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Sorensen XG Series / XTR Series

850 W, 1U Half Rack Programmable DC Power Supplies

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



670–850 W

6–600 V

1.4–110 A

~		110	220

ETHERNET USB GPIB RS232

The Sorensen XG Series and the Sorensen XTR Series are the same 850 Watt, 1U half-rack DC power supply, produced in a black, Sorensen branded model primarily for the United States and produced in a White, Sorensen branded model primarily for North American distribution and International markets.

The XG / XTR Series is the new standard for powerful, programmable DC power systems. Designed for test, production, laboratory, OEM and quality assurance applications, the XG / XTR 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 / XTR 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 / XTR 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 / XTR 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 / XTR Series that exactly meet your existing requirements, while allowing for future expansion.

Multi-Channel Support
Up to 30 XGs / XTR 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 / XTR Series needed for your applications.

Straightforward Front Panel Controls
The XG / XTR 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 / XTR Series.

High Reliability
To guarantee long-term trouble-free performance, the XG / XTR 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 / XTR 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 / XTR Series exceeds the reliability and quality standards of both AMETEK and our customers.

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SiGNAL TEST™
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XG / XTR Series : Product Specifications

Output : Voltage and Current			
Models	Output Voltage [1]	Output Current [2]	Output Power [3]
XG 6-110 / XTR 6-110	6 V	110 A	670 W
XG 8-100 / XTR 8-100	8 V	100 A	810 W
XG 12-70 / XTR 12-70	12 V	70 A	850 W
XG 20-42 / XTR 20-42	20 V	42 A	850 W
XG 33-25 / XTR 33-25	33 V	25 A	835 W
XG 40-21 / XTR 40-21	40 V	21 A	850 W
XG 60-14 / XTR 60-14	60 V	14 A	850 W
XG 80-10.5 / XTR 80-10.5	80 V	10.5 A	850 W
XG 100-8.5 / XTR 100-8.5	100 V	8.5 A	860 W
XG 150-5.6 / XTR 150-5.6	150 V	5.6 A	850 W
XG 300-2.8 / XTR 300-2.8	300 V	2.8 A	850 W
XG 600-1.4 / XTR 600-1.4	600 V	1.4 A	850 W

	Line Regulation Voltage	Line Regulation Current	Load Regulation Voltage	Load Regulation Current
Models	(0.005% of rated output voltage +2 mV) [4]	(0.01% of rated output current +2 mA) [5]	(0.005% of rated output voltage + 2 mV) [6]	(0.02% of rated output current +5 mA) [7]
XG 6-110 / XTR 6-110	2.3 mV	13 mA	2.3 mV	27 mA
XG 8-100 / XTR 8-100	2.4 mV	12 mA	2.4 mV	25 mA
XG 12-70 / XTR 12-70	2.6 mV	9 mA	2.6 mV	19 mA
XG 20-42 / XTR 20-42	3.0 mV	6.2 mA	3.0 mV	13.4 mA
XG 33-25 / XTR 33-25	3.7 mV	4.5 mA	3.7 mV	10 mA
XG 40-21 / XTR 40-21	4 mV	4.1 mA	4 mV	9.2 mA
XG 60-14 / XTR 60-14	5 mV	3.4 mA	5 mV	7.8 mA
XG 80-10.5 / XTR 80-10.5	6 mV	3.1 mA	6 mV	7.1 mA
XG 100-8.5 / XTR 100-8.5	7 mV	2.9 mA	7 mV	6.7 mA
XG 150-5.6 / XTR 150-5.6	9.5 mV	2.6 mA	9.5 mV	6.1 mA
XG 300-2.8 / XTR 300-2.8	17 mV	2.3 mA	17 mV	5.6 mA
XG 600-1.4 / XTR 600-1.4	32 mV	2.1 mA	32 mV	5.3 mA

	Output Noise (rms, 300 kHz)		Output Ripple (p-p, 20 MHz)
Models	Voltage	Current [8]	Voltage
XG 6-110 / XTR 6-110	8 mV	200 mA	50 mV
XG 8-100 / XTR 8-100	8 mV	180 mA	50 mV
XG 12-70 / XTR 12-70	8 mV	120 mA	50 mV
XG 20-42 / XTR 20-42	8 mV	75 mA	50 mV
XG 33-25 / XTR 33-25	8 mV	60 mA	50 mV
XG 40-21 / XTR 40-21	8 mV	45 mA	50 mV
XG 60-14 / XTR 60-14	8 mV	35 mA	50 mV
XG 80-10.5 / XTR 80-10.5	8 mV	25 mA	80 mV
XG 100-8.5 / XTR 100-8.5	8 mV	20 mA	80 mV
XG 150-5.6 / XTR 150-5.6	10 mV	16 mA	100 mV
XG 300-2.8 / XTR 300-2.8	25 mV	10 mA	150 mV
XG 600-1.4 / XTR 600-1.4	50 mV	6 mA	250 mV

1. Maximum output voltage is guaranteed to be 0.1% 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 0.2% 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.

Note: All specifications are subject to change.

Model	Maximum Recommended Remote Sense Line Drop Compensation per Line [9]	Up-prog. Response Time, 0~Vmax [10]	Efficiency [11] (100/200 VAC input)
XG 6-110 / XTR 6-110	1 V	60 ms	75/77%
XG 8-100 / XTR 8-100	1 V	60 ms	77/80%
XG 12-70 / XTR 12-70	1 V	60 ms	79.5/82.5%
XG 20-42 / XTR 20-42	1.5 V	60 ms	82/85%
XG 33-25 / XTR 33-25	2 V	60 ms	83/86%
XG 40-21 / XTR 40-21	2 V	60 ms	83/87%
XG 60-14 / XTR 60-14	3 V	60 ms	83/87%
XG 80-10.5 / XTR 80-10.5	5 V	100 ms	83/87%
XG 100-8.5 / XTR 100-8.5	5 V	100 ms	83/87%
XG 150-5.6 / XTR 150-5.6	5 V	100 ms	83/87%
XG 300-2.8 / XTR 300-2.8	5 V	150 ms	83/87%
XG 600-1.4 / XTR 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 / XTR 6-110	60 ms	300 ms	0.5–7.5 V
XG 8-100 / XTR 8-100	60 ms	400 ms	0.5–10 V
XG 12-70 / XTR 12-70	60 ms	500 ms	1–15 V
XG 20-42 / XTR 20-42	60 ms	600 ms	1–24 V
XG 33-25 / XTR 33-25	60 ms	700 ms	2–39 V
XG 40-21 / XTR 40-21	60 ms	800 ms	2–44 V
XG 60-14 / XTR 60-14	60 ms	900 ms	3–66 V
XG 80-10.5 / XTR 80-10.5	100 ms	1000 ms	3–95 V
XG 100-8.5 / XTR 100-8.5	100 ms	1200 ms	3–125 V
XG 150-5.6 / XTR 150-5.6	100 ms	1800 ms	3–180 V
XG 300-2.8 / XTR 300-2.8	150 ms	2200 ms	5–330 V
XG 600-1.4 / XTR 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 and UL61010-1. Marked with cCSAus, CE EN61010-1
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.

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 / XTR Series : Product Specifications

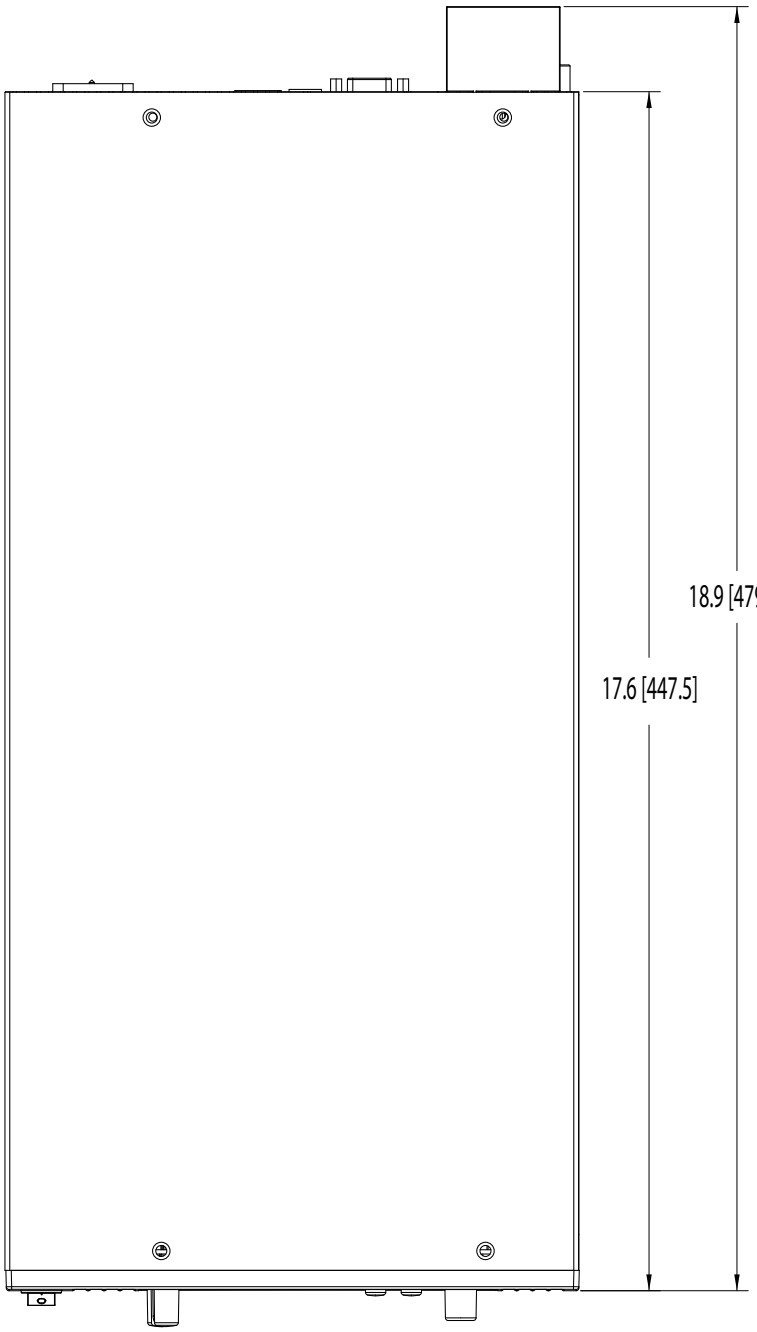
Programming Mode	APG	ISOL	Digital
Voltage & Current Output Voltage Programming	0-100% Voltage control range is 0.0 to 2.0 - 10.0V in 0.1V increments		
Voltage & Current Output Resistive Programming	0-100% Resistive control range is 0.0 to 2.0 - 10.0V in 0.1V increments		
Output Voltage and Current Monitor	0-100% Output Voltage Monitor range is 0.0 to 2.0 - 10.0V in 0.1V increments		
Voltage Programming Accuracy [1]	± 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 [1]	± 0.5% of rated output current, max (0 to 4.0V / 4K Ohm range) ± 0.5% of rated output current, typical in other ranges		± 0.2% of rated output current
Voltage Feedback Accuracy	± 1% of rated output voltage		± 0.1% of rated output voltage
Current Feedback Accuracy	± 1% of rated output current		± 0.2% of rated output current
Isolation (Prog and Readback Lines)	With respect to chassis potential: 500 V	With respect to: chassis potential: 600 V negative or positive main output 1500 V negative or positive auxiliary output 300 V	
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)
Constant Voltage (CV) Constant Current (CC) Indicator	CV: TTL High (4-5 V) CC TTL Low (0-0.6 V)		
Shutdown Control [2]		Logic low 0.0 - 1.4 V Logic high 2.0 - 15 V 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

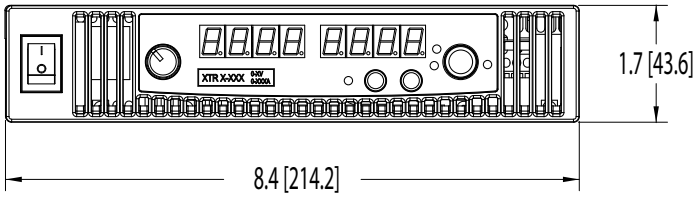
AC Line Input Specifications	
Rated AC Input Voltage/Frequency	100–240 Vac, 47–63 Hz
Operational AC Input Voltage/Frequency	85–265 Vac continuous, 47–63 Hz, single phase
Input Current (at 100/200 Vac)	11.5/6 A (850 W)
Inrush Current (100/200 Vac)	Less than: 25 A (850 W)
Power Factor Correction	0.99@100/200 Vac, rated output power
Output Performance Specifications	
Temperature Coefficient	100 PPM/° C from rated output voltage, after a 30-minute warm-up
Drift (8 hours)	0.05% of rated output voltage & current over an 8 hour interval with constant line, load & temperature, after a 30-minute warm-up
Hold-up Time	Typical 20 ms at any rated input line.
Transient Response Time [2]	Less than 1 ms for 6 V to 60 V models. Less than 2 ms for 80 V to 600 V models
Meter Accuracy	0.5% of actual output voltage or current ± 1 count
Aux output [1]	+5 V: +0.4 V, – 0.5 V at 0.4 A +15 V: +1.2 V, – 1.4 V at 0.4 A
AC Line Input Specifications	
XG 850 Watt (W×H×D)	8.4 × 1.7 × 19.0 inch (214 × 43.6 × 483 mm)
Weight	11 lb (5kg)
Cooling	Forced air cooling by internal fans
Isolation	
AC Input to Output AC Input to Chassis Output to Chassis [3]	1350 Vac 1350 Vac 500 Vac

1. Current: 0.51 A minimum guaranteed, 0.72 A 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 set point 10-100%
2. 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%
3. For floating chassis ground applications, please contact application engineering for system design assistance.

Note: All specifications are subject to change.



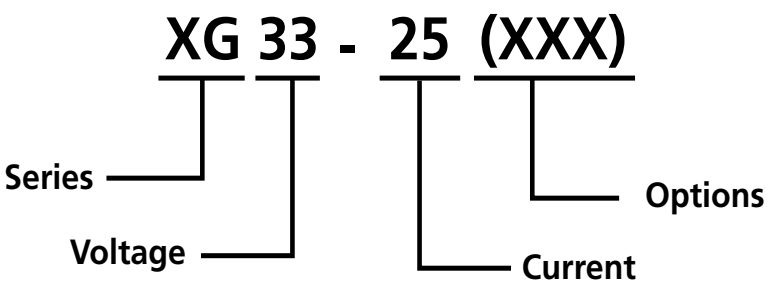
TOP VIEW



FRONT VIEW

XG / XTR Series

Model Number Description



XG / XTR Options	
MEA	ETHERNET
MGA	GPIB, IEEE 488.2
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
XTR Options and Accessories	
RM - XTR1	Rackmount Angle Brackets
RM - D - XTR1	Rackmount Kit for 2 Units
RM - S - XTR1	Rackmount Kit for 1 Unit

Note: All specifications are subject to change.

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