Elgar Electronics Corp.

SG Series

Programmable Precision DC Power Supply

5 kW - 150 kW // 40 V - 600 V

Product Validation

Production ATE

Burn-In

DC Bus Power

LXI Ethernet

For Further Information or Sales Support
Contact Elgar Electronics Corporation
www.Elgar.com 858.450.0085

Overview

The SG series represents the next generation of high power programmable DC power supplies. Designed for exceptional load transient response, low noise and the highest power density in the industry. The industry leading 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 SG 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. Available in two control versions, the SGA has basic analog controls, while the SGI provides intelligent control features

SGI: Advanced Intelligent Control

(Sorensen General purpose Intelligent) The SGI 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 SGI idea for repetitive testing. An impressive vacuum fluorescent graphical display in eight languages, context sensitive "soft" keys and front panel keyboard simplify programming of the SGI.

SGA: Outstanding Value - Analog Control

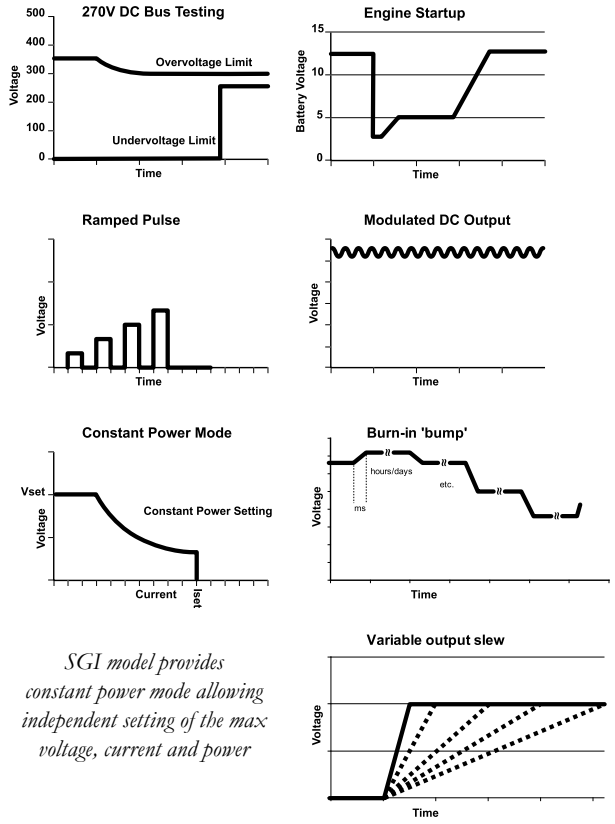
(Sorensen General purpose Analog) The SGA, with its industry leading price performance, is available for customers requiring simple front panel analog controls or external control. With the same high performance power electronics as the SGI, the SGA provides essential features like 10- turn potentiometers for setting voltage and current, 3 ½ digit LED readout plus front panel over-voltage protection (OVP) preview/adjustment and reset.

SGI / SGA Comparison Chart

Feature	SGA	SGI
Modular Design	•	•
Fast Load Transient	•	•
Parallelable	•	•
Analog & Digital Summing	Optional	•
Direct Front Panel V/I Control	•	•
3½ Digit LED Readout	•	
Graphics Display		•
Sequencing		•
Save/Recall Setups		•
System Power Readouts		•
Constant Power Mode		•
IEEE-488.2/RS-232C	Optional	RS-232C Std IEEE-488.2 Optional
LXI Compliant Ethernet	Optional	Optional

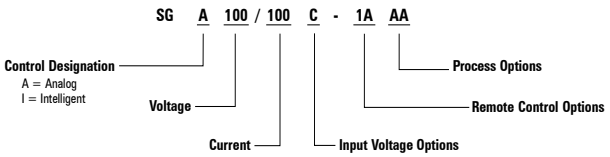
LXI Compliant Ethernet

Advanced Power Simulation



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

SGI / SGA Model Number Description



Options and Accessories

Control Options:
- A: Analog
- I: Intelligent

Input 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
- 1C: Ethernet + RS-232C
- 1D: Isolated Analog Control
- 1E: Shaft Locks (SGA series only)

Contact factory for other combinations

Process Options:
- AA: No option
- AB: Certificate of Calibration (includes Test Data)

Accessories:
- 890-453-03: Paralleling Cable (for up to 5 units, requires one cable per unit placed in parallel)
- K550212-01: 3U Rack Slides (for 5kW, 10kW and 15kW models)
- K550213-01: 6U Rack Slides (for 20kW, 25kW and 30kW models)

Applications

Process Control

Whether you are controlling ion beams for the manufacture of semiconductors, or driving a current through electrolyte for precise control in a plating process, the SG series is an ideal choice with it's small size, reliable modular design and standard analog programmability. Direct control of V and I along with monitoring of the actual voltage and current, provides a simple interface for your PLC or other type of analog controller.

Product Development

Testing & Burn-in of DC-DC converters, laser diodes, automotive and semiconductor components and aircraft flight hardware are just a few of the items being tested using the SG product family. From simple front panel control to complex test sequences for compliance testing, the SG series will keep pace with your changing application needs.

Research

A research environment presents some of the most demanding requirements on your test instrumentation. Equipment that is sufficient today, may not meet the needs of the next project. With the SG series this is no longer a problem. The modular design allows you to easily upgrade to higher power levels in the future, or parallel units to achieve up to 150 kW. With the sophisticated sequencing capability of the SGI model, you can build an infinite variety of test or diagnostic programs and have them execute directly from the power supply.

Automotive Component Test

The 16-bit resolution and Ethernet enabled hardware triggering allows for detailed sequencing associated with battery fluctuation simulation. The tight load regulation capability of the SG series makes it a superior source for validation and acceptance testing and burn-in of automotive components. The 40V models, in particular, provide a full range of testing to simulate battery conditions. Margin testing of components, such as electronic control units (ECU) and electromechanical components, is easily achieved.

Rackmount ATE Systems

The high power density of the SG series makes it ideal for ATE System integration. The wide variety of voltage and current combinations in 3U and 6U heights allows multiple voltage outputs in a small amount of space. The wide variety of control methods possible, allows easy integration into legacy systems as well as high speed systems.

Battery Charging

The SG series provides high accuracy voltage output to optimize battery charging. Battery charging requires high accuracy voltage and stable current output. With the remote interface options, the charging process can easily be automated for volume production.

Applications	
Burn-In	**Compliance Testing**
Materials Research	**Process Control**
Product Validation	**Automotive Electronics**
Rackmount ATE Systems	**Battery Charging**

*See the **SFA** product brochure for very high current slew rate and low stored energy applications.*

Key Features

- **High Power Density:** Up to 15 kW in a 3U / 30 kW in a 6U chassis
- **Wide Voltage Range:** 0-40V up to 0-600V, in increments of 5 kW from 5 to 30 kW
- **Fast Load Transient Response:** Protection from undesired voltage excursions
- **Low Ripple and Noise:** Suitable for the most sensitive applications
- **Parallelable up to 150 kW:** Expandable as your requirement grows
- **Modular Design:** Upgradeable for the ultimate in investment protection.
- **Sequencing:** Program custom waveforms
- **Easy-to-read Fluorescent Display:** SGI supports English, French, German, Italian, Spanish, Chinese, Japanese, and Korean languages
- **16-bit Resolution:** Optional IEEE-488.2 + RS-232C or Ethernet provides precise control
- **Ethernet Control:** LXI Class C compliant communication with integrated web server
- **Direct Relay Control:** Control output and sense isolation relays, along with polarity relays. (Ethernet Option Only)
- **Hardware Trigger:** Ethernet Option Only
- **5 Year Warranty**

Product Specifications

Common	
Remote Sense	Load-line loss compensation for models <= 100 V is 10% above full scale voltage total (5% per load-line), and models > 100 V is 4% above full scale voltage total (2% per load-line).
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	208/220 VAC (operating range 187 - 242 VAC) 380/400 VAC (operating range 342 - 440 VAC) 440/480 VAC (operating range 396 - 528 VAC)* *Optional
Frequency	47 – 63Hz
Power Factor	>0.9 typical at 208/220 VAC input >0.78 typical at 380/400 VAC input >0.69 typical at 440/480 VAC input
Protection	½ cycle ride-though on all three phases, 3 cycle ride through on single phase; missing phase shutdown
Environmental	
Operating Temperature	0 to 50° C
Storage Temperature	-25° C to 65° C
Humidity Range	Relative humidity up to 95% non-condensing, 0° C – 50° 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. Units may be stacked without spacing.
Regulatory	Certified to UL/CSA 61010 and IEC/EN 61010-1, CE Compliant, Semi-F47 Compliant
Physical	
Dimensions	Width: 19.00" (48.3 cm), Depth 25.0" (63.5 cm) Height: 5-15 kW units: 3U – 5.25" rack mount (13.34 cm) 20-30 kW units: 6U – 10.5" rack mount (26.67 cm)
Weight	3U < 80 lbs. (36 kg) 6U <160 lbs. (73 kg)
Shipping Weight	See web site for more product & shipping weights.

Output: Voltage and Current Ranges

	3U			6U			Ripple & Noise	
Power	5 kW	10 kW	15 kW	20 kW	25 kW	30 kW	rms (20 Hz-300 kHz)	p-p (20 Hz-20 MHz)
Voltage	Current							
40	125	250	375	500*	625*	750*	20 mV	75 mV
60	83	167	250	333	417	500	20 mV	75 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
330	15	30	45	61	76	91	30 mV	200 mV
400	12	25	38	50	63	75	30 mV	300 mV
600	8	17	25	33	42	50	60 mV	350 mV

** By way of paralleling 5 kW, 10 kW & 15 kW supplies*

Output	
Ripple & Noise (Voltage Mode)	Ripple and noise, typical, measured at full load, nominal AC input. Noise measured with 6 ft. cable, 1μf at load.
Ripple (Current Mode)	<+/- 0.04% of full scale rms current
DC Voltage Slew Rate	100 ms 5-95% of full scale typical (Contact factory for model specific slew rates)
DC Current Slew Rate	45A / ms typical
Line Regulation	(±10% of nominal AC input, constant load) Voltage Mode: +/- 0.01% of full scale Current Mode: +/- 0.05% of full scale
Load Regulation	(no load to full load, nominal AC input) Voltage Mode: +/- 0.02% of full scale Current Mode: +/- 0.1% of full scale
Load Transient Response	Recovers within 1ms to +/-0.75% of steadystate 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 8 hrs. warm-up at fixed line, load and temperature
Temperature Coefficient	0.02%/ C of maximum output voltage rating for voltage set point 0.03%/ C of maximum output current rating for current set point
Output Float Voltage	Negative terminal within +/- 150 V of chassis potential.

Programming & Read-back Specifications

	Programming		Read-Back / Monitoring		
	Accuracy	Resolution	Accuracy	Resolution	
Front panel Display	SGA: +/- (0.5%fs + 1 digit) SGI, Voltage: +/- 0.1% of full scale SGI, Current: +/- 0.4% of full scale	SGA: 3.5 digits SGI: 4.0 digits	SGA: +/- (0.5%fs + 1 digit) SGI, Voltage: +/- 0.1% of full scale SGI, Current: +/- 0.4% of full scale	SGA: 3.5 digits SGI: 4.0 digits	Knob control & Display read-back
Remote Analog Interface	Voltage: +/-0.25% of full scale for 0-5 V range, +/-0.5% of full scale for 0-10 V range Current: 0.8% of full scale	NA	+/-1.0% of full scale (0 - 10V)	NA	25-pin D-sub connector (0~5 V or 0~10 V)
Remote Digital Interface	Voltage: +/- 0.1% of full scale, Current: +/- 0.4% of full scale	+/-0.002% of full scale	Voltage: +/- 0.15% of full scale, Current: +/- 0.4% of full scale	+/-0.002% of full scale	RS-232C (Standard on SGI), 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 See www.elgar.com/go/pinouts
Software	IVI & CVI drivers available under SUPPORT at: www.Elgar.com				

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