



TECHNICAL MANUAL

Phase monitoring relay with
LCD display RKF-2S EKF

1 DESCRIPTION

Phase monitoring relay with LCD display RKF-2S EKF is a micro-controller-based device. The relay is used in automation systems and is designed for high-precision control of the power supply quality in electrical installations up to 1000 V AC in a three-phase network.

The relay monitors the following conditions:

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

Relay capabilities:

The relay has an easy to read LCD display with moonlight backlighting and convenient programming buttons on the front panel.

The relay allows for measuring line and phase voltages (voltmeter mode), setting first-up and fault recovery time delay, enabling and disabling automatic fault recovery, enabling and disabling voltage control and phase sequence functions.

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

The phase monitoring relay complies with IEC 60947-5-1:2009.

2 TECHNICAL DATA

The main technical data are listed in Table 1 below.

Table 1

Characteristics	Values
Supply voltage (Ue), V AC	125-300 +N
Rated frequency, Hz	45-65
Overvoltage range, V AC	221-300
Undervoltage range, V AC	150-219
Voltage asymmetry range, %	5-20
Voltage hysteresis, V	5
Asymmetry hysteresis, %	2
Time delay range (asymmetry, overvoltage or undervoltage), s	0,1-20
First-up 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, %	±5 +0,1 s
Rated insulation voltage, (Ui), V	415
Fuse size	5 A
Contacts	2 C/O
Degree of protection	IP20
Pollution degree	3
Electrical life, cycles	100 000
Mechanical life, cycles	1 000 000
Rated load current, A	8 at 230 V AC1

Characteristics	Values
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 N•m
Mounting	35 mm DIN rail

2.1 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 an emergency, the relay contacts open. The relay settings menu can be used to turn the functions on/off or to set the time delay.

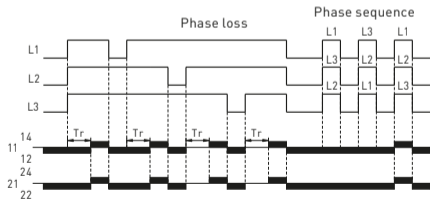


Figure 1 – Principles of relay operation during phase loss / sequence fault

Overvoltage and undervoltage (with time delay)

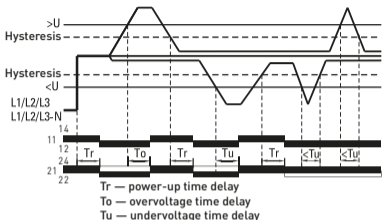


Figure 2 – Principles of relay operation during over- or undervoltage

Asymmetry (time delayed)

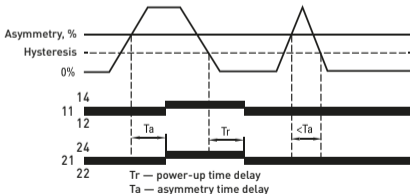


Figure 3 – Principles of relay during voltage asymmetry

3 INSTALLATION AND OPERATION

SETUP:

1. Install and secure the relay in the intended location.
2. Connect the relay as per wiring diagram (Fig.4).
3. Set the desired voltage setpoints (see p.3.1).
4. Set the desired trip conditions and timings (see p.3.1).
5. Press the up or down arrow to cycle through displayed phase voltages (Fig. 6).

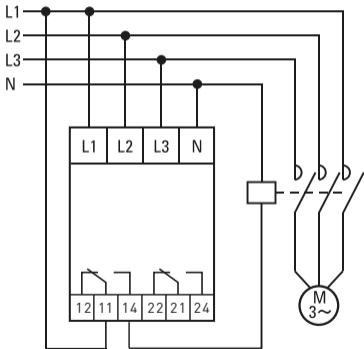


Figure 4 - Relay wiring diagram

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

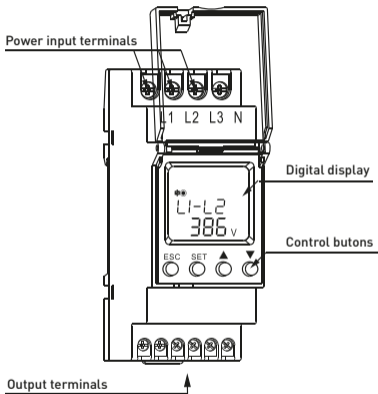


Figure 5 - Main control elements of the relay

The displayed elements are shown in Table 2.

Table 2

Display	Description
⊕●	Indicates that relay is operational
⊕○	Indicates that relay is off
Start	Indicates that the 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	Overtoltage 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

A breakdown of the control buttons is given in Table 3.

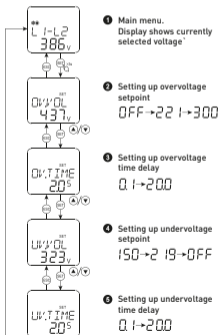
Table 3

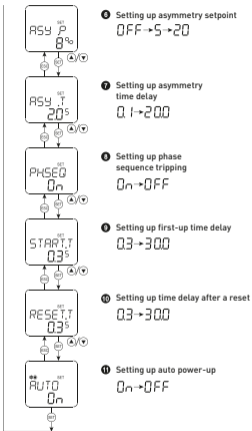
ESC ●	Exit menu / Return to the previous menu item
▲ ●	Scroll menu items / Displayed phase voltage switch (next)
SET RST ● ← ●	Manual reset
SET ●	Enter menu / Confirm
● ▼	Scroll menu items / Displayed phase voltage switch (previous)



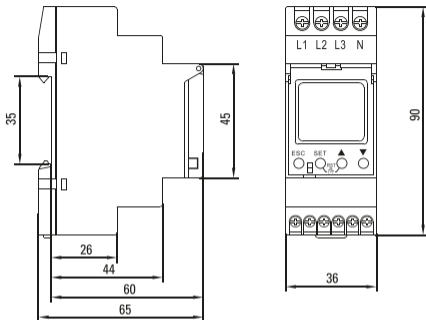
Figure 6 - Three-phase voltage display

3.1 Configuring the Relay





4 OVERALL DIMENSIONS



5 DELIVERY SCOPE

Phase monitoring relay with LCD display RKF-2S EKF — 1 pc.

6 SAFETY REQUIREMENTS

- 6.1. Do not operate relays with visible mechanical damage.
- 6.2. The relays conform to IEC 61140 Class 0 for protection against electrical shock and must be installed in Class 1 enclosures or higher.

7 MAINTENANCE

7.1. For maintenance, follow national safety rules for operation of electrical Installations.

7.2. Under normal operating conditions, visually inspect the relay and tighten screw terminals every 6 months.

7.3. Do not operate the device with damaged housing.

7.4 The relay must be installed and maintained by qualified personnel.

7.5 Do not install the relay without a protective cover in any area which is exposed to water, corrosion or direct sunlight.

8 TRANSPORTATION AND STORAGE

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

8.2 Relays shall be stored indoors, in their original packaging, at the ambient temperatures from -30 °C to +70 °C and max. relative humidity of 80% at +25 °C.

9 DISPOSAL

Life-expired and failed the twilight relay with LCD display RKF-2S EKF shall be disposed of in compliance with the national and local laws and regulations in force. To dispose of the product, send it to an authorized company for recycling in compliance with the national and local laws and regulations in force.

10 MANUFACTURER'S WARRANTY

10.1 The manufacturer guarantees the relays comply with the declared characteristics and requirements of IEC 60947-5-1:2003, provided that the consumer follows the operation, transportation and storage conditions and requirements.

10.2 Service life: 10 years.

10.3 Shelf life: 7 years.

10.4 Warranty period: 7 years.

Manufacturer: for information, refer to the product package.

Importer and EKF trademark service representative: EKF ELECTRICAL SOLUTION – FZCO, Dubai Silicon Oasis, DDP, Building A2, Dubai, United Arab Emirates.

Importer and EKF trademark service representative on the territory of the Russian Federation: OOO «Electroresheniya», Otradnaya st., 2b bld. 9, 5th floor, 127273, Moscow, Russia. Tel.: +7 (495) 788-88-15.

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.

11 CERTIFICATE OF ACCEPTANCE

Phase monitoring relay with LCD display RKF-2S has been manufactured in compliance with the applicable regulations and requirements and has been approved for operation.

Date of manufacture:

For information, refer to the product package.

Quality control stamp

EAC



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