

1.2 SPECIFICATIONS

The following subsections provide environmental, electrical, and physical characteristics for the SGA Series power supplies.

Note: Specifications are subject to change without notice.

Note: The SGA Series power supplies are intended for indoor use only. Refer to Section 2.3 for use/location requirements.

1.2.1 ENVIRONMENTAL CHARACTERISTICS

| Parameter | Specification |
|---------------------|---|
| Ambient Temperature | |
| Operating | 0°C to 50°C |
| Storage | -25°C to 65°C |
| Cooling | Forced convection with internal, linearly-variable-speed fans; vents on front, sides and rear; units may be stacked without clearance above or below. |
| Humidity | 95% maximum, non-condensing, 0°C to 50°C; 45°C maximum wet-bulb temperature. |
| Altitude | 5,000 ft (1,524 m) operating at full rated output power, derate 10% of full power for every 1,000 ft (3,048 m) higher; non-operating to 40,000 ft (12,192m) |
| Agency Approvals | CE Compliant: Certified to UL/CSA 61010 and IEC/EN 61010-1 by a NRTL; LVD Categories: Installation Category II, Pollution Degree 2, Class II Equipment, for Indoor Use Only; EMC Directive, EN 61326:1998; Semi-F47 Compliant |

1.2.2 ELECTRICAL CHARACTERISTICS

Note: Output voltage accuracy, regulation, and stability specifications are valid at the point where the remote sense leads are connected.

| Parameter | Specification |
|---------------|--|
| Input Power | |
| Voltage | 208/230 VAC \pm 10%, allowed range 187-253 VAC; 380/400 VAC \pm 10%, allowed range 342-440 VAC; 440/480 VAC \pm 10%, allowed range 396-528 VAC |
| Frequency | 47 Hz to 63 Hz; 400 Hz at 208 VAC for 3 U models; 400 Hz at 208 VAC for 6U models is an optional modification ("CV" in model number) and does not carry CE, UL or CSA markings |
| Configuration | 3-phase, 3-wire plus ground; not phase rotation sensitive; neutral not used. |

| Parameter | Specification |
|--|---|
| Power Factor (at full rated load; 50/60 Hz); contact factory for power factor of specific models | |
| PFC models: 10V-30V, 50V, 1000V, and models with optional modification, "PF" | 0.90, typical, for all AC input ratings; with passive power factor correction (PFC) |
| Non-PFC models: 40V-800V | 0.75, typical, for 208/230 VAC input; 0.72, typical, for 380/400 VAC input; 0.69, typical, for 440/480 VAC input; power factor is not solely determined by power supply input characteristics, but is dependent on the level of DC output power and interaction with the source impedance of AC mains. |
| Efficiency | 87%, typical, at full load, nominal AC line |
| Hold-Up Time | 1/2 cycle, typical, for loss of all three phases (6.4 ms, typical for 800V/1000V models); 3 cycle, typical, for loss of one phase; sustained missing phase will result in shutdown of the output. |
| Rated Output Power | 4-15 kW for 3U chassis for 10V-30V models; 5-15 kW for 3U chassis for 40V-1000V models; 20-30 kW for 6U chassis for 40V-600V models; maximum output power is the product of the rated output voltage and current; for specific values refer to Section 1.2.3. |
| Load Regulation (specified for $\pm 100\%$ rated load change, at nominal AC input voltage) | |
| Voltage | $\pm 0.05\%$, maximum, of rated output voltage for 10V- 30V models; $\pm 0.02\%$, maximum, of rated output voltage for 40V-1000V models |
| Current | $\pm 0.1\%$, maximum, of rated output current |
| Line Regulation (specified for $\pm 10\%$ change of nominal AC line voltage, at constant load) | |
| Voltage | $\pm 0.05\%$, maximum, of rated output voltage for 10V- 30V models; $\pm 0.01\%$, maximum, of rated output voltage for 60V-1000V models |
| Current | $\pm 0.05\%$, maximum, of rated output current |
| Temperature Coefficient | |
| Voltage | $\pm 0.02\%/^{\circ}\text{C}$, maximum, of rated output voltage |
| Current | $\pm 0.03\%/^{\circ}\text{C}$, maximum, of rated output current |
| Stability | $\pm 0.05\%$, maximum, of rated output voltage or current, over 8 hrs at fixed line, load, and temperature, after 30 min warm-up |
| Output Voltage Ripple/Noise | Refer to Ripple/Noise specifications in tables of Section 1.2.3. |
| Load Transient Response | 1 ms, typical, to recover within 0.75% of rated output voltage for load step change of 50% of rated output current |
| Output Voltage Rise Time (with rated load, resistive) | 10 ms, maximum, from 10-90% of programming change from zero to rated output voltage for 10V-30V models; 100 ms, maximum, from 5-95% of programming change from zero to rated output voltage for 40V-1000V models; contact factory for values of specific models |

| Parameter | Specification |
|--|--|
| Output Voltage Fall Time (with rated load, resistive) | 10 ms, maximum, from 90-10% of programming change from rated output voltage to zero for 10V-30V models; contact factory for values of specific models |
| Output Voltage Fall Time (with no load) | 50 ms, maximum, from 90-10% of programming change from rated output voltage to zero for 10V-30V models; 1.5 s, typical, from 100% to 10% of programming change from rated output voltage to zero for 40V-1000V models; contact factory for values of specific models |
| Front Panel Meter | |
| Display Resolution | 3.5 digit |
| Voltage Accuracy (to actual output) | ±0.5%, maximum, of rated output voltage + 1 digit |
| Current Accuracy (to actual output) | ±0.5%, maximum, of rated output current + 1 digit |
| Remote Sensing | |
| Connection | Voltage accuracy/regulation specifications apply at the point where the remote sense leads are connected. |
| Line Drop | 1 V, maximum per line for 10V-20V models; 1.5 V, maximum per line for 30V model; 5%, maximum of rated output voltage per line for models, 40V to less than 160V; 2%, maximum of rated output voltage per line for models greater than or equal to 160V; higher levels of line drop is allowed, but output voltage regulation specifications no longer apply. |
| Line Drop Effect on Output Voltage | Rated output voltage applies at the rear panel output terminals, and line drop voltage subtracts from the voltage available at the load terminals |
| Remote Analog Interface | |
| Programming Accuracy | |
| Voltage | ±0.25%, maximum, of rated output voltage for 0-5 VDC range, and ±0.5%, maximum, for 0-10 VDC range |
| Current | ±1.0%, maximum, of rated output current for 0-5 VDC range, and ±1.2%, maximum, for 0-10 VDC range for 10V-30V models; ±0.8%, maximum, of rated output current for 0-5 VDC range, and ±1.0%, maximum, for 0-10 VDC range for 40V-1000V models |
| Overvoltage Protection (OVP) | ±1%, maximum, of rated output voltage |
| Readback Monitor Accuracy | |
| Voltage (of actual output value) | ±0.5%, maximum, of rated output voltage |
| Current (of actual output value) | ±1%, maximum, of rated output current |

| Parameter | Specification |
|--|--|
| Resistive-Control Programming | |
| Voltage | 0–5 k Ω for 0-100% of rated output voltage |
| Current | 0–5 k Ω for 0-100% of rated output current |
| Voltage-Control Programming | |
| Voltage | 0–5 VDC or 0–10 VDC for 0-100% of rated output voltage |
| Current | 0–5 VDC or 0–10 VDC for 0-100% of rated output current |
| Overvoltage Protection (OVP) | 0.25–5.5 VDC for 5-110% or rated output voltage |
| Remote Control/Monitor Interface | On/Off control via contact closure, 6-120 VDC or 12-240 VAC, and TTL or CMOS gate; output voltage and current monitors; output voltage, current, and OVP programming; summary fault status |
| Output Isolation | |
| Output Float Voltage | |
| Negative Output Terminal | ± 300 V(PK), maximum, with respect to chassis ground; exceeding the limit will be detected as a fault by a protective supervisory monitor and shutdown of the output will be executed; this condition will be latched, requiring reset to resume normal operation. |
| Isolation of optional Isolated Analog Interface (J1) to output negative terminal | 1000 V(PK), maximum; Isolated Analog Interface (J1 signals) are galvanically isolated from negative output terminal; operation of Isolated Analog Interface signals should be at SELV safety voltage conditions to chassis ground. |
| Reference of standard Non-Isolated Analog Interface (J1) to output negative terminal | The standard Non-Isolated Analog Interface (J1 signals) is connected to the negative output terminal and, therefore, is not isolated from the output. |
| Parallel Operation | |
| Parallel Group | Up to 5 units, of the same voltage rating, may be connected in parallel for additional output current; specifications apply as for single unit, with the exception that each additional paralleled unit will add 0.3% to the output current accuracy. Contact factory for applications requiring paralleling more than five units. |
| Series Operation | |
| Series Group | Up to 2 units, of the same current rating, may be connected in series for additional output voltage; see restrictions in Output Isolation section. |

1.2.3 SGA SERIES VOLTAGE AND CURRENT SPECIFICATIONS

The following tables present the specifications for rated voltage and current, and ripple/noise for the 10V-1000V models.

| Rated Voltage, VDC | Rated Current, ADC | | | | | | Ripple/ Noise** RMS, mV | Ripple/ Noise* PK-PK, mV |
|--------------------|--------------------|-------|-------|-------|--------|-------|-------------------------|--------------------------|
| | 4 kW | 5 kW | 8 kW | 10 kW | 12 kW | 15 kW | | |
| 0-10 ^{††} | 0-400 | N/A | 0-800 | N/A | 0-1200 | N/A | 20 | 50 |
| 0-15 ^{††} | 0-267 | N/A | 0-534 | N/A | 0-801 | N/A | 20 | 50 |
| 0-20 ^{††} | N/A | 0-250 | N/A | 0-500 | N/A | 0-750 | 20 | 60 |
| 0-30 ^{††} | N/A | 0-167 | N/A | 0-334 | N/A | 0-501 | 20 | 60 |

| Rated Voltage, VDC | Rated Current, ADC | | | | | | Ripple/ Noise** RMS, mV | Ripple/ Noise* PK-PK, mV |
|--------------------|--------------------|--------|--------|--------------------|---------------------|---------------------|-------------------------|--------------------------|
| | 5 kW | 10 kW | 15 kW | 20 kW | 25 kW | 30 kW | | |
| 0-40 | 0-125 | 0-250 | 0-375 | 0-500 [†] | 0-625 [†] | 0-750 [†] | 20 | 75 |
| 0-50 | 0-100 | 0-200 | 0-300 | 0-400 [†] | 0-500 [†] | 0-600 [†] | 20 | 75 |
| 0-60 | 0-83 | 0-167 | 0-250 | 0-333 | 0-417 | 0-500 | 20 | 75 |
| 0-80 | 0-63 | 0-125 | 0-188 | 0-250 | 0-313 | 0-375 | 20 | 100 |
| 0-100 | 0-50 | 0-100 | 0-150 | 0-200 | 0-250 | 0-300 | 20 | 100 |
| 0-160 | 0-31 | 0-63 | 0-94 | 0-125 | 0-156 | 0-188 | 25 | 150 |
| 0-200 | 0-25 | 0-50 | 0-75 | 0-100 | 0-125 | 0-150 | 25 | 175 |
| 0-250 | 0-20 | 0-40 | 0-60 | 0-80 | 0-100 | 0-120 | 30 | 200 |
| 0-330 | 0-15 | 0-30 | 0-45 | 0-61 | 0-76 | 0-91 | 30 | 200 |
| 0-400 | 0-12 | 0-25 | 0-38 | 0-50 | 0-63A | 0-75 | 40 | 300 |
| 0-500 | 0-10 | 0-20 | 0-30 | 0-40 | 0-50 | 0-60 | 50 | 350 |
| 0-600 | 0-8 | 0-17 | 0-25 | 0-33 | 0-42 | 0-50 | 60 | 350 |
| 0-800 | 0-6.2 | 0-12.5 | 0-18.7 | 0-25 [†] | 0-31.2 [†] | 0-37.5 [†] | 80 | 500 |
| 0-1000 | 0-5 | 0-10 | 0-15 | 0-20 [†] | 0-25 [†] | 0-30 [†] | 100 | 650 |

* PK-PK ripple/noise, over 20 Hz to 20 MHz bandwidth, is measured across a 1 μ F capacitor at the end of a 6' load cable with the supply operating at full load and nominal AC line voltage.

** RMS ripple/noise, over 20 Hz to 300 kHz bandwidth, is measured directly across the output terminals with the supply operating at full load and nominal AC input line voltage.

[†] Power level not available in 6U models, but could be produced with paralleled 3U units; up to 75 kW could be produced by paralleling up to five power supplies. Note that paralleling will increase ripple/noise.

^{††} Models from 10V-30V are not available in 6U chassis.

1.2.4 PHYSICAL CHARACTERISTICS

| Dimensions | 3U Models, 10V-30V | 3U Models, 40V-1000V | 6U Models, 60V-600V |
|---------------------|--|---|---|
| Width | 19.00 in (48.26 cm) | 19.00 in (48.26 cm) | 19.00 in (48.26 cm) |
| Depth | From inner surface of front panel to maximum protrusion of protective covers at rear panel; refer to installation drawings for chassis dimensions. | | |
| | 28.09 in (71.35 cm) | 25.46 in (64.67 cm) | 27.18 in (69.04 cm) |
| Height | 5.25 in (13.34 cm) | 5.25 in (13.34 cm) | 10.5 in (26.67 cm) |
| Weight (nominal) | 65 lb (29 kg), (4 kW, 10V, 15V) | 40 lb (18 kg), (5 kW) 60 lb (27 kg), (10 kW) 80 lb (36 kg), (15 kW) | 120 lb (54 kg), (20 kW) 140 lb (64 kg), (25 kW) 160 lb (73 kg), (30 kW) |
| | 65 lb (29 kg), (5 kW, 20V, 30V) | | |
| | 85 lb (39 kg), (8 kW, 10V, 15V) | | |
| | 85 lb (39 kg), (10 kW, 20V, 30V) | | |
| | 110 lb (50 kg), (12 kW, 10V, 15V) | | |
| | 110 lb (50 kg), (15 kW, 20V, 30V) | | |
| Shipping Weight | Contact factory for weights of specific models | | |