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## PF-434 TRMS

Automatic phase switch,  
(for cooperation with a contactor),  
with priority phase,  
with regulation



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**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 PF-434 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 ( $3 \times 230 \text{ V} + \text{N}$ ) 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 the upper or lower setting level (its voltage value is incorrect), the output will show the voltage of phase L2 or L3 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 (priority of phases from highest to lowest is L1, L2, L3). If the output phase voltage is 10 V below the set value or 10 V above the set value, the switchover will occur with a 10-second delay. If the phase goes outside this range, it will be disconnected immediately (approximately 200 ms).

The operating voltage range for all three phases is set using the Vmax and Vmin knobs. The Vmax knob determines the maximum permissible output voltage and the Vmin knob determines the minimum voltage. If the phase voltage is between the Vmin and Vmax thresholds, it is considered correct.

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 there is a complete voltage loss on the device (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.

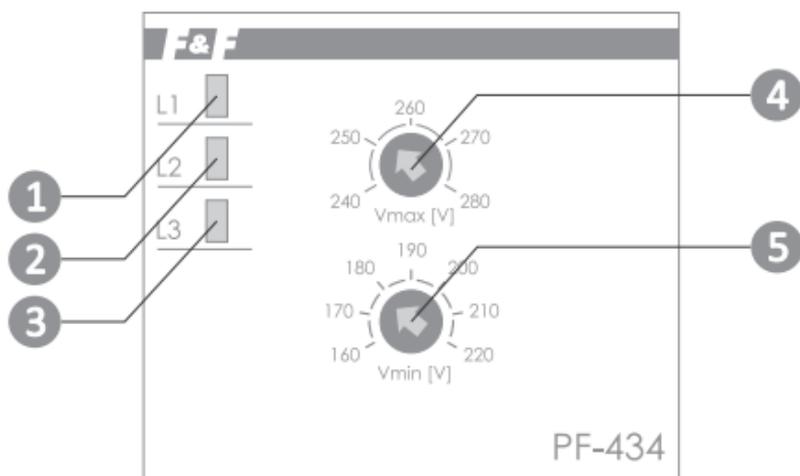
## Mounting

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, and the phase with stabilised parameters to terminal 3, as the priority phase. For the system with contactors, additionally apply the voltages of phases L1, L2 and L3 to the input contacts of the contactors.
3. Output:
  - » **For direct connection (<16 A)** – short-circuit all outputs K3 (10), K2 (11), K1 (12) and input Uk (9). The phases will be switched via the internal contacts of the switch. This circuit is to be connected to the power supply of the load.

- » **For the system with contactors (>16 A)** – from outputs K3 (10), K2 (11), K1 (12) provide power supply to coils of corresponding contactors. Connect outputs of main tracks of contactors to each other and connect to input Uk (9). Output this circuit to the power supply of the receiver.

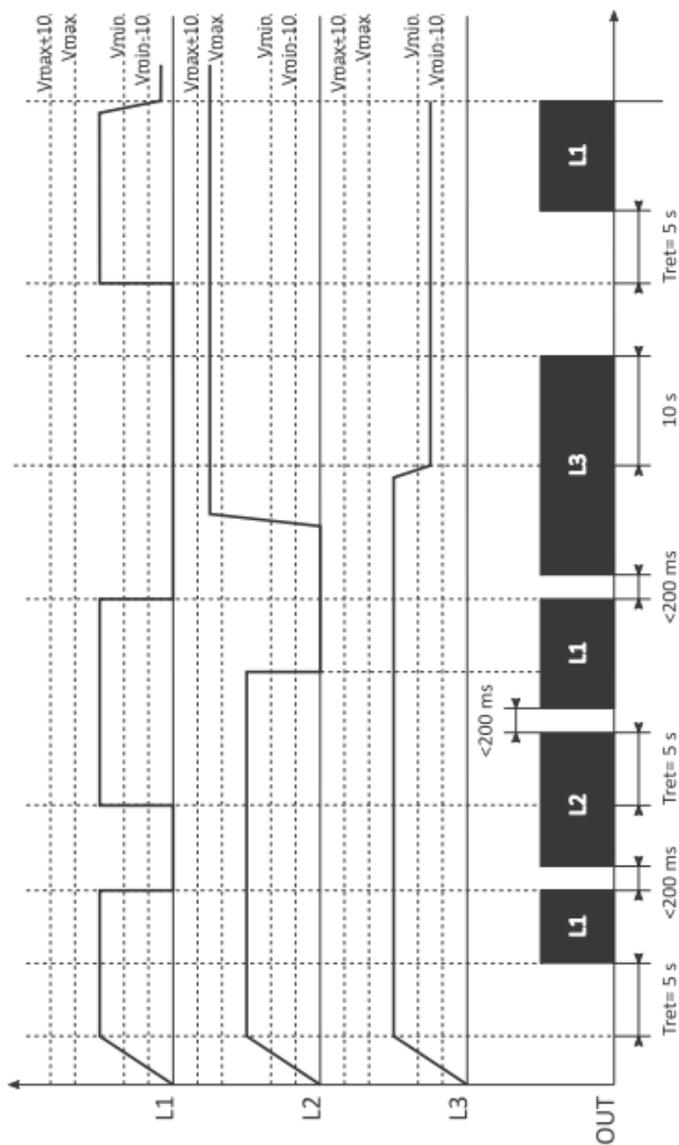
4. Set the upper and lower voltage thresholds with the knobs.

### Front description



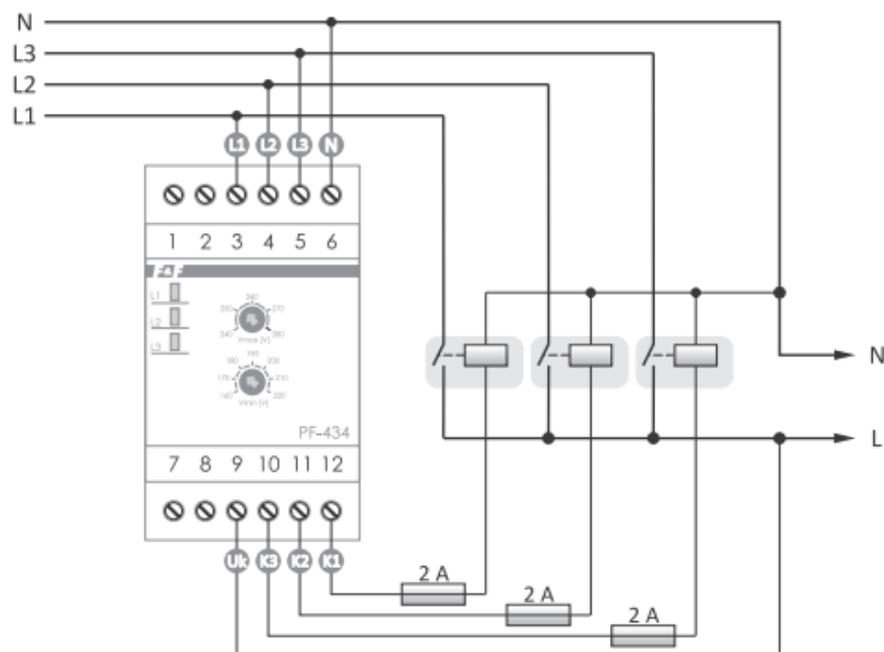
- 1 indication of the current output L1 phase
- 2 indication of the current output L2 phase
- 3 indication of the current output L3 phase
- 4 adjustment of the maximum permissible voltage
- 5 adjustment of the minimum permissible voltage

## Time course



With the priority phase

## Wiring diagram



### inputs

- 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 <sup>7</sup>
electrical strength of contacts (16 A/AC-1)	1×10 <sup>5</sup>
TrueRMS measurement	yes
sampling frequency of the signal	2 kHz
actuator	3× relay
return hysteresis	10 V
setting range V <sub>min</sub>	160÷220 V
setting range V <sub>max</sub>	240÷280 V
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 mm <sup>2</sup> 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](http://www.fif.com.pl) on the product subpage.