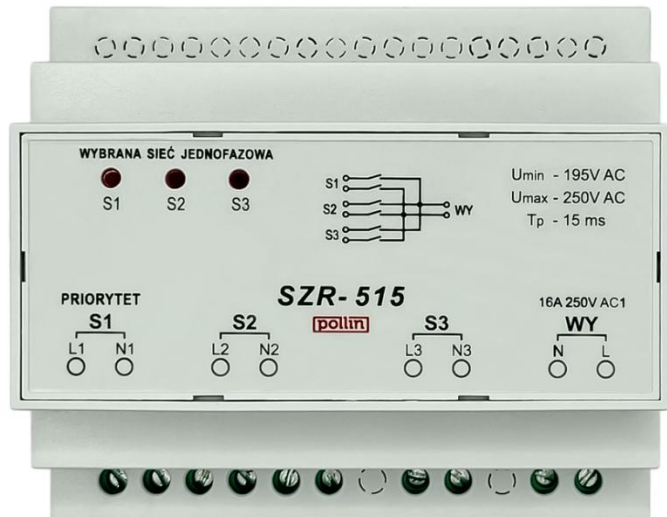


1-phase automatic transfer switch controller SZR-515

Description

- 515 controller is designed for use in automatic transfer switch systems **with three 230 V AC power sources, with or without a common neutral conductor (N)**. Its purpose is to eliminate power outages caused by incorrect grid parameters by automatically switching loads between the primary and backup sources. The SZR - 515 is a simple-to-use and reliable controller that operates with S1 source priority. The device works with a generator, provided the correct power is selected and AVR voltage stabilization is used, ensuring the voltage remains within the permissible range. Voltage measurement is performed using the TRMS method, with sufficient accuracy to control operating thresholds, and the operating frequency is within the 47-52 Hz range, ensuring proper response to typical 50 Hz grid fluctuations.



SZR-515 enables direct power supply to receivers with the following parameters: 16 A 250 V AC AC-1 (2.5 A 250 V AC AC-15).

The modular housing (6 DIN modules) is made of self-extinguishing plastic and is designed for mounting on a TH35 rail.

Principle of operation

- 515 controller controls the parameters of three independent single-phase power sources with a rated voltage of 230 V AC. The front panel features three LEDs – only one illuminates, indicating the currently selected power source (the one fed to the device's output). The SZR - 515 version has factory-set voltage thresholds and transfer time, requiring no user adjustment. The lower threshold is approximately 195 V AC, the upper threshold approximately 250 V AC; the delay for dropping below the lower threshold is approximately 10 s, and for exceeding the upper threshold, the response occurs after approximately 200 ms. TRMS measurement and grid voltage monitoring ensure proper response to both voltage drops and slow voltage fluctuations.

The switching interval is very short – approximately 15 ms – which in practice means uninterrupted power supply for most loads. The controller operates in priority mode, so it automatically returns to the S1 source once its correct voltage parameters are restored.

Cooperation of the SZR-515 controller with a generator or energy storage

The SZR-515 controller can operate with a single-phase generator as a backup power source, provided that the generator is properly matched to the load and has an adequate power reserve and an AVR (Automatic Voltage Regulation) voltage stabilization system, which maintains the voltage at a stable level.

Why is this so important?

controller monitors the power source voltage and, provided it is within the acceptable range, allows the load circuits to be powered from that source. However, if the voltage exceeds the limit values (either over or under), the controller recognizes it as abnormal. This can occur when the generator is unable to maintain stable speed, causing the voltage to "fluctuate." The controller interprets this as an anomaly and shuts down the unstable power source. In such a situation, the controller operates correctly, but a user (unaware of its operating principles) may mistakenly consider it to be faulty.

A similar situation can occur when the power source connected to the SZR-515 controller is an emergency power supply system with an inverter (e.g., energy storage, UPS). The quality of the voltage generated by the inverter is crucial – a waveform with low harmonic distortion (THD < 3%, full sine wave) is required.

Some inverters generate voltages with significant distortion, which results in higher harmonics. This can lead to incorrect interpretation of power supply parameters by the controller's measurement systems, preventing proper switching to the secondary source or incorrectly switching to it.

Power sources that do not generate a "clean" sine wave or do not provide a stable voltage value are not suitable for use with the SZR-515 controller, and their use may lead to unexpected switching or a complete power failure.

It's also worth remembering that implementing automation that automatically starts and stops a generator requires the use of additional devices working in conjunction with the controller. The design of such a system should be carried out by an experienced designer or automation technician with the appropriate knowledge and qualifications.

Pollin is not responsible for the selection or operation of generators or other power sources compatible with the SZR-515 controller. Pollin does not provide consulting services regarding generator selection. Selection of the appropriate device should be entrusted to a qualified specialist who will take into account the nature of the load, voltage stability requirements, and compatibility with the SZR-515 controller.

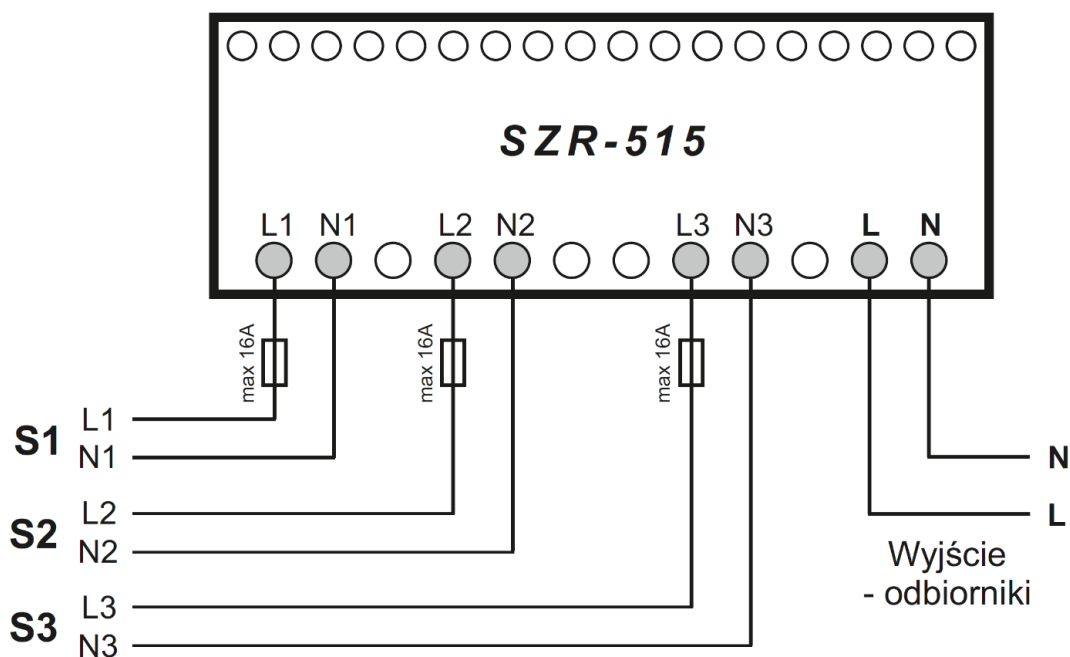
Technical data

Parameter name	Value
Rated supply voltage	3 x 230 V AC + N1, N2, N3 (3 voltage sources without common neutral N)
Operating supply voltages	150 to 265 VAC
Power supply operating frequency	47 to 52 Hz
Operating temperature range	-20 to 50 °C
Max power consumption	9.4 VA
Operating mode	Source Priority S1 (L1, N1)
Cooperation with power generators	Yes
Number of relay outputs	1
Contact arrangement	Voltage output
Maximum load current AC-1	16A / 250V AC
Maximum load current AC-15	2.5A / 250V AC
Measurement of U power supply from 47 to 52 Hz	150 to 265 VAC
Upper threshold U of the power switch L1 L2 L3	250V AC
Lower threshold U of the power switch L1 L2 L3	195V AC
Hysteresis U when switching power supply	Lower switching threshold 7V; upper switching threshold 3V

Parameter name	Value
Measurement accuracy	± 1%
Delay in response to "<" / ">" U power supply	For the lower threshold 10 s; for the upper threshold 200 ms
Switch return response delay	For the lower threshold 10 s; for the upper threshold 10 s
Case	Modular housing (6 DIN modules)
Degree of protection	IP20
Installation	TH35 rail
Delayed response to power asymmetry	-
Switching break time	15 ms
Reaction to incorrect phase sequence	-
Clamp type	Elevator
Wire stripping length	9 mm
Single-wire conductor	0.5 to 2.5 mm ²
Multi-stranded conductor (stranded wire) without ferrule	0.5 to 2.5 mm ²
Stranded wire with square crimp sleeve	0.5 to 2.5 mm ²
Tighten to maximum torque	0.5 Nm

Full technical specifications are available on the website www.pollin.pl/do-pobrania or by scanning the QR code provided in the warranty and guarantee section.

Connection diagram



Installation

The SZR-515 controller must be installed in accordance with applicable electrical installation standards and regulations. The following guidelines are intended to ensure the installer's safety and the proper operation of the device:

1. **Authorizations** - The device may only be installed by a person with appropriate qualifications and authorizations to work on electrical installations.
2. **Disconnecting the power supply** - Before starting any work, it is essential to disconnect the power supply at the distribution board and make sure that the circuit is voltage-free (e.g. using a voltage indicator).
3. **Personal Protection** - The installer should use personal protective equipment such as electrically insulating gloves and safety glasses.
4. **Mechanical installation** - The device should be mounted on a standard TH35 rail in the distribution board, ensuring stable mounting and adequate ventilation space.
5. **Wiring** - Connections should be made according to the wiring diagram provided by the manufacturer. Ensure that the terminals are tightened with the correct torque and that wires of the appropriate cross-section are used. Only one wire may be inserted into each terminal – regardless of whether it is solid or stranded with a crimped ferrule. NOTE! The bottom of the SZR-515 controller has two output terminals marked "L" and "N" – these terminals carry 230 V AC.
6. **Checking the connections** - After completing the installation, carefully check the correctness of all connections, make sure that the terminals are securely tightened and that there are no exposed wires that could cause a short circuit or a shock hazard.
7. **Restoring Power** - After completing the installation and inspection, turn on the power and check the operation of the device according to the instructions.
8. **Tests** - After completing the assembly, check the correct operation of the device.

Sequence of assembly steps :

1. Turn off the power to two or three power sources, which may be three independent sources or different phases of the same system.
2. Attach the SZR-515 controller.
3. Connect the wires according to the diagram.
4. Turn on the power.
5. Check the correct operation of the controller (perform the following steps separately for S1, S2 and S3)
 - Turn off the power source connected to the input terminals being tested, for example, L1 and N1.
The controller should switch the loads to the next available stable backup source. The LED on the appropriate source should be continuously lit.
 - Reconnect the voltage to source S1. After the set recovery time has elapsed, the controller should automatically switch the receivers back to S1. The S1 LED should be continuously lit.

Warranty and guarantee – short information

The warranty applies to every purchaser, including consumers. Warranty claims should be directed to the seller from whom the purchase was made.

If a defect is found in the device, the customer has the right to choose: he or she can use the statutory warranty (in accordance with the provisions of the Civil Code) or the manufacturer's warranty.



Pollin Guarantee



Pollin devices are covered by a 10-year manufacturer's warranty – Zakład Elektroniczny POLLIN Wojciech Polak. The warranty applies only to devices purchased by businesses and covers material and manufacturing defects.

Warranty claims should be submitted by e-mail to: pollin@pollin.pl, in accordance with the procedure described in the full version of the document.

The warranty does not cover, among other things, mechanical damage, unauthorized modifications, installation by unqualified persons and natural wear and tear of consumables.

The full text of the warranty terms is available at: <https://pollin.pl/do-pobrania> or via the attached QR code.

Markings



This symbol on a device indicates that the used equipment should not be disposed of with other household waste. Used equipment should be taken to one of the designated electronic waste collection points or returned to the store when purchasing new equipment. Improper disposal of electronic waste poses a threat to the environment and human health.



The CE marking confirms that the product meets the essential requirements of all applicable European Union directives and regulations.



This marking indicates that installation, connection and all servicing of the device may only be performed by qualified personnel with electrical qualifications.

Technical support – the fastest help from Pollin experts

If you have any questions regarding the operation, configuration or installation of the device, **please contact us by email – this is the fastest way to obtain technical support**.

Send a message to: support@pollin.pl, describe the problem in detail and leave your contact number and the hours when we can call you.

Our engineers will review your request and make every effort to provide you with professional assistance as quickly as possible.



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