world-class support, AE creates successful partnerships and enables customers to push the boundaries of innovation and stay ahead of evolving market needs.



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CAUTION:
High Voltage

Read and understand all documentation before you install, operate, or maintain Advanced Energy high-voltage power supplies. Follow all safety instructions and precautions to protect against property damage and serious or possibly fatal bodily injury. Never defeat safety interlocks or grounds.

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