

# 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 (D<sup>3</sup>C), enabling wide range of operational and diagnostic capabilities through an intuitive GUI. D<sup>3</sup>C 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 (D<sup>3</sup>C) 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  $\mu$ A  
 (-35 kV for conditioning)  
 Extractor +10 kV, 400  $\mu$ A  
 Suppressor -1 kV, 100  $\mu$ 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

## 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

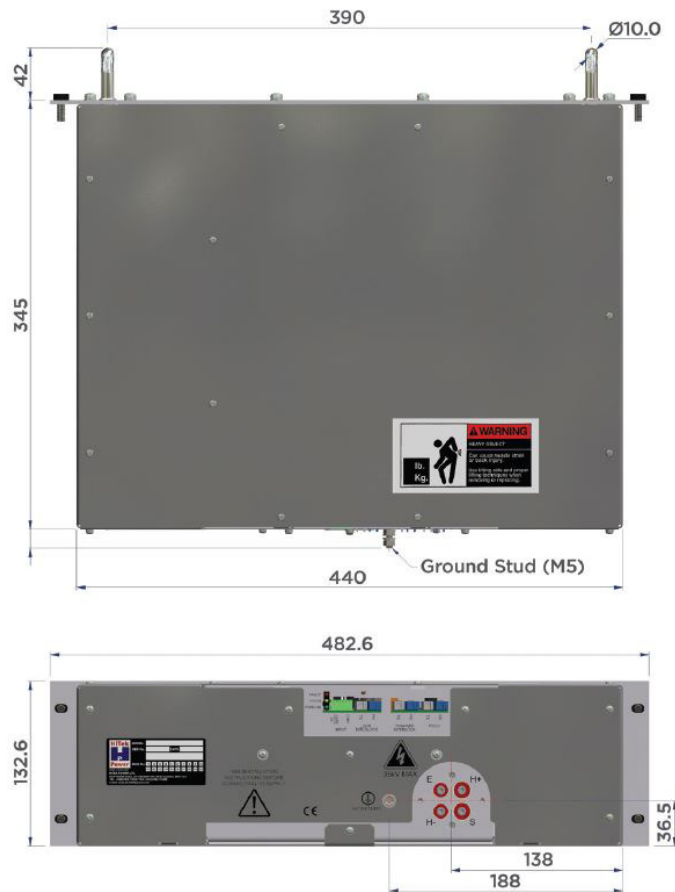
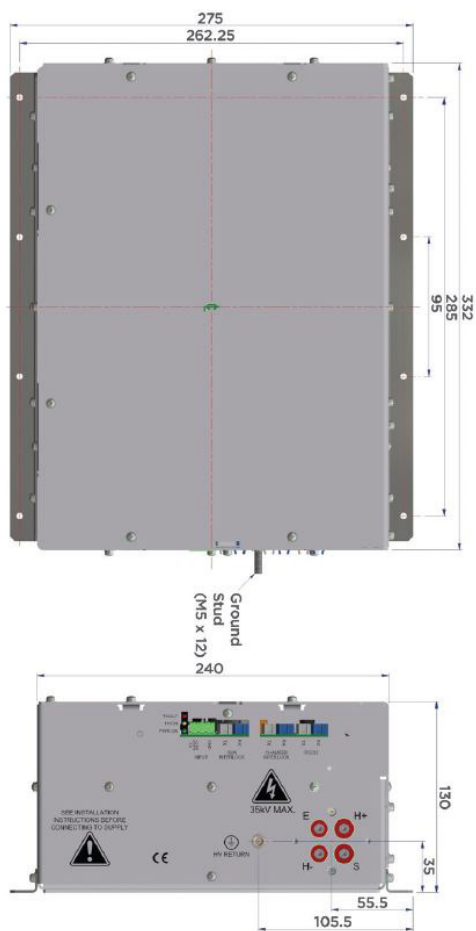
Electrical Output	Accelerator	Suppressor	Extractor	Filament
Line Regulation	< 0.3 V for a 1 VDC input voltage change	< 0.1 V for a 1 VDC input voltage change	< 0.5 V for a 1 VDC input voltage change	1 mA max for a 10% change in input voltage
Load Regulation	< 0.3 V for a 100 $\mu$ A load change	< 0.1 V for a 10 $\mu$ A load change	< 0.5 V for a 400 $\mu$ A load change	2 mA max from 0.4 to 1 $\Omega$ load change at 3 A
Output	-30 kV, 200 $\mu$ A, -35 kV for conditioning only (ground referenced)	-1 kV, 100 $\mu$ A (accelerator referenced)	+10 kV, 400 $\mu$ 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 $\mu$ A 16-bit resolution $\pm$ 0.5% accuracy	0 to 150 $\mu$ A 16-bit resolution $\pm$ 0.5% accuracy	0 to 500 $\mu$ 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	Meets the requirements of EU Directive 2011/65/EU, Delegated directive 2015/863 and SI 2012 No. 3032 on the restriction of use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS).
	Meets the requirements of Low Voltage Directive, 2014/35/EU, SI 2016 No. 1101 by complying with BS EN61010-1:2010 when installed as a component part of compliant equipment. Units are CE and UKCA marked accordingly.

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	



## HITEK POWER EG353 SERIES

### INTERFACE

Input Connector	Shell: Molex KK series 3001 (10-01-1104)
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: HPT-1521/HP R-2521 (rear-panel mounted)
Control Interface Connector	HP versatile optical link: HPT-1521/HP R-2521
Control Interface	RS-232; supplied by fully-isolated fiber optics (9-way female D-type connector)

### STANDARD OPTIONS

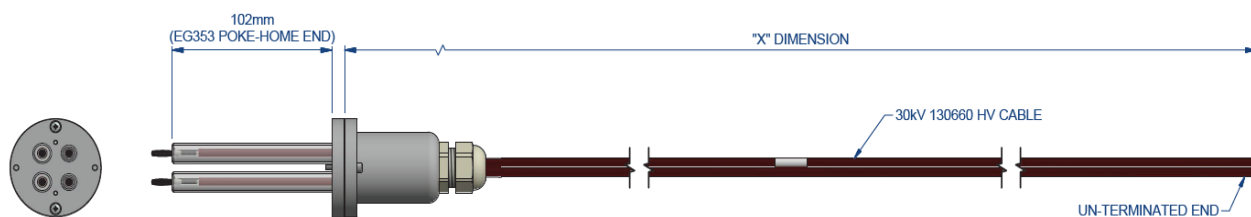
Supply Connectors	Standard EG353 4-point connector
	Claymount CA15 connector
Installation Type	Compact module
	19 in rack mount

**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)



**ACCESSORIES**

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



For international contact information,  
visit [advancedenergy.com](http://advancedenergy.com).

[powersales@aei.com](mailto:powersales@aei.com) (Sales Support)  
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## 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.

PRECISION | POWER | PERFORMANCE



**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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