

# Sorensen XG 850 Series

670–850 W

## 850 W, 1U Half Rack Programmable DC Power Supplies

6–600 V

- Highest Power Density
- Comprehensive Digital and Analog Interface Options
- Scalable, Multi-Unit Design
- Multi-Channel Support
- Straightforward Front Panel Controls
- High Reliability



1.4–110 A

~

110

220

ETHERNET   RS232 

The Sorensen XG Series is an 850 Watt, 1U half-rack DC power supply. The XG Series is the new standard for powerful, programmable DC power systems. Designed for test, production, laboratory, OEM and quality assurance applications, the XG Series provides a wealth of features to ensure accuracy and greater efficiency. It puts clean, reliable power at your disposal and delivers stable, variable output voltage and current for a broad range of development, test and system requirements.

### Highest Power Density

High frequency, soft switching technology in the XG Series provides up to 850 Watts in a 1U half-rack package. This represents the highest power density available from any manufacturer. With 12 models, there is a configuration available to meet every application.

### Comprehensive Digital and Analog Interface Options

The XG Series comes standard with USB 2.0, RS-232, RS-485, isolated and non-isolated analog interfaces to provide a comprehensive set of options to connect to a PC or other network device. This design provides the convenience of being able to accommodate a wide range of installation configurations. Ethernet and GPIB interfaces are available as options.

### Scalable, Multi-Unit Design

XG Series power supplies can be connected in parallel or series to produce greater current or voltage output for your applications. This scalability allows you to build rack-mounted systems with the XG Series that exactly meet your existing requirements, while allowing for future expansion.

### Multi-Channel Support

Up to 30 XGs Series can be connected easily via an RS-485 bus to provide the ultimate flexibility in remote programming. This eliminates the cost and complexity of requiring GPIB cards in each unit. Once connected, multiple power supplies can be controlled via a single LAN, USB 2.0, GPIB, RS-232 or RS-485 interface. This provides an efficient option to centrally manage each XG Series needed for your applications.

### Straightforward Front Panel Controls

The XG Series is equipped with a unique push-button encoder and function selector dial to provide a simple, uncluttered front panel. Both voltage and current can be set quickly and easily using these two controls. Front panel access can be locked out to ensure secure remote operation. This streamlined front panel layout results in fast, intuitive set-up and operation of the XG Series.

### High Reliability

To guarantee long-term trouble-free performance, the XG Series was designed with reliability in mind. Soft-switching technology ensures higher mean time between failure (MTBF) by eliminating high voltage transients found in conventional hard-switching power supplies which can cause premature failure of power components. AMETEK engineers also rigorously tested the XG Series during the design phase using Highly Accelerated Life Testing (HALT). This rigorous test procedure combines powerful thermal and vibration technologies to stress a product beyond its rated specifications. HALT testing allows our engineers to uncover and correct design issues early in the development cycle. This care in design and comprehensive testing ensures the XG Series exceeds the reliability and quality standards of both AMETEK and our customers.

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**AMETEK**<sup>®</sup>  
PROGRAMMABLE POWER

# XG 850 Series : Product Specifications

Output : Voltage and Current				
Models	Output Voltage <sup>1</sup>	Output Current <sup>2,9</sup>	Output Power <sup>3</sup>	
XG 6-110	6 V	110 A	670 W	
XG 8-100	8 V	100 A	810 W	
XG 12-70	12 V	70 A	850 W	
XG 20-42	20 V	42 A	850 W	
XG 33-25	33 V	25 A	835 W	
XG 40-21	40 V	21 A	850 W	
XG 60-14	60 V	14 A	850 W	
XG 80-10.5	80 V	10.5 A	850 W	
XG 100-8.5	100 V	8.5 A	860 W	
XG 150-5.6	150 V	5.6 A	850 W	
XG 300-2.8	300 V	2.8 A	850 W	
XG 600-1.4	600 V	1.4 A	850 W	
Models	Line Regulation Voltage (0.005% of rated output voltage +2 mV) <sup>4</sup>	Line Regulation Current (0.01% of rated output current +2 mA to +1 mA) <sup>5</sup>	Load Regulation Voltage (0.005% of rated output voltage + 2 mV) <sup>6</sup>	Load Regulation Current (0.02% of rated output current +5 mA to +4 mA)
XG 6-110	2.3 mV	12 mA	2.3 mV	26 mA
XG 8-100	2.4 mV	11 mA	2.4 mV	24 mA
XG 12-70	2.6 mV	8 mA	2.6 mV	18 mA
XG 20-42	3.0 mV	5.2 mA	3.0 mV	12.4 mA
XG 33-25	3.7 mV	3.5 mA	3.7 mV	9 mA
XG 40-21	4 mV	3.1 mA	4 mV	8.2 mA
XG 60-14	5 mV	2.4 mA	5 mV	6.8 mA
XG 80-10.5	6 mV	2.1 mA	6 mV	6.1 mA
XG 100-8.5	7 mV	1.9 mA	7 mV	5.7 mA
XG 150-5.6	9.5 mV	1.6 mA	9.5 mV	5.1 mA
XG 300-2.8	17 mV	1.3 mA	17 mV	4.6 mA
XG 600-1.4	32 mV	1.1 mA	32 mV	4.3 mA
Models	Output Noise (rms, 300 kHz)		Output Ripple (p-p, 20 MHz)	
Models	Voltage	Current <sup>8</sup>	Voltage	
XG 6-110	8 mV	200 mA	50 mV	
XG 8-100	8 mV	180 mA	50 mV	
XG 12-70	8 mV	120 mA	50 mV	
XG 20-42	8 mV	75 mA	50 mV	
XG 33-25	8 mV	60 mA	50 mV	
XG 40-21	8 mV	45 mA	50 mV	
XG 60-14	8 mV	35 mA	50 mV	
XG 80-10.5	8 mV	25 mA	80 mV	
XG 100-8.5	8 mV	20 mA	80 mV	
XG 150-5.6	10 mV	16 mA	100 mV	
XG 300-2.8	25 mV	10 mA	150 mV	
XG 600-1.4	50 mV	6 mA	250 mV	

1. Maximum output voltage is guaranteed to be  $\leq 0.2\%$  of the rated voltage at zero output setting, using the front panel or digital remote programming modes.
2. Maximum output current is guaranteed to be  $\leq 0.4\%$  of the rated current at zero output setting, using the front panel or digital remote programming modes, and when measured with rated load resistance.
3. Total output power is also based on AUX1 Output Voltage (5 V) and AUX1 Output Current (0.5 A) and AUX2 Output Voltage (15 V) and AUX2 Output Current (0.5 A).
4. From 85–132 Vac or 170–265 Vac, constant load.
5. From 85–132 Vac or 170–265 Vac, constant load.
6. From no load to full load, constant input voltage.
7. For load voltage change, equal to the unit voltage rating, constant input voltage.
8. For 6 V models the current ripple is measured at 2–6 V output voltage and full output current. For all other models, the current ripple is measured at 10–100% output voltage and full output current.
9. OCP setpoint can be programmed from 0 - 105% of rated current.

Note: All specifications are subject to change.

# XG 850 Series : Product Specifications

# 670–850 W

Model	Maximum Recommended Remote Sense Line Drop Compensation per Line <sup>9</sup>	Up-prog. Response Time, 0–Vmax <sup>10</sup>	Efficiency <sup>11</sup> (100/200 VAC input)
XG 6-110	1 V	60 ms	75/77%
XG 8-100	1 V	60 ms	77/80%
XG 12-70	1 V	60 ms	79.5/82.5%
XG 20-42	1.5 V	60 ms	82/85%
XG 33-25	2 V	60 ms	83/86%
XG 40-21	2 V	60 ms	83/87%
XG 60-14	3 V	60 ms	83/87%
XG 80-10.5	5 V	100 ms	83/87%
XG 100-8.5	5 V	100 ms	83/87%
XG 150-5.6	5 V	100 ms	83/87%
XG 300-2.8	5 V	150 ms	83/87%
XG 600-1.4	5 V	250 ms	83/87%

Model	Down-prog. Response Time: Full Load	Down-prog. Response Time: No Load	Over-Voltage Trip Point
XG 6-110	50 ms	300 ms	0.5–7.5 V
XG 8-100	50 ms	400 ms	0.5–10 V
XG 12-70	50 ms	500 ms	1–15 V
XG 20-42	50 ms	600 ms	1–24 V
XG 33-25	50 ms	700 ms	2–39 V
XG 40-21	50 ms	800 ms	2–44 V
XG 60-14	50 ms	900 ms	3–66 V
XG 80-10.5	80 ms	1000 ms	3–95 V
XG 100-8.5	100 ms	1200 ms	3–125 V
XG 150-5.6	150 ms	1800 ms	3–180 V
XG 300-2.8	150 ms	2200 ms	5–330 V
XG 600-1.4	250 ms	3500 ms	5–660 V

Environmental Specifications (Indoor use)	
Operating Temperature Range	32°F to 122°F, 100% load (0°C to 50°C)
Storage Temperature Range	-4°F to 158°F (-20° C to 70°C)
Operating Humidity Range	30–90% RH (no condensation)
Storage Humidity Range	10–95% RH (no condensation)
Operating Altitude	Up to 6,500 feet (2,000 m)
Installation Category	II (IEC 1010-1)
Pollution Degree	2 (IEC 1010-1)
Regulatory Approvals	
Safety	CSA 22.2 No. 61010-1, 60950-1-07 and UL61010-1, UL60950-1-(2nd Ed) <sup>12</sup> . Marked with cCSAus, CE for EMC & low voltage directive
EMC	Complies with EN61326-1 Complies with EN55022, Class B, FCC Part 15B for conducted emissions Complies with EN55022, Class A, FCC Part 15A for radiated emissions Complies with EN61000-4 series of standards for immunity

9. When using remote sense, the total of the load voltage and the load line drops must not exceed the rated output of the power supply. For example, for an XG 6-110 in an application with 1 V of load line loss (0.5 V/Line), the maximum available load voltage would be 6–1= 5 V. Note: The unit may operate at higher output voltages than this, but there is no guarantee that the power supply will meet performance specifications. Ultimately, the upper limit of the output voltage will be determined by internal circuitry of the power supply (non-adjustable.)

10. With rated, resistive load.

11. At maximum output power.

12. Double insulation on primary to secondary isolation barriers. Basic insulation primary to protective earth ground.

Applies to all footnotes: Programming and Readback: RS-232, RS-485, USB built in. GPIB, Ethernet optional. Specifications are guaranteed from 1% to 100% of the rated output voltage, current, and power.

Note: All specifications are subject to change.

# XG 850 Series : Product Specifications

Programming Mode	APG	ISOL	Digital
Voltage and Current Output Voltage Programming	0–100%. Voltage control range is 0.0 to 2.0-10.0V in 0.1V increments.		
Voltage and Current Output Resistive Programming	0-100%. Resistive control range is 0.0 to 2.0 - 10.0K in 0.1K increments.		
Output Voltage and Current Monitor	0-100%. Output voltage monitor range is 0.0 to 2.0 - 10.0V in 0.1V increments.		
Voltage Programming Accuracy <sup>1</sup>	± 0.5% of rated output voltage, max. (0 to 4.0V / 4K Ohm range) ± 0.5% of rated output voltage, typical in other ranges		±0.1% of rated output voltage
Current Programming Accuracy <sup>1</sup>	± 1.0% of rated output current, max. (0 to 4.0V / 4K Ohm range) ± 1.0% of rated output current, typical in other ranges		±0.2% of rated output current
Power Programming Accuracy <sup>1</sup>			±0.3% of rated output power
Voltage Readback Accuracy	± 1% of range full scale		±0.1% of rated output voltage
Current Readback Accuracy	± 1% of range full scale		±0.2% of rated output current
Power Readback Accuracy			±0.3% of rated output power
Isolation (Prog and Readback Lines)	With respect to chassis potential: 500V	With respect to: chassis potential: 600 V . negative or positive main output: 1500 V	
Power, Voltage, OVP and Current Programming Resolution			0.012% of full scale
Power, Voltage and Current Readback Resolution			0.012% of full scale
Parallel Operation	Up to 4 units in master/slave mode	Up to 4 units in master/slave mode	Up to 4 units in master/slave mode
Series Operation	Up to 2 units (with external diodes)	Up to 2 units (with external diodes)	Up to 2 units (with external diodes)
Constant Voltage (CV)/Constant Current (CC) Indicator	CV: TTL High (4–5 V) CC: TTL Low (0–0.6 V)		
Shutdown Control <sup>2</sup>		Logic low 0.0 - 1.4V Logic high 2.0 - 15V Dry contact compatible	
AUX On/Off Control		TTL level or dry contact compatible	
Power Supply Status Signal		TTL high: OK (4–5 V) TTL low: fail (0–0.6 V)	
Interlock Enable/Disable		Dry contact. Open/Short: On or Off, programmable	
1. Typical APG or isolated APG accuracy can be improved to max accuracy by user calibration at the specific range selected. 2. The shutdown input has user selectable negative logic operation via front panel or remote digital input/output.			
<b>AC Line Input Specifications</b>			
Rated AC Input Voltage/Frequency	100–240 Vac, 47–63 Hz		
Operational AC Input Voltage/Frequency	85–265 Vac continuous, single phase, 47–63 Hz, 360-440 Hz* * Contact factory for details regarding this mode of operation		
Input Current (at 100/200 Vac)	11.5/6 A (850W)		
Inrush Current (100/200 Vac)	Less than 25A (850W)		
Power Factor Correction	0.99@100/200 Vac, rated output power		
<b>Output Performance Specifications</b>			
Temperature Coefficient	100 PPM/° C from rated output voltage, after a 30-minute warm-up		
Drift (8 hours)	0.05% of rated output (over an 8 hour interval with constant line, load and temperature, after a 30-minute warm-up)		
Hold-up Time	Typical 20 ms at any rated input line.		
Transient Response Time <sup>4,6</sup>	Less than 1 ms for 6 V to 60 V models. Less than 2 ms for 80 V to 600 V models		
OVP Trip Point Accuracy	1% of set point		
Meter Accuracy <sup>8</sup>	0.5% of actual output voltage or current ± 1 count		
Data Readback Transfer Time <sup>7</sup>	3 ms		
Programming and Readback	Less than 300ms for the whole time loop from sending the command to getting the readback voltage and current data		
Aux output <sup>3</sup>	+5V: +0.4V, – 0.5V at 0.4A +15V: +1.2V, – 1.4V at 0.4A		
Isolation <sup>9</sup>	1500VAC or 2121Vdc between mains terminals and accessible conductive parts/chassis ground. Output to chassis <sup>5</sup> 500Vac		
<b>Physical</b>			
XG850 Watt (WxHxD)	8.4x1.7x19.0 inch (2.14 x 43.6 x 483mm)		
Weight	11lb (5kg)		
Cooling	Forced air cooling by internal fans		

3. Current: 0.51A minimum guaranteed, 0.72A typically available. Overcurrent protection (each output) is automatic, non-latching. When OCP is tripped the aux voltage folds back and will recover to nominal condition when the over current condition is removed (typ. < 0.2A). To protect external circuits attached to the aux outputs it is recommended that customers use an appropriately rated fuse in series with the aux outputs being used.

4. Time for the output voltage to recover within 0.5% at its rated output for a load change 10–90% of rated output current. Output set point 10–100%.

5. For floating chassis ground applications, please contact applications engineering for system design assistance.

6. 3 mSec time for the output voltage to recover within 1% at its rated output for a load change 50%–100% or 100% - 50% of rated output current.

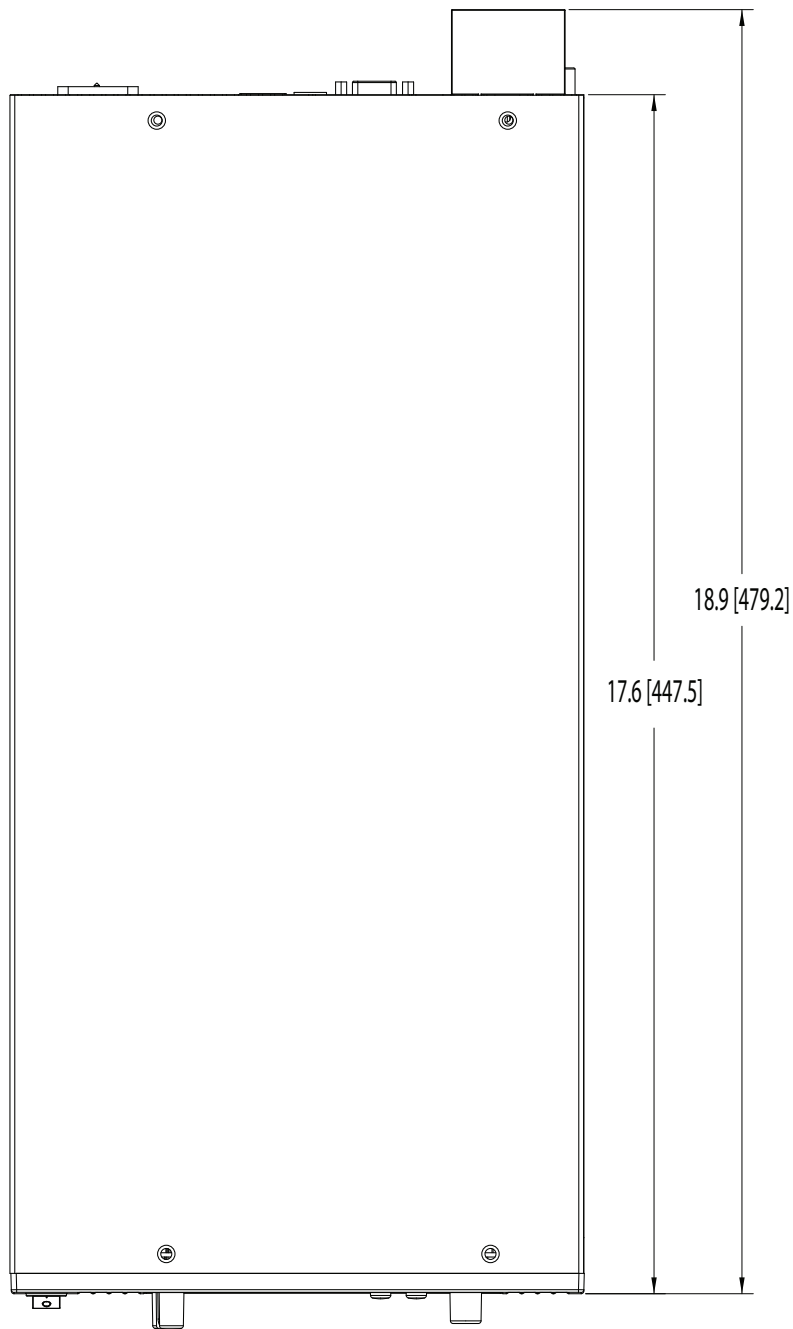
7. Time to provide data back to the controller using LAN interface option (does not include A/D conversation time)

8. 0.5% of actual output voltage or current ± 1 count, floating display dot (for ex. XG150-5.6 model accuracy will be 0.75V, for voltage and 0.025 for current, in the appropriate measure range).

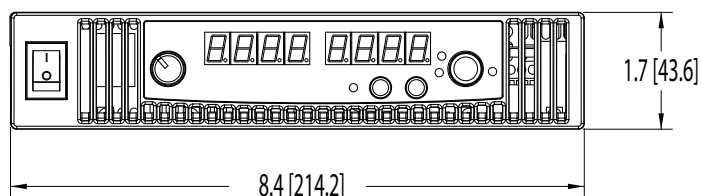
Contact factory for details regarding this mode of operation

9. Double insulation on primary to secondary isolation barriers. Basic insulation primary to protective earth ground.

Note: All specifications are subject to change.



TOP VIEW

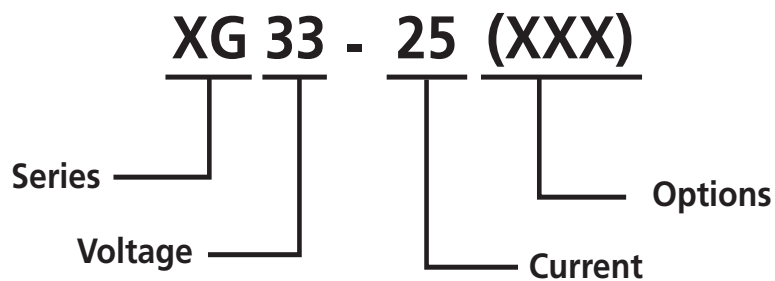


FRONT VIEW

Standard model comes in half rack configuration. For full rack configuration model, please consult factory.

# XG 850 Series

## Model Number Description



## XG 850 Options

MGA	GPIB, IEEE 488.2
MEB	LXI Class C ETHERNET

## XG Options and Accessories

RM - XG1	Rackmount Angle Brackets
RM - D - XG1	Rackmount Kit for 2 Units
RM - S - XG1	Rackmount Kit for 1 Unit
Constant Power Mode available	Please consult factory for option model numbers and lead times.
XG 850 available in Full Rack	Please consult factory for option model numbers and lead times.

Note: All specifications are subject to change.

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