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PF-432 TRMS

Automatic phase switch,
(for cooperation with a contactor),
with priority phase,
without regulation

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Purpose

The PF-432 TRMS automatic phase switch is used to maintain the continuity of the power supply of a single-phase receiver in case of phase failure or when the phase exceeds preset parameters. The compact size of the device allows you to save space in the electrical cabinet.

By measuring the RMS value of the voltage (True RMS), the switch guarantees the correct operation even when operating with a severely disturbed power supply network.

Functioning

A three-phase voltage (3×230 V+N) is connected to the input terminals of the device. A single-phase voltage (230 V) of one of the phases appears at the output of the relay. The electronic circuit of the switch controls the voltage values of the supplied phases so that the output voltage is not lower or higher than the set

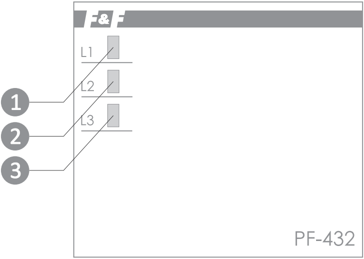
values. The phase with the correct parameters is directed to the output switch. The device measures the RMS value (True RMS) of the voltage, so it is perfect for modern automation systems, where the supply voltage is often distorted due to the operation of nearby devices with pulse power supplies. The corresponding green LED light indicates that the phase is connected to the output of the switch. Phase L1 is the priority phase and if its parameters are correct for a minimum of 5 s, it will be connected to the output. If phase L1 exceeds 253 V or falls below 207 V (its voltage value is incorrect), then either phase L2 or L3 will be connected to the output in turn, depending on which phase is correct. If none of the other phases is correct, the output will be disconnected. If phase L3 is connected to the output and phase L2 returns to the correct parameters, it will be switched to the output (the priority of the phases from highest to lowest is L1, L2, L3). If the output phase voltage is 10 volts below 207 volts, or 10 volts above 253 volts, the switchover will occur with a 10-second delay. If the phase goes outside this range, it will be disconnected immediately (approximately 200 ms).
In addition, the device has a control contact for continuous monitoring of the output status. In this way, it is possible to detect anomalies such as a stuck contact of one of the contactors or a non-functioning contact. If, after all contactors have been switched off, a voltage of more than 20 V is still present at the output for more than 1 s, all LEDs will start flashing. The corresponding contactor will only be switched on when the voltage drops below 20 V. If the decay occurs up to 1 s, the LEDs will not start flashing. This protection detects a possible stuck contactor contact, or prevents the contactor from switching on if the output voltage is generated externally.

If the contactor of the selected phase is switched on and the output voltage after 1 s is at least 10 V lower than the input voltage, the contact is considered to be faulty. The phase is deactivated until the voltage on the device has completely disappeared (reset). This situation is indicated by the flashing of the faulty phase LED. If the device detects that all 3 contactors are faulty, it will attempt self-repair and after 60 s, all of the outputs will be recognised as operational. If the situation persists and none of the contacts are operational, all outputs will be blocked until the power supply fails.

Mounting

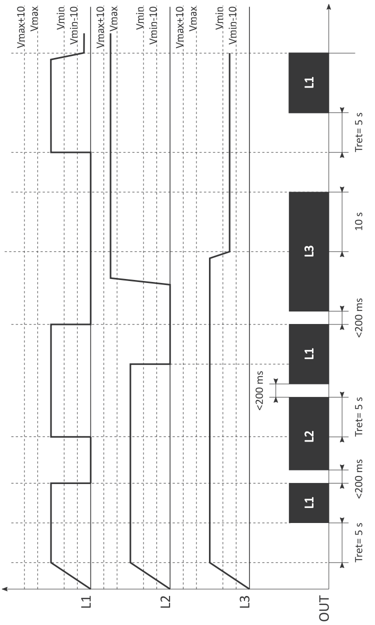
1. .Turn off the power supply.
2. Connect the input voltages to terminals 3, 4, 5 and the neutral wire to terminal 6. Connect the phase with the most variable parameters to terminal 5, while the phase with stabilized parameters to terminal 3 as the priority phase. In the case of a system with contactors, in addition, the voltages of phases L1, L2 and L3 should be input to the input contacts of the contactors.
3. Output:
   » **For direct connection system (<16A)** – short-circuit all outputs K3 (10), K2 (11), K1 (12) and input Uk (9). The phases will be switched through the internal contacts of the switch. Output this circuit connect to the power supply of the receiver.
   » **For a system with contactors (>16A)** – from the outputs K3 (10), K2 (11), K1 (12), lead the power supply to the coils of the corresponding contactors. Connect the outputs of the main tracks of the contactors to each other and connect to the input Uk (9). Output this circuit to the power supply of the receiver.

Front description



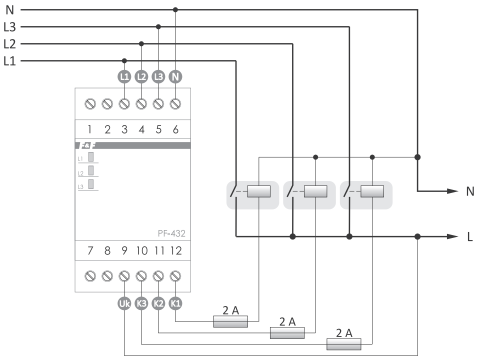
1 indication of the current output L1 phase
2 indication of the current output L2 phase
3 indication of the current output L3 phase

Time course



With the priority phase

Wiring diagram



inuts

3 L1 phase
4 L2 phase
5 L3 phase
6 neutral wire
9 voltage control input

outputs

10 L3 phase contactor coil output
11 L2 phase contactor coil output
12 L1 phase contactor coil output

Technical data

power supply	3×230 V+N
minimum operating voltage (with power from a single phase)	85 V
maximum phase voltage	420 V
frequency	45÷55 Hz
cooperation with power generators	no
maximum load current (AC-1)*	16 A
mechanical strength of contacts	1×10^7
electrical strength of contacts (16 A/AC-1)	1×10^5
TrueRMS measurement	yes
sampling frequency of the signal	2 kHz
actuator	3× relay
return hysteresis	5 V
upper activation threshold	253 V (230 V ±10%)
lower activation threshold	207 V (230 V ±10%)
voltage measurement error	±1%
switching time	200 s
return time	5 s
work mode	with priority phase
indication of the output voltage	3×LED
power consumption	1.5 W
terminal	4.0 mm² screw terminals
tightening torque	0.5 Nm
working temperature	-25÷50°C
dimensions	3 modules (52.5 mm)
mounting	on TH-35 rail
ingress protection	IP20

** This is the permissible load on the internal contacts of the device. When using a system with external contactors, this value will depend on the nominal load current of the contactors used.*

Warranty

F&F products are covered by a 24-month warranty from the date of purchase. The warranty is only valid with proof of purchase. Contact your dealer or contact us directly.

CE declaration

F&F Filipowski sp. j. declares that the device is in conformity with the essential requirements of The Low Voltage Directive (LVD) 2014/35/EU and the Electromagnetic Compatibility (EMC) Directive 2014/30/UE.
The CE Declaration of Conformity, along with the references to the standards in relation to which conformity is declared, can be found www.fif.com.pl on the product subpage.