

**SINGLE-PHASE BACKUP
SWITCHING CONTROLLER**

SZR-277

WARRANTY. The F&F products are covered by a warranty of the 24 months from the date of purchase. Effective only with proof of purchase. Contact your dealer or directly with us. More information how to make a complaint can be found on the website: www.fif.com.pl/reklamacje



Do not dispose of this device in the trash along with other waste! According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that end point of collection, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.

Purpose

The SZR-277 single-phase controller of backup switching is used to control the voltage of the single-phase power supply network and to switch the receiving line to the power supply from the generator in case of incorrect parameters of the main power supply line.

Functioning

If the mains voltage is within the specified range, the contact between terminals 2-7 is closed and the mains power is transferred to the receiving line. If the permissible voltage parameters are exceeded, the contact 2-7 is opened and the supply line is disconnected from reception. When the main line is disconnected, the generator starts up and then, by closing the 3-9 contact, the power supply from the generator is transferred to the receiving line. If the power supply on the main line is restored and is within the specified range for 10 seconds, the contact 3-9 will

be opened and the generator will be disconnected.

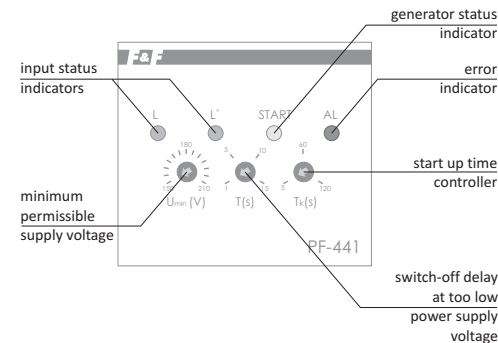
Features

- * control of supply line parameters;
- * protection of receivers against too high or too low voltage;
- * control of the relay contacts and protection against short-circuit of the generator with the main line;
- * generator start up control;
- * emergency, external safety switch;
- * backup power supply of the controller from the battery together with the battery charging system

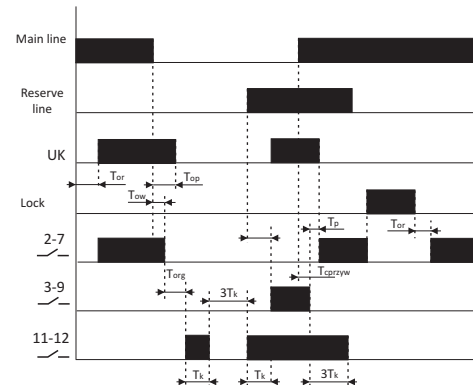


Keep the product in a warm room for at least 2 hours before connecting it to the mains power supply (for storage or transport at low temperatures) to prevent damage caused by condensation.

Control panel



Wykres pracy



Main line	230 V AC mains supply
Reserve line	line supplied from the generator
UK	voltage of contacts control and load switching (terminal 6)
Tor	start-up delay after switching on the power supply or resetting the lock signal (1÷2 seconds)
Tow	delay in disconnecting the line after a power failure
Top	switching time of the devices
Torg	generator start-up delay time (15 seconds)
Tk	generator start-up time
Tcprzyw	time to qualify a line as good (10 seconds)
Tp	time of switching the power supply from reserve to main input (0.3 seconds)

Generator operation



For proper operation of the system it is necessary to have a generator equipped with an automatic start function controlled by closing the contact 11-12 of the SZR-277 controller

In case of incorrect parameters of the main line, the startup process of the generator is carried out according to the following scheme: 15 seconds after disconnecting the main line, the 11-12 contacts that start the generator are closed.

Then, for the time T_k , the controller waits for the start and stabilization of the generator voltage. In case of a proper start-up, contacts 3-9 are closed and the power supply from the generator is connected to the receiving line. If the start-up is not completed correctly, the generator is shut down for a time $3 \times T_k$, followed by another attempt at start-up. Four consecutive unsuccessful attempts to start the generator block further attempts to protect the battery of the generator against discharge.



Resetting of the lock is possible by switching off and on the controller power supply, short pressing of the lock resetting button (input 5) or automatically after 3 minutes of correct operation of the main power supply line.

After disconnecting the receiving line from the generator, its operation is maintained for a time $3 \times T_k$, after which the generator is switched off (opening of contact 11-12).

The battery connected to terminal 4 is used to power the controller when there is no main power supply and the generator has not yet started.

In other cases, the controller is powered from the main line or generator. If the voltage on the main line is correct, it is also used to charge the battery.

Mounting

1. Switch off the power supply of the switchgear.
2. Connect the controller according to one of the following diagrams. It is recommended to use additional contactors for switching the power line (diagram 2). In the case of small loads lower than 16 A (AC-1), the system from scheme 1 can be used.
3. Set the desired controller operation parameters.
4. Switch on the power supply of the switchgear.

Description of leads

- 1 neutral line (N), common for the generator and the main power line
- 2 phase line (L) of the main supply network
- 3 phase line (L') from the generator
- 4 "+" from the battery
- 5 lock input; closing of the contact between 5 and N causes an emergency shutdown of all relays, switching off of the generator and disconnection of the receiving line
- 6 input of output voltage control; line switching is possible if there is no voltage on input 6

7,9
11-12

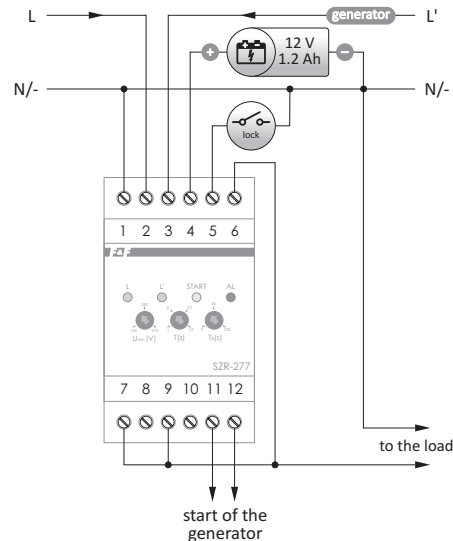
WARNING!

The controller can work without a connected control input, but in this case the protection against gluing contacts of the actuator relays does not work.

power output from the main line and generator relay contacts of generator start-up

Connection scheme

connection with load current <16 A (AC-1)

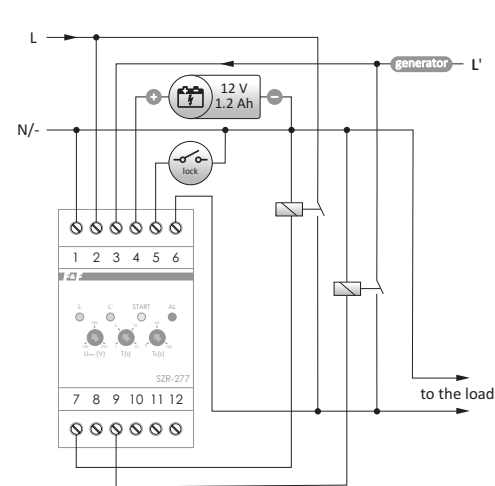


2 — 7

3 — 9

11 — 12

connection with contactors at current load >16 A (AC-1)



2 — 7

3 — 9

11 — 12

Indication

AL failure indication	
load off	on
normal operation	off
incorrect contact configuration (voltage at the Uk output)	4 blinks/sec
relay lock (input 5 connected to the neutral line)	short switching on

L i L' phase status indicators	
reduced voltage/lack of voltage	off
voltage too high	4 blinks/sec
line connected to the reception	on
qualification of the line as good	short switching off
voltage correct, phase is not used	short switching on

START generator status indicators	
generator off	off
generator start	short switching off
countdown of the pause time between a restart attempt	short switching on
normal operation	on
generator error	4 blinks/s

Technical data

rated supply voltage	
mail linia (1-2 terminals)	230 V AC
generator (1-3 terminals)	230 V AC
battery (1-4 terminals)	10÷12 V DC*
maximum permissible voltage (1-2, 1-3 terminals)	400 V AC
contacts	3×NO
maximum switching current of internal contacts	
AC-1	16 A/250 V
AC-15	3 A/250 V
voltage threshold**	
lower (adjustable)	150÷210 V
upper	270 V
hysteresis	5 V
switch-off time	
lower threshold (adjustable)	1÷15 sec
upper threshold	0.3 sec
switching time	0.3 sec
time to qualify the line as a good	10 sec
generator start time	5÷120 sec
durability of relay contacts	>10 ⁵ switchings
power consumption	1.5 W
working temperature	-25÷50°C
connection	2.5 mm ² screw termianls
tightening torque	0.4 Nm
dimensions	3 modules (52 mm)
mounting	on the TH-35 mm rail
protection level	IP20

* recommended battery type: URLA, voltage 12 V, capacity 1.2 Ah

** at voltage over 300 V, the load is disconnected in no more than 0.1 seconds

CE declaration

Declaration of CE conformity of the device can be downloaded from the product page from the website: www.fif.com.pl.

