

Sorensen XHR Series

1 kW

DC Power Supply

7.5–600 V

- Universal input 85-250 Vac
- Power Factor Correction (PFC)
- Zero voltage “soft switching”
- Simultaneous front panel display voltage and current
- Constant voltage or constant current operation
- Front and rear connectors
- Remote sense with 5 V line loss compensation
- LabVIEW® and LabWindows® drivers



0–1.7 A

~

115

230

↔ GPIB RS232

The Sorensen XHR Series provides 1000 watts of DC power in a compact half-rack package. The supplies are designed for benchtop and system use, and as an ideal companion for other half-rack instruments in a test console. Its unique size also eliminates the need for a blank panel to preserve vertical rack space for OEM applications.

The XHR is power factor corrected for low current draw — only 11 amps at 120 volts AC for 1000 watts — and reduced generation of input current harmonics. Zero voltage or “soft switching” virtually eliminates switching transients for high efficiency, low noise and high reliability. It is also stackable, with a small footprint, front panel binding post connectors, and a low current requirement with universal input, making the XHR ideal for benchtop applications.

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AMETEK®
 PROGRAMMABLE POWER

XHR Series : Product Specifications

| Common | |
|--|--|
| Switching Frequency | 7.5 V to 300 V models: nominal 125 kHz (250 kHz output ripple); 600 V model: nominal 62.5 kHz (125 kHz output ripple) |
| Time Delay | 4 sec maximum from power on until output stable |
| Voltage Mode Transient Response Time | 1 ms for output voltage to recover within 0.5% of its previous level after a step change in load current of up to 50% of rated output |
| Maximum Voltage Differential | ±600 Vdc from output to safety ground |
| Remote Start/Stop and Interlock | 2.5-15 V signal or TTL-compatible input, selectable logic |
| Remote Analog Programming | Voltage and current programming inputs (source must be isolated): 0-5 k, 0-10 k resistances; 0-5 V (default), 0-10 V voltage sources |
| Remote Analog Monitoring | Voltage and current monitor outputs 0-5 V (default), 0-10 V ranges for 0-100% of output |
| Remote Programming & Monitoring Accuracy | 1% zero to full scale output for the default range |
| Front Panel Voltage and Current Control | 10-turn voltage and current potentiometers |
| Front Panel Voltage Control Resolution | 0.02% of maximum voltage |
| Main Output Connector | 7.5 to 40 V models: nickel-plated copper bus bars; 60 to 600 V models: 4-terminal wire clamp connector for DC output and local sense |
| Protection Features | Over-voltage protection and Over-temperature protection |
| Approvals | CE-marked units meet: EN61010-1, EN61000-6-2 and EN61000-6-4; CSA C/US certified to UL61010-1B and CSA C22.2 No 1010.1; Meets USA EMC standard: FCC, part 15B, Class A; Meets Canadian EMC standard: ICES-001, Class A. |
| Environmental | |
| Operating Temperature | 0°C to 40°C |
| Storage Temperature | -40°C to 85°C |
| Humidity Range | Up to 80% RH, non-condensing |
| Physical | |
| Dimensions | Width: 8.5" (216 mm) Height: 3.4" (86.4 mm) Depth: 18.6" (472.2 mm) |
| Weight | Approximately 14 lbs. (6.4 kg) |
| Input | |
| Voltage Ranges | 85-250 VAC, 47-63 Hz, power factor corrected. Derate maximum output power to 900 W for AC input less than 95 V |
| Phases | |
| Power Factor | 0.99 minimum for full load and 120 Vac input |
| Current | 13 A maximum at 100 Vac; 11 A maximum at 120 Vac; 6 A maximum at 220 Vac |
| AC Input Connector Type | IEC 320 connector |

XHR Series : Product Specifications

1 kW

| Output | | | |
|-------------|---------|---------|--------|
| Model | Voltage | Current | Power |
| XHR 7.5-130 | 0-7.5 | 0-130 | 975 W |
| XHR 20-50 | 0-20 | 0-50 | 1000 W |
| XHR 33-33 | 0-33 | 0-33 | 1089 W |
| XHR 40-25 | 0-40 | 0-25 | 1000 W |
| XHR 60-18 | 0-60 | 0-18 | 1080 W |
| XHR 100-10 | 0-100 | 0-10 | 1000 W |
| XHR 150-7 | 0-150 | 0-7 | 1050 W |
| XHR 300-3.5 | 0-300 | 0-3.5 | 1050 W |
| XHR 600-1.7 | 0-600 | 0-1.7 | 1020 W |

| Output : At the front panel binding posts | | | | | | |
|---|----------------|---------------|------------------------------|---------|------------------------------|---------|
| Model | Output Ratings | | Line Regulation ² | | Load Regulation ³ | |
| | Voltage (VDC) | Current (ADC) | Voltage | Current | Voltage | Current |
| XHR 7.5-130 | 0-7.5 | 0-130 | 3 mV | 14 mA | 3 mV | 66 mA |
| XHR 20-50 | 0-20 | 0-50 | 4 mV | 6 mA | 4 mV | 26 mA |
| XHR 33-33 | 0-33 | 0-33 | 5 mV | 4.3 mA | 5 mV | 18 mA |
| XHR 40-25 | 0-40 | 0-25 | 8 mV | 3.5 mA | 6 mV | 14 mA |
| XHR 60-18 | 0-60 | 0-18 | 8 mV | 2.8 mA | 8 mV | 10 mA |
| XHR 100-10 | 0-100 | 0-10 | 12 mV | 2 mA | 12 mV | 6 mA |
| XHR 150-7 | 0-150 | 0-7 | 17 mV | 1.7 mA | 17 mV | 4.5 mA |
| XHR 300-3.5 | 0-300 | 0-3.5 | 32 mV | 1.3 mA | 32 mV | 3 mA |
| XHR 600-1.7 | 0-600 | 0-1.7 | 62 mV | 1.2 mA | 62 mV | 2 mA |

| Model | Meter Accuracy | | Output Noise (0-20 MHz) Voltage (p-p) | Output Ripple (rms) Voltage | Drift (8 hours) ⁴ | |
|-------------|--|--|---|-----------------------------------|---|--|
| | Voltage <small>(0.5% to 1% of Vmax + 1 count)</small> | Current <small>(0.5% of Imax + 1 count)</small> | | | Voltage <small>(0.05% of Vmax)</small> | Current <small>(0.1% of Imax)</small> |
| XHR 7.5-130 | 0.09 V | 1.4 A | 70 mV | 10 mV | 3.75 mV | 130 mA |
| XHR 20-50 | 0.3 V | 0.6 A | 70 mV | 10 mV | 10 mV | 50 mA |
| XHR 33-33 | 0.43 V | 0.43 A | 75 mV | 7.5 mV | 16.5 mV | 33 mA |
| XHR 40-25 | 0.5 V | 0.35 A | 75 mV | 7.5 mV | 20 mV | 25 mA |
| XHR 60-18 | 0.7 V | 0.19 A | 75 mV | 10 mV | 30 mV | 18 mA |
| XHR 100-10 | 1.1 V | 0.11 A | 100 mV | 10 mV | 50 mV | 10 mA |
| XHR 150-7 | 1.6 V | 0.08 A | 150 mV | 20 mV | 75 mV | 7 mA |
| XHR 300-3.5 | 4 V | 0.05 A | 250 mV | 30 mV | 150 mV | 3.5 mA |
| XHR 600-1.7 | 7 V | 0.03 A | 500 mV | 120 mV | 300 mV | 1.7 mA |

3. For 0-100% load variation, with constant nominal line voltage. Measured at the rear panel output connector unless stated otherwise.

4. Maximum drift over 8 hours with constant line, load, and temperature, after 30-minute warm-up.

XHR Series : Product Specifications

| Model | Temperature Coefficient ⁵ | | Maximum Remote Sense Sense Line Drop Compensation ⁶ | OVP Adjustment Range (5% to 110% of Vmax) | Efficiency ⁷ |
|-------------|--------------------------------------|-------------------------------|--|--|-------------------------|
| | Voltage (0.02% of Vmax/°C) | Current (0.03% of Imax/°C) | | | |
| XHR 7.5-130 | 1.5 mV | 39 mA | 3 V / line | 0.375-8.25 V | 81% |
| XHR 20-50 | 4 mV | 15 mA | 5 V / line | 1-22 V | 83% |
| XHR 33-33 | 6.6 mV | 9.9 mA | 5 V / line | 1.65-36.3 V | 83% |
| XHR 40-25 | 8 mV | 7.5 mA | 5 V / line | 2-44 V | 83% |
| XHR 60-18 | 12 mV | 5.4 mA | 5 V / line | 3-66 V | 84% |
| XHR 100-10 | 20 mV | 3 mA | 5 V / line | 5-110 V | 84% |
| XHR 150-7 | 30 mV | 2.1 mA | 5 V / line | 7.5-165 V | 85% |
| XHR 300-3.5 | 60 mV | 1.1 mA | 5 V / line | 15-330 V | 85% |
| XHR 600-1.7 | 120 mV | 0.48 mA | 5 V / line | 30-660 V | 85% |

XHR 1 kW Internal Interface Specifications with RS-232 or GPIB Interface Installed ^{1,8}

| Model | Program Accuracy | | | Readback Accuracy | |
|-------------|------------------|-----------------|-------------|-------------------|------------|
| | Voltage (mV) | Current (mA) | OVP (mV) | Voltage | Current |
| XHR 7.5-130 | 10 +0.12% | 900 +0.1% | 80 | 30 +0.12% | 900 +0.1% |
| XHR 20-50 | 50 +0.12% | 750 +0.1% | 200 | 60 +0.12% | 750 +0.1% |
| XHR 33-33 | 75 +0.12% | 500 +0.1% | 330 | 75 +0.12% | 500 +0.1% |
| XHR 40-25 | 75 +0.3% | 350 +0.15% | 400 | 75 +0.3% | 350 +0.1% |
| XHR 60-18 | 150 +0.25% | 250 +0.1% | 600 | 150 +0.25% | 250 +0.1% |
| XHR 100-10 | 150 +0.35% | 140 +0.15% | 800 | 150 +0.35% | 140 +0.15% |
| XHR 150-7 | 225 +0.35% | 120 +0.1% | 1500 | 225 +0.35% | 120 +0.1% |
| XHR 300-3.5 | 225 +0.35% | 80 +0.1% | 3000 | 225 +0.35% | 80 +0.1% |
| XHR 600-1.7 | 250 +0.35% | 80 +0.1% | 6000 | 300 +0.35% | 80 +0.1% |

Specifications subject to change without notice.

1. Specifications indicate typical performance at 25°C ± 5°C, nominal line input of 120 Vac.

5. Change in output per °C change in ambient temperature, with constant line and load.

6. Line drop is subtracted from total voltage available at supply output.

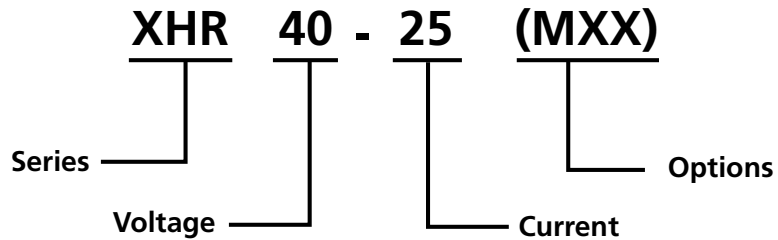
7. Typical efficiency at 115 Vac input and rated output power.

8. Apply accuracy specifications according to the following voltage program accuracy example:

Set a model 20-50 power supply to 10 V. The expected result will be within the range of 10 V ± 75 mV ± 0.12% of the set voltage of 10 V.

XHR Series

Model Number Description



Options and Accessories

| | |
|--------|--|
| MGA * | GPIB / IEEE 488.1 |
| MGP * | Multi-channel GPIB / IEEE 488.2 |
| MCA * | Interface for linking multiple units using one GPIB address (used with GPIB-M) |
| MRA * | RS-232 interface card |
| MIA * | ISOL interface card provides isolated analog control and readback |
| RM-XHR | 19-inch Rack Mount Kit for up to two XHR power supplies |
| M13A | Locking knobs for front panel controls |
| M22A | No front binding post |

* Options cannot be combined

