

# Asterion

**Sorensen**

## Asterion DC Series

High Performance Programmable DC Power Supply

**1.7 / 3.4 / 5 / 10 kW**  
**40 V to 400 V**  
**4.3 A to 250 A**

### Advanced Features

- High power density up to 5 kW in a 1U chassis and 10 kW in a 2U chassis
- Fixed or autoranging output models
- Intuitive touch panel control
- Multi-language display for global operation
- Auto paralleling for higher power
- Active power factor correction (PFC)
- Standard LXI LAN, USB, and RS232 interfaces
- Optional EtherCAT and GPIB interface
- Full remote control via Virtual Panels™



### Performance. Reliance. Brilliance.

The Sorensen™ Asterion® DC Series is the newest addition to the Asterion platform of power testing solutions. The new DC series features two types of product lines: fixed range and autoranging. The fixed range supplies are economical, traditional, rectangular wave output power supplies with all the enhanced operation advantages standard with the Asterion platform. The autoranging supplies feature expanded current and voltage range at the full output power level, enabling the ability to satisfy a wider testing need without requiring the purchase of additional models.

**Maximize rack space utilization with leading DC power density in a 1U or 2U chassis.**

**Autoranging models satisfy a wider testing need in a single power supply.**

**Quickly and expertly control the DC supply with intuitive touchscreen.**

### Control via Front Panel Touchscreen & Encoder Knob or available digital control interfaces

The Asterion AC Series is Digital Signal Processor (DSP) controlled and can be operated from the intuitive, easy-to-use front panel touchscreen or the Ethernet LXI, USB and RS232 standard control interfaces, as well as through the optional GPIB or EtherCAT control interface.

The touchscreen function group icons include a Dashboard, Output Programming Parameters, Measurements, Sequencing, Configuration, Control Interfaces, Applications, and System Settings. Function selection and parameter entry can be achieved either by direct selection from the touchscreen or by using the encoder selector button. The control resolution is adjusted by a dynamic rate change algorithm that combines the benefits of precise control over small parameter changes with quick sweeps through the entire range.

## Applications

The Asterion DC Series is designed for testing today's complex electronics, including telecommunications and commercial electronics requiring low profile, light weight power supplies with high power density. Other applications include:

- Military and aerospace electronics test
- DC power simulation
- Commercial manufacturing and process control
- Research and development
- Automotive component and battery testing
- ATE applications

## Autoranging Model Output Characteristic

The Asterion DC autoranging models have an output characteristic where the full rated output power is available at voltage and current ranges greater than the conventional rectangular output characteristic of fixed range power supplies. The output current versus output voltage follows a constant-power curve to provide users a wider current and voltage operating range in a single power supply.

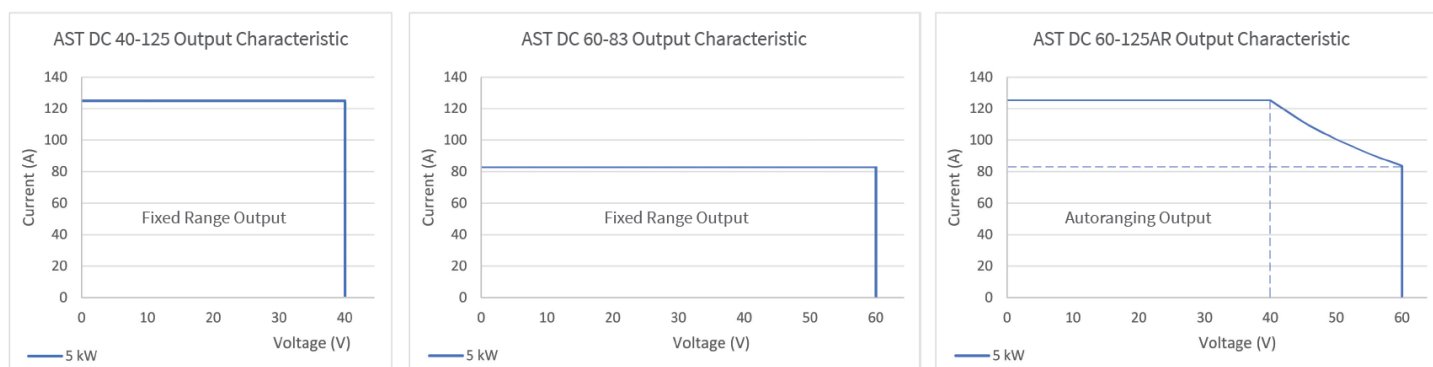


Figure 1 - Fixed Range vs Autoranging Output

## Asterion DC Virtual Panels (Graphical User Interface)

Virtual Panels allow remote control of the Asterion DC power supply as well as programming communication and monitoring of the instrument without the front panel display. You can perform all operations via the remote Virtual Panels control as you could working directly with the unit's front panel.



Virtual Panels "main status," "sequencing" and "output ramp" screens are shown.

## Specifications

## Asterion DC Output Specifications – 1.7 kW Fixed Range Models

MODEL		AST 40-42	AST 60-28	AST 100-17	AST 150-12	AST 200-9	AST 300-6	AST 400-4.3
Rated Output Voltage	V	40	60	100	150	200	300	400
Rated Output Current	A	42	28	17	12	9	6	4.3
Rated Output Power	W	1700	1700	1700	1700	1700	1700	1700
Line Regulation	V	+/- 0.01% of rated voltage						
	A	+/- 0.05% of rated current						
Load Regulation	V	+/- 0.02% of rated voltage						
	A	+/- 0.15% of rated current						
Ripple RMS (20Hz-300kHz) c.v	mV	7	7	12	20	20	20	40
Output noise p-p (20Hz-20MHz) c.v	mV	60	60	75	75	100	120	300
Remote sense compensation		5% maximum of rated output voltage						
Temperature drift	PPM/C	100						
Stability		0.05% of output rating						

## Asterion DC Output Specifications – 3.4 kW Fixed Range Models

MODEL		AST 40-85	AST 60-56	AST 100-34	AST 150-23	AST 200-17	AST 300-11	AST 400-8.5
Rated Output Voltage	V	40	60	100	150	200	300	400
Rated Output Current	A	85	56	34	23	17	11	8.5
Rated Output Power	W	3400	3400	3400	3400	3400	3400	3400
Line Regulation	V	+/- 0.01% of rated voltage						
	A	+/- 0.05% of rated current						
Load Regulation	V	+/- 0.02% of rated voltage						
	A	+/- 0.15% of rated current						
Ripple RMS (20Hz-300kHz) c.v	mV	12	12	15	20	40	60	80
Output noise p-p (20Hz-20MHz) c.v	mV	75	75	90	120	150	200	300
Remote sense compensation		5% maximum of rated output voltage						
Temperature drift	PPM/C	100						
Stability		0.05% of output rating						

Asterion DC Output Specifications – 5 kW Fixed Range Models								
MODEL		AST 40-125	AST 60-83	AST 100-50	AST 150-34	AST 200-25	AST 300-17	AST 400-13
Rated Output Voltage	V	40	60	100	150	200	300	400
Rated Output Current	A	125	83	50	34	25	17	13
Rated Output Power	W	5000	5000	5000	5000	5000	5000	5000
Line Regulation	V	+/- 0.01% of rated voltage						
	A	+/- 0.05% of rated current						
Load Regulation	V	+/- 0.02% of rated voltage						
	A	+/- 0.15% of rated current						
Ripple RMS (20Hz-300kHz) c.v	mV	12	12	15	20	40	60	80
Output noise p-p (20Hz-20MHz) c.v	mV	75	75	90	120	150	200	300
Remote sense compensation		5% maximum of rated output voltage						
Temperature drift	PPM/C	100						
Stability		0.05% of output rating						

Asterion DC Output Specifications – 10 kW Fixed Range Models								
MODEL		AST 40-250	AST 60-167	AST 100-100	AST 150-67	AST 200-50	AST 300-34	AST 400-25
Rated Output Voltage	V	40	60	100	150	200	300	400
Rated Output Current	A	250	167	100	67	50	34	25
Rated Output Power	W	10000	10000	10000	10000	10000	10000	10000
Line Regulation	V	+/- 0.01% of rated voltage						
	A	+/- 0.05% of rated current						
Load Regulation	V	+/- 0.02% of rated voltage						
	A	+/- 0.15% of rated current						
Ripple RMS (20Hz-300kHz) c.v	mV	12	12	15	20	40	60	80
Output noise p-p (20Hz-20MHz) c.v	mV	75	75	90	120	150	200	300
Remote sense compensation		5% maximum of rated output voltage						
Temperature drift	PPM/C	100						
Stability		0.05% of output rating						

## Asterion DC Output Specifications – 1.7 kW and 3.4 kW Autoranging Models

MODEL		AST 60-42AR	AST 40-85AR	AST 60-56AR	AST 200-17AR	AST 400-6AR	AST 40-125AR	AST 60-85AR	AST 200-34AR	AST 400-12AR
Rated Output Voltage	V	60	40	60	200	400	40	60	200	400
Rated Output Current	A	42	85	56	17	6	125	85	34	12
Rated Output Power	W	1700	1700	1700	1700	1700	3400	3400	3400	3400
Line Regulation	V	+/- 0.01% of rated voltage								
	A	+/- 0.05% of rated current								
Load Regulation	V	+/- 0.02% of rated voltage								
	A	+/- 0.15% of rated current								
Ripple RMS (20Hz-300kHz) c.v	mV	12	12	7	20	40	12	12	40	80
Ripple RMS (20Hz-300kHz) c.v	mV	75	75	60	100	300	75	75	150	300
Remote sense compensation		5% maximum of rated output voltage								
Temperature drift	PPM/C	100								
Stability		0.05% of output rating								

## Asterion DC Output Specifications – 5 kW and 10 kW Autoranging Models

MODEL		AST 60-125AR	AST 200-50AR	AST 400-18AR	AST 60-250AR	AST 200-100AR	AST 400-36AR
Rated Output Voltage	V	60	200	400	60	200	400
Rated Output Current	A	125	50	18	250	100	36
Rated Output Power	W	5000	5000	5000	10000	10000	10000
Line Regulation	V	+/- 0.01% of rated voltage					
	A	+/- 0.05% of rated current					
Load Regulation	V	+/- 0.02% of rated voltage					
	A	+/- 0.08% of rated current					
Ripple RMS (20Hz-300kHz) c.v	mV	12	40	80	12	40	80
Ripple RMS (20Hz-300kHz) c.v	mV	75	150	300	75	150	300
Remote sense compensation		5% maximum of rated output voltage					
Temperature drift	PPM/C	100					
Stability		0.05% of output rating					

Programming & Readback (Front Panel or Remote Digital Interface)	
Voltage Output programming accuracy	+/- 0.1% of rated output voltage
Current Output programming accuracy	+/- 0.2% of rated output current
Power Output programming accuracy	+/- 0.3% of rated output power
Overvoltage programming accuracy	±1%, maximum, of rated output voltage
Voltage Output programming resolution	0.012% of full scale
Current Output programming resolution	0.012% of full scale
Power Output t programming resolution	0.012% of full scale
Overvoltage programming resolution	0.1% of full scale
Voltage Output readback accuracy	+/- 0.1% of rated output voltage
Current Output readback accuracy	+/- 0.2% of rated output current
Pout readback accuracy	+/- 0.3% of rated output power
Voltage Output readback resolution	0.012% of full scale
Current Output readback resolution	0.012% of full scale
Power Output readback resolution	0.012% of full scale
Overvoltage Response time	20 ms

1.7 kW and 3.4 kW Output Transient Specifications							
	Rated Voltage (V)						
	40 V	60 V	100 V	150 V	200 V	300 V	400 V
<b>Voltage Rise Time<sup>1</sup> (ms), Full load</b>	20	20	25	50	75	100	100
<b>Voltage Fall Time<sup>2</sup> (ms), Full load</b>	50	50	60	120	150	200	200
<b>Voltage Fall Time<sup>3</sup> (ms), No load</b>	1.2	1.5	2.6	2.9	3.5	4.6	4.6
<b>Transient response<sup>4</sup> (ms)</b>	1	1	1	2	2	2	2

<sup>1)</sup> Maximum time, from 0-100% of programming change from zero to rated output voltage with rated resistive load.  
Current rise time is same as the voltage rise time

<sup>2)</sup> Maximum time, from 100%-0 of programming change from rated output voltage to zero with rated resistive load.  
Current fall time is same as the voltage fall time

<sup>3)</sup> Maximum time, from 100%-0 of programming change from rated output voltage to zero with No load

<sup>4)</sup> Typical time to recover within 0.5% of rated output voltage for load step change 10-90% of rated output current

**5 kW and 10 kW Output Transient Specifications**

	Rated Voltage (V)						
	40 V	60 V	100 V	150 V	200 V	300 V	400 V
<b>Voltage Rise Time<sup>1</sup> (ms), Full load</b>	30	50	50	50	50	50	75
<b>Voltage Fall Time<sup>2</sup> (ms), Full load</b>	80	80	100	100	100	100	150
<b>Voltage Fall Time<sup>3</sup> (ms), No load</b>	900	1000	1900	2000	2500	3000	3000
<b>Transient response<sup>4</sup> (ms)</b>	1	1	1	2	2	2	2

<sup>1)</sup> Maximum time, from 0-100% of programming change from zero to rated output voltage with rated resistive load.

Current rise time is same as the voltage rise time

<sup>2)</sup> Maximum time, from 100%-0 of programming change from rated output voltage to zero with rated resistive load.

Current fall time is same as the voltage fall time

<sup>3)</sup> Maximum time, from 100%-0 of programming change from rated output voltage to zero with No load

<sup>4)</sup> Typical time to recover within 0.5% of rated output voltage for load step change 10-90% of rated output current

**Remote Control Digital Interfaces**

<b>LAN</b>	Ethernet 10BASE-T and 100BASE-T over twisted-pair cables compliant with IEEE 802.3; Connector: 8P8C modular jack.
<b>RS-232</b>	Serial interface compliant to RS-232C; Protocol: data bits, 7 with parity and 8 without parity; stop bits, 2; baud rate, 9600 to 115200; handshake, CTS and RTS; Connector: Subminiature-D, 9-contact receptacle.
<b>USB</b>	Serial interface compliant to USB 2.0; Connector: Type-B receptacle.
<b>ECAT-3 (Option)</b>	EtherCAT (Ethernet for Control Automation Technology) is an Ethernet-based fieldbus system. The protocol is standardized in IEC 61158 and is suitable for both hard and soft real-time computing requirements in automation technology.
<b>IEEE-488 (Option)</b>	Parallel interface complies with IEEE-488.1, IEEE-488.2, and the SCPI command specification; command execution response time, 10 ms, typical; connector: IEEE-488.1 compliant.

Unit Protection	
Output Overvoltage Protection (OVP)	Programmable to 110% of full-scale output voltage, exceeding OVP threshold results in shutdown of output.
Output Current Limit Protection	User-selectable fold back mode CV/CC/CP or CV or CC or CP modes.
	In CV/CC/CP mode, output current or power is regulated to setpoint on reaching limit.
	In CV mode, on reaching current or power limits results in shutdown of output.
	In CC mode, on reaching voltage or power limits results in shutdown of output.
	In CP mode, on reaching voltage or current limits results in shutdown of output.
	In CV or CC or CP mode, shutdown delay on reaching the limit is programmable from 100 ms to 5 s.
AC Input Overcurrent Protection	Internal fuses in each phase for fault isolation; not user replaceable.
AC Input Undervoltage Protection	Automatic shutdown for insufficient AC input voltage.
AC Input Transient Protection	Protection to withstand EN61326-1, Class-A surge levels.
Overtemperature Protection (OTP)	Internal temperature monitors cause shutdown of output if temperature thresholds are exceeded.

AC Input Specifications	
Input Voltage, Nominal Rating	<b>1.7 kW to 5 kW Models:</b> <b>1-Phase line-neutral:</b> Low Input Range: 100 VAC-132 VAC, High Input Range: 200 VAC-240 VAC. <b>3 Phase Line-Line:</b> 200 VAC-240 VAC <b>3 Phase Line-Line:</b> 400 VAC  <b>10 kW Models:</b> <b>3 Phase Line-Line:</b> 200 VAC-240 VAC <b>3 Phase Line-Line:</b> 400 VAC
Input Voltage, Operating Range	<b>1.7 kW to 5 kW Models:</b> <b>1-Phase line-neutral:</b> Low Input Range: 90-145 VAC, High Input Range: 180 VAC-264 VAC. <b>3-Phase line-line:</b> 180 VAC-264 VAC <b>3 Phase line-line:</b> 342-457 VAC  <b>10 kW Models:</b> <b>3 Phase Line-Line:</b> 180-264 VAC <b>3 Phase Line-Line:</b> 342-457 VAC
Current <sup>1</sup> , maximum per phase	<b>1-Phase line-neutral:</b> 19 A (RMS) at 90 VAC, 18 A (RMS) at 180 VAC, 21 A (RMS) at 200 VAC  <b>3-Phase line-line:</b> 20 A (RMS) per phase at 180 VAC 18 A (RMS) per phase at 360 VAC.
Input Frequency, Nominal Rating	50 Hz, 60 Hz
Input Frequency Range	47-63 Hz
Efficiency <sup>1</sup> , typical	89% for 1.7 kW models
	91% for 3.4 kW, 5 kW, and 10 kW models
Power Factor <sup>2</sup> , typical	0.98 for single-phase high range and 0.94 for 3-phase input

AC Input Specifications	
Hold-Up Time <sup>3</sup> , typical	≥ 10 ms
Inrush Current, typical <sup>4</sup>	≤ 50 A
1-PH Input Connections (1.7 kW to 5 kW models only)	2 wires + ground, 264 VAC, maximum line-neutral or line-line
3-PH Input Connections	3 wires + ground, delta configuration, 264 VAC maximum line-to-line 4 wires + ground, wye configuration, 457 VAC maximum line-to-line
Isolation Voltage	1500 VAC primary to earth, 3000 VAC on primary to SELV and Hazardous secondary to SELV isolation barriers

<sup>1)</sup> Typical Value, at full load, with 200/400VAC Input voltage

<sup>2)</sup> At full load and with 200/400VAC input voltage, 50/60 Hz input frequency

<sup>3)</sup> Typical Value, At full load and with nominal AC input voltage, 50/60 Hz input frequency

<sup>4)</sup> Not including EMI filter inrush, less than 200 µSec

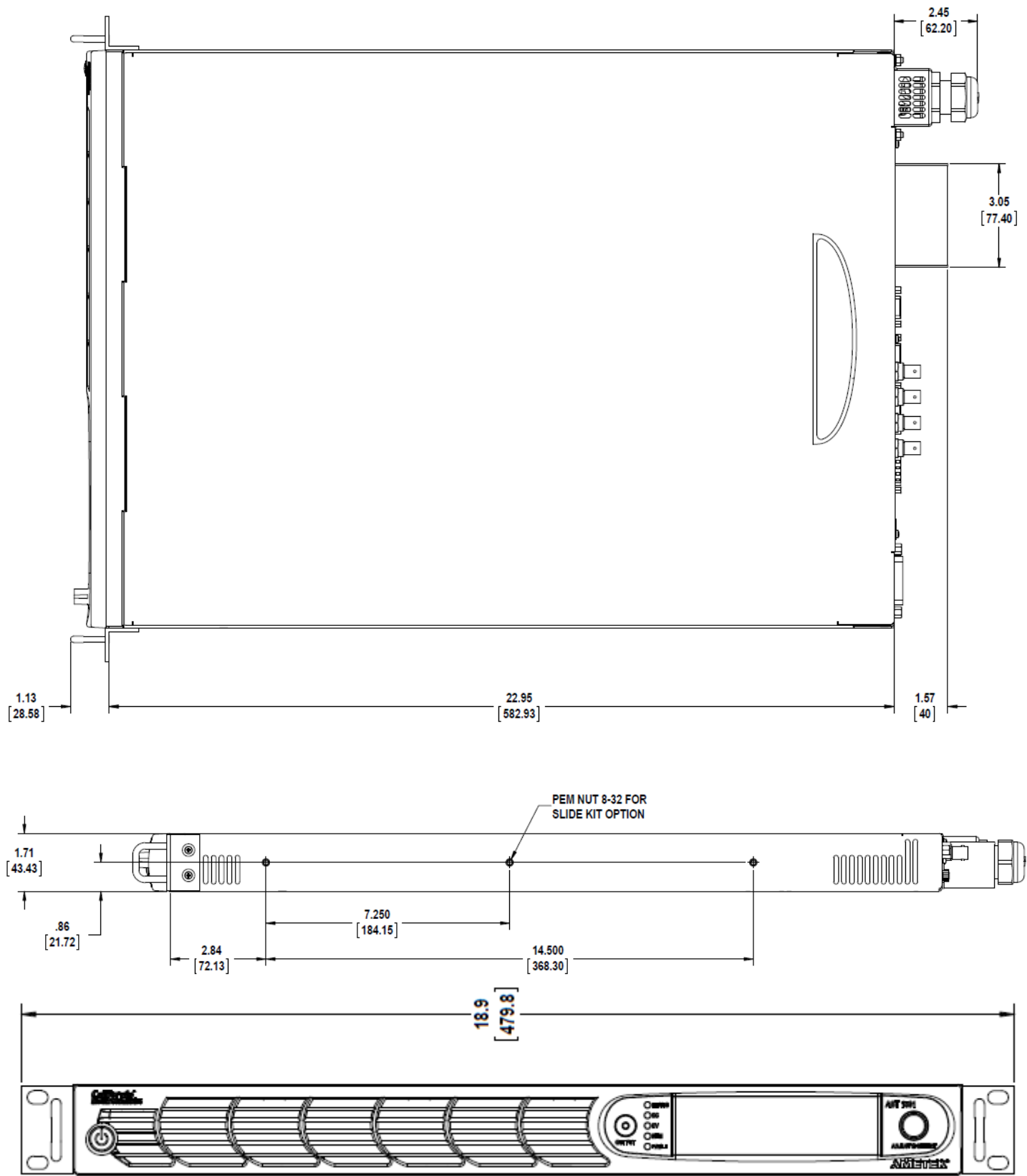
Output Power Derating Characteristics with AC Input Voltage				
Rated Output Power	1-Phase Low Input Range	1-Phase High Input Range	1-Phase High Input Range	3-Phase
	90 -145 VAC	180-200 VAC	200-264 VAC	180-264 VAC or 342-457 VAC
1.7 kW	1.2 kW <sup>1</sup>	1.7 kW	1.7 kW	1.7 kW
3.4 kW	1.2 kW <sup>1</sup>	3.0 kW	3.4 kW	3.4 kW
5.0 kW	1.7 kW	3.4 kW	3.4 kW <sup>2</sup>	5.0 kW
10.0 kW	NA	NA	NA	10.0 kW

<sup>1)</sup> 1.7 kW if unit is powered by greater than or equal to 20 A and ambient does not exceed 40°C.  
<sup>2)</sup> 5 kW if unit is powered by greater than or equal to 30 A and ambient does not exceed 40°C.

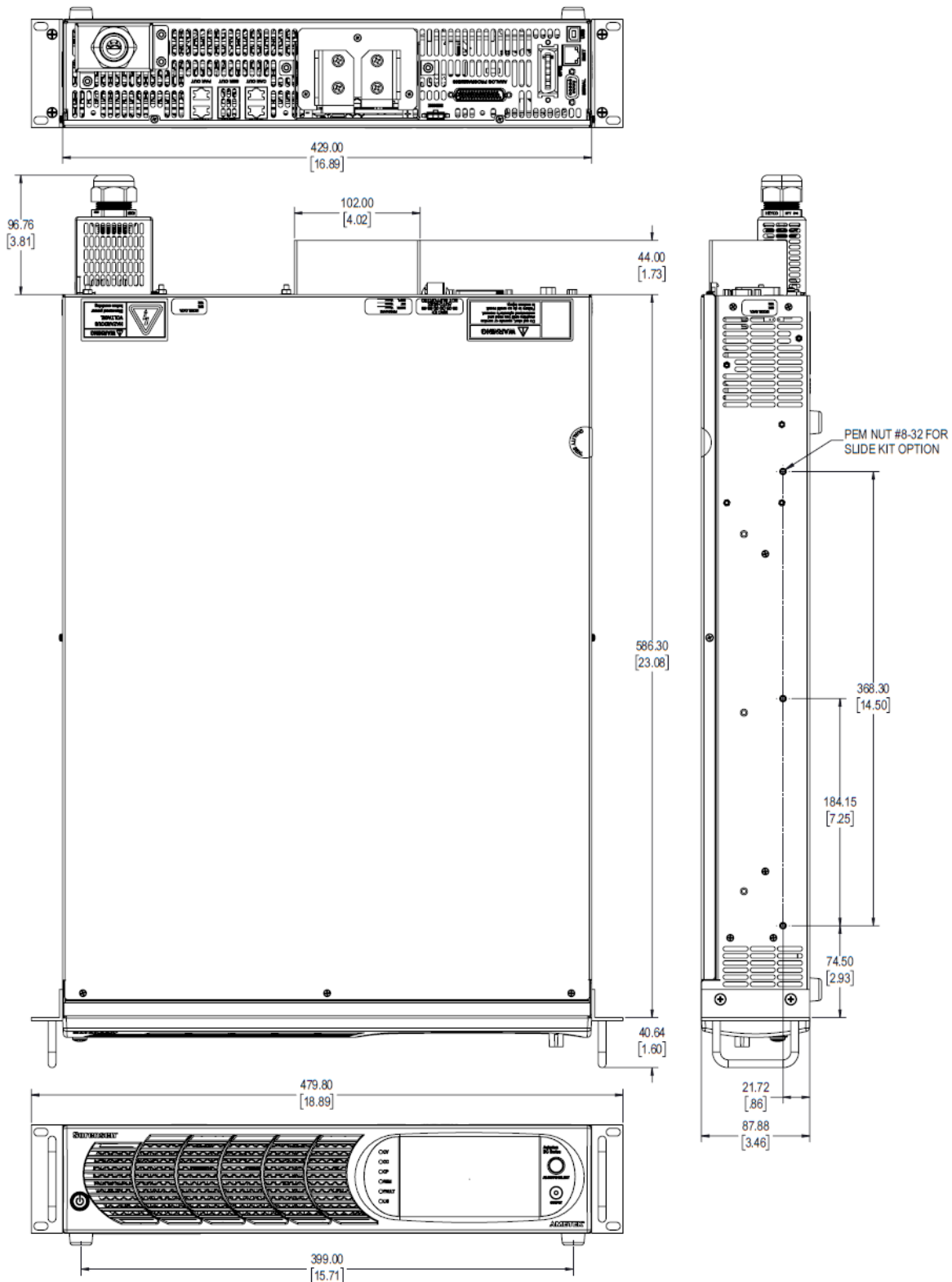
Mechanical Specifications	
Dimensions	1.7 kW to 5 kW models: H, 1.75" (44.45 mm); W (front panel), 19.0" (483 mm); D, 23.0" (584 mm); H, 1.75" (44.45 mm); W (chassis), 16.9" (483 mm); D, 23.0" (584 mm).  10 kW models: H, 3.47" (88.1 mm); W (front panel), 19.0" (483 mm); D, 23.0" (584 mm); H, 3.47" (88.1 mm); W (chassis), 16.9" (429.2 mm); D, 23.0" (584 mm).
Unit Weight	1.7 kW to 5 kW models: 28 lbs (12.7 kg) 10 kW models: 42 lbs (20.5 kg)
Shipping Weight	1.7 kW to 5 kW models: 34 lbs (15.4 kg) 10 kW models: 60 lbs (27.2 kg)
Chassis Material	Steel with plastic front panel
Chassis Finish	Galvanized Zinc, G90

Environmental Specifications	
Operating Temp	0° to +50° C
	+32° to +122° F
Storage Temp	-30° to +85 °C
	-22° to +185° F
Operating Humidity	20-90 %, non-condensing
Storage Humidity	10-95 %, non-condensing
Altitude	3000 m (10,000 ft), output current derating 2%/100 m or Tambient 1°C/100 m above 2000 m
Cooling	Force-air cooling; linear, variable fan speed control; air intake at front/sides and exhaust at rear
Vibration	MIL-PRF-28800F, Class 3; 5-500 Hz per Paragraph 4.5.5.3.1
Shock	MIL-PRF-28800F, Class 3; 30G half-sine with 11ms duration per Paragraph 4.5.5.4.1
Transportation Integrity	ISTA Test Procedure 1A
Regulatory Agency Compliance	
EMC	CE marked for EMC Directive 2014/30/EU per EN61326-1:2013, Class-A for emissions and immunity as required for the EU CE mark
Safety	CSA NRTL certified for US and Canada to CAN/CSA-C22.2 No. 61010-1-12, UL 61010-1 Third Edition. CE marked for LVD compliance 2014/35/EU to EN 61010-1 Third Edition as required for the EU CE mark
CE Mark LVD Categories	Installation Overvoltage Category: II; Pollution Degree: 2; Class II equipment; indoor use only
RoHS	CE marked for compliance with EU Directive 2015/863/EU for Restriction of Hazardous Substances in Electrical and Electronic Equipment

Chassis Dimension Drawings (1U)

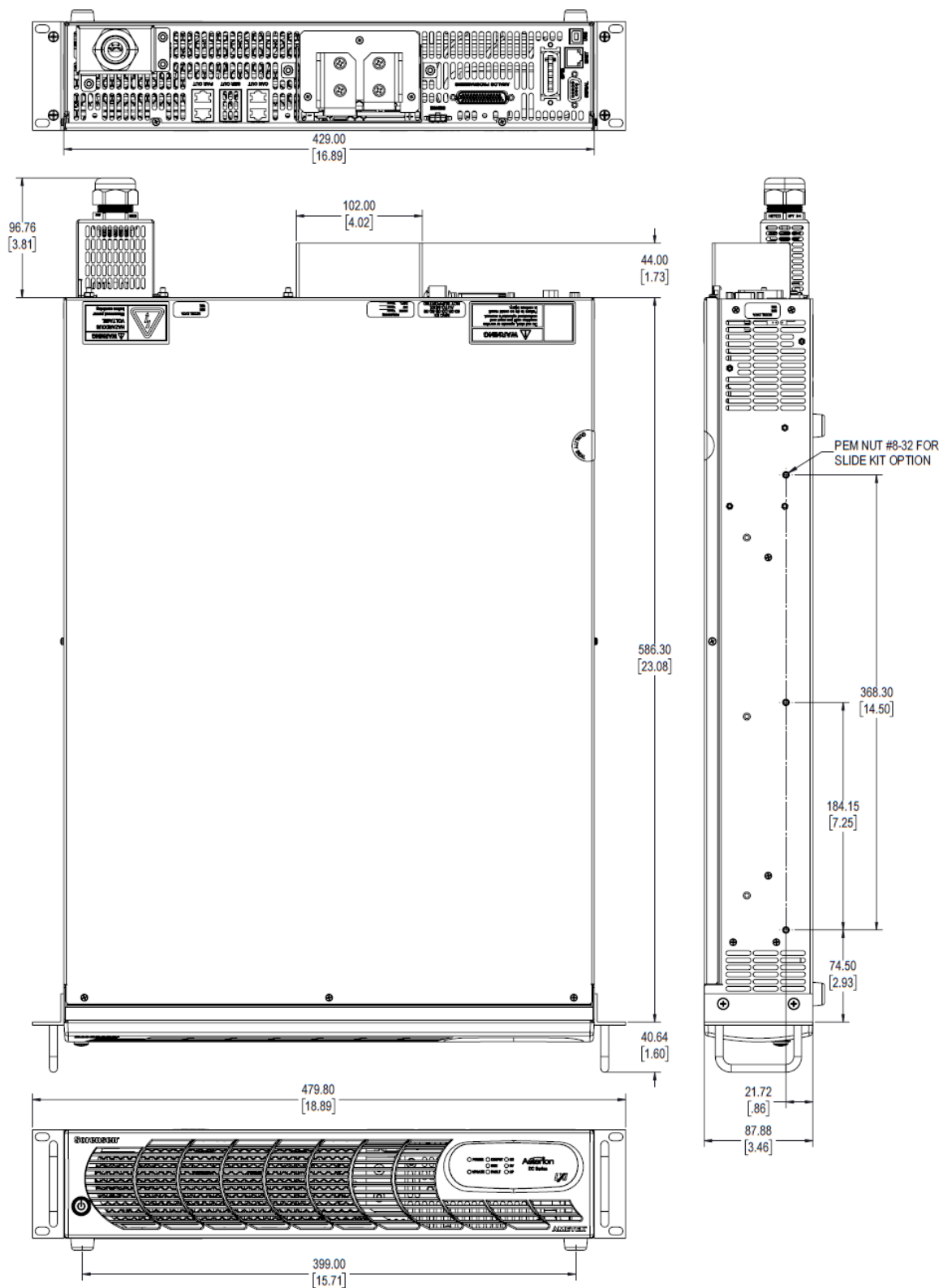


## Chassis Dimension Drawings (2U)



Installation Drawing, Enhanced Front Panel Version, Asterion DC Series 2U Models

Chassis Dimension Drawings (2U)

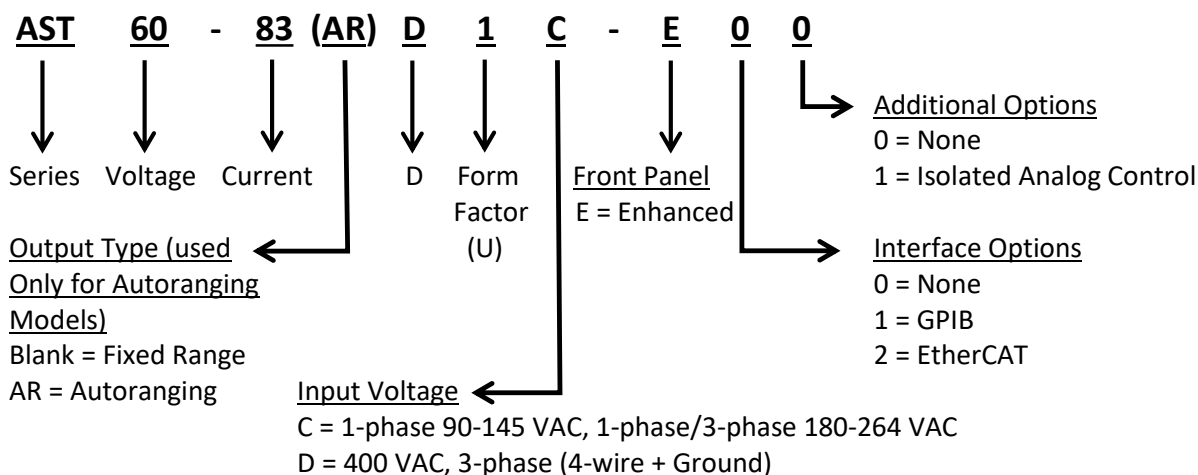


Installation Drawing, Asterion DC Series 2U Models

## Options &amp; Order Information

Option	Description
<b>Interface options</b>	
0	None
1	GPIB Interface
2	EtherCAT
<b>Additional Options</b>	
0	None
1	Isolated Analog Control
<b>ACCESSORIES</b>	
5330201-01R	Rack Slides (1 pair)
890-524-01	Paralleling/Series Cable - *Note: 2 cables are required to parallel/series 2 units
AST-Z540	ANSI Z540 Certified Calibration
AST-17025	ISO 17025 Certified Calibration

## Model Number Description:



\*Note: See manual for output power ratings vs input voltage.

## Warranty Statement:

AMETEK Programmable Power Inc. warrants its products to be free from defects in material and workmanship. The warranty period is from the date of original shipment of the product to the original purchaser (see website for warranty periods by product). Asterion DC comes with a **five (5)** year warranty. Extended warranties available.

Note: All specifications subject to change without notice.



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