

Sorensen SG Series - Water Cooled

5–75 kW

Programmable Precision High Power DC Power Supply

40–60 V

- High Power Density: up to 15 kW in 3U
- Wide Voltage Range: 0-40 V and 0-60 V, in increments of 5 kW from 5 to 15 kW
- Fast Load Transient Response: Protection from undesired voltage excursions
- Low Ripple and Noise
- Hardware Trigger (Ethernet Option)
- Parallelable up to 75 kW
- Sequencing: Free system controller & speed up test
- Low audible noise
- Water Cooled



83–1875 A



400

480

ETHERNET



LXI RS232

The Sorensen SG series (hereafter SG Series) represents the next generation of high power programmable DC power supplies. The SG Series is designed for exceptional load transient response, low noise and the highest power density in the industry. With a full 15 kW available in a 3u package the SG leads the industry in power density. Water cooling allows for use in applications where the environment precludes the use of air cooled power supplies.

At the heart of the SG series is a 5 kW power module. Depending on the output voltage, one to three modules can be configured in a single chassis to deliver 5 kW to 15 kW of power. Combinations of these chassis can then be easily paralleled to achieve power levels up to 75 kW. Paralleled units operate like one single supply providing total system current.

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. 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.

AMETEK
Programmable Power
9250 Brown Deer Road
San Diego, CA 92121-2267
USA

AMETEK[®]
PROGRAMMABLE POWER

SG Series - Water Cooled : Product Specifications

| Common | | | | | |
|--|--|-------------------------|--|-------------------------|---|
| Remote Sense | Terminals are provided to sense output voltage at point of load. Maximum line drop 5% of rated voltage per. (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 | 380/400 VAC (operating range 342 - 440 VAC) 440/480 VAC (operating range 396 - 528 VAC) | | | | |
| Frequency | 47 – 63Hz | | | | |
| Power Factor | 0.95 typical, at full-rated load and nominal AC input voltage | | | | |
| Protection (typical) | ½ cycle ride-through on all three phases, 3 cycle ride through on single phase; missing phase shutdown | | | | |
| Programming & Read-back Specifications (with sense wires used) | | | | | |
| | Programming | | Read-Back / Monitoring | | |
| | Accuracy | Resolution | Accuracy | Resolution | |
| Front panel Display | +/- (0.5%fs + 1 digit) | 3.5 digits | +/- (0.5%fs + 1 digit) | 3.5 digits | Knob control & Display read-back |
| Remote Analog Interface | Voltage +/-0.25% of full scale Current 0.8% of full scale | NA | +/-1.0% of full scale | 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: +/- 0.1% of full scale Current: +/- 0.4% of full scale | +/-0.002% of full scale | Optional RS-232C, IEEE-488.2 and 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 | | | | | |
| Width | 19.00 in (48.3 cm) | | | | |
| Depth | 25.95 in (65.9 cm) | | | | |
| Height | 5.22 in (13.3 cm) | | | | |
| Weight | (5kW) ~ 73 lbs (33.2 kg) (10kW) ~ 85 lbs (38.6 kg) (15kW) ~ 97 lbs (44.0 kg) | | | | |
| Shipping Weight | Contact factory for more product & shipping weights | | | | |

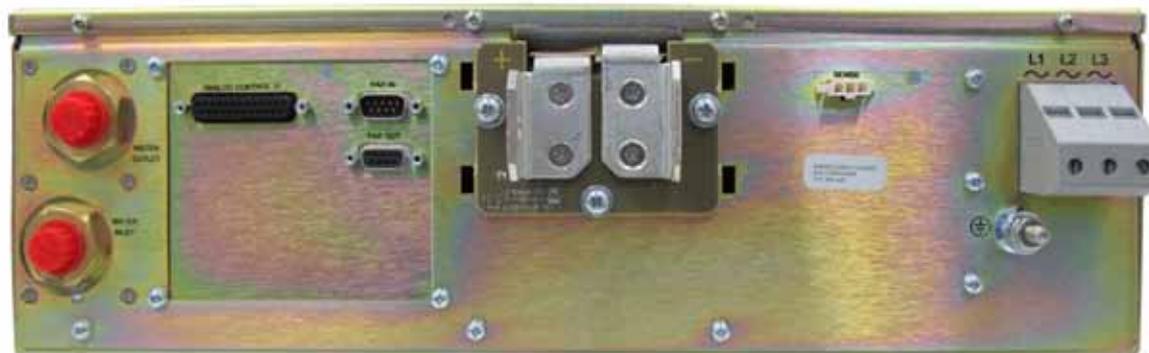
SG Series - Water Cooled

5-75 kW

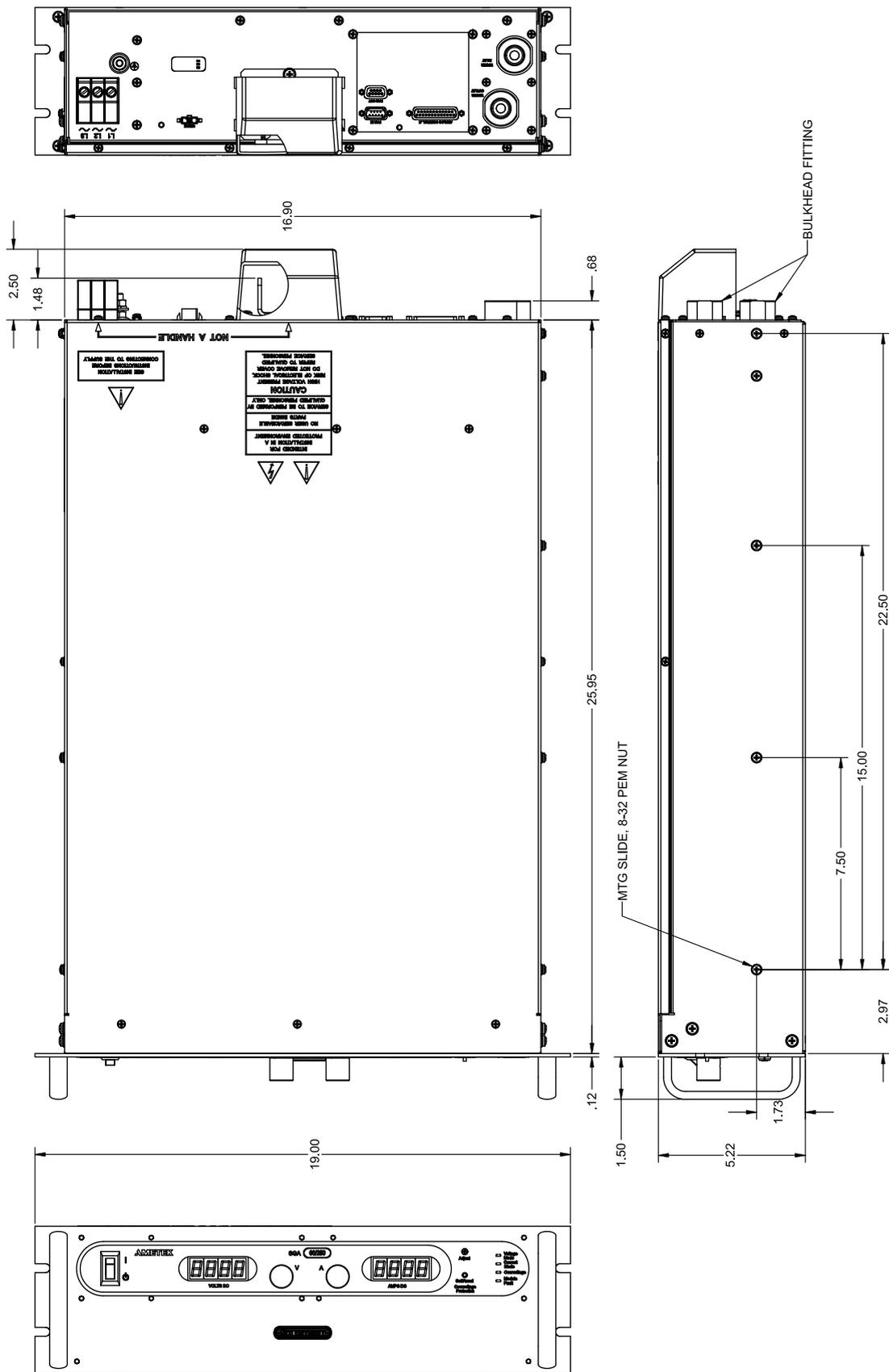
| Output | |
|---|--|
| Ripple & Noise (Voltage Mode, Typical) | See Output: Voltage & Current Ranges Chart below. Ripple and noise specified at full load, nominal AC input. Noise measured with 6 ft. cable, 1µf at load |
| Ripple (Current Mode) | < +/- 0.04% of full scale rms current |
| DC Voltage Slew Rate | < 100 ms 5-95% of full scale typical - resistive load (Contact factory for model specific slew rates) |
| Line Regulation (with sense wires used) | (±10% of nominal AC input, constant load) Voltage Mode: +/- 0.01% of full scale Current Mode: +/- 0.05% of full scale |
| Load Regulation (with sense wires used) | (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 full-scale 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 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 (IAI).) Supplies in "series" should be the same output voltage/current, in not system current is limited to lower of the two supplies. |

| Output: Voltage and Current Ranges | | | | | |
|------------------------------------|---------|-------|-------|------------------------|-----------------------|
| | 3U | | | Ripple & Noise | |
| Power | 5 kW | 10 kW | 15 kW | rms (20 Hz-300 kHz) | p-p (20 Hz-20 MHz) |
| Voltage | Current | | | | |
| 40 | 125 | 250 | 375 | 20 mV | 75 mV |
| 60 | 83 | 167 | 250 | 20 mV | 75 mV |

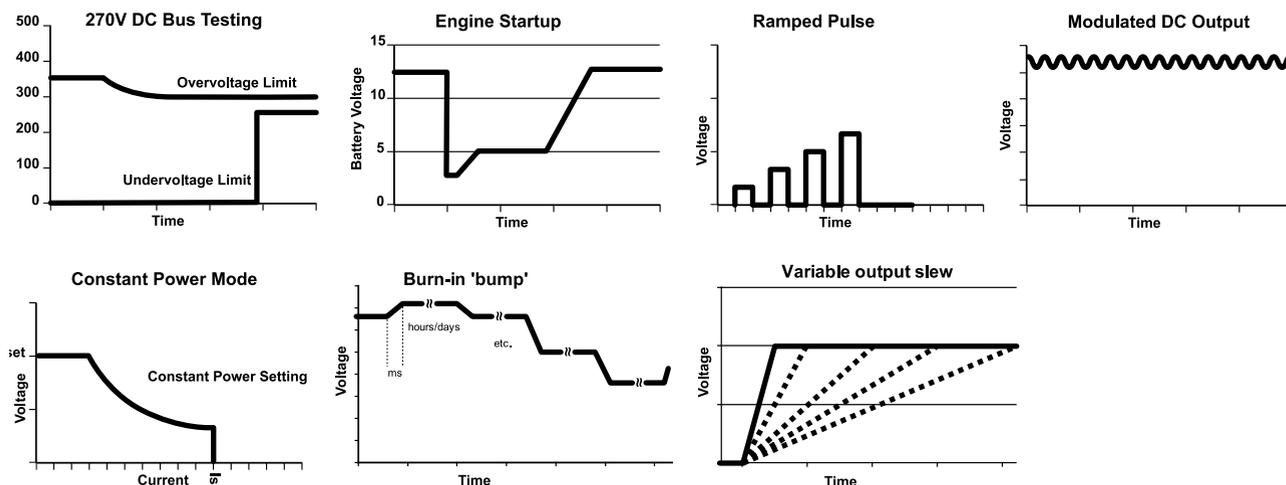
SG Series - Water Cooled - Back Panel



SG Series - Water Cooled : Product Diagram



Advanced Power Simulation (with Digital Interface Options)



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

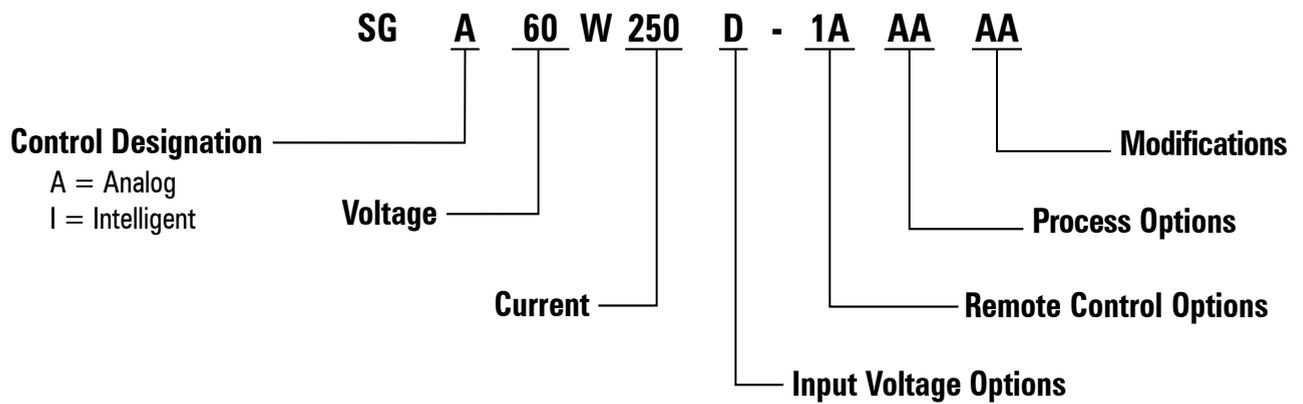
SGI / SGA Comparison Chart

| Feature | SGA |
|--------------------------------|---------------------------------|
| Modular Design | • |
| Fast Load Transient | • |
| Parallelable | • |
| Analog & Digital Summing | Optional |
| Direct Front Panel V/I Control | • |
| 3½ Digit LED Readout | • |
| Sequencing | With optional digital interface |
| Save/Recall Setups | |
| System Power Readouts | |
| Constant Power Mode | |
| IEEE-488.2/RS-232C | Optional |
| LXI Class C Ethernet/ RS-232 | Optional |

Environmental

| | |
|------------------------------|---|
| Operating Temperature | 0 to 50° C |
| Liquid Cooling Temperature | 30 ° C Max (Temp vs dew point must prevent condensation) |
| Coolant Flow Rate | 1.25 GPM minimum, 26 GPM maximum |
| Static Pressure | 80 PSI Max |
| Static Pressure Differential | 8 PSI, Typical at 1.5 GPM |
| Storage Temperature | 0° C to 65° C |
| Humidity Range | Relative humidity up to 95% non-condensing, 0° C – 50° C |
| Condensation | Internal condensation must be prevented by ensuring that the temperature of the coolant is sufficiently high compared with the ambient air dew point. |
| 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 | Water or water/ethylene glycol |
| 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. EMC Directive, EN 61326:1998 |

SG Series - Water Cooled



Options and Accessories

| | |
|--|---|
| Control Options | A: Analog |
| Input Options | 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 (Check for availability) 1C: Ethernet + RS-232C (Check for availability) 1D: Isolated Analog Control 1E: Shaft Locks |
| 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) |
| Contact factory for other combinations | |