

PSG Series



PSG Series

Product Description

Eaton's PSG Series of power supplies is designed to be a high-performance, high-quality line of products covering a majority of 12 Vdc and 24 Vdc control applications. With global certifications, a compact size and an impressive operating temperature range, the PSG Series fits a wide variety of applications at a competitive price.

Our expansive 22 model offering is able to provide solutions for most applications with PSG outputs ranging from 12 Vdc at 1.25 A up to 24 Vdc at 40 A, plus redundancy and buffer modules to ensure uptime.

Application Description

The PSG Series is a line of general-purpose power supplies for use in a wide variety of industrial control applications. Applications include communication networks, sensors, PLCs and many other electrical systems. Each model is equipped with the options of a rugged metal or plastic housing, heavy-duty screw or finger-safe terminals and a variety of protection features, making the PSG one of the most versatile industrial power supply lines on the market.

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Features, Benefits and Functions

- Universal input voltages: 100–240 Vac for single-phase units, 400–500 Vac for three-phase units
- General-purpose 12 Vdc and 24 Vdc adjustable output
- 150% power surge output
- Wide operating temperature range: –25 °C to +80 °C
- MTBF up to 1,000,000 hours ensures uptime and reliability
- Protection from overvoltage, overcurrent and over-temperature conditions
- Rugged aluminum and plastic housings provide the durability required to stand up to harsh environments
- All-metal DIN rail mounting hardware
- Heavy-duty screw and finger-safe terminals
- LED indicating light for DC OK simplifies troubleshooting
- Conformal coated electronics
- Hazardous Location Class I, Division 2 rated models
- UL/NEC® Class 2 rated model
- Redundancy modules keep loads up and running in the event of a device failure
- Buffer module has the stored power needed to keep loads running through a short duration power failure
- Three-year standard warranty

Standards and Certifications

- cULus listed—UL 508
- CSA listed—CSA 22.2 No. 107.1-01
- Hazardous Location, Class I, Div. 2, Groups A, B, C, D
- IEC
- EN
- NEC Class 2
- UL Class 2
- CE marked
- RoHS compliant

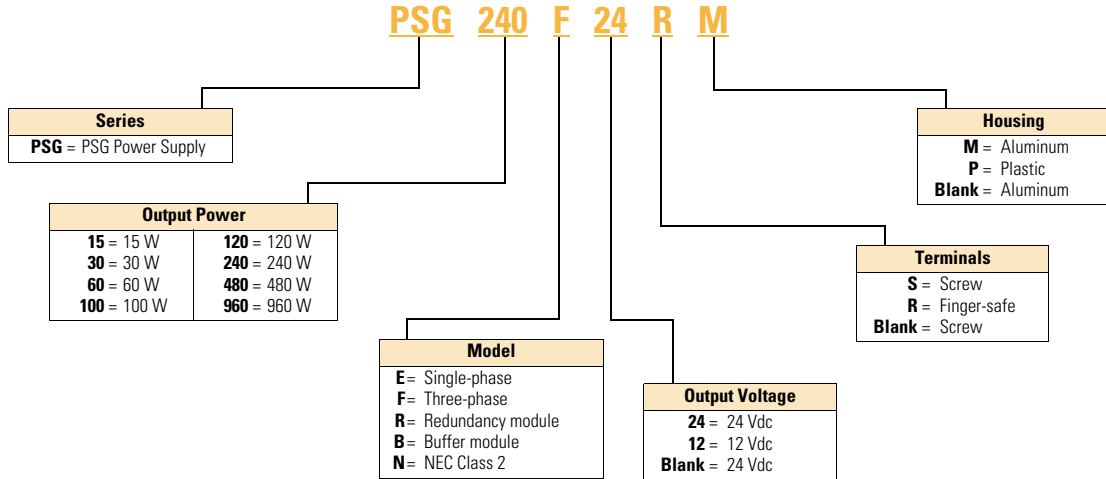


Note: Some models may not carry all certifications listed.

Catalog Number Selection

Note: Catalog number selection breakdown shown below is for illustrative purposes only and not to be used to create new catalog number configurations.

PSG Series



Note: Not all combinations are available. See Pages **V7-T6-19–V7-T6-26** for all available combinations.

6.1

Power Supplies

General-Purpose and Sensor Power Supplies

Product Selection

PSG Series

Screw Type Terminals—Connections for those that require multiple types of terminations and lug connections.

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PSG100E12SM



12 Vdc output single-phase power supplies (100–240 Vac nominal input)

| Power | Description | Catalog Number |
|-----------------------------|---------------------------------------|--------------------|
| Screw Type Terminals | | |
| | 15 W 1.25 A output, plastic housing | PSG15E12SP |
| | 30 W 2.5 A output, plastic housings | PSG30E12SP |
| | 60 W 5 A output, aluminum housing | PSG60E12SM |
| | 100 W 8.33 A output, aluminum housing | PSG100E12SM |

PSG60E



24 Vdc output single-phase power supplies (100–240 Vac nominal input)

| | | |
|--|-------------------------------------|-------------------|
| | 60 W 2.5 A output, aluminum housing | PSG60E |
| | 60 W 2.5 A output, plastic housing | PSG60E24SP |
| | 120 W 5 A, aluminum housing | PSG120E |
| | 240 W 10 A, aluminum housing | PSG240E |
| | 480 W 20 A, aluminum housing | PSG480E |

Finger-Safe Terminals—Connections for those that require IP20 terminals for all your safety solutions

PSG60E24RM



24 Vdc output single-phase power supplies (100–240 Vac nominal input)

| Power | Description | Catalog Number |
|------------------------------|--|--------------------|
| Finger-Safe Terminals | | |
| | 60 W 2.5 A output, aluminum housing | PSG60E24RM |
| | 120 W 5 A, aluminum housing | PSG120E24RM |
| | 240 W 10 A, aluminum housing | PSG240E24RM |
| | 480 W 20 A, aluminum housing | PSG480E24RM |
| | 60 W 2.5 A output, plastic housing, UL/NEC Class 2 | PSG60N24RP |

PSG480F24RM



24 Vdc output, three-phase power supplies (400–500 Vac nominal input)

| | | |
|--|------------------------------|--------------------|
| | 60 W 2.5 A, aluminum housing | PSG60F24RM |
| | 120 W 5 A, aluminum housing | PSG120F24RM |
| | 240 W 10 A, aluminum housing | PSG240F24RM |
| | 480 W 20 A, aluminum housing | PSG480F24RM |
| | 960 W 40 A, aluminum housing | PSG960F24RM |

PSG480B24RM



Module power supplies (24 Vdc input)

| | | |
|--|---|--------------------|
| | Buffer module, 480 W 20 A output, aluminum housing | PSG480B24RM |
| | Redundancy module, 480 W <20 A output, aluminum housing | PSG480R24RM |
| | Redundancy module, 960 W <40 A output, aluminum housing | PSG960R24RM |

Technical Data and Specifications

PSG Series

| | Single-Phase PSG15E12SP | PSG30E12SP | PSG60E12SM | PSG100E12SM | PSG60E | PSG60E24SP | PSG60E24RM |
|--|-------------------------------------|--------------------------------|--------------------------------|---|--|---|---|
| Input | | | | | | | |
| Nominal voltage | 100–240 Vac | 100–240 Vac | 100–240 Vac | 100–240 Vac | 100–240 Vac | 100–240 Vac | 100–240 Vac |
| AC input range | 85–264 Vac | 85–264 Vac | 85–264 Vac | 85–264 Vac | 85–264 Vac | 85–264 Vac | 85–264 Vac |
| DC input range | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc |
| Frequency | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz |
| Nominal current ^① | <0.37 A | <0.7 A | <1.35 A | <2.5 A | 1.1 A | <1.10 A | <1.4 A |
| Inrush current limitation ^① | <30 A | <30 A | <50 A | <100 A | 30 A | <40 A | <20 A |
| Internal fuse | T3.15 AH / 250 V | T3.15 AH / 250 V | T3.15 AH / 250 V | T3.15 AH / 250 V | T3.15 AH / 250 V | T3.15 AH / 250 V | T3.15 AH / 250 V |
| External fusing | 4 A or 6 A | 4 A or 6 A | 6 A, 10 A or 16 A | 6 A, 10 A or 16 A | 6 A, 10 A or 16 A | 6 A, 10 A or 16 A | 6 A, 10 A or 16 A |
| Leakage current | <1 mA | <1 mA | <1 mA | <1 mA | <1 mA | <1 mA | <1 mA |
| Output | | | | | | | |
| Power | 15 W | 30 W | 60 W | 100 W | 60 W | 60 W | 60 W |
| Nominal output voltage | 12 Vdc ±2% | 12 Vdc ±2% | 12 Vdc ±2% | 12 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% |
| Adjustment range | 11–14 Vdc | 11–14 Vdc | 11–14 Vdc | 11–14 Vdc | 22–28 Vdc | 22–28 Vdc | 24–28 Vdc |
| Nominal current | 1.25 A | 2.5 A | 5 A | 8.33 A | 2.5 A | 2.5 A | 2.5 A |
| Startup with capacitive loads | Max. 5000 µF | Max. 6600 µF | Max. 8000 µF | Max. 10,000 µF | Max. 8000 µF | Max. 8000 µF | Max. 8000 µF |
| Efficiency | >84% at 115 Vac, >83% at 230 Vac | >85% at 115 Vac and 230 Vac | >85% at 115 Vac and 230 Vac | >85.5% at 115 Vac, >87.5% at 230 Vac | >85% typ | >86% at 115 Vac, >87% at 230 Vac | >90% at 115 Vac and 230 Vac |
| Current surge | 1.875 A | 3.75 A | 7.5 A | 12.495 A | 3.75 A | 3.75 A | 3.75 A |
| Current surge time | 3 s | 3 s | 3 s | 3 s | 1 s (at 10 s intervals) | 3 s | 5 s |
| Residual ripple/peak switching (20 MHz) | <100 mVpp | <100 mVpp | <100 mVpp | <100 mVpp | <50 mV / <240 mVpp | <50 mV / <240 mVpp | <50 mVpp / <150 mVpp |
| Turn-on time | <2.5 s | <2.5 s | <2.5 s | <0.6s | <2.5 s | <3 s | <2s |
| Mains buffering at nominal load (typ.) ^① | >22 ms | >22 ms | >22 ms | >22 ms | >20 ms | >20 ms | >20 ms |
| Parallel operation | With o-ring diode | With o-ring diode | With o-ring diode | With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode |
| Galvanic Isolation | | | | | | | |
| Input/output | 4 k Vac | 4 k Vac | 4 k Vac | 4 k Vac | 4 k Vac (type test) / 3 k Vac (routine test) | 4 k Vac | 4 k Vac |
| Input/ground | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac (type test) / 1.5 k Vac (routine test) | 1.5 k Vac | 1.5 k Vac |
| Output/ground | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac (type test) / 500 Vac (routine test) | 1.5 k Vac | 1.5 k Vac |
| General/Physical Data | | | | | | | |
| Housing material | Plastic | Plastic | Aluminum | Aluminum | Aluminum | Plastic | Aluminum |
| Signals | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK |
| MTBF | >1,000,000 hr | >1,000,000 hr | >800,000 hr | >800,000 hr | >800,000 hr | >800,000 hr | >1,000,000 hr |
| Dimensions (L) | 100 mm | 100 mm | 121 mm | 121 mm | 121 mm | 120.6 mm | 121 mm |
| Dimensions (W) | 32 mm | 32 mm | 32 mm | 50 mm | 32 mm | 32 mm | 32 mm |
| Dimensions (H) | 100.6 mm | 100.6 mm | 120 mm | 118.7 mm | 120 mm | 113 mm | 125 mm |
| Weight (kg) | 0.18 | 0.2 | 0.33 | 0.64 | 0.37 | 0.33 | 0.37 |
| Terminals | Screw | Screw | Screw | Screw | Screw | Screw | Finger-safe, removable |
| Wire size | AWG 22–14 | AWG 22–14 | AWG 22–14 | AWG 18–24 | AWG 22–14 | AWG 22–14 | AWG 22–12 |
| Operating temperature | –20 °C to +75 °C | –20 °C to +75 °C | –20 °C to +75 °C | –20 °C to +75 °C | –20 °C to +75 °C | –20 °C to +75 °C | –20 °C to +80 °C |
| Storage temperature | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C |

Note

^① Ratings for single-phase models are at 115 Vac; three-phase models are at 400 Vac.

6.1

Power Supplies

General-Purpose and Sensor Power Supplies

PSG Series, continued

| | Single-Phase PSG15E12SP | PSG30E12SP | PSG60E12SM | PSG100E12SM | PSG60E | PSG60E24SP | PSG60E24RM |
|--|---|--|--|--|--|--|--|
| General/Physical Data, continued | | | | | | | |
| Power derating— vertical mounting | >50 °C derate power by 2.5% / °C, >70 °C derate power by 4% / °C | >50 °C derate power by 2.5% / °C, >70 °C derate power by 4% / °C | >50 °C derate power by 2.5% / °C, >70 °C derate power by 4% / °C | >50 °C derate power by 2.5% / °C | >50 °C derate power by 2.5% / °C | <0 °C to –20 °C derate power by 1% / °C, >50 °C derate power by 2.5% / °C, >70 °C derate power by 4% / °C | >50 °C derate power by 2.5% / °C |
| Power derating— horizontal mounting | N/A | N/A | N/A | >50 °C derate power by 2.5% / °C, >70 °C derate power by 4% / °C | N/A | N/A | >50 °C derate power by 2.5% / °C |
| Operating humidity | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing |
| Vibration | 10 to 150 Hz, 0.35 mm acc. 50 m/s ² , single amplitude (5G max.) for 90 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | | | | | | |
| Pollution degree | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Climatic class | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 |
| Safety and Protection | | | | | | | |
| Transient surge voltage | Varistor | Varistor | Varistor | Varistor | Varistor | Varistor | Varistor |
| Surge voltage protection against internal surge | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Safety class | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection |
| Shock | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 |

General-Purpose and Sensor Power Supplies

PSG Series, continued

| | Single-Phase, continued | | | | | | |
|--|---|--|---|--|---|--|---|
| | PSG60N24RP | PSG120E | PSG120E24RM | PSG240E | PSG240E24RM | PSG480E | PSG480E24RM |
| Input | | | | | | | |
| Nominal voltage | 100–240 Vac | 100–240 Vac | 100–240 Vac | 100–240 Vac | 100–240 Vac | 100–240 Vac | 100–240 Vac |
| AC input range | 85–264 Vac | 85–264 Vac | 85–264 Vac | 85–264 Vac | 85–264 Vac | 85–264 Vac | 85–264 Vac |
| DC input range | N/A | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc | 120–375 Vdc |
| Frequency | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz |
| Nominal current ^① | <1.5 A at 100 Vac | 1.4 A | <2.2 A | 2.9 A | <2.5 A | 5.7 A | <5 A |
| Inrush current limitation ^① | <40 A | <80 A | <35 A | N/A | <35 A | N/A | <35 A |
| Internal fuse | T3.15 AH / 250 V | T3.15 AH / 250 V | T4 AH / 250 V | T6.3 AH / 250 V | T6.3 AH / 250 V | F10H / 250 A | T8 AH / 250 V |
| External fusing | 6 A, 10 A or 16 A | 6 A, 10 A or 16 A | 6 A, 10 A or 16 A | 10 A or 16 A | 10 A or 16 A | 10 A or 16 A | 10 A or 16 A |
| Leakage current | <1 mA | <1 mA | <1 mA | <3.5 mA | <1 mA | <1 mA | <3 mA |
| Output | | | | | | | |
| Power | 60 W | 120 W | 120 W | 240 W | 240 W | 480 W | 480 W |
| Nominal output voltage | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% |
| Adjustment range | 22–28 Vdc | 22–28 Vdc | 24–28 Vdc | 22–28 Vdc | 24–28 Vdc | 22–28 Vdc | 22–28 Vdc |
| Nominal current | 2.5 A | 5 A | 5 A | 10 A | 10 A | 20 A | 20 A |
| Startup with capacitive loads | Max. 8000 µF | Max. 10,000 µF | Max. 10,000 µF | Max. 10,000 µF | Max. 10,000 µF | Max. 10,000 µF | Max. 10,000 µF |
| Efficiency | >86% at 115 Vac, >87% at 230 Vac | >84% typ | >89% at 115 Vac, >90% at 230 Vac | >84% typ | >90% at 115 Vac and 230 Vac | >86% typ | >90% at 115 Vac and 230 Vac |
| Current surge | N/A | 7.5 A | 7.5 A | 15 A | 15 A | 30 A | 30 A |
| Current surge time | N/A | 1 s (at 10 s intervals) | 5 s | 1 s (at 10 s intervals) | 5 s | 1 s (at 10 s intervals) | 5 s |
| Residual ripple/peak switching (20 MHz) | <50 mVpp / <240 mVpp | <50 mV / <240 mVpp | <50 mVpp / <150 mVpp | <50 mV / <240 mVpp | <50 mVpp / <150 mVpp | <50 mV / <240 mVpp | <50 mVpp |
| Turn-on time | <3 s | <1 s | <1 s | <1 s | <1 s | <1 s | <1 s |
| Mains buffering at nominal load (typ.) ^① | >20 ms | >35ms | >20 ms | >20 ms | >20 ms | >20 ms | >20 ms |
| Parallel operation | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode |
| Galvanic Isolation | | | | | | | |
| Input/output | 4 k Vac | 4 k Vac (type test) / 3 k Vac (routine test) | 4 k Vac | 4 k Vac (type test) / 3 k Vac (routine test) | 4 k Vac | 4 k Vac (type test) / 3 k Vac (routine test) | 4 k Vac |
| Input/ground | 1.5 k Vac | 1.5 k Vac (type test) / 1.5 k Vac (routine test) | 1.5 k Vac | 1.5 k Vac (type test) / 1.5 k Vac (routine test) | 1.5 k Vac | 1.5 k Vac (type test) / 1.5 k Vac (routine test) | 1.5 k Vac |
| Output/ground | 1.5 k Vac | 1.5 k Vac (type test) / 500 Vac (routine test) | 1.5 k Vac | 1.5 k Vac (type test) / 500 Vac (routine test) | 1.5 k Vac | 1.5 k Vac (type test) / 500 Vac (routine test) | 1.5 k Vac |
| General/Physical Data | | | | | | | |
| Housing material | Aluminum | Aluminum | Aluminum | Aluminum | Aluminum | Aluminum | Aluminum |
| Signals | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK |
| MTBF | >800,000 hr | >800,000 hr | >800,000 hr | >300,000 hr | >500,000 hr | >300,000 hr | >500,000 hr |
| Dimensions (L) | 120.6 mm | 121 mm | 121 mm | 121 mm | 121 mm | 121 mm | 121 mm |
| Dimensions (W) | 32 mm | 32 mm | 50 mm | 85 mm | 85 mm | 160 mm | 144 mm |
| Dimensions (H) | 119.3 mm | 120 mm | 123.1 mm | 118.5 mm | 124.1 mm | 115 mm | 118.6 mm |
| Weight (kg) | 0.33 | 0.54 | 0.72 | 1.04 | 1.1 | 1.8 | 1.37 |
| Terminals | Finger-safe, fixed | Screw | Finger-safe, removable | Screw | Finger-safe, removable | Screw | Finger-safe, fixed |
| Wire size | AWG 22–10 | AWG 22–14 | AWG 20–12 | AWG 22–14 | AWG 16–12 | AWG 16–14 (input) AWG 12–10 (output) | AWG 18–10 |
| Operating temperature | –20 °C to +80 °C | –20 °C to +75 °C | –20 °C to +80 °C | –20 °C to +75 °C | –20 °C to +80 °C | –20 °C to +75 °C | –25 °C to +75 °C |
| Storage temperature | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C |

Note

^① Ratings for single-phase models are at 115 Vac; three-phase models are at 400 Vac.

6.1

Power Supplies

General-Purpose and Sensor Power Supplies

PSG Series, continued

Single-Phase, continued

PSG60N24RP PSG120E PSG120E24RM PSG240E PSG240E24RM PSG480E PSG480E24RM

General/Physical Data, continued

| | | | | | | | |
|--|--|---|---|---|---|---|---|
| Power derating— vertical mounting | >50 °C derate power by 2.5% / °C, >70 °C derate power by 4% / °C | >50 °C derate power by 2.5% / °C | >50 °C derate power by 2.5% / °C | >50 °C derate power by 2.5% / °C, >70 °C derate power by 4% / °C | >50 °C derate power by 2.5% / °C | >50 °C derate power by 2.5% / °C | >50 °C derate power by 2.5% / °C, >70 °C to 75 °C derate power by 5% / °C |
| Power derating— horizontal mounting | >50 °C derate power by 2.5% / °C, >70 °C derate power by 4% / °C | N/A | >50 °C derate power by 2.5% / °C | N/A | N/A | N/A | N/A |
| Operating humidity | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing |
| Vibration | 10 to 500 Hz, 0.35 mm acc. 30 m/s ² , single amplitude (3 G max.) for 60 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | 10 to 150 Hz, 0.35 mm acc. 50 m/s ² , single amplitude (5G max.) for 90 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | 10 to 150 Hz, 0.35 mm acc. 50 m/s ² , single amplitude (5G max.) for 90 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | 10 to 150 Hz, 0.35 mm acc. 50 m/s ² , single amplitude (5G max.) for 90 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | 10 to 150 Hz, 0.35 mm acc. 50 m/s ² , single amplitude (5G max.) for 90 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | 10 to 150 Hz, 0.35 mm acc. 50 m/s ² , single amplitude (5G max.) for 90 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | 10 to 150 Hz, 0.35 mm acc. 50 m/s ² , single amplitude (5G max.) for 90 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 |
| Pollution degree | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Climatic class | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 |

Safety and Protection

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| Transient surge voltage | Varistor | Varistor | Varistor | Varistor | Varistor | Varistor | Varistor |
| Surge voltage protection against internal surge | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Safety class | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection |
| Shock | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 |
| UL 1310 | Class 2 | — | — | — | — | — | — |

PSG Series, continued

| | Three-Phase PSG60F24RM | PSG120F24RM | PSG240F24RM | PSG480F24RM | PSG960F24RM |
|--|---|---|---|---|--|
| Input | | | | | |
| Nominal voltage | 3 x 400–500 Vac | 3 x 400–500 Vac | 3 x 400–500 Vac | 3 x 400–500 Vac | 3 x 400–500 Vac |
| AC input range | 3 x 320–600 Vac | 3 x 320–600 Vac | 3 x 320–600 Vac | 3 x 320–600 Vac | 3 x 320–600 Vac |
| DC input range | 450–800 Vdc | 450–800 Vdc | 450–800 Vdc | 450–800 Vdc | 450–800 Vdc |
| Frequency | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz | 47–63 Hz |
| Nominal current ^① | <0.3 A | <0.5 A | <0.75 A | <1 A | <1.7 A |
| Inrush current limitation ^① | <30 A | <30 A | <40 A | <50 A | <40 A |
| Internal fuse | T 3.15 AH / 500 V, 600 V | T 3.15 AH / 500 V, 600 V | T 3.15 AH / 500 V, 600 V | T 3.15 AH / 500 V | T 4 AH / 500 V |
| External fusing | 3 x circuit breakers 6 A, 10 A or 16 A | 3 x circuit breakers 6 A, 10 A or 16 A | 3 x circuit breakers 6 A, 10 A or 16 A | 3 x circuit breakers 6 A, 10 A or 16 A | 3 x circuit breakers 10 A or 16 A |
| Leakage current | <3.5 mA | <3.5 mA | <3.5 mA | <3.5 mA | <3.5 mA |
| Output | | | | | |
| Power | 60 W | 120 W | 240 W | 480 W | 960 W |
| Nominal output voltage | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% | 24 Vdc ±2% |
| Adjustment range | 24–28 Vdc | 24–28 Vdc | 24–28 Vdc | 24–28 Vdc | 24–28 Vdc |
| Nominal current | 2.5 A | 5 A | 10 A | 20 A | 40 A |
| Startup with capacitive loads | Max. 10,000 µF | Max. 10,000 µF | Max. 10,000 µF | Max. 10,000 µF | Max. 10,000 µF |
| Efficiency | >86% at 3 x 400 Vac and 3 x 500 Vac | >88% at 3 x 400 Vac and 3 x 500 Vac | >92% at 3 x 400 Vac and 3 x 500 Vac | >91% at 3 x 400 Vac and 3 x 500 Vac | >92% at 3 x 400 Vac and 3 x 500 Vac |
| Current surge | 3.75 A | 7.5 A | 15 A | 30 A | 60 A |
| Current surge time | 5 s | 5 s | 5 s | 5 s | 5 s |
| Residual ripple/peak switching (20 MHz) | <50 mVpp | <50 mVpp | <150 mVpp | <150 mVpp | <240 mVpp |
| Turn-on time | <1 s | <1 s | <1 s | <1 s | <1.5 s |
| Mains buffering at nominal load (typ.) ^① | >20 ms | >20 ms | >20 ms | >20 ms | >20 ms |
| Parallel operation | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG480R24RM / PSG960R24RM / With o-ring diode | PSG960R24RM / With o-ring diode |
| Galvanic Isolation | | | | | |
| Input/output | 4 k Vac | 4 k Vac | 4 k Vac | 4 k Vac | 4 k Vac |
| Input/ground | 2 k Vac | 2 k Vac | 2 k Vac | 2 k Vac | 2 k Vac |
| Output/ground | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac | 1.5 k Vac |
| General/Physical Data | | | | | |
| Housing material | Aluminum | Aluminum | Aluminum | Aluminum | Aluminum |
| Signals | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK | Green LED for DC OK |
| MTBF | >500,000 hr | >500,000 hr | >300,000 hr | >500,000 hr | >300,000 hr |
| Dimensions (L) | 121 mm | 121 mm | 121 mm | 121 mm | 121 mm |
| Dimensions (W) | 50 mm | 50 mm | 70 mm | 140 mm | 255 mm |
| Dimensions (H) | 117.3 mm | 117.3 mm | 117.3 mm | 117.3 mm | 117.3 mm |
| Weight (kg) | 0.66 | 0.66 | 0.89 | 1.35 | 2.6 |
| Terminals | Finger-safe, fixed | Finger-safe, fixed | Finger-safe, fixed | Finger-safe, fixed | Finger-safe, fixed |
| Wire size | AWG 18–12 | AWG 18–12 | AWG 18–12 (input) AWG 16–12 (output) | AWG 18–8 (input) AWG 12–10 (output) | AWG 18–8 (input) AWG 12–10 (output) |
| Operating temperature | –25 °C to +75 °C | –25 °C to +75 °C | –25 °C to +75 °C | –25 °C to +80 °C | –25 °C to +65 °C |
| Storage temperature | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C | –25 °C to +85 °C |

Note

^① Ratings for single-phase models are at 115 Vac; three-phase models are at 400 Vac.

6.1

Power Supplies

General-Purpose and Sensor Power Supplies

PSG Series, continued

Three-Phase, continued

PSG60F24RM

PSG120F24RM

PSG240F24RM

PSG480F24RM

PSG960F24RM

General/Physical Data, continued

| | | | | | |
|--|--|--|--|--|--|
| Power derating— vertical mounting | >50 °C derate power by 2.5% / °C, >70 °C derate power by 5% / °C | >50 °C derate power by 2.5% / °C, >70 °C derate power by 5% / °C | >50 °C derate power by 2.5% / °C, >70 °C derate power by 5% / °C | >50 °C derate power by 2.5% / °C, >70 °C derate power by 5% / °C | >50 °C derate power by 2.5% / °C |
| Power derating— horizontal mounting | >45 °C derate power by 2.5% / °C, >55 °C derate power by 1.66% / °C, >70 °C derate power by 5% / °C | >40 °C derate power by 2.5% / °C, >60 °C derate power by 5% / °C | >40 °C derate power by 2.5% / °C, >60 °C derate power by 5% / °C | N/A | N/A |
| Operating humidity | <95% RH, noncondensing | <95% RH, noncondensing | <95% RH, noncondensing | 5 to 95% RH, noncondensing | 5 to 95% RH, noncondensing |
| Vibration | 10 to 500 Hz, 0.35 mm acc. 30 m/s ² , single amplitude (3 G max.) for 60 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | | | | |
| Pollution degree | 2 | 2 | 2 | 2 | 2 |
| Climatic class | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 | 3K3 according to EN 60721 |
| Safety and Protection | | | | | |
| Transient surge voltage | Varistor | Varistor | Varistor | Varistor | Varistor |
| Surge voltage protection against internal surge | Yes | Yes | Yes | Yes | Yes |
| Safety class | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection | Class I with ground connection |
| Shock | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/s ²) in all directions according to IEC 60068-2-27 |

PSG Series, continued

| | Redundancy Modules | |
|-------------------------------------|---|---|
| | PSG480R24RM | PSG960R24RM |
| Input | | |
| Nominal voltage | 24–48 Vdc | 24–48 Vdc |
| DC input range | 22–60 Vdc | 22–60 Vdc |
| Nominal current | <20 A | <40 A |
| Inrush current limitation | <25 A | <50 A |
| Output | | |
| Nominal output voltage | Vin–0.65 V (typ.) | Vin–0.65 V (typ.) |
| Nominal current | <20 A | <40 A |
| Efficiency | >97% typ. | >97% typ. |
| Galvanic Isolation | | |
| Input/ground | 1.5 k Vac | 1.5 k Vac |
| Output/ground | 1.5 k Vac | 1.5 k Vac |
| General/Physical Data | | |
| Housing material | Aluminum | Aluminum |
| Signals ^① | Green LED for DC Vin1 OK and DC Vin2 OK | Green LED for DC Vin1 OK and DC Vin2 OK |
| MTBF | >800,000 hr | >800,000 hr |
| Dimensions (L) | 121 mm | 121 mm |
| Dimensions (W) | 50 mm | 50 mm |
| Dimensions (H) | 122.1 mm | 122.1 mm |
| Weight (kg) | 0.375 | 0.515 |
| Terminals | Finger safe—fixed | Finger safe—fixed |
| Wire size | AWG 12–10 | AWG 12–10 |
| Operating temperature | –40 °C to +80 °C | –40 °C to +80 °C |
| Storage temperature | –40 °C to +85 °C | –40 °C to +85 °C |
| Power de-rating—vertical mounting | > 50 °C de-rate power by 2.5% / °C | > 50 °C de-rate power by 2.5% / °C |
| Power de-rating—horizontal mounting | N/A | N/A |
| Operating humidity | < 95% RH, noncondensing | < 95% RH, noncondensing |
| Vibration | 10 to 500 Hz, 0.35 mm acc. 30m/s ² , single amplitude (3 G max.) for 60 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 | 10 to 500 Hz, 0.35 mm acc. 30m/s ² , single amplitude (3 G max.) for 60 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 |
| Pollution degree | 2 | 2 |
| Climatic class | 3K3 according to EN 60721 | 3K3 according to EN 60721 |
| Safety and Protection | | |
| Safety class | Class 2 with ground connection | Class III with ground connection |
| Shock | 30 G (300 m/S ²) in all directions according to IEC 60068-2-27 | 30 G (300 m/S ²) in all directions according to IEC 60068-2-27 |

Note

^① The LED will turn on when the Vin1 and Vin2 > 18 V ±5% (for 24 V system) or > 36 V ±5% (for 48 V system) and not more than 30 V (for 24 V system) or not more than 60 V (for 48 V system), the relay contacts will be closed. If Vin1 and Vin2 is under or over this range, the LED will be turned off.

PSG Series, continued

**Buffer Module
PSG480B24RM****Input**

| | |
|--------------------------|--|
| Nominal voltage | 24 Vdc |
| DC input range | 22.8–28.8 Vdc |
| Maximum voltage | 35 Vdc |
| Current | Charging mode: <0.6 A Discharging mode: 20 A max. |
| Power (standby mode) | 2.5 W average |
| Maximum signal (inhibit) | 35 V / 10 mA |
| Max inrush current | < 20 A |
| Charging time | < 30s |

Output

| | |
|---------------------|---|
| Nominal voltage | 24 Vdc typ. |
| DC adjustment range | Switch = "Fix 22V": Buffering starts if terminal voltage falls below 22 V Switch = "Vin-1V" (Factory Setting): Buffering starts if terminal voltage is decreased by >1 V |
| Maximum voltage | 35 Vdc |
| Current | 20 A max. |
| buffering time | 250 ms min. at 24 V/20 A load, 5 s min. at 24 V/1 A load |
| Maximum signal | 35 V / 10 mA |
| PARD (20MHz) | <200 mVpp |
| Galvanic isolation | |
| Input/ground | 1.5 k Vac |
| Output/ground | 1.5 k Vac |
| Signal/ground | 1.5 k Vac |

General/Physical Data

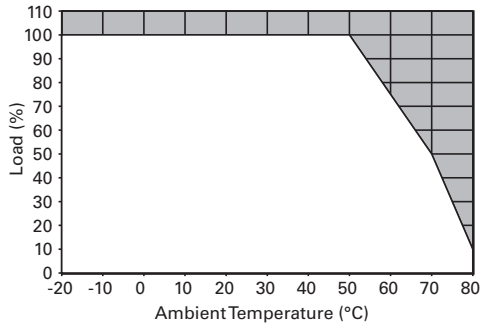
| | |
|-----------------------------------|--|
| Housing material | Aluminum |
| Signals | Green LED off: unit is discharged or Vin < 22 Vdc Green LED on: unit is fully charged Green LED blinking slowly: unit is charging Green LED blinking quickly: unit is discharging |
| MTBF | >800,000 hr |
| Parallel connection | Yes |
| Series connection | No |
| Dimensions (L) | 121 mm |
| Dimensions (W) | 70 mm |
| Dimensions (H) | 120.1 mm |
| Weight (kg) | 0.76 |
| Terminals | Finger safe-fixed |
| Wire Size | Input / Output: AWG 12–10 Signal: AWG 24–10 |
| Operating temperature | –25 °C to +75 °C |
| Storage temperature | –25 °C to +85 °C |
| Power de-rating—vertical mounting | >70 °C de-rate power by 5% / °C |
| Operating humidity | < 95% RH, noncondensing |
| Vibration | 10 to 500 Hz, 0.35 mm acc. 30 m/s ² , single amplitude (3 G max.) for 60 min. in each X, Y and Z directions, in accordance with IEC 60068-2-6 |
| Pollution degree | 2 |

Safety and Protection

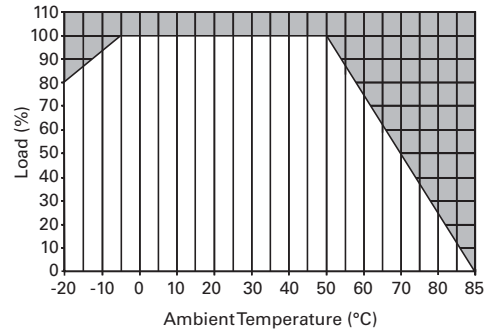
| | |
|--------------|---|
| Shock | 30 G (300 m/S ²) in all directions according to IEC60068-2-27 |
| Safety class | Class I with ground connection |

Power Derating Curves

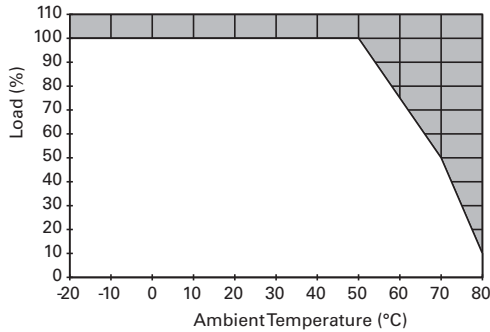
Vertical Mounting Position PSG15E12SP



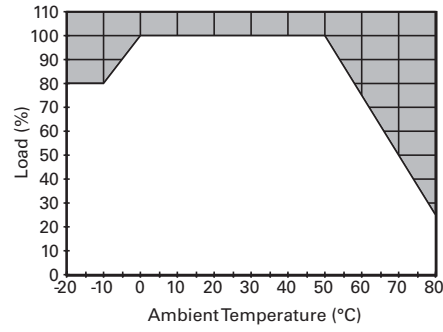
Vertical Mounting Position PSG60E



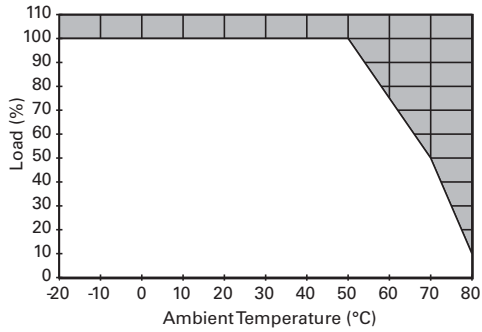
Vertical Mounting Position PSG30E12SP



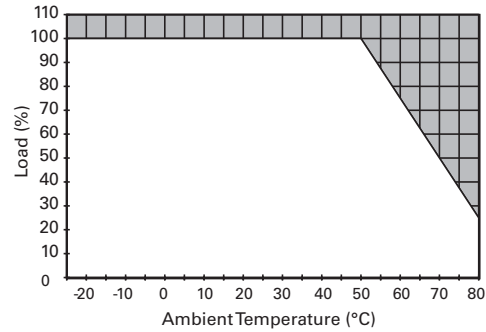
Vertical Mounting Position PSG60E24SP



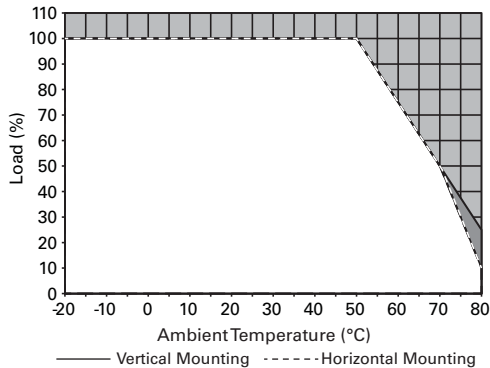
Vertical Mounting Position PSG60E12SM



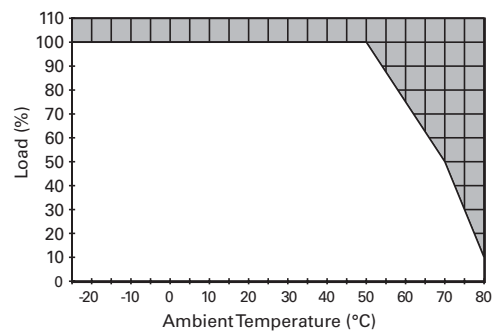
Vertical and Horizontal Mounting Position PSG60E24RM



Vertical and Horizontal Mounting Position PSG100E12SM



Vertical and Horizontal Mounting Position PSG60N24RP



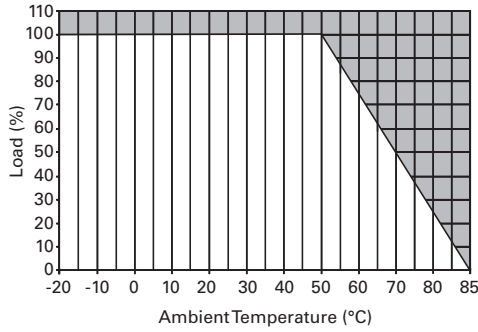
6.1

Power Supplies

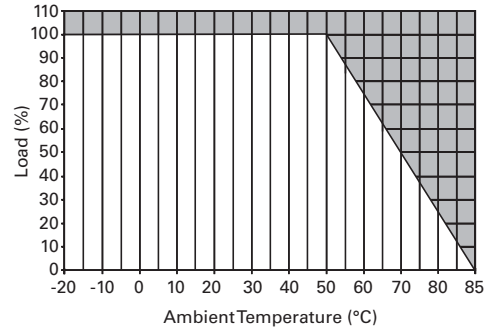
General-Purpose and Sensor Power Supplies

6

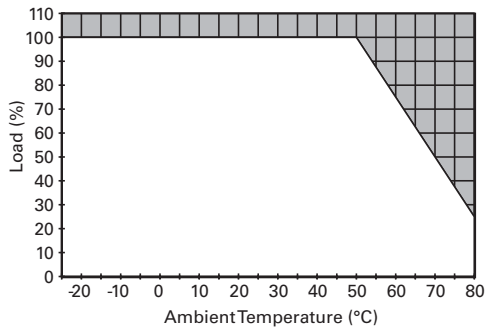
Vertical Mounting Position PSG120E



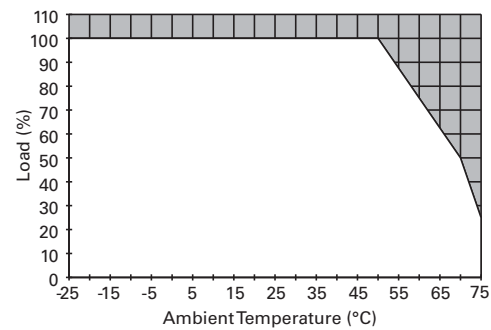
Vertical Mounting Position PSG480E



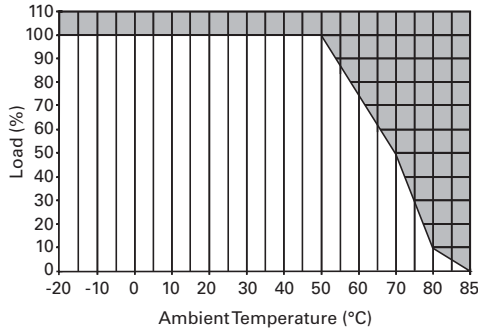
Vertical and Horizontal Mounting Position PSG120E24RM



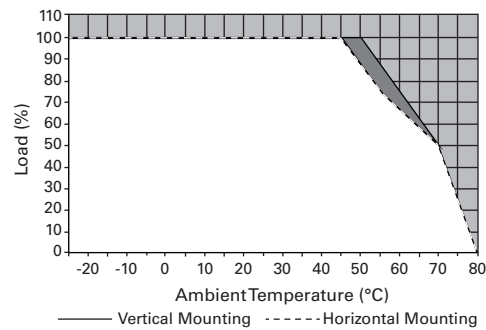
Vertical Mounting Position PSG480E24RM



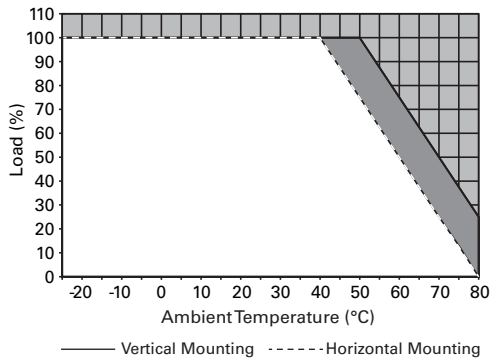
Vertical Mounting Position PSG240E



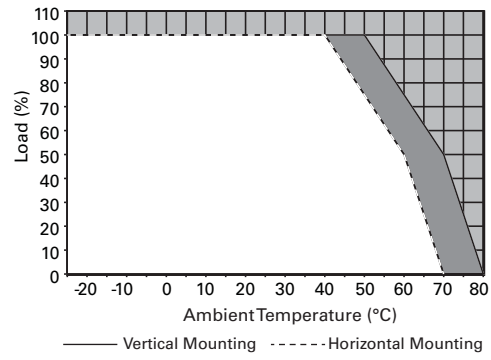
Vertical and Horizontal Mounting Position PSG60F24RM



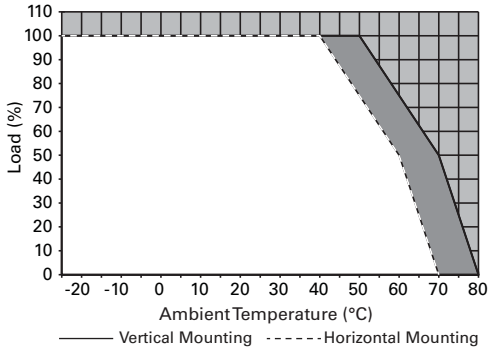
Vertical and Horizontal Mounting Position PSG240E24RM



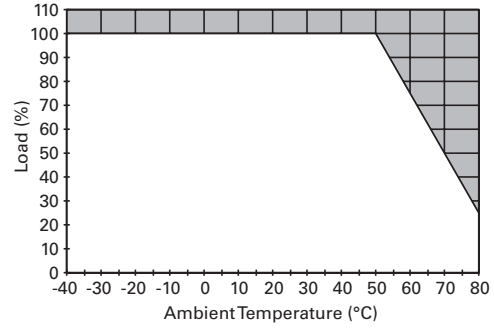
Vertical and Horizontal Mounting Position PSG120F24RM



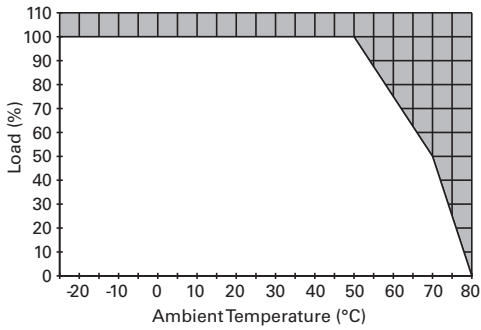
Vertical and Horizontal Mounting Position PSG240F24RM



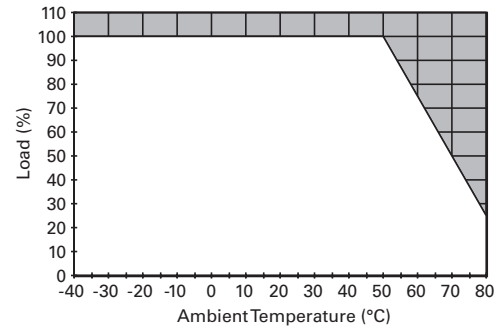
Vertical Mounting Position PSG480R24RM



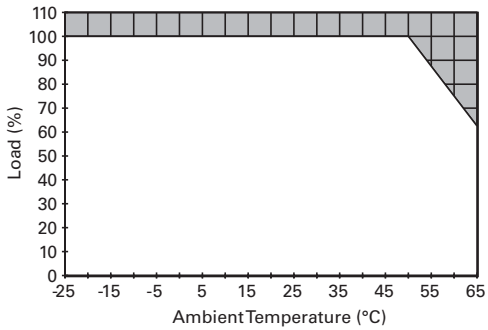
Vertical Mounting Position PSG480F24RM



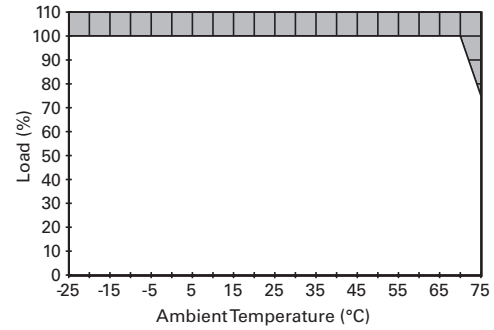
Vertical Mounting Position PSG960R24RM



Vertical Mounting Position PSG960F24RM



Vertical Mounting Position PSG480B24RM



6.1

Power Supplies

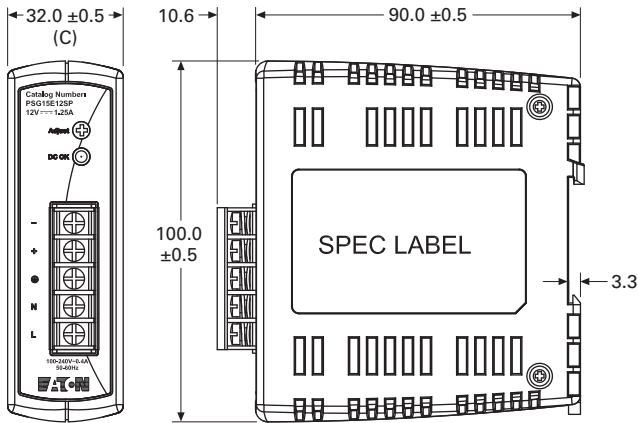
General-Purpose and Sensor Power Supplies

Dimensions

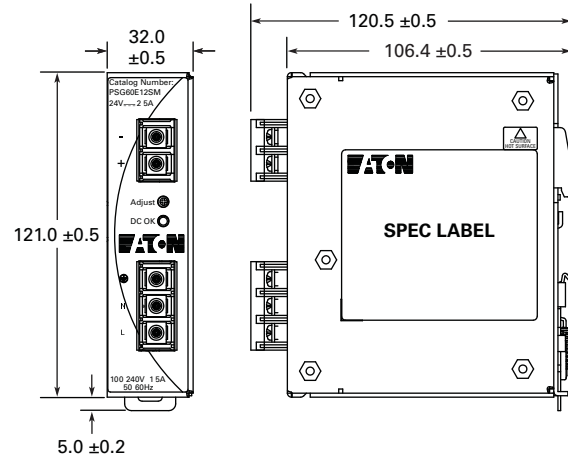
Approximate Dimensions in mm

Note: Dimensions are for reference only.

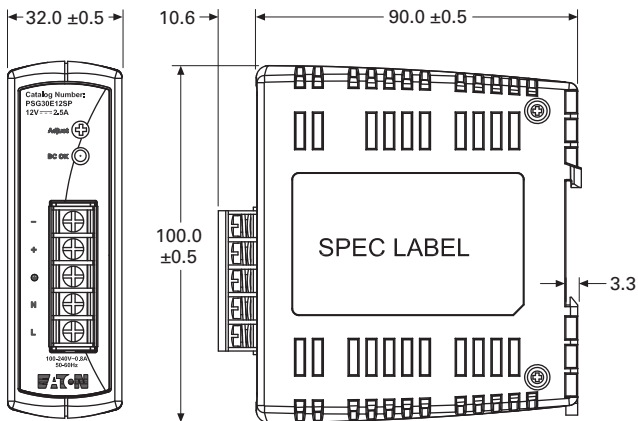
PSG15E12SP



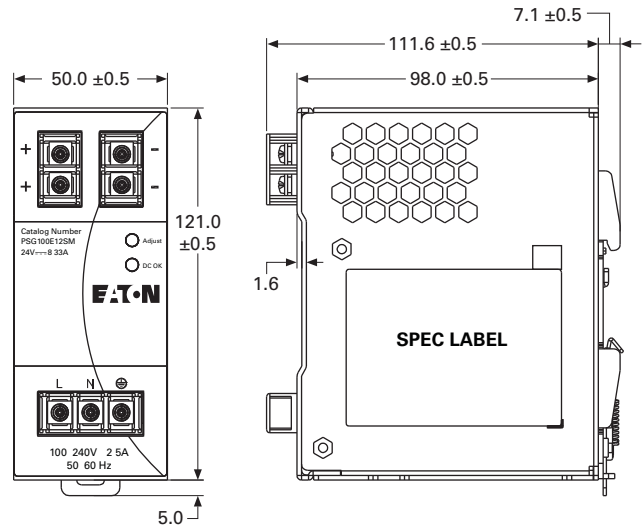
PSG60E12SM



PSG30E12SP



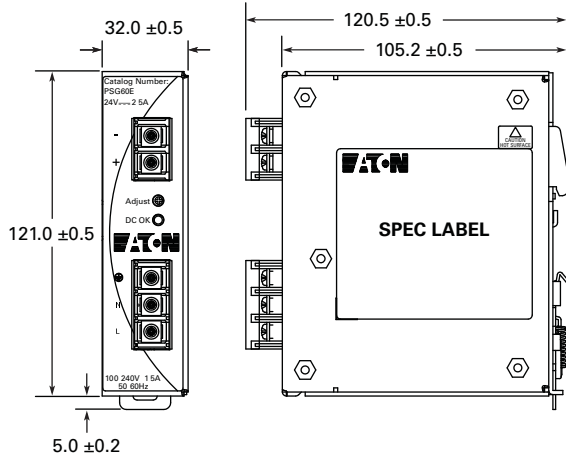
PSG100E12SM



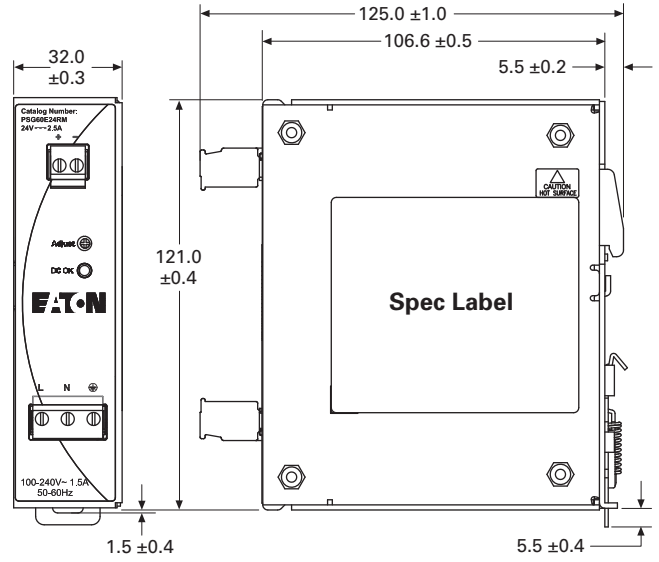
Approximate Dimensions in mm

Note: Dimensions are for reference only.

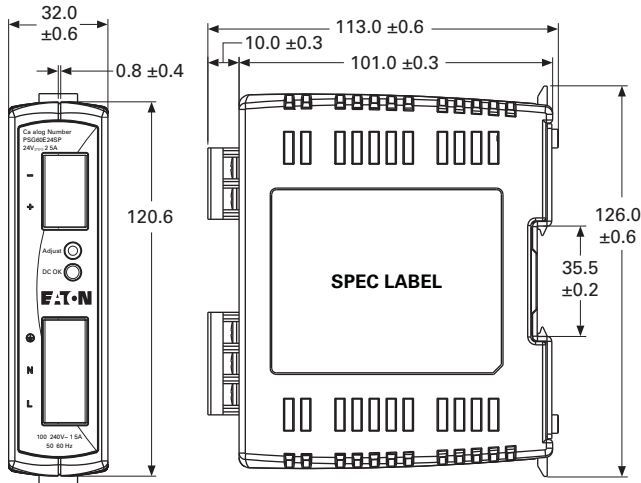
PSG60E



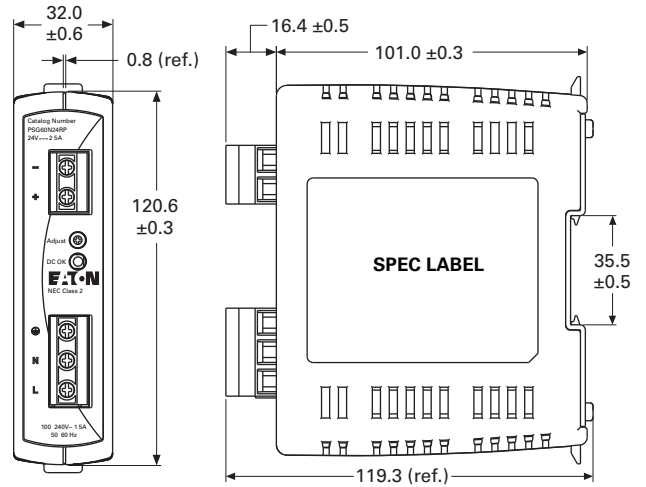
PSG60E24RM



PSG60E24SP



PSG60N24RP



6.1

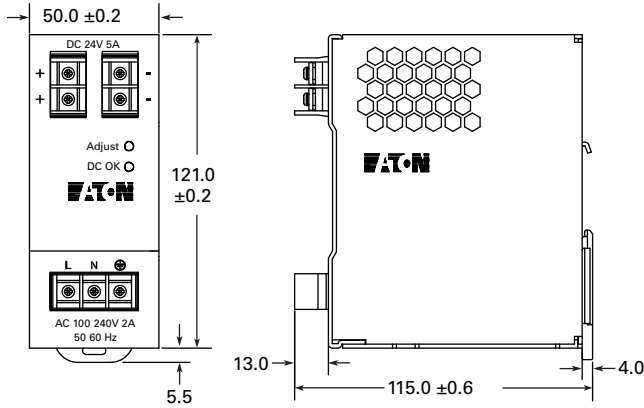
Power Supplies

General-Purpose and Sensor Power Supplies

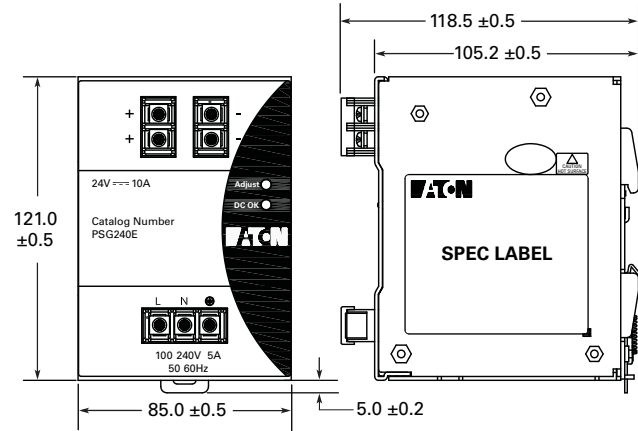
Approximate Dimensions in mm

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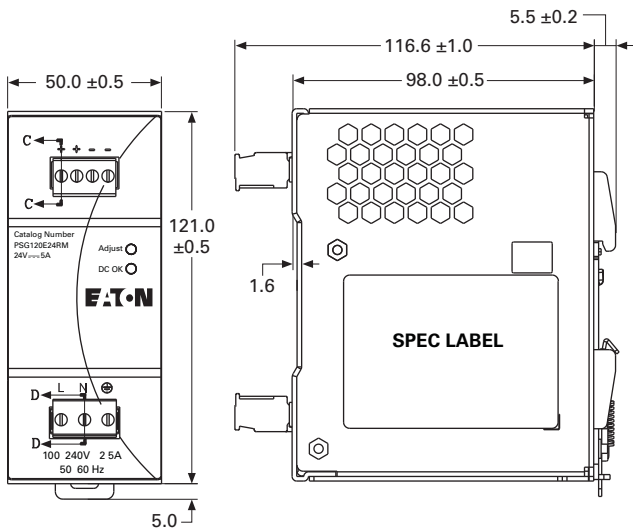
PSG120E



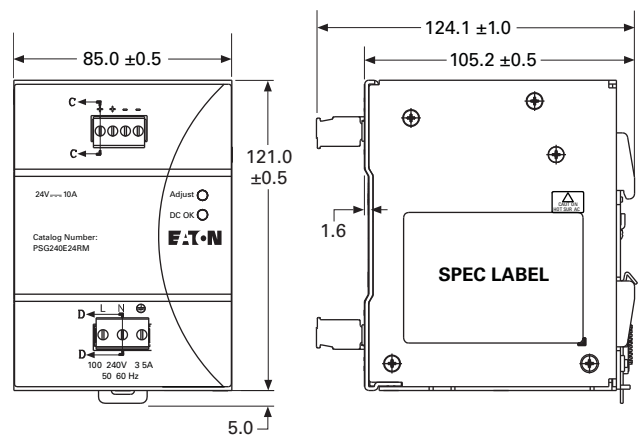
PSG240E



PSG120E24RM



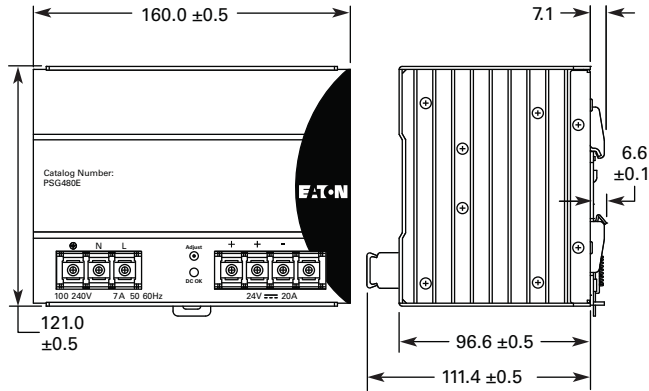
PSG240E24RM



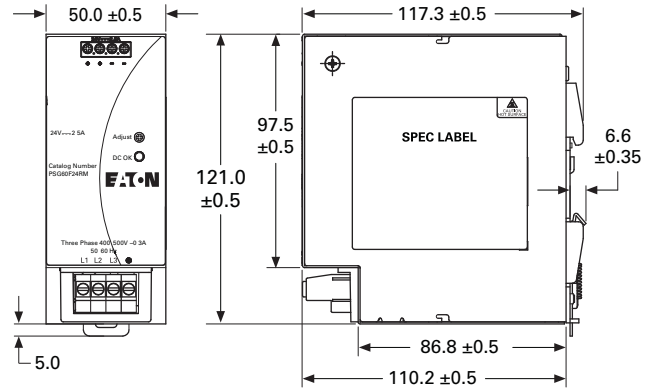
Approximate Dimensions in mm

Note: Dimensions are for reference only.

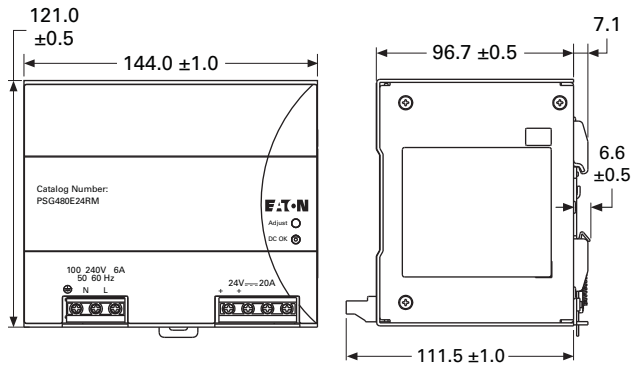
PSG480E



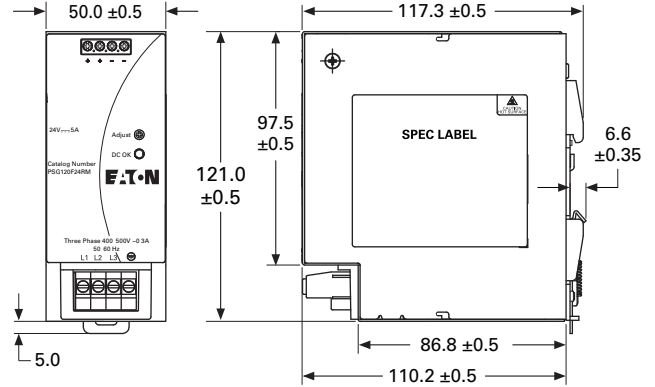
PSG60F24RM



PSG480E24RM



PSG120F24RM



6.1

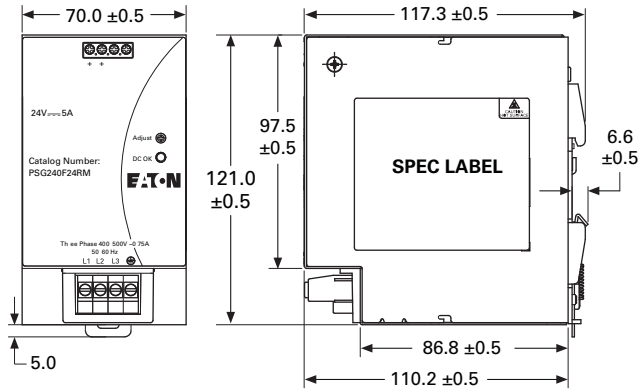
Power Supplies

General-Purpose and Sensor Power Supplies

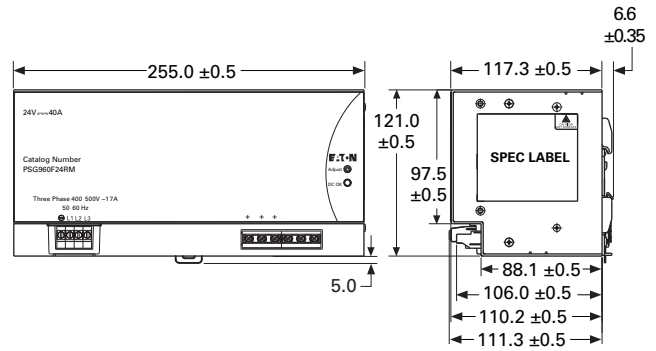
Approximate Dimensions in mm

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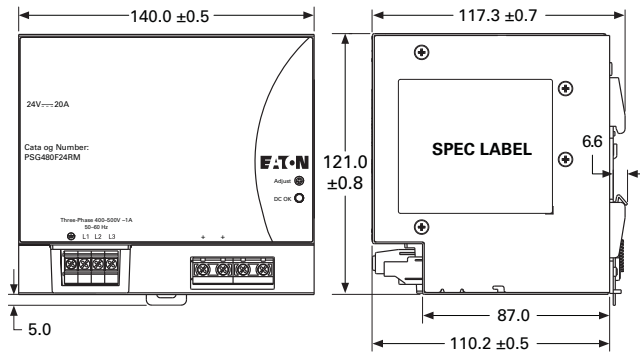
PSG240F24RM



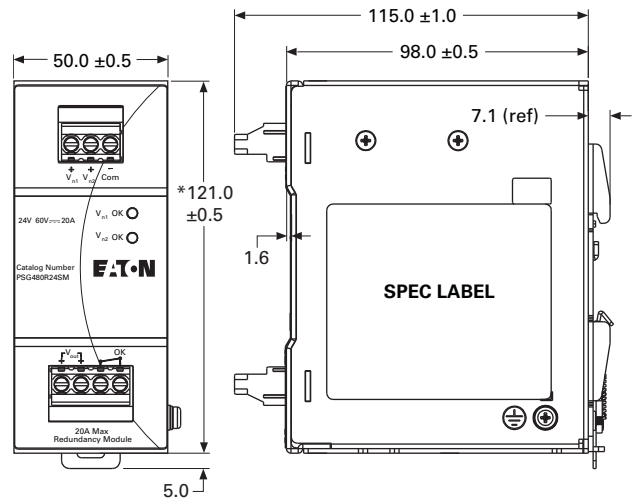
PSG960F24RM



PSG480F24RM



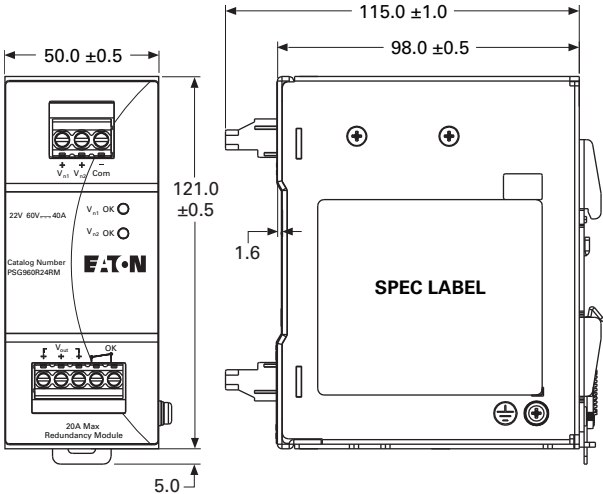
PSG480R24RM



Approximate Dimensions in mm

Note: Dimensions are for reference only.

PSG960R24RM



PSG480B24RM

