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CZF-310 TRMS

Phase loss sensor



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 CZF-310 phase loss microprocessor sensor is designed to protect electric motor powered from the three-phase network in following cases:

- » voltage loss in at least one phase;
- » voltage drop in at least one phase below 150 V;
- » voltage increase in at least one phase above 280 V;
- » voltage unbalance between phases above 55 V.



The sensor correctly measures the true rms value of the voltage (TrueRMS), even when the power supply voltage is (disturbed) distorted.

Functioning

The correct power supply voltage is indicated by illumination of LEDs in the circuit of each phase.

Voltage drop below 150 V or increase above 280 V on at least one, any phase, is signaled by the absence of illumination of the diode corresponding to the phase.

Voltage asymmetry above 55 V is signaled by the flashing of the LED indicating the phase that causes the asymmetry.

If the asymmetry occurs between all phases (e.g. F1 – 170 V, F2 – 220 V, F3 – 270 V) then all LEDs will flash.

Both of the above anomalies (voltage threshold exceeded, asymmetry) cause the device relay to switch off, resulting in the disconnection of the motor.

In the case of asymmetry, the disconnection is carried out with a 4-second delay to avoid accidental shutdowns for temporary disturbances in the network.

In case of voltage drop below 150 V or increase above 280 V, the disconnection is realized after a time of 1 sec.

Re-activation of the relay is automatic when the correct network parameters return (voltage hysteresis is about 5 V).

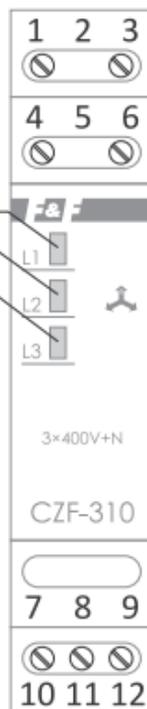
In case of incorrect connection of input wires (phase in place of neutral wire), the diodes flash in the order L1, L2, L3 signaling a connection error (in such a situation the output relay will not be switched on either).

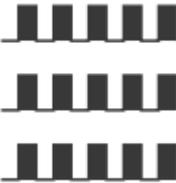
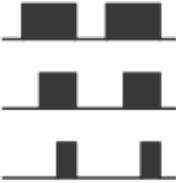


Long-term operation with an incorrectly connected neutral wire can cause irreparable damage to the controller.

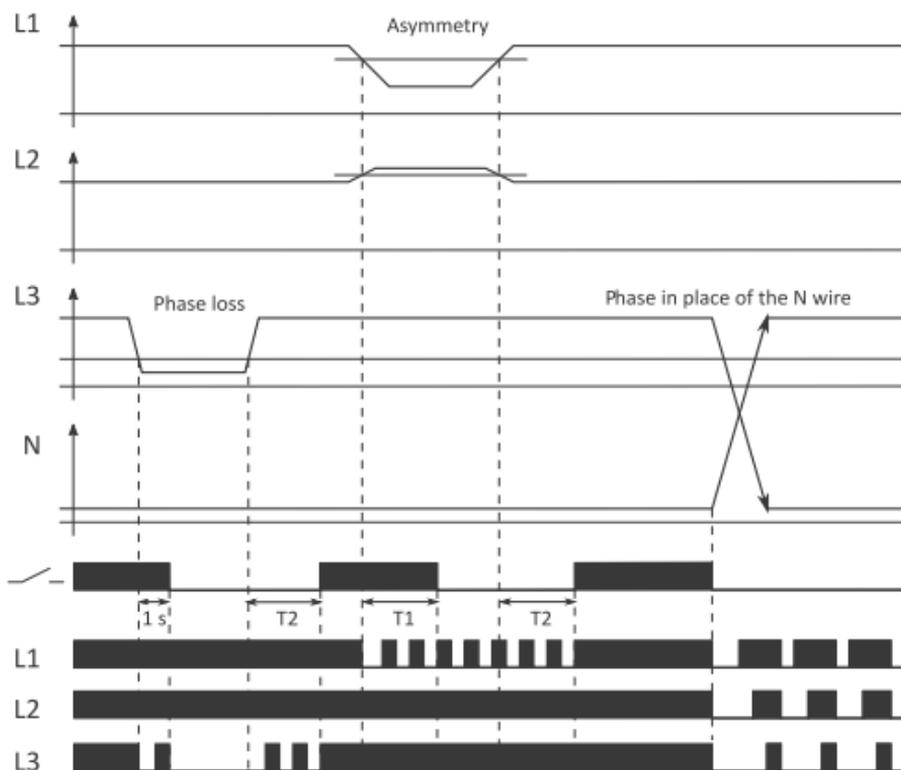
Front panel

phases presence
signalling



Signalling	Description
	<p>Correct network parameters, the relay is on</p>
	<p>L1 phase induces asymmetry above the set value (e.g., for asymmetry of 40 V: L1= 200 V, L2= 245 V, L3= 230 V). Analogous signaling occurs for the other phases.</p>
	<p>All 3 phases cause asymmetry above the set value (e.g., for asymmetry of 20 V: L1= 190 V, L2= 210 V, L3= 240 V)</p>
	<p>Voltage threshold exceeded. L1 phase voltage below 150 V or above 280 V. Analogous signaling occurs for other phases.</p>
	<p>Incorrect connection of neutral wire (phase wire swapped with the neutral wire on the device terminals)</p>

Voltage waveforms



Legend:

$T1 = 4 \text{ s}$

$T2 = 4 \text{ s}$

If a voltage drop below 150 V or a rise above 280 V is detected, the relay will be switched off with a delay of 1 s. The diode corresponding to the phase that exceeded the voltage threshold will be switched off. If the phase voltages return to normal values, the relay will be switched on after T2 time.

If a voltage asymmetry between phases occurs, the relay will be switched off after T1 time. The diode corresponding to the phase that caused the asymmetry will also flash.

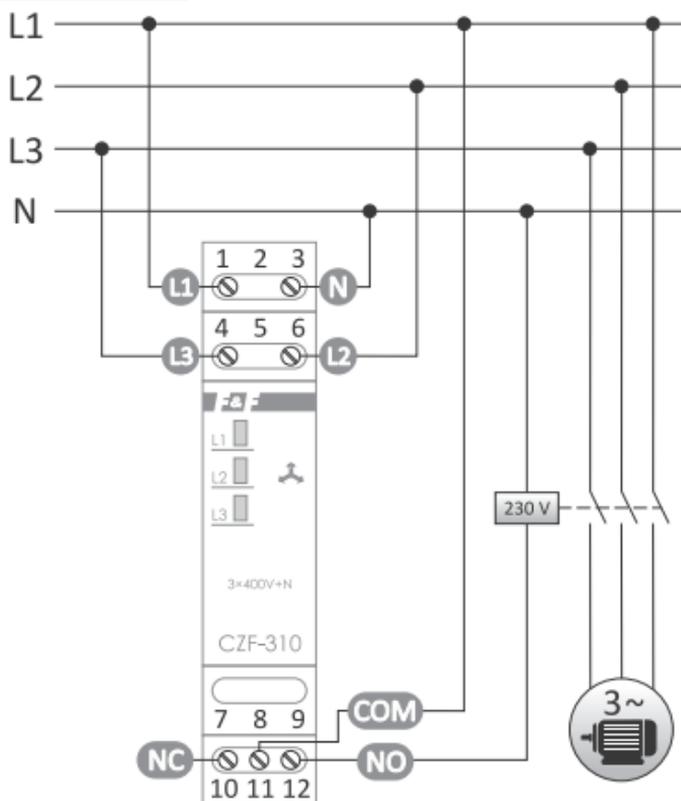
If the phase voltages return to normal values, the relay will be switched on after T2 time.

If the neutral wire is connected to the wrong terminal, the relay will not be switched on, and the LEDs will flash in the order L1, L2, L3.

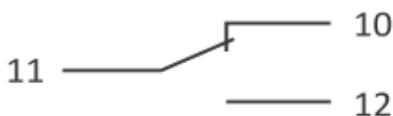
Mounting

1. Check the correct operation of the motor (direction of rotation).
2. Disconnect the power supply.
3. Fix the sensor on a rail in the control box.
4. Connect the phases in sequence to terminals 1, 6, 4. To terminal 3 connect N-wire.
5. Connect the power supply of the switching contactor coil in series to terminals 11-12.
6. Terminals 10-11 can be used for fault signalling.
7. Switch on the power supply.
8. 3 green LEDs L1, L2, L3 are flashing – correct voltage asymmetry and phase voltage value – motor can be started.
9. In any other case than those described in points 8, see the signalling table (page 4).

Wiring diagram



Contacts configuration



Changeover contact of the relay allows to connect a visual or audible signalling system that informs about the relay activation, which means switching off the motor.

Technical data

power supply	3×400 V+N
contact	separated 1×NO/NC
maximum load current (AC-1)	10 A
signalling of correct power supply	3×LED
minimum phase voltage	150 V
maximum phase voltage	280 V
effective voltage unbalance	55 V
voltage hysteresis	5 V
deactivation delay on asymmetry	4 s
deactivation delay in no phase	1 s
activation delay	4 s
power consumption	1.6 W
working temperature	-25÷40°C
terminal	2.5 mm ² screw terminals (cord/wire)
tightening torque	0.4 Nm
dimensions	1 module (18 mm)
mounting	on TH-35 rail
ingress protection	IP20

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.

CE declaration

F&F Filipowski L.P. 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 at www.fif.com.pl on the product page.