Asterion

Sorensen
Asterion DC ASA Series

High Performance 3-Channel Programmable DC Power Supply

3-Channels x 600W
1800W Total Power
60 V to 400 V
6 A to 42 A

Advanced Features

- 3 independent, isolated 600W channels
- Total power density up to 1800W in a 1U chassis
- 4 autoranging output channel options
- Intuitive color touch panel control
- Multi-language display for global operation
- Multi-channel programmable sequencing, ramps and delays
- Active power factor correction (PFC)
- Standard LXI LAN, USB, and RS232 interfaces
- Optional remote analog programming and GPIB interface
- Full remote control via Virtual Panels™

Performance. Reliance. Brilliance.

The Sorensen™ Asterion® DC ASA Series is the newest addition to the Asterion platform of power testing solutions. The new ASA series features three independent, isolated 600W channels for a combined 1800W total output power. 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 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 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.

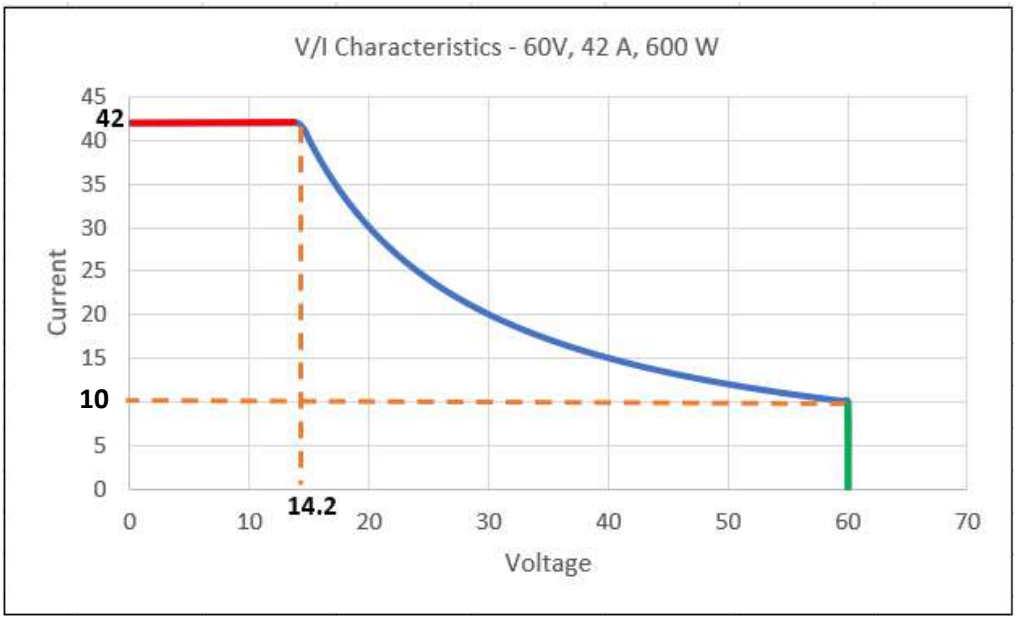
Applications

The Asterion DC ASA 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:

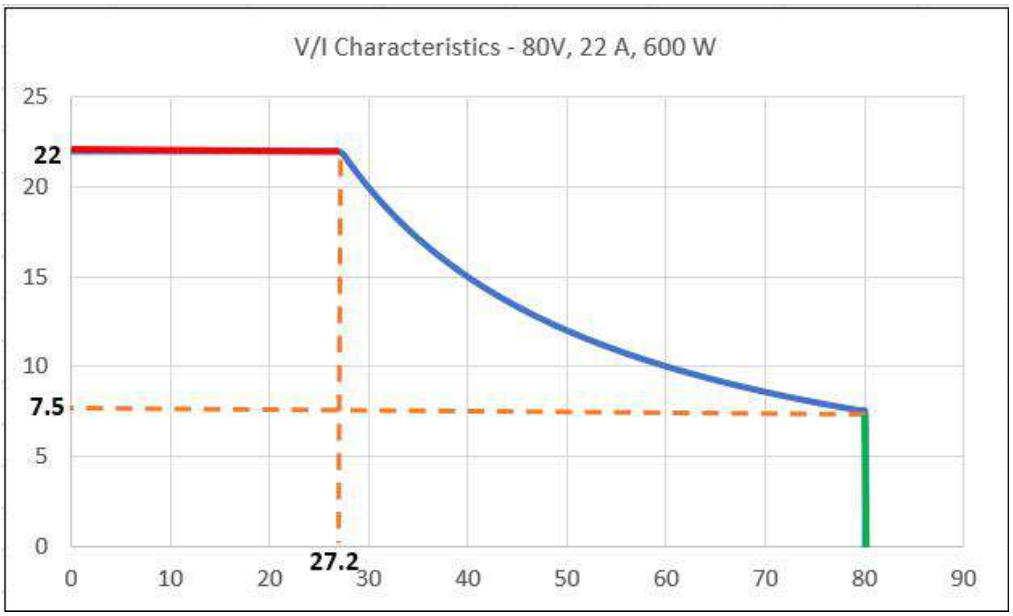
- Military and aerospace electronics test
- DC power simulation
- Commercial manufacturing and process control
- Research and development
- Automotive component and battery testing
- ATE applications

Autoranging Model Output Characteristic

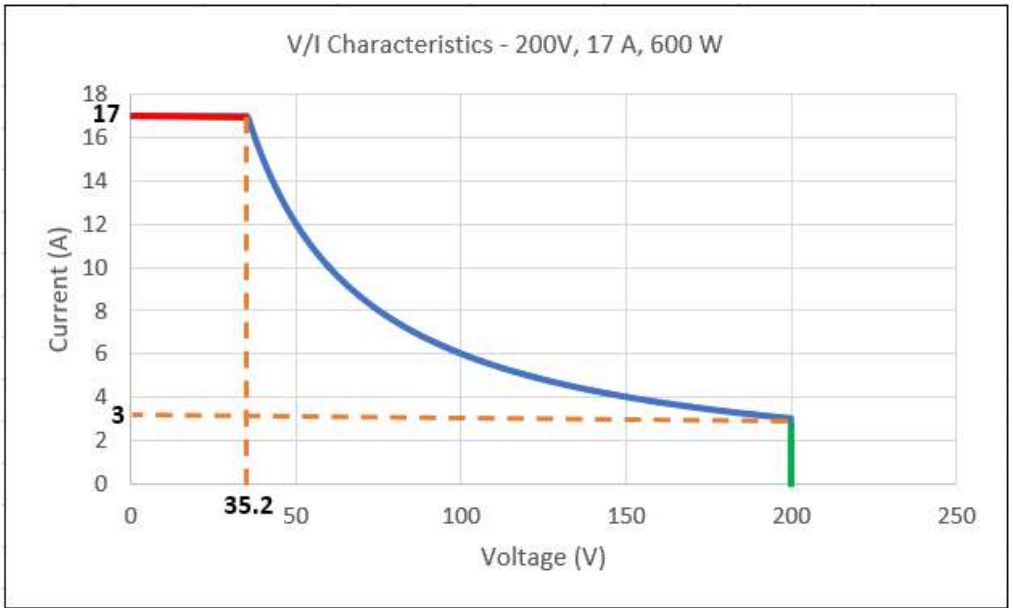
The Asterion DC autoranging models have an output characteristic where the full rated output power is available at voltage and current ranges greater than the conventional rectangular output characteristic of fixed range power supplies. The output current versus output voltage follows a constant-power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



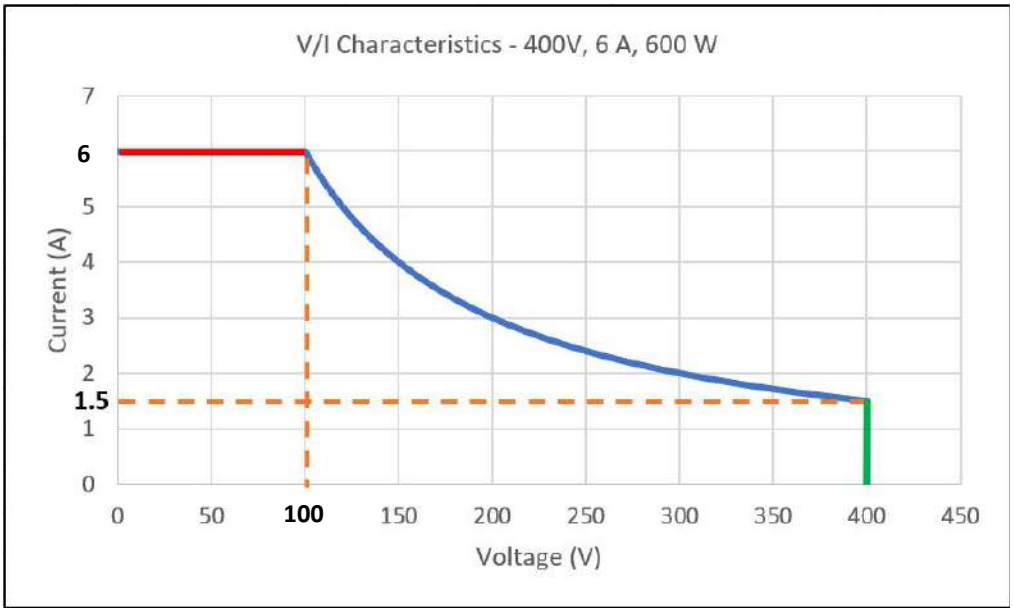
ASA Series 600W, 60V, 42A Voltage Vs Current Characteristics



ASA Series 600W, 80V, 22A Voltage Vs Current Characteristics



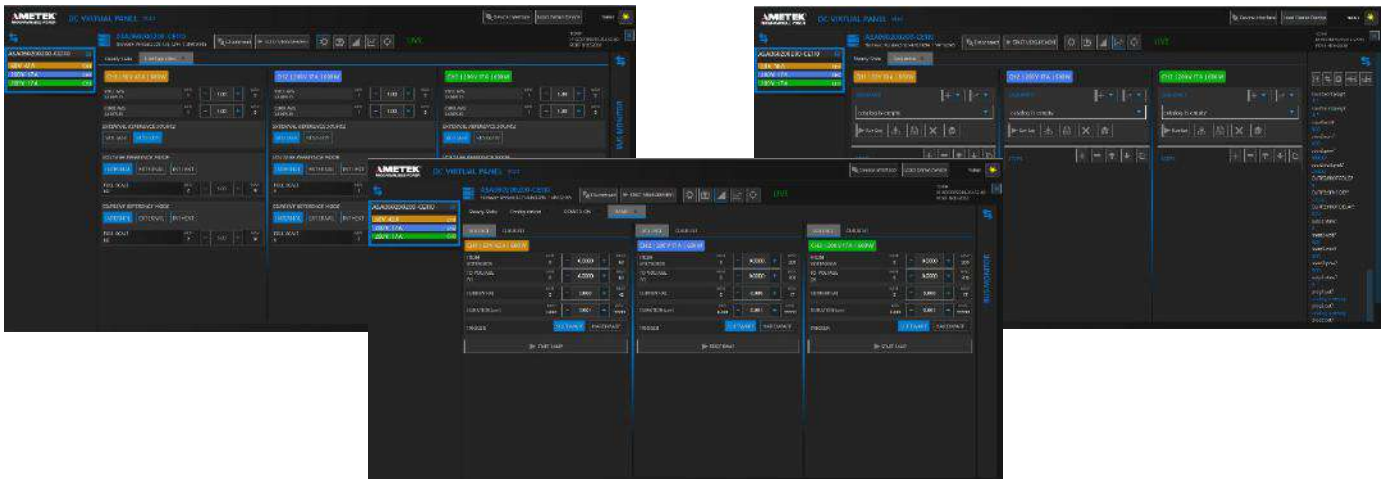
ASA Series 600W, 200V, 17A Voltage Vs Current Characteristics



ASA Series 600W, 400V, 6A Voltage Vs Current Characteristics

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.

Sequencing: Store 50 sequences of 20 individual steps. Sequences may be tied together. Extensive list of step functions, ramping, looping, Go-To and subroutine calls. Sequences are only available through remote interfaces, not available on the front panel.

Voltage and Current Ramps: Programmable dwell time from 1 millisecond minimum to 9,999 seconds maximum.

On and Off Delays: Programmable from 0.1 second minimum to 9,999 seconds maximum.

Specifications

DC Output Specifications – 600W Autoranging Channel Options					
MODEL		**ASA60-42**	**ASA80-22**	**ASA200-17**	**ASA400-6**
Rated Output Voltage	V	60	80	200	400
Rated Output Current	A	42	22	17	6.0
Rated Output Power	W	600	600	600	600
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 [1] (20Hz-300kHz) c.v	mV	12	15	40	80
Output noise p-p [2] (20Hz-20MHz) c.v	mV	75	90	150	300
Remote sense compensation	V	3	5	5	5
Temperature drift	PPM/°C	100			
Stability		0.05% of output rating			

[1)] RMS ripple/noise, over 20 Hz to 300 kHz bandwidth, is measured directly across the output terminals with the supply operating into 90% of rated resistive load in all channels and nominal AC input line voltage.

[2)] PK-PK ripple/noise, over 20 Hz to 20 MHz bandwidth with the supply operating into 90% of rated resistive load in all channels and nominal AC input line voltage.

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 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

Output Transient Specifications

	Rated Voltage (V)			
MODEL	**60 V**	**80 V**	**200 V**	**400 V**
Voltage Rise Time[3] (ms), Full load	20	25	75	100
Voltage Fall Time[4] (ms), Full load	50	60	150	200
Voltage Fall Time[5] (ms), No load	1500	2600	3500	4600
Transient response[6] (ms)	1	1	2	2

[3] 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.

[4] 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.

[5] Maximum time, from 100%-0 of programming change from rated output voltage to zero with No load.

[6] Typical time to recover within 0.5% of rated output voltage for load step change 10-90% of rated output current.

Remote Isolated User Control I/O Signal Interface Characteristics

Remote Output ON/OFF Control	Each channel is provided with control inputs to turn output ON/OFF the power supply. DC Input (+) 2.7V-24V will enable (turn-on) the output of the supply.
Remote Inhibit Input	Switch/Relay contact closure or direct short from this terminal to signal return is required to Turn ON/OFF the power supply. Opening the contact would shut down the output. Remote inhibit can be configured in two modes (LATCH and LIVE) Latch - after reclosing the contact, user needs to clear the fault and turn ON the output. Live - after reclosing the contact, user needs to turn ON the output. Remote circuit must sink up to 10 mA from 5 VDC to enable.
TRIGGER IN	TTL compatible Input signal, active-high; provides external hardware triggering of voltage, current Ramp, and sequencing functions. Signal connects to Open-anode of opto-isolator diode with internal 1kΩ series resistor internal to power supply. Voltage Rating: Maximum 24V, Minimum -5V Low state: 0.3 V max, High State 2.7V min
TRIGGER OUT	Output signal, active-high; synchronization pulse of 10 ms when a change in the output occurs. Open collector transistor output, Collector is connected the 26-pin connector. Emitter point of transistor is connected to common return pin of the interface connector. Voltage Rating: Maximum 30V, Minimum 3V for Active High Sink Current: 50mA
CC/CV status Output	Output signal, High state indicates Constant Current mode operation and Low state indicates Constant Voltage mode operation. Open collector transistor output, Collector is connected the 26-pin connector. Emitter point of transistor is connected to common return pin of the interface connector. Voltage Rating: Maximum 30V, Minimum 3V for Active High, Sink Current: 50mA
Output ON/OFF Status	Output signal, High state indicates Channel Output is ON and Low state indicates Channel Output is OFF Open collector transistor output, Collector is connected the 26-pin connector. Emitter point of transistor is connected to common return pin of the interface connector. Voltage Rating: Maximum 30V, Minimum 3V for Active High, Sink Current: 50mA

Remote Isolated User Control I/O Signal Interface Characteristics	
FAULT Status	Output Signal, High state indicates fault state of the power supply. Open collector transistor output, Collector is connected the 26-pin connector. Emitter point of transistor is connected to common return pin of the interface connector. Voltage Rating: Maximum 30V, Minimum 3V for Active High, Sink Current: 50mA

Optional Remote Isolated Analog Programming Interface Characteristics	
Remote Analog Programming of Output Voltage and Output Current	Independent Signal inputs for output voltage and current programming using External Analog Reference. Analog reference source is user selectable and can be a voltage or resistance. Selected analog reference source type is common to both voltage and current programming. Voltage as Reference Source: Full Scale Voltage could be set by the user from 5V to 10V. Resistance as Reference Source: Full Scale Voltage could be set by the user from 5kΩ to 10kΩ. Programming accuracy and linearity: ±1% of rated output Programming accuracy and linearity: ±1% of rated output
Monitor Signals for the Output Voltage and Output Current	Monitor Signals for the Output Voltage and Current. Full Scale range: 0V to 10V corresponds to 0-100% full-scale output Minimum recommended Load: 100kΩ, typical Maximum Load: 20 kΩ Monitor accuracy and linearity: ±1% of full-scale output

Remote Control Digital Interfaces	
LAN	Ethernet 10BASE-T and 100BASE-T over twisted-pair cables compliant with IEEE 802.3; Connector: 8P8C modular jack.
RS-232	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.
USB	Serial interface compliant to USB 2.0; Connector: Type-B receptacle.
IEEE-488 (Option)	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.
Firmware Upgrade	Firmware can be upgraded through the LAN interface.

Unit Protection	
Output Overvoltage Protection (OVP)	Programmable to 110% of full-scale output voltage, exceeding OVP threshold results in shutdown of output.
Output Mode 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.

Unit Protection	
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.

Output Isolation	
Output terminal Positive (+Ve) and Negative (-Ve)	±600 VRMS, maximum, with respect to chassis ground.
Isolated Analog interface Signals and External User Control I/O interface to Output Negative terminal	±600 VRMS, maximum; optional Isolated Analog programming and external user interface signals are isolated from negative output terminal; operation of Isolated Analog Interface signals should be at SELV safety voltage conditions to chassis ground.

AC Input Specifications	600 W per Channel, Total 1800 W for 3 Channels in a Chassis
Input Voltage, Nominal Rating (Factory Configurable Only)	**Input Option "C": 3 phase, 3 wire + Gnd or 1 Phase, 2 wire + Gnd** Nominal Rating Range for 3 phase 3 wire+ Gnd: 200- 240 VAC, 3 Phase, Line- Line. Nominal Rating Range for 1 phase, 2 wire+ Gnd Low Line range: 100 – 132 VAC(7), 1 Phase, Line- Neutral. Nominal Rating for 1 phase, 2 wire+ Gnd High Line range: 200 – 240 VAC(8), 1 Phase, Line-Neutral. **Input Option "D", 3 phase, 3 wire + Gnd** Nominal Rating: 380 – 415 VAC, 3 Phase, Line- Line **Input Option "E", 3 phase, 3 wire + Gnd** Nominal Rating: 440- 480 VAC, 3 Phase, Line- Line
Input Voltage, Operating Range	**Input Option "C": 3 phase, 3 wire + Gnd,** Operating Range 180 V-264 VAC Line-Line. **Input Option "C": 1 phase, 2 wire + Gnd, Low line,** Operating Range 90V-145 VAC Line-Neutral. **Input Option "C": 1 phase, 2 wire + Gnd, High line,** Operating Range 180V-264 VAC Line-Neutral. **Input Option "D": 3 phase, 3 wire + Gnd,** Operating Range 342-456 VAC Line-Line. **Input Option "E": 3 phase, 3 wire + Gnd,** Operating Range 396-528 VAC Line-Line.
Input Current, Maximum RMS	**Input Option "C": 3 phase, 3 wire + Gnd:** 7.2 A at 180 VAC Line-Line **Input Option "C": 1 phase, 2 wire + Gnd, Low line:** 25 A at 90 VAC Line-Neutral. **Input Option "C": 1 phase, 2 wire + Gnd, High line:** 12.5 A at 180 VAC Line-Neutral. **Input Option "D", 3 phase, 3 wire + Gnd:** 3.8 A at 342 VAC Line- Line. **Input Option "E", 3 phase, 3 wire + Gnd:** 4.4 A at 396 VAC Line- Line
Efficiency	**Input Option "C": 3 phase, 3 wire + Gnd:** 80%(9) **Input Option "C": 1 phase, 2 wire + Gnd, Low line:** 80%(10) **Input Option "C": 1 phase, 2 wire + Gnd, High line:** 80%(11) **Input Option "D", 3 phase, 3 wire + Gnd:** 80%(12) **Input Option "E", 3 phase, 3 wire + Gnd:** 80%(13)

AC Input Specifications	600 W per Channel, Total 1800 W for 3 Channels in a Chassis
Inrush Current, typical[8]	**Input Option "C": 3 phase, 3 wire + Gnd:** 55 A Peak @ 264 V L-L **Input Option "C": 1 phase, 2 wire + Gnd, Low line:** 30 A Peak @ 132 V L-N **Input Option "C": 1 phase, 2 wire + Gnd, High line:** 55 A Peak @ 264 V L-N **Input Option "D", 3 phase, 3 wire + Gnd:** 55 A Peak @ 456 VAC L-L **Input Option "E", 3 phase, 3 wire + Gnd:** 55 A Peak @ 528 VAC L-L
Input Frequency, Nominal Rating	50 Hz, 60 Hz
Input Frequency Range	47 Hz - 63 Hz
Power Factor[14], typical	a) 1-Ph: 0.98; active PFC b) 3-Ph: 0.95, active PFC
Hold-Up Time[15], typical	≥ 10 ms
Isolation Voltage	1500 VAC Input to Ground, 3000 VAC Input to Hazardous Secondary, 3000 VAC Input to Isolated SELV barriers

[7] In Single Phase the Low Line Range 90 – 132 V AC, operating ambient temperature of operation to be limited to 40° C. Ensure the inlet wiring is capable of handling current up to 25 A to load up to 1800 W (600 W per Channel). *If the unit is powered from the standard 15 A outlet, unit power to be derated to 1200 W (400W Per Channel).*

[8] In Single Phase High Line Range 180 – 264 V AC, operating ambient temperature to be limited to 40° C.

[9] Typical value at full load 1800 W output (600 W per channel) and nominal AC input voltage of 208VAC L-L at 50/60 Hz input frequency.

[10] Typical value at full load 1800 W output (600 W per channel) and nominal AC input voltage of 110VAC L-N at 50/60 Hz input frequency.

[11] Typical value at full load 1800 W output (600 W per channel) and nominal AC input voltage of 220VAC L-N at 50/60 Hz input frequency.

[12] Typical value at full load 1800 W output (600 W per channel) and nominal AC input voltage of 400VAC L-L at 50/60 Hz input frequency

[13] Typical value at full load 1800 W output (600 W per channel) and nominal AC input voltage of 480VAC L-L at 50/60 Hz input frequency.

[14] Not including EMI filter inrush less than 200us.

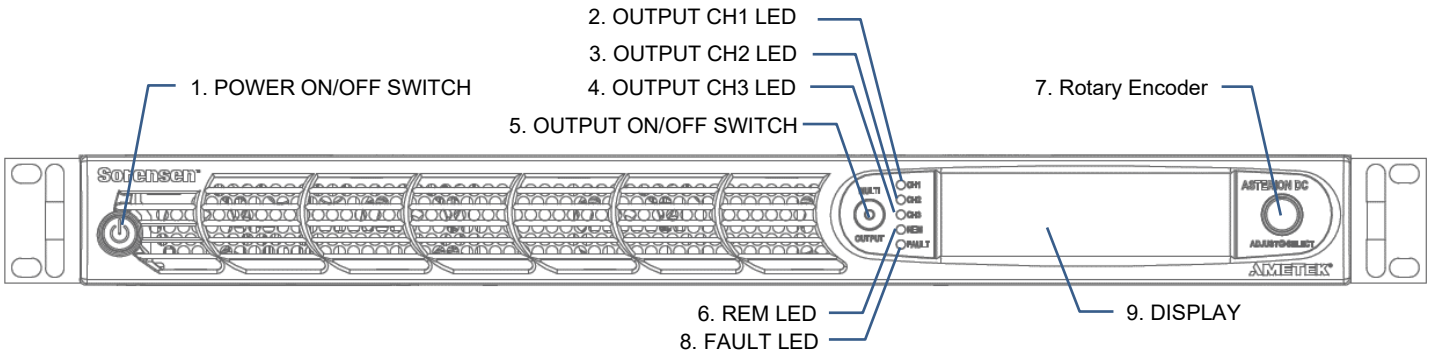
[15] Measured at full load at rated nominal AC input voltage of 208 VAC/ 400 VAC/ 480 VAC L-L for 3 phase input and 110 VAC/ 220 VAC L-N for single phase input.

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 $T_{ambient}$ 1ºC/100 m above 2000 m
Cooling	Force-air cooling; linear, variable fan speed control; air intake at front/sides and exhaust at rear
Acoustic Noise	68 dBA, maximum; measured at 1 m with A-weighting
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

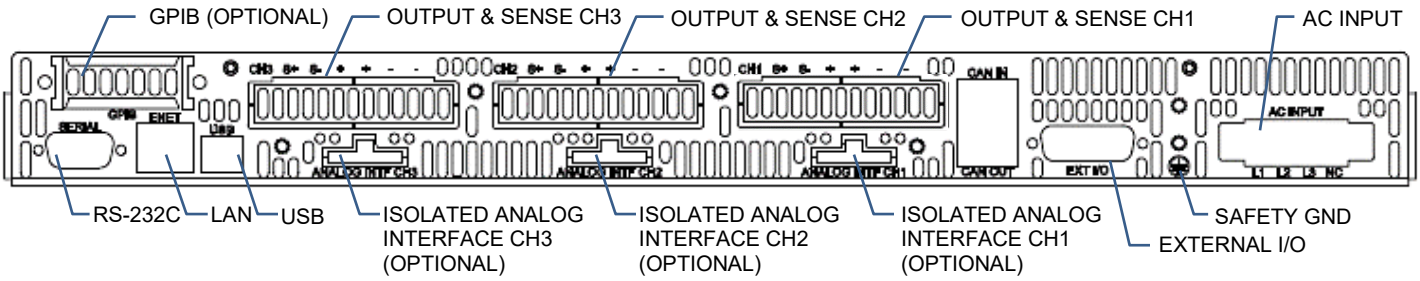
Regulatory Agency Compliance	
EMC	CE marked for EMC Directive 2014/30/EU per EN61326-1:2013, Class-A for emissions and immunity as required for the EU CE mark
Safety	CSA NRTL certified for US and Canada to AN/CSA-C22.2 No. 61010-1-12, UL 61010-1 Third Edition. CE marked for LVD compliance 2014/35/EU 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 RoHS3 EU Directive 2015/863/EU for Restriction of Hazardous Substances in Electrical and Electronic Equipment

Front Panel Controls and Indicators

Enhanced Front Panel	
1	POWER ON/OFF Switch: turns unit on/off.
2	OUTPUT ON/OFF Switch: turns output on/off of the selected channel. Output channel to be turned on/off could be selected through front panel dashboard.
3	Output CH1 LED; indicates Channel-1 of the unit is in ON condition.
4	Output CH2 LED; indicates Channel-2 of the unit is in ON condition.
5	Output CH3 LED; indicates Channel-3 of the unit is in ON condition.
6	REM LED: Indicates that the unit is under control of the remote digital interface.
7	FAULT LED: Indicates that an internal fault has been detected and the output of all channels has been shut down.
8	Display Touch-Panel, TFT color LCD display with menu-based control. Size: 1U models, 3.9” diagonal.
9	Rotary encoder for menu navigation and parameter adjustment and entry, with integrated selection switch.



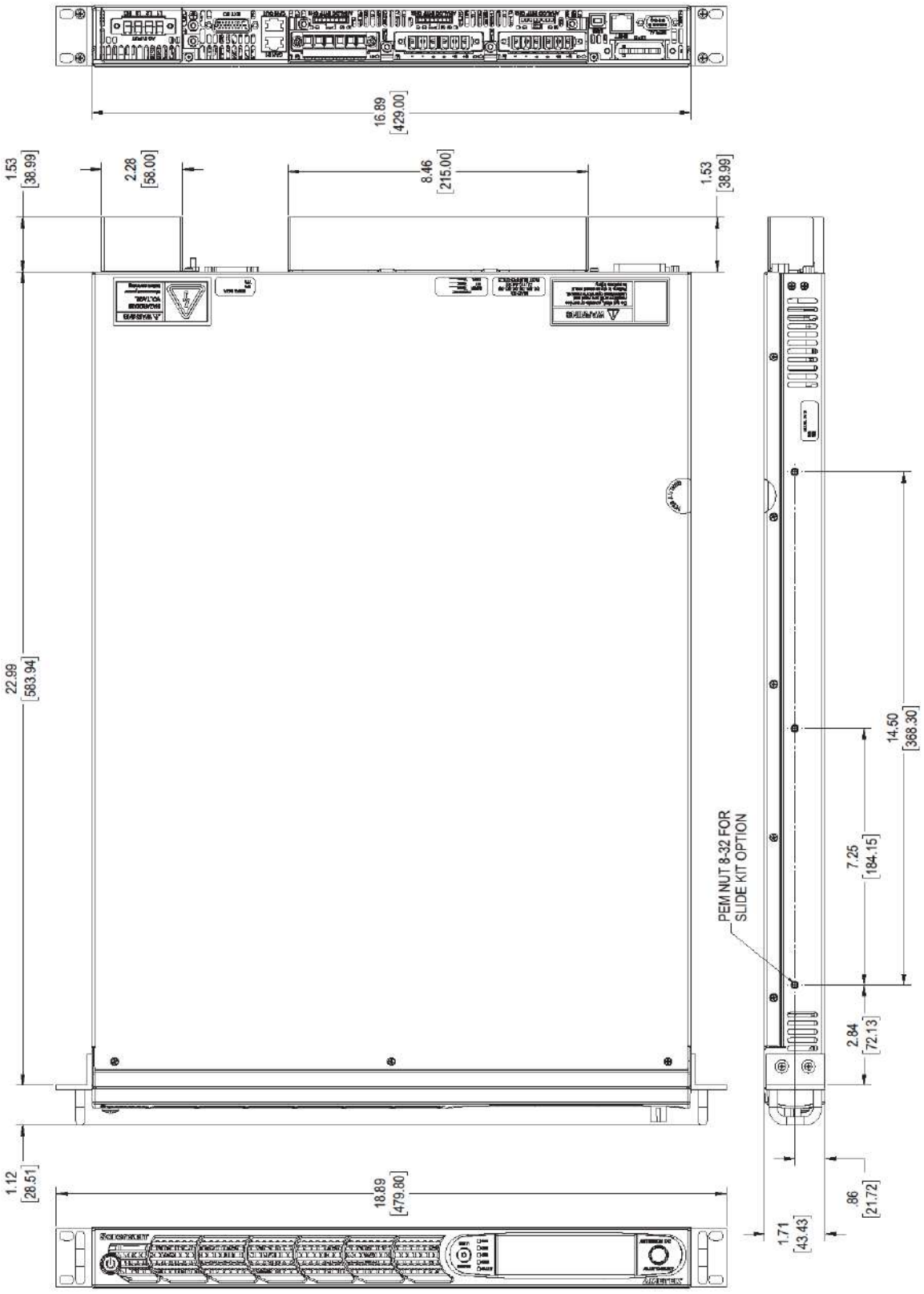
Rear Panel Connectors with GPIB Option



Rear Panel Connectors	
AC Input	1-Phase AC input: connector terminals L1/L2 or L2/L3; 3-Phase AC input: connector terminals L1, L2, and L3; Unit side connector: compression terminals, Phoenix P/N 1708514; Mating Connector, Phoenix P/N 1709173
Safety-Ground	M4 x 0.7 chassis stud
DC Output and Remote Sense	DC Output and remote sense terminal; Unit side connector: compression terminals, Phoenix P/N 1720835 Mating Connector, Phoenix P/N 1777875
Isolated External User Control I/O interface	User Control signal interface Connector; Unit side connector: high-density, 26-contact, female D-Type, Norcomp P/N 181-026-213R531 Mating connector, Norcomp P/N 180-026-103L001
Isolated Analog interface (Optional)	Isolated analog interface connector, Total 3 Nos, Individual connector for each channel; Unit side connector: Miniature mate and lock type, TE Connectivity P/N 2-1445055-8 Mating Connector, TE Connectivity P/N 1445022-8
LAN Interface	Ethernet 10BASE-T and 100BASE-T; safety isolation SELV-rated, referenced to chassis; connector: 8P8C modular jack.
RS-232 Interface	Serial interface to RS-232C; safety isolation SELV-rated, referenced to chassis; connector: Subminiature-D, 9-contact receptacle.
USB Interface	Serial interface to USB 2.0; safety isolation SELV-rated, referenced to chassis; connector: Type-B.
IEEE-488 Interface (Optional)	Parallel interface to IEEE-488.1, IEEE-488.2, and SCPI; safety isolation SELV-rated, referenced to chassis; connector: IEEE-488.1 compliant.

Mechanical Specifications	
Dimensions	H, 1.75” (44.45 mm); W (front panel), 19.0” (483 mm); D, 24.0” (609.6 mm) H, 1.75” (44.45 mm); W (chassis), 16.9” (429 mm); D, 23.0” (584 mm).
Unit Weight	28 lbs (12.7 kg)
Shipping Weight	34 lbs (15.4 kg)
Chassis Material	Steel with plastic front panel
Chassis Finish	Galvanized Zinc, G90
Installation	Protective covers are provided for AC input and DC output. Rackmount as per ANSI-EIA-310-D, with front panel mounting flange brackets and chassis provisions for mounting rack slides; slides and flange brackets/handles options available.

Chassis Dimension Drawings (1U)



Options & Order Information:

ASA XXX XXX XXX X - X X X X

SERIES

ASA - Asterion DC Multioutput, 600 W/ Channel, 1800 W Total

CHANNEL-1 VOLTAGE
Enter 3 Digit Voltage Code, Select from table below
(Lowest Voltage Option in Channel 1)

CHANNEL-2 VOLTAGE
Enter 3 Digit Voltage Code, Select from table below

CHANNEL-3 VOLTAGE
Enter 3 Digit Voltage Code, Select from table below
(Highest Voltage Option in Channel 3)

UNIT INPUT VOLTAGE (VAC)

C = 1Ph Low Line Nominal Range = 100-132 VAC, Operating Range = 90-145 VAC

1Ph High Line Nominal Range = 200-240 VAC, Operating Range = 180-264 VAC

3Ph Delta Line-Line Nominal Range = 200-240 VAC, Operating Range =180-264 VAC

D = 3Ph Delta Line-Line Nominal Range = 380-415 VAC, Operating Range =342-456 VAC

E = 3Ph Delta Line-Line Nominal Range = 440-480 VAC, Operating Range =396-528 VAC

FRONT PANEL

E = With Display

COMMUNICATION OPTIONS

0 = None

1 = GPIB

ADDITIONAL OPTIONS

0 = None

1 = Isolated Analog Interface

FIRMWARE/SOFTWARE OPTIONS

0 = None

Asterion ASA Series Voltage Channel Codes	
060	60 VDC, 42 A, 600 W
080	80 VDC, 22 A, 600 W
200	200 VDC, 17 A, 600 W
400	400 VDC, 6 A, 600 W
000	Channel not mounted, only applicable for Channel 3

When selecting different voltage channel options always configure the lowest voltage option in Channel 1 and highest voltage option in Channel 3.

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.