



TECHNICAL MANUAL

Phase monitoring relay with LCD RKF-2S EKF

1 DESCRIPTION

Phase monitoring relay with LCD RKF-2S EKF is a microcontroller-based switching and protection device used in automation systems to monitor voltage quality and protect electrical equipment in three-phase AC circuits up to 1000 V. The relay is designed for protection against:

- phase loss;
- undervoltage, with delayed response time;
- overvoltage, with delayed response time;
- asymmetry, with delayed response time;
- phase sequence;
- neutral loss.

The relay has a large LCD with moonlight backlight and programming buttons on the front panel.

The relay enables measuring line and phase voltages (voltmeter mode), setting initial startup and fault recovery delays, automatic fault recovery, voltage and phase sequence control functions.

The relay will react immediately to phase sequence failure as this function is not timer-controlled. Phase loss fault is timer-controlled only for automatic fault recovery delay. On detecting phase loss fault, the relay will trip immediately, without any delay.

The phase monitoring relay complies with IEC 60947-5-1.

2 TECHNICAL DATA

The main technical data are listed in Table 1 below.

Table 1

Characteristics	Values
Supply voltage U_e , V AC	125–300 +N
Rated frequency, Hz	45–65
Overvoltage range, V AC	221–300
Undervoltage range, V AC	150–219
Asymmetry adjustment range, %	5–20
Voltage hysteresis, V	5
Asymmetry hysteresis, %	2
Time delay range (asymmetry, overvoltage or undervoltage), s	0,1–20
Start time delay, s	0,1–30
Recovery time delay, s	0,1–30
Trip delay at phase loss, phase sequence fault, s	<0,2
Voltage measurement error, %	<1 (full scale)
Trip delay accuracy, %	$\pm 5 \pm 0,1$ s
Rated insulation voltage U_i , V	415
Fuse size	5 A
Contacts	2 C/O
Degree of protection	IP20
Pollution degree	3
Electrical endurance, cycles	100 000
Mechanical endurance, cycles	1 000 000

Table 1 continued

Characteristics	Values
Rated load current, A	8 at 230 V, AC-1
Maximum power consumption, VA	2
Altitude above sea level, m	max. 2000
Operating temperature, °C	-20 to +55
Storage temperature, °C	-30 to +70
Max. conductor cross-section, mm ²	2,5
Tightening torque, N•m	0,5
Mounting	35 mm DIN rail

Principle of Operation

If the power supply is normal, the contacts of the relay (11-14; 21-24) are closed and the controlled device will be energized. In the event of a fault, the relay contacts open. The relay settings menu can be used to turn the functions on/off or to set the time delay.

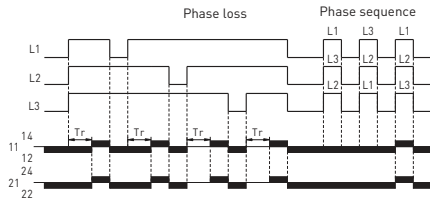


Fig. 1 – Principles of relay operation during phase loss / sequence fault

Overvoltage and undervoltage (with time delay)

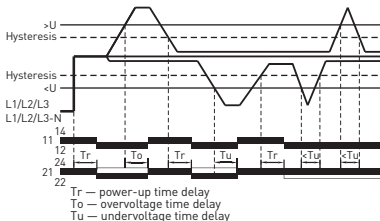


Fig. 2 – Principles of relay operation during over- or undervoltage

Voltage asymmetry (with delayed response)

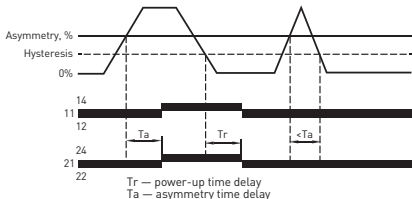


Fig. 3 – Principles of relay during voltage asymmetry

3 INSTALLATION AND OPERATION

Setup:

1. Install and secure the relay in the intended location.
2. Connect the relay as per wiring diagram (refer to Figure 4).
3. Set the desired voltage setpoints (refer to "Configuring the relay" paragraph).
4. Set the desired trip conditions and timings (refer to "Configuring the relay" paragraph).
5. Press the up or down button to cycle through displayed phase voltages (refer to Figure 6).

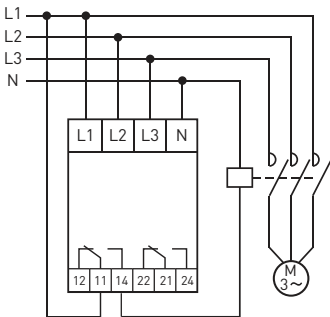


Fig. 4 – Relay wiring diagram

The main control elements of the relay are shown in Figure 5.

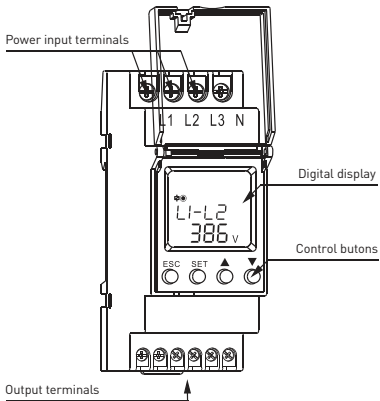


Fig. 5 – Main control elements of the relay

The displayed elements are shown in Table 2.

Table 2

Display	Description
	Indicates that relay is in operation mode
	Indicates that relay is off
Start	Indicates that relay is powering up
Error	Indicates a malfunction, in the even of malfunction the relay opens the circuit
SET	Indicates that relay is in settings mode
OV	Overvoltage values or overvoltage settings
UV	Undervoltage values or undervoltage settings
PHSEQ	Indicates phase loss or phase sequence fault
PHFAILS	Indicates phase failure
ASY	Asymmetry values or asymmetry settings

The control buttons are listed in Table 3.

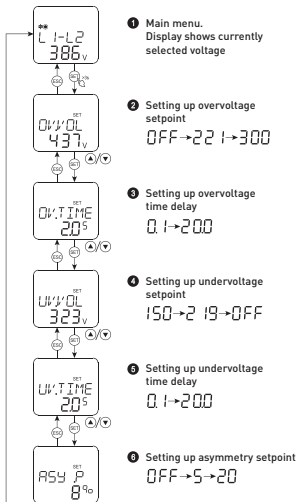
Table 3

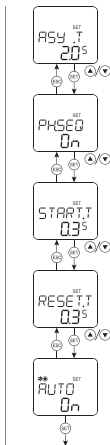
ESC 	Exit menu / Return to the previous menu item
	Scroll menu items / Displayed phase voltage switch (next)
SET RST 	Manual reset
SET 	Enter menu / Confirm
	Scroll menu items / Displayed phase voltage switch (previous)



Fig. 6 – Three-phase voltage display

Configuring the Relay





- 7 Setting up asymmetry time delay

0.1→200

- 8 Setting up phase sequence tripping

0n→OFF

- 9 Setting initial startup timer

0.3→300

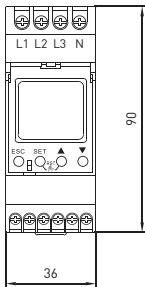
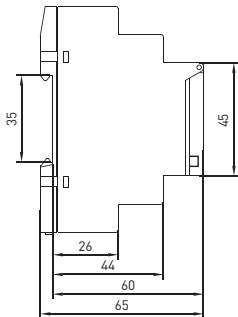
- 10 Setting automatic reset timer

0.3→300

- 11 Setting automatic reset (on/off)

0n→OFF

4 OVERALL DIMENSIONS



5 OPERATION CONDITIONS

Operating temperature: -5°C to +50°C

Max. altitude above sea level: 2000 m.

6 DELIVERY SCOPE

The phase monitoring relays are supplied in individual and group package. For all available documentation, scan the QR-code on the insert or on the inside of the package.

7 SAFETY REQUIREMENTS

Do not operate relays with visible mechanical damage.

The relays conform to IEC 61140 Class 0 for protection against electrical shock and must be installed in Class 1 enclosures or higher.

8 MAINTENANCE

The relay must be installed and maintained by qualified personnel. For maintenance, follow national safety rules for operation of electrical Installations.

Under normal operating conditions, visually inspect the relay and check the set modes and trigger time every 6 months.

Tighten the screw terminals, as they may become loose due to cyclical changes in the ambient temperature and material flow.

Follow the wiring diagram when installing the relay.

Do not install the relay without protective cover in any area exposed to water or direct sunlight.

9 TRANSPORTATION AND STORAGE

Relays can be transported by any means of enclosed transport that protects the packaged goods from mechanical impact and weather exposure.

Relays shall be stored indoors, in their original packaging, at the ambient temperatures from -25°C to +75°C and max. relative humidity of 80% at +25°C.

10 DISPOSAL

Life-expired and failed products shall be disposed of in compliance with the effective national and local laws and regulations.

To dispose of the product, send it to an authorized company for recycling in compliance with the effective national and local laws and regulations.

11 MANUFACTURER'S WARRANTY

The manufacturer guarantees the relays comply with the declared characteristics, provided that the consumer observes the operation, transportation and storage conditions and requirements.

Warranty period: 7 years from the date of sale specified in the sales receipt. Shelf life: 7 years from the date of manufacture specified on the product package or housing. Service life: 10 years.

Manufacturer: OOO Electroresheniya, Otradnaya st., 2b/9, 127273, Moscow, Russia, tel. +7 (495) 788-88-15.

Importer and EKF trademark service representative:

EKF ELECTRICAL SOLUTION – FZCO, Dubai Silicon Oasis, DDP, Building A2, Dubai, United Arab Emirates, tel. +971-4-547-06-18.

Importer and EKF trademark service representative on the territory of the Republic of Kazakhstan:

TOO «Energoresheniya Kazakhstan», Kazakhstan, Almaty, Bostandyk district, Turgut Ozal st., 247, apt 4.

12 CERTIFICATE OF ACCEPTANCE

Phase monitoring relay with LCD RKF-2S EKF has been manufactured in compliance with the effective laws and regulations and has been approved for operation.

Date of manufacture: for information,
refer to the product package.

Quality control stamp

EHL



v3

ekfgroup.com

EKF