

Installation Instructions for POWER SUPPLY UNIT (PSU) PSG960F24RM

**READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE.
KEEP FOR FUTURE REFERENCE.**

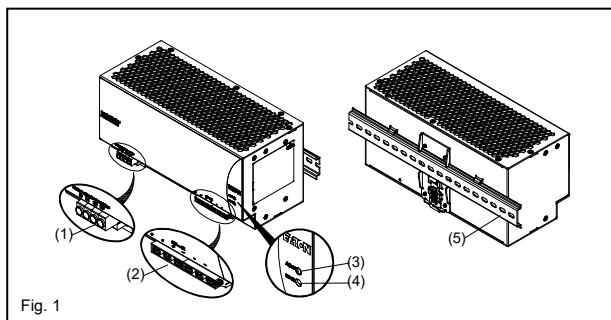


Fig. 1

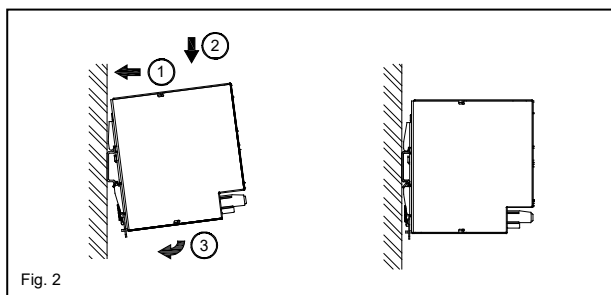


Fig. 2

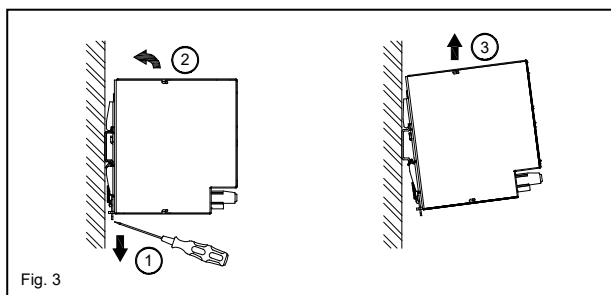


Fig. 3

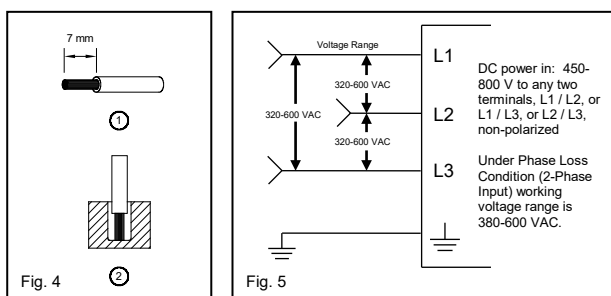


Fig. 4

Fig. 5

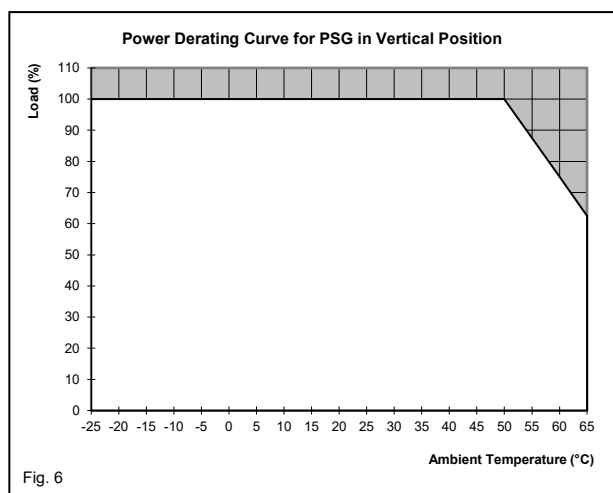


Fig. 6

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- To guarantee sufficient convection cooling, please keep a distance of 200 mm above and below the device as well as a lateral distance of 5 mm to other units.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
- Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.

CAUTION: "FOR USE IN A CONTROLLED ENVIRONMENT".

2. Device description (Fig. 1)

- (1) Input terminal block connector
- (2) Output terminal block connector
- (3) DC voltage adjustment potentiometer
- (4) DC OK control LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounting on 35 mm DIN rails in accordance with EN 60715. The device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

Snap on the DIN rail as shown in Fig. 2:

1. Tilt the unit slightly upwards and put it onto the DIN rail.
2. Push downwards until stopped.
3. Press against the bottom front side for locking.
4. Shake the unit slightly to ensure that it is secured.

4. Dismounting (Fig. 3)

To uninstall, pull or slide down the latch as shown in Fig. 3. Then, slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

Table	Stranded / Solid		Torque	
	(mm ²)	(AWG)	(Nm)	(lb in)
(1)	0.82-8.4	18-8	0.91	8.1
(2)	3.3-5.3	12-10*	0.91	8.1

*Ensure that all output terminals are connected.

To secure reliable and shock proof connections, the stripping length should be 7 mm (see Fig. 4 (1)).

Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2).

In accordance to EN 60950 and EN 62368, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of:

1. 60°C, 60°C / 75°C for USA
2. At least 75°C for ambient not exceeding 60°C, and 90°C for ambient exceeding 60°C for Canada.

5.1. Input connection (Fig. 1, Fig. 5)

Use L1, L2, L3 and PE connections of input terminal connector to establish the 3 x 400-500 VAC connection. Fig. 5 shows the connection to the various network types (Recommend to use 4-core input cable for better EMI performance).

In the event of a phase failure, unrestricted operation is possible with nominal capacity.

The unit is protected with internal fuse (not replaceable) at L1, L2 and L3 pins, which have been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above. Thus, if an external protective device is necessary, or, utilized, a minimum value of 10A B- or 6A C- characteristic breaker should be used.



The internal fuse must not be replaced by the user.

5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 24Vdc connection. The output provides 24 VDC. The output voltage can be adjusted from 24 to 28 VDC on the potentiometer (see Fig. 1(3)). The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 35 VDC.

5.3. Output characteristic curve



The device functions normal under operating line and load conditions. In the event of a short circuit or overload the output voltage and current collapses (I_{OL} or I_{SC} is $>I_{surge}$ (150%)). The secondary voltage is reduced and bounces until short circuit or overload on the secondary side has been removed.

5.4. Thermal behavior (Fig. 6).

In the case of ambient temperatures above +50°C (Vertical), the output capacity has to be reduced by 2.5% per degree Celsius increase in temperature. If the output capacity is not reduced when $T_{Amb} > 50^\circ\text{C}$, the device will run into thermal protection by switching off i.e. device will go in bouncing mode and will recover when ambient temperature is lowered or load is reduced as far as necessary to keep device in working condition.

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TECHNICAL DATA FOR PSG960F24RM

Input	
Nominal input voltage / frequency	3 x 400-500 VAC / 50-60 Hz or 500 VDC (for ITE only)
Voltage range	320-600 VAC or 450-800 VDC
Frequency	47-63 Hz
Nominal current	< 1.70 A @ 3 x 400 VAC < 2.25 A @ 560 VDC
Inrush current limitation. I _{2t} (+25°C) typ.	< 60 A @ 3 x 400 VAC & 3 x 500 VAC < 45 A @ 560 VDC
Mains buffering at nominal load (typ.)	> 20 ms @ 3 x 400 VAC & 3 x 500 VAC > 16 ms @ 560 VDC
Turn-on time	< 1.5 sec.
Internal fuse	T 4 AH / 500 V
Leakage current	< 3.5 mA
Output	
Nominal output voltage U _N / tolerance	24 VDC ± 2 %
Adjustment range of the voltage	24-28 VDC (maximum power ≤ 960 W)
Nominal current	40 A
Derating	> 50°C (2.5 % / °C) in Vertical
Startup with capacitive loads	Max. 10,000 µF
Max. power dissipation idling / nominal load approx.	94 W
Efficiency (at 400 VAC & 500 VAC and nominal values)	> 92.0% @ 3 x 400 VAC & 3 x 500 VAC
Residual ripple / peak switching (20 MHz) (at nominal values)	< 80 mVpp / < 240 mVpp
Parallel operation	PSG960R24SM / With ORing Diode
General Data	
Type of housing	Aluminium
Signals	Green LED DC OK
MTBF	> 300,000 hrs.
Dimensions (L x W x H)	121 mm x 255 mm x 117.3 mm
Weight	2.60 kg
Connection method	Screw connection
Stripping length	7 mm
Operating temperature (surrounding air temperature)	-25°C to +65°C (Refer to Fig. 6)
Storage temperature	-25°C to +85°C
Humidity at +25°C, no condensation	< 95% RH
Vibration (non-operating)	10 to 500 Hz @ 30 m/s ² (3 G peak); displacement of 0.35 mm; 60 min. per axis for all X, Y, Z directions in acc. with IEC 60068-2-6
Shock (in all directions)	30 G (300 m/s ²) in all directions according to IEC 60068-2-27
Altitude (operating)	2,000 Meters for industrial application 2,500 Meters for ITE application
Pollution degree	2
Climatic class	3K3 according to EN 60721
Certification and Standards	
Electrical equipments of machines	IEC 60204-1 (over voltage category III)
Electronic equipment for use in electrical power installations	EN 62477-1 / IEC 62103
Safety entry low voltage	PELV (EN 60204), SELV (EN 60950)
Industrial control equipment	cULus listed to UL 508 and CSA C22.2 No.107.1-01, CSA to CSA C22.2 No.107.1-01 (File No. 250468)
Protection against electric shock	DIN 57100-410
CE	In conformance with EMC directive 2014/30/EU (only AC input) and low voltage directive 2014/35/EU
Component Power Supply for general use	EN 61204-3
ITE	EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024
Industrial	EN 55011
Limitation of mains harmonic currents	EN 61000-3-2
  	
RoHS Compliant	Yes
Safety and Protection	
Transient surge voltage protection	VARISTOR
Current limitation at short-circuits approx.	I _{surge} = 150 % of P _{o max} typically
Surge voltage protection against internal surge voltages	Yes
Isolation voltage:	
Input / output	4 kVAC
Input / PE	2 kVAC
Output / PE	1.5 kVAC
Protection degree	IP20
Safety class	Class I with PE connection

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