

EN	SP960.241-SR Installation Manual	Redundancy Power Supply 1-Phase, 24V, 40A, 960W	
DE	SP960.241-SR Installationsanleitung	Stromversorgung mit eingebauter Redundanz 1-Phase, 24V, 40A, 960W	
FR	SP960.241-SR Manuel d'installation	Alimentation électrique à redondance intégrée 1-Phase, 24V, 40A, 960W	
ES	SP960.241-SR Manual de instalación	Fuente de alimentación redundante 1-Phase, 24V, 40A, 960W	
IT	SP960.241-SR Manuale di installazione	Alimentazione ridondante 1-Phase, 24V, 40A, 960W	
PT	SP960.241-SR Manual de instalação	Fonte de alimentação redundante 1-Phase, 24V, 40A, 960W	



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Read this first!

English

Before operating this device please read this manual thoroughly and retain this manual for future reference! This device may only be installed and put into operation by qualified personnel. If damage or malfunction should occur during operation, immediately turn power off and send device to the factory for inspection. The device does not contain serviceable parts. The information presented in this document is believed to be accurate and reliable and may change without notice. For any clarifications the English translation will be used.



WARNING

Risk of electrical shock, fire, personal injury, or death:

- Turn power off before working on the device. Protect against inadvertent re-powering.
- Do not open, modify or repair the device.
- Use caution to prevent any foreign objects from entering the housing.
- Do not use in wet locations or in areas where moisture or condensation can be expected.
- Do not touch during power-on and immediately after power-off. Hot surfaces may cause burns.

A lire avant mise sous tension!

Français

Veuillez lire ces instructions de montage et d'entretien avant de mettre l'alimentation sous tension. Conservez ce manuel qui vous sera toujours utile. Cette alimentation ne doit être installée que par du personnel qualifié et compétent. En cas de dommage ou dysfonctionnement, coupez immédiatement la tension d'alimentation et retournez l'appareil à l'usine pour vérification. ! L'alimentation ne contient pas de pièces échangeables Les données indiquées dans ce document servent uniquement à donner une description du produit et n'ont aucune valeur juridique. En cas de divergences, le texte anglais fait foi.



AVERTISSEMENT

Prendre en compte les points suivants, afin d'éviter toute détérioration électrique, incendie, dommage aux personnes ou mort:

- Mettre l'alimentation hors tension avant toute intervention sur celle-ci et s'assurer qu'il n'y a pas risque de redémarrage.
- Ne pas ouvrir, modifier ou réparer l'alimentation.
- Veiller à ce qu'aucun objet ne rentre en contact avec l'intérieur de l'alimentation (trombones, pièces métalliques).
- Ne pas faire fonctionner l'appareil dans un environnement humide ou dans un environnement où il peut y avoir de la condensation.
- Ne pas toucher le carter pendant le fonctionnement ou directement après la mise hors tension. Surface chaude risquant d'entraîner des blessures.

Leggere prima questa parte!

Italiano

Prima di collegare il sistema di alimentazione elettrica si prega di leggere attentamente le seguenti avvertenze. Conservare le istruzioni per la consultazione futura. Il sistema di alimentazione elettrica deve essere installato solo da personale competente e qualificato. Se durante il funzionamento si verificano anomalie o guasti, scollegare immediatamente la tensione di alimentazione. In entrambi i casi è necessario far controllare l'apparecchio dal produttore! I dati sono indicati solo a scopo descrittivo del prodotto e non vanno considerati come caratteristiche garantite dell'apparecchio. In caso di differenze o problemi è valido il testo inglese



AVVERTENZA

Il mancato rispetto delle seguenti norme può provocare folgorazione elettrica, incendi, gravi incidenti e perfino la morte:

- Prima di eseguire interventi di installazione, di manutenzione o di modifica scollegare la tensione di rete ed adottare tutti i provvedimenti necessari per impedirne il ricollegamento non intenzionale.
- Non tentare di aprire, di modificare o di riparare da soli l'apparecchio.
- Impedire la penetrazione di corpi estranei nell'apparecchio, ad esempio fermagli o altri oggetti metallici.
- Non far funzionare l'apparecchio in un ambiente umido. Non far funzionare l'apparecchio in un ambiente soggetto alla formazione di condensa o di rugiada.
- Non toccare quando acceso e subito dopo lo spegnimento. La superficie calda può causare scottature.

Product Description

The SP960.241-SR is a DIN-rail mountable single-phase-input power supply with a built-in decoupling MOSFET for 1+1 or n+1 redundant power supply systems. It provides a floating, stabilized and galvanically separated SELV/PELV/ES1 output voltage.

Intended Use

This device is designed for installation in an enclosure and is intended for commercial use, such as in industrial control, process control, monitoring and measurement equipment or the like. Do not use this device in equipment where malfunction may cause severe personal injury or threaten human life without additional appropriate safety devices that are suited for the end-application. If this device is used in a manner outside of its specification, the protection provided by the device may be impaired.

Installation Instructions

The enclosure of this built-in device provides a degree of protection of IP20 and has no protection against spilled liquids. Install the device in an enclosure providing protection against electrical, mechanical and fire hazards. The device is designed for a pollution degree 2 indoor environment. Condensation or frost are not allowed. For outdoor use, install the device in an outdoor enclosure. For dimensioning the input feed, a maximum input current of 13.2A for AC 100V, 10.8A for AC 120V and 5.3A for AC 230V mains is possible. This is the input current at the max. allowed continuous output power and 90% of the rated input voltage.

Install the device onto a DIN rail according to EN 60715 with the input terminals on the bottom of the device. Other mounting orientations require a reduction in output current.

Make sure that the wiring is correct by following relevant local and national codes. Use appropriate copper cables that are designed for a minimum operating temperature of 60°C for ambient temperatures up to +45°C, 75°C for ambient temperatures up to +60°C and 90°C for ambient temperatures up to +70°C. Ensure that all strands of a stranded wire enter the terminal connection. Use ferrules for wires on the input terminals. Unused screw terminals should be securely tightened. The isolation of the device is designed to withstand impulse voltages of overvoltage category III according to IEC 60664-1.

The device is designed as "Class of Protection I" equipment according to IEC 61140. Do not use without a PE (Protective Earth) connection.

The device is suitable to be supplied from TN-, TT- and IT mains networks. The voltage between the L or N terminal and the PE terminal must not exceed 264Vac continuously.

A disconnecting means shall be provided for the input of the device.

The device is designed for free convection cooling and does not require an external fan. Do not obstruct airflow and do not cover ventilation grid!

The device is designed for altitudes up to 5000m. Above 2000m a reduction in output current and overvoltage category is required.

Keep the following minimum installation clearances: 40mm on top and bottom, 5mm at left and right side. Increase from 5mm to 15mm in case the adjacent device is a heat source. When the device is permanently loaded with less than 50%, no lateral clearances are required.

The device is designed, tested and approved for branch circuits up to 32A (IEC) and 30A (UL) without additional protection device. If an external input protection device is utilized, do not use one lower than 16A B- or C-Characteristic to avoid a nuisance tripping.

The maximum surrounding air temperature is +70°C. The operational temperature is the same as the ambient or surrounding air temperature and is defined 3cm below the device.

The device is designed to operate in areas between 5% and 95% relative humidity.

Installation Instructions for Hazardous Location Areas

The device is suitable for use in Class I Division 2 Groups A, B, C, D locations and for use in Group II Category 3 (Zone 2) environments.

Classification: EPS 25 ATEX 1 144 U, II 3G Ex ec nC IIC and IECEx EPS 25.0040U

The devices meet the requirements for temperature class T4 when installed and operated according to the instructions. Compliance must be checked in the end device. Proof can be provided by measuring the temperature at component V100, which must be less than 115°C.

WARNING EXPLOSION HAZARDS!

Use only in standard vertical mounting orientation with the terminals on bottom of the unit.

Substitution of components may impair suitability for this environment.

Do not connect or disconnect the device or operate the voltage adjustment unless power has been switched off or the area is known to be non-hazardous.

A suitable, tool secured, enclosure must be provided for the end product, which has a minimum protection of IP54 and fulfils the requirements of the EN 60079-0.

Functional Description

The output is galvanically isolated from the input voltage. The output is electronically protected against no-load, overload and short circuit. In case of a protection event, audible noise may occur. The device is designed to supply resistive, capacitive or inductive loads. Capacitive loads larger than 20F can result in an intermittent mode of the device. At heavy overloads (when output voltage falls below 13V), the device delivers continuous output current for 2s. After this, the output is switched off for 18s before a restart attempt with 2s is automatically performed. This cycle is repeated as long as overload exists.

The device is equipped with a "Parallel Use" feature, which enables load sharing between power supplies when they are connected in parallel. The "Parallel Use" mode regulates the output voltage in such a manner that the voltage at no load is approx. 4% higher than at nominal load.

Do not apply return voltages from the load to the output higher than 35V.

The output voltage can be adjusted with a small flat-blade screwdriver on the front of the unit.

A green DC LED reports an output voltage above 90% of the adjusted voltage of a running device and is independent of a return voltage from a unit which is connected in parallel.

A red DC LED reports an output voltage below 90% due to overload or output short circuit.

The DC OK relay monitors the output voltage and the contact is closed when the DC LED is green. Max. 0.3A for resistive loads. The sum of output and applied DC OK voltage must not exceed 60Vdc.

The device is equipped with an over-temperature protection. In case of over-temperature, the output shuts down and restarts automatically after cooling off.

Devices can be paralleled to increase the output power. The ambient temperature for parallel use is not allowed to exceed +60°C (+55°C for AC 100V mains). The output voltage of all devices shall be adjusted to the same value (±100mV) with the same load conditions on all units, or the devices' factory settings can be used. After the adjustments, link pin 4.3 and pin 4.4 on all units to set the unit in "Parallel Use" mode. Energize all units at the same time. It also might be necessary to cycle the input power (turn-off for at least five seconds) after output overload or short circuit.

Same devices can be connected in series for higher output voltages. It is allowed to connect as many devices in series as needed, providing the sum of the output voltage does not exceed 150Vdc.

In case of an internal defect, a redundant circuit limits the maximum output voltage to 32V. The output switches off and performs three restart attempts. If the failure continues, the output shuts down. Cycle input power to reset.

Technical data

All values are typical figures specified at 230Vac 50Hz input voltage, 24V 40A output load, single-use mode, 25°C ambient temperature and after a 5 minutes run-in time unless otherwise noted.

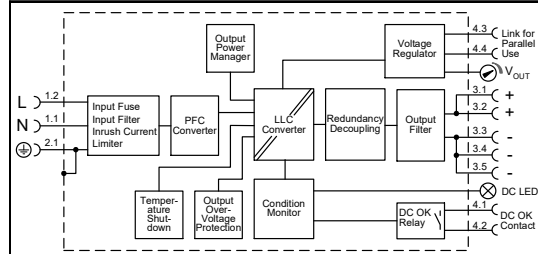
Output voltage	DC 24V	Nominal
Adjustment range	24 – 28Vdc	Factory setting 24.1V
Output current	Continuous for AC 120 – 240V mains	
	48 – 41.1A	Below +45°C ambient
	40 – 34.3A	Below +60°C ambient
	30 – 25.7A	At +70°C ambient
	Derate linearly between +45°C and +70°C	
	Continuous for AC 100 V mains	
	48 – 41.1A	Below +40°C ambient
	40 – 34.3A	Below +55°C ambient
	30 – 25.7A	At +70°C ambient
	Derate linearly between +40°C and +70°C	
	Short-term for AC 100 – 240V mains	
	60 – 51.4A	Short-term, up to 5s

60A represents a case with 1.5 times the nominal output current for up to 5s. The allowed time may be significantly longer depending on the short-term and previously drawn current. See datasheet for details.

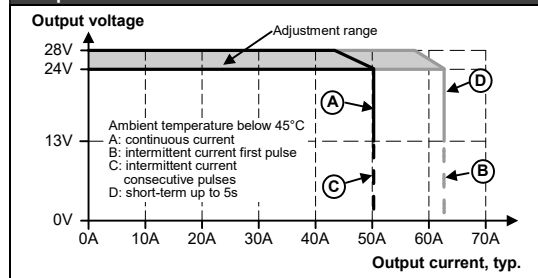
The average output power must NOT exceed the continuous output power.

Input voltage AC	AC 100V	±10%
	AC 120 - 240V	-15%/+10%
Mains frequency	50 – 60Hz	±6%
Input current AC	8.5 / 4.4A	At 120 / 230Vac
Power factor	0.99 / 0.99	At 120 / 230Vac
Input inrush current	14 / 8A peak	At 120 / 230Vac
Efficiency	94.9 / 96.2%	At 120 / 230Vac
Power losses	51.6 / 37.9W	At 120 / 230Vac
Hold-up time	28 / 28ms	At 120 / 230Vac
Temperature range	-25 to +70°C	
Max. wire size (litz wire)	4mm ²	Input terminals
Wire size AWG	AWG 20-10	Input terminals
Max. wire diameter	2.8mm	Input terminals
Wire stripping length	7mm	Input terminals
Tightening torque	1Nm	Input terminals
Max. wire size (litz wire)	10mm ²	Output terminals
Wire size AWG	AWG 22-8	Output terminals
Max. wire diameter	5.2mm	Output terminals
Wire stripping length	12mm	Output terminals
Tightening torque	2.3Nm	Output terminals
Max. wire size (litz wire)	1.5mm ²	Signal terminals
Wire size AWG	AWG 24-16	Signal terminals
Max. wire diameter	1.6mm	Signal terminals
Wire stripping length	7mm	Signal terminals
Size (wxhxd)	96x124x132mm	Without DIN rail
Weight	1700g	

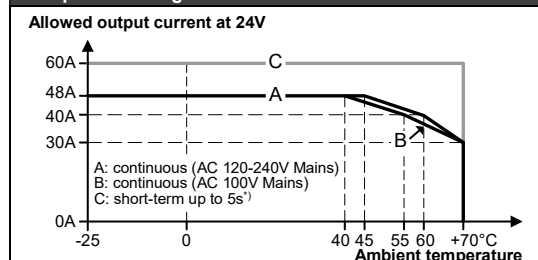
Functional diagram



Output characteristics



Temperature range



*) The curve C represents 60A load current for up to 5s. The allowed time may be significantly longer depending on the short-term and previously drawn current. See datasheet for details. The average output power must NOT exceed the continuous output power.