

HITEK POWER EG353 SERIES

HIGH-STABILITY 35 kV HIGH VOLTAGE POWER SUPPLIES



Dependable, high-stability power supplies for scanning electron microscopes (SEM) with built-in flexibility to accommodate various Schottky emission electron gun configurations. The HiTek Power® 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.

PRODUCT HIGHLIGHTS

- 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/°C
Extractor: < 25 ppm/°C
Suppressor: < 20 ppm/°C
Heater: < 100 ppm/°C

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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	± 20 V	± 5 V	± 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 ± 2 mA accuracy for 2 to 3 A ± 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

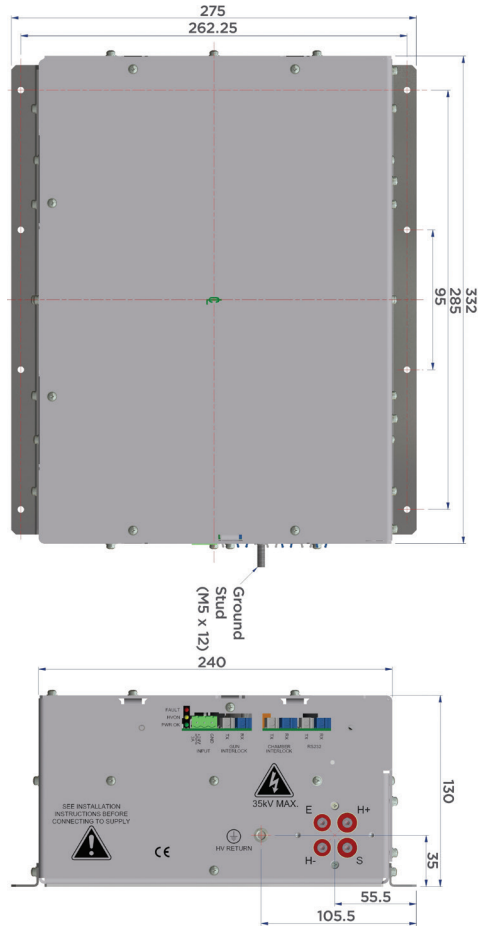
Environmental	
Operational Temperature	10 to 45 $^{\circ}$ C (50 to 113 $^{\circ}$ F)
Storage/Transport Temperature	-20 to +70 $^{\circ}$ C (-4 to 158 $^{\circ}$ F)
Altitude	Sea level to 2000 m (6562 ft)
Humidity	80% max relative humidity up to 31 $^{\circ}$ C, reducing linearly to 50% at 40 $^{\circ}$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

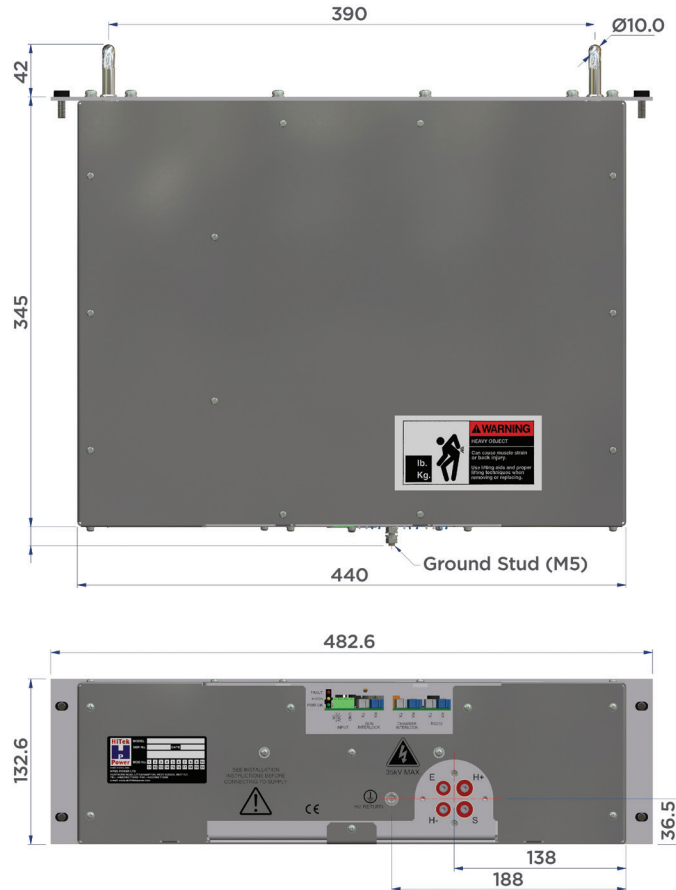
MECHANICAL SPECIFICATIONS

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

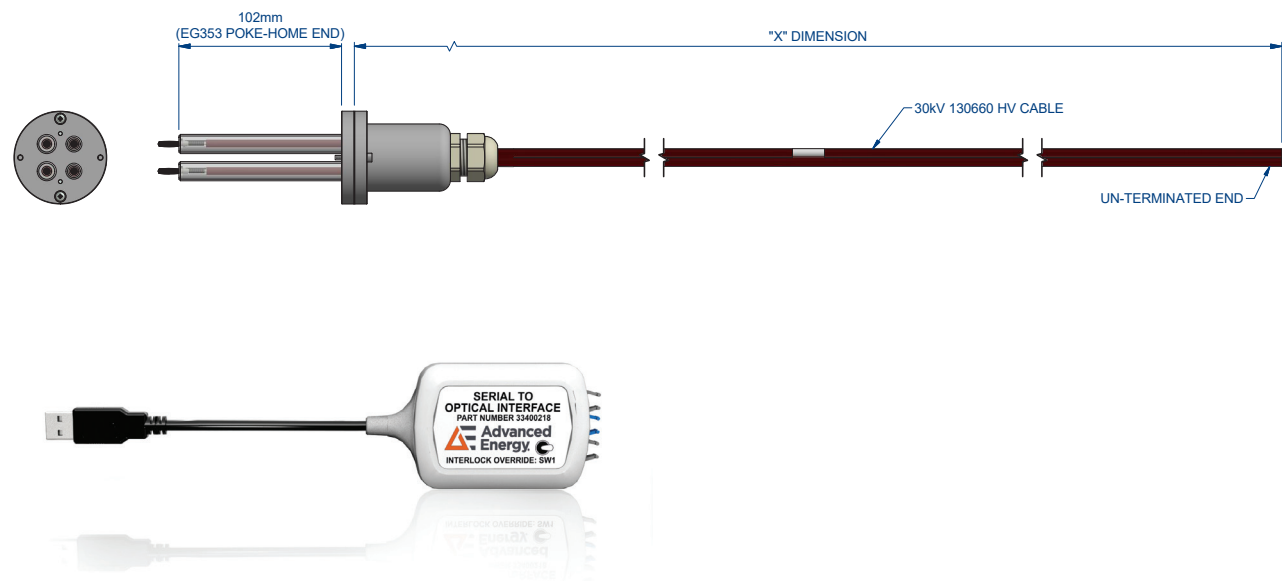
Supply Connectors	Standard EG353 4-point connector
	Claymount CA12 connector
Installation Type	Compact module
	19 in rack mount

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

Part Number	Description
A1053803-1M0	Cable EG353 HV Output 1 m (3.2 ft)
A1053803-3M0	Cable EG353 HV Output 3 m (9.8 ft)
A1053803-5M0	Cable EG353 HV Output 5 m (16.4 ft)
33400218-00	Cable Serial to Optical Interface with 1 M (3.2 Ft)



ORDERING INFORMATION

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