Sorensen SGX Series

Programmable Precision High Power DC Power Supply

4-150 kW

10-1000 V

5-6000 A

	208	400	480

ETHERNET GPIB LXI RS232

- High Power Density: Up to 15 kW in 3U, 30 kW in a 6U chassis
- Wide Voltage Range: 0-10V up to 0-1000V, from 4 to 30 kW
- Fast Load Transient Response: Protection from undesired voltage excursions
- Low Ripple and Noise
- Intuitive Touch Screen Display
- Parallelable up to 150 kW
- Sequencing: Free system controller & speed up test
- Low audible noise: Temperature controlled variable speed fans



Next Generation DC Supply

The Sorensen SGX Series represents the next generation of high power programmable DC power supplies. The SGX Series is designed for exceptional load transient response, low noise and the highest power density in the industry. With a full 15 kW available down to 20 V output in a 3U package the SGX leads the industry in power density. The power density is enhanced by a stylish front air intake allowing supplies to be stacked without any required clearance between units.

At the heart of the SGX series is a 5 kW power module. Depending on the output voltage, one to six modules can be configured in a single chassis to deliver 5 kW to 30 kW of power.

Combinations of these chassis can then be easily paralleled to achieve power levels up to 150 kW. Paralleled units operate like one single supply providing total system current.

Advanced Intelligent Control

The SGX combines onboard intelligent controls with the outstanding power electronics common to all SG family supplies. These controls enable sophisticated sequencing, constant power mode and save/recall of instrument settings. Looping of sequences makes the SGX ideal for repetitive testing.

The SGX Series is operated from the intuitive, easy-to-use front panel touch screen display. Quickly access output programming parameters, measurements, sequencing, configuration and system settings from the touch screen interface. Functions and parameters can be directly selected from the touch screen 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.

Additionally, the instrument can be controlled via LXI Ethernet and RS232 standard control interfaces, as well as through the optional GPIB control interface.

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Programmable Power
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AMETEK
PROGRAMMABLE POWER

SGX Series : Product Specifications

Common	
Remote Sense	Terminals are provided to sense output voltage at point of load. Maximum line drop 5% of rated voltage per line for 40-100V models, line drop 1V of rated voltage per line for 10-20V models, 1.5V for 30V models, 2% of rated voltage per line for models 160V and greater. (Greater line drop is allowed, but output regulation specifications no longer apply).
Parallel Operation	Up to 5 units may be paralleled for additional current within the power supply single-unit specifications, with exception of the DC output current set accuracy. Additional paralleled SG units will add 0.3% inaccuracy per unit. To parallel more than 5 units, contact factory.
Series Operation	Up to 2 units (see Output Float Voltage)
Input	
Nominal Voltage 3 phase, 3 wire + ground	208/230 VAC (operating range 187 - 253 VAC) 380/400 VAC (operating range 342 - 440 VAC) 440/480 VAC (operating range 396 - 528 VAC)
Frequency	47 – 63Hz , 400Hz (400Hz @ 208VAC, for 6U units is optional modification and does not carry CE, UL or CSA markings)
Power Factor (at full rated load; 50/60Hz)	0.90, typical, for all AC input ratings. Power factor is not solely determined by power supply input characteristics, but is dependent on the level of DC output power and interaction with the source impedance of AC mains.
Protection (typical)	½ cycle ride-though , typical, on all three phases, 3 cycle ride through on single phase; missing phase shutdown (800V model 6.4 msec on all 3 phases)

Programming & Read-back Specifications (with sense wires used)

	Programming		Read-Back / Monitoring		
	Accuracy	Resolution	Accuracy	Resolution	
Front Panel Display	SGX (40-1000V) +/- 0.1% of voltage at full scale SGX (40-1000V) +/- 0.4% of current at full scale	SGX: 4.0 digits	SGX, Voltage: +/- 0.1% of full scale SGX, Current: +/- 0.4% of full scale	SGX: 4.0 digits	Knob control & Display read-back
	SGX (10-30V) 0.1% of set point +0.1% of voltage rating SGX (10-30V) 0.1% of set point +0.4% of current rating		SGX (10-30V) 0.1% of actual +0.15% voltage rating		
Remote Analog Interface	Voltage +/-0.25% of full scale Current (40-1000V) 0.8% of full scale , (10-30V) 1.0% of full scale	NA	(40-1000V) +/-1.0% of full scale	NA	25-pin D-sub connector (0~5 V or 0~10 V)
			(10-30V) +/-0.5% of full scale		
Remote Digital Interface	Voltage: +/- 0.1% of full scale, Current: +/- 0.4% of full scale	+/-0.002% of full scale	Voltage: +/- 0.1% of full scale Current: +/- 0.4% of full scale	+/-0.002% of full scale	RS-232C (Standard on SGX), Optional IEEE-488.2 and Optional LXI Compliant 10/100 base-T Ethernet (see Options)
OVP	+/- 1% of full scale	+/-0.002% of full scale			Programming range: 5-110% Configured from front panel, remote analog or via optional digital inputs
User I/O	Disconnect & Polarity-reversal relay control (Only available with Ethernet Option)				Digital 10-pin Molex type connector
Software	IVI & CVI drivers available under SUPPORT at: www.ProgrammablePower.com				

Physical	3U Models (10V-30V)	3U Models (40V-1000V)	6U Models (60V-600V)
Width	19.00 in (48.3 cm)	19.00 in (48.3 cm)	19.00 in (48.3 cm)
Depth	28.0 in (71.1 cm)	26.3 in (66.8 cm)	27.1 in (68.8 cm)
Height	5.25 in (13.3 cm)	5.25 in (13.3 cm)	10.5 in (26.7 cm)
Weight	(4kW, 10V 15V) ≈<65 lbs (29 kg) (5kW, 20V 30V) ≈<65 lbs (29 kg) (8kW, 10V 15V) ≈<85 lbs (39 kg) (10kW, 20V 30V) ≈<85 lbs (39 kg) (12kW, 10V 15V) ≈<110 lbs (50 kg) (15kW, 20V 30V) ≈<110 lbs (50 kg)	(5kW) ≈ ≤60 lbs (27 kg) (10kW) ≈ ≤75 lbs (34 kg) (15kW) ≈ ≤90 lbs (41 kg)	(20kW) ≈ ≤140 lbs (64 kg) (25kW) ≈ ≤155 lbs (71 kg) (30kW) ≈ ≤170 lbs (78 kg)
Shipping Weight	Contact factory for more product & shipping weights		

SGX Series : Product Specifications

4-150 kW

Output

Ripple & Noise (Voltage Mode, Typical)	See Output: Voltage & Current Ranges Chart below. Ripple and noise specified at full load, nominal AC input. Noise measured with 6 ft. cable, 1µF at load
Output Rise Time (40-1000V)	≈< 100 ms 10-90% of full scale typical - full resistive load (Contact factory for model specific slew rates)

Output Voltage Rise Time (10-30V)	Rise Time, ms, max	Condition
	10	Measured from 10% to 90% of the output voltage change - resistive load, typical

Output Voltage Fall Time (10-30V)	Fall Time, ms max			Condition
	No Load	100% CC Load	100% CR Load	Measured from 90% to 10% of the output voltage change. - resistive load, typical
	50	10	10	

Output Current Rise Time (10-30V)	Rise Time, ms max	Condition
	20	Measured from 10% to 90% of the output current change - resistive load, typical

Output Current Fall Time (10-30V)	Fall Time, ms max	Condition
	10	Measured from 90% to 10% of the output current change - resistive load, typical

Line Regulation (with sense wires used)	(±10% of nominal AC input, constant load) Voltage Mode: +/- 0.01% of full scale (40-800V) Current Mode: +/- 0.05% of full scale (40-800V) Voltage Mode and Current Mode: +/- 0.05% of full scale (10-30V)
Load Regulation (with sense wires used)	(no load to full load, nominal AC input). Voltage Mode: +/- 0.02% of full scale (40-800V) Current Mode: +/- 0.1% of full scale Voltage Mode: +/- 0.05% of full scale (10-30V)
Load Transient Response	Recovers within 1ms to +/-0.75% of full-scale of steady-state output for a 50% to 100% or 100% to 50% load change
Efficiency	87% typical at nominal line and max load
Stability	±0.05% of set point after 30 minute warm-up and over 8 hours at fixed line, load and temperature, typical
Temperature Coefficient	0.02%/ C of maximum output voltage rating for voltage set point, typical 0.03%/ C of maximum output current rating for current set point, typical
Output Float Voltage	Negative terminal within +/- 300 V of chassis potential. (We recommend the use of optional isolated analog Interface.) Supplies in "series" have a system current limit of the lowest current supply in the system.

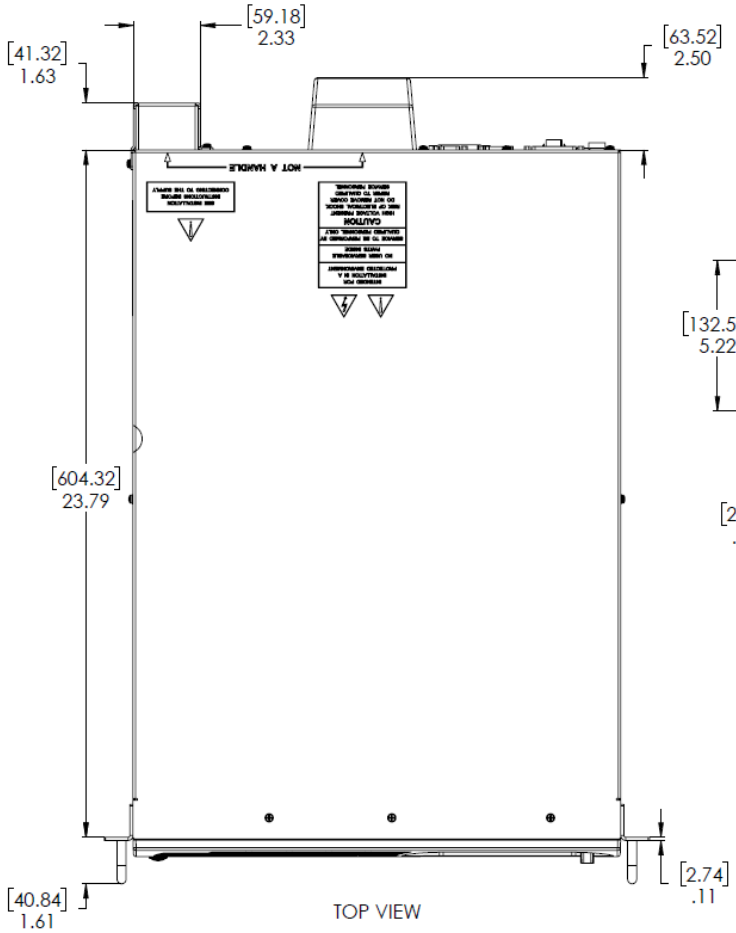
Output: Voltage and Current Ranges

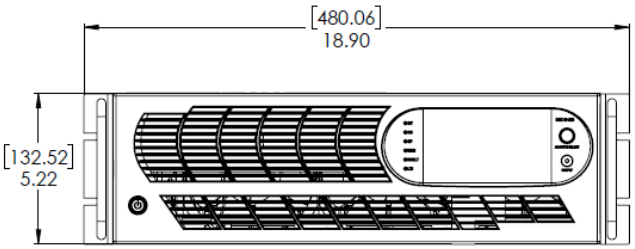
	3U			6U			Ripple & Noise	
Power	4/5 kW	8/10 kW	12/15 kW	16/20 kW	20/25 kW	24/30 kW	rms (20 Hz-300 kHz)	p-p (20 Hz-20 MHz)
Voltage	Current							
10	400	800	1200	1600*	2000*	2400*	20 mV	50 mV
15	267	534	801	1068*	1335*	1602*	20 mV	50 mV
20	250	500	750	1000*	1250*	1500*	20 mV	60 mV
30	167	334	501	668*	835*	1002*	20 mV	60 mV
40	125	250	375	500*	625*	750*	20 mV	75 mV
50	100	200	300	400*	500*	600*	20 mV	75 mV
60	83	167	250	333	417	500	20 mV	75 mV
75	67	133	200	267	333	400	20 mV	100 mV
80	63	125	188	250	313	375	20 mV	100 mV
100	50	100	150	200	250	300	20 mV	100 mV
160	31	63	94	125	156	188	25 mV	150 mV
200	25	50	75	100	125	150	25 mV	175 mV
250	20	40	60	80	100	120	30 mV	200 mV
300	17	33	50	67	83	100	30 mV	200 mV
330	15	30	45	61	76	91	30 mV	200 mV
400	12	25	38	50	63	75	30 mV	300 mV
500	10	20	30	40	50	60	50mV	350 mV
600	8	17	25	33	42	50	60 mV	350 mV
800	6.2	12.5	18.7	25*	31.2*	37.5*	80 mV	500 mV
1000	5	10	15	20*	25*	30*	100 mV	650 mV

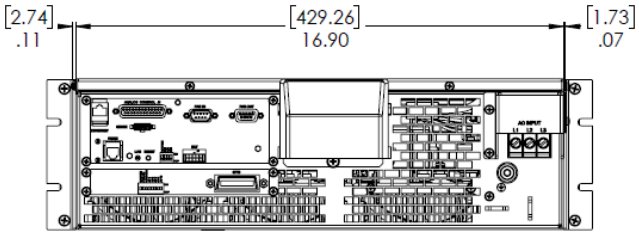
*** By way of paralleling 3U supplies**

Available Q4 2018

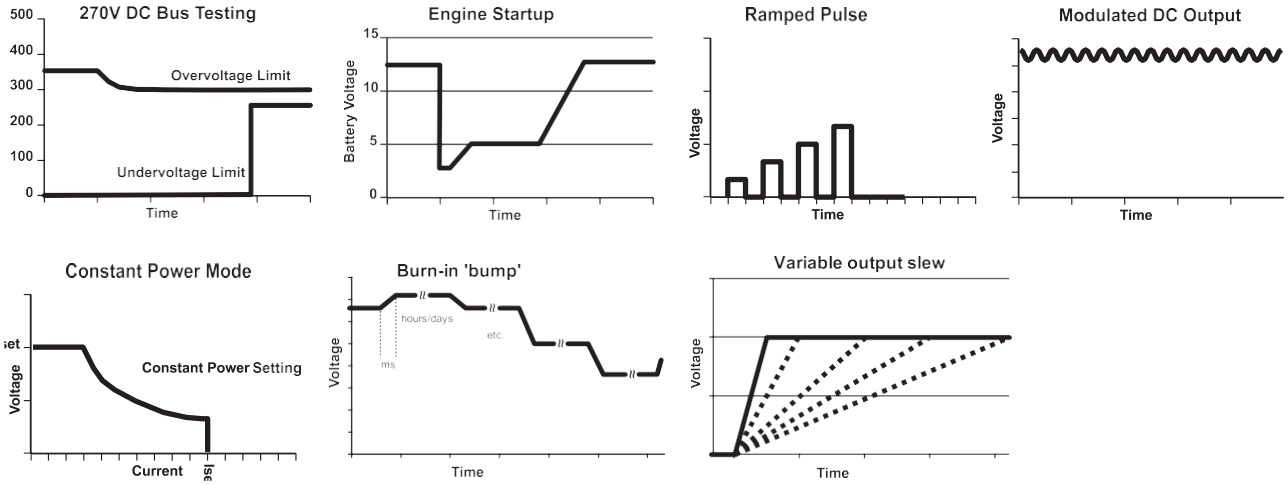
SGX Series : Product Diagram







Advanced Power Simulation



SGX model provides constant power mode allowing independent setting of the max voltage, current and power

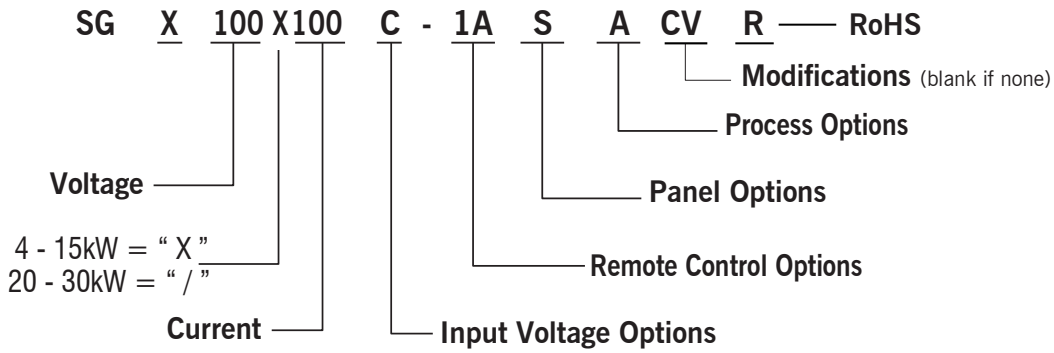
SGX / SGI Comparison Chart

Feature	SGX	SGI
Modular Design	•	•
Fast Load Transient	•	•
Parallelable	•	•
Analog & Digital Summing	•	•
Direct Front Panel V/I Control	•	•
Touch Screen	•	
Sequencing	•	•
Save/Recall Setups	•	•
System Power Readouts	•	•
Constant Power Mode	•	•
RS-232C	Standard	Standard
LXI Class C Ethernet	Standard	Optional
GPIB	Optional	Optional

Environmental

Operating Temperature	0 to 50ºC
Storage Temperature	-25º C to 65º C
Humidity Range	Relative humidity up to 95% non-condensing, 0º C – 50º C
Altitude	Operating full power available up to 5,000 ft. (~1,500 m), derate 10% of full power for every 1,000 feet higher; non-operating to 40,000 ft. (~12,000 m)
Cooling	Front and side air inlet, rear exhaust. Temperature controlled, variable speed fans. Units may be stacked without spacing.
Regulatory	Certified to UL/CSA 61010 and IEC/EN 61010-1 by a NRTL, CE Compliant, Semi-F47 Compliant. LVD Categories: Installation Category II: Pollution Degree 2; Class II Equipment: for Indoor Use Only, back panel not user accessible (see user manual for installation instructions) EMC Directive, EN 61326:1998
Front Panel Dust Filter (Consult Factory)	30 PPI (Pores Per Inch) - must ensure adequate airflow and / or derate max. temperature. 3U unit only.

SGX Series



(For units with greater than 3 digits, Voltage/Current is represented in numeric format, e.g., above "100" represents 100A. For units at 1000 and above, the voltage is represented by the format "XKX", e.g, 1K2 = 1200V and 1K0 = 1000V)

Options and Accessories	
Input Voltage Options	C: Input Voltage 187 / 242VAC, 3 Phase D: Input Voltage 342 / 440VAC, 3 Phase E: Input Voltage 396 / 528VAC, 3 Phase
Remote Control Options	0A: No Option 1A: IEEE-488.2 + RS-232C (Note: SGX comes standard with RS-232C and Ethernet) 1D: Isolated Analog Control 2A: Combined Options 1A+1D
Panel Options	S: Standard N: No Display
Process Options	A: No option B: Certificate of Calibration to ANSI / NCSL Z540-1 (includes Test Data)
Modifications	CV: 400Hz AC input @ 208 VAC (does not carry CE, CSA or UL marks) (6U only) STD on 3U Blank if no modifications
RoHS	R: RoHS is standard (must include in part number)
Accessories	890-453-03: Paralleling Cable (for up to 5 units, requires one cable per unit placed in parallel) K550212-01R: 3U Rack Slides (for 5kW, 10kW and 15kW models) K550213-01R: 6U Rack Slides (for 20kW, 25kW and 30kW models) 5551082-01R: Optional AC input cover kit - 3U unit only
Contact factory for other combinations	

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