



## TECHNICAL MANUAL

Phase monitoring relay

RKF-31, RKF-34, RKF-37 EKF

## 1 DESCRIPTION

Phase monitoring relay RKF-31, RKF-34, RKF-37 EKF are electro-mechanical switching devices designed to monitor voltage in three-phase AC circuits and to protect the load in the event of a drop or increase in the supply voltage beyond the preset values, as well as in the event of phase loss, incorrect phase sequence and voltage asymmetry. Over- and undervoltage setpoints can be adjusted (see Table 2). The available functions for each type of relay are presented in Table 1.

Phase monitoring relays complies with IEC 60947-5-1.

## 2 TECHNICAL DATA

Table 1

| Name   | Overvoltage, U> | Undervoltage, U< | Phase loss | Phase sequence fault | Voltage asymmetry |
|--------|-----------------|------------------|------------|----------------------|-------------------|
| RKF-31 |                 |                  | •          | •                    |                   |
| RKF-34 | •               | •                | •          |                      |                   |
| RKF-37 | •               | •                | •          | •                    | •                 |

Table 2 - Technical data

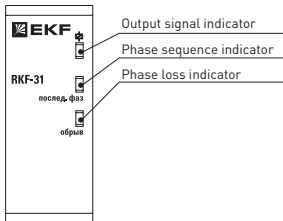
| Characteristics            | Values                     |             |
|----------------------------|----------------------------|-------------|
| Connection                 | 3-wire                     | 4-wire      |
| Supply voltage Un, V       | 380/400/415                | 220/230/240 |
| Operating voltage range, V | 266-540                    | 154-312     |
| Rated frequency, Hz        | 50/60                      |             |
| U> setting range           | (1,05-1,25)*Un             |             |
| U< setting range           | [0,75-0,95]*Un             |             |
| Voltage asymmetry range, % | Adjustable 5-20% Preset 8% |             |

Table 2 continued

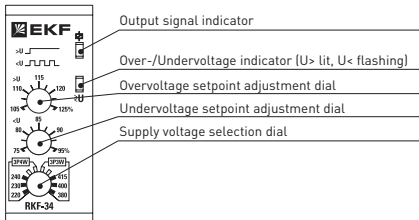
| <b>Characteristics</b>                               | <b>Values</b>                      |
|------------------------------------------------------|------------------------------------|
| Overvoltage trip delay                               | Preset 2 s                         |
| Undervoltage trip delay                              | Preset 2 s                         |
| Asymmetry trip delay                                 | Preset 2 s                         |
| Voltage hysteresis, V                                | 6                                  |
| Asymmetry hysteresis, %                              | 2                                  |
| Time delay at phase loss and phase sequence fault, s | <0,5                               |
| Trip delay accuracy, %                               | ±10 +0,1 s                         |
| Set-point accuracy, %                                | 1 (full scale)                     |
| Rated insulation voltage $U_i$ , V                   | 480                                |
| Output contacts                                      | 2 C/O                              |
| Rated current, A                                     | 8 at 250V, AC-1                    |
| Electrical endurance, cycles                         | 100 000                            |
| Mechanical endurance, cycles                         | 1 000 000                          |
| Degree of protection                                 | IP20                               |
| Pollution degree                                     | 3                                  |
| Operating temperature, °C                            | -20 to +55                         |
| Conductor cross-section, mm <sup>2</sup>             | 0,5–2,5                            |
| Tightening torque, N•m                               | 0,5                                |
| Altitude above sea level, m                          | 2000                               |
| Max. relative humidity                               | ≤ 50% at 40 °C<br>(non-condensing) |
| Storage temperature, °C                              | -30 to +70                         |
| Mounting                                             | DIN rail                           |

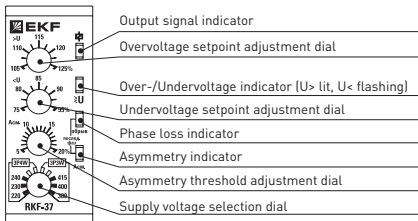
## CONTROL PANEL

### RKF-31



### RKF-34





## Phase loss and phase sequence

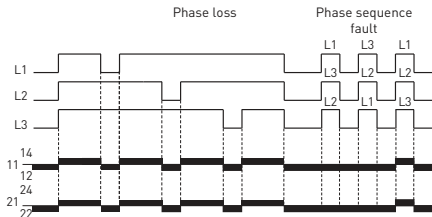


Fig. 1 – Principles of relay operation during phase loss and incorrect phase sequence

## OVER- AND UNDERVOLTAGE

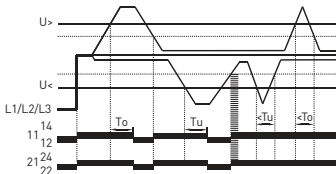
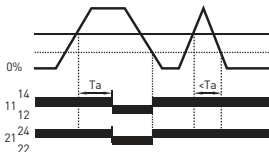


Fig. 2 – Principles of relay operation during over- or undervoltage

## VOLTAGE ASYMMETRY



Coefficient of asymmetry: 
$$Asy = \frac{U_{max} - U_{min}}{U_n}$$

Fig. 3 – Principles of relay operation during voltage asymmetry

## WIRING DIAGRAM

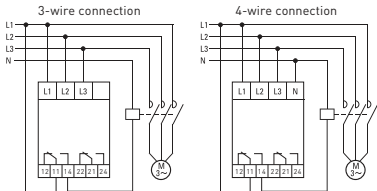


Fig. 4 – Relay wiring diagram

## 3 OVERALL DIMENSIONS

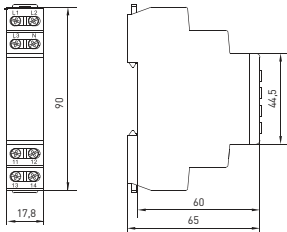


Fig. 5 – Overall dimensions of phase monitoring relays

## **4 INSTALLATION AND OPERATION**

The relay must be installed and maintained by qualified personnel.

Make sure the circuit is de-energized before relay installation and connection.

Before connecting, select the supply voltage (RKF-34, RKF-37 models).

Do not change the supply voltage setpoint while the relay is energized.

In case of a circuit fault, the output contact of the relay will remain open after the relay is energized.

In the undervoltage event the relay will trip after a preset time delay (RKF-34, RKF-37).

If the circuit voltage is  $\leq 0,5U_n$ , the relay will trip with phase loss fault.

Phase sequence and phase loss faults will trip the relay and light up an associated LED without time delay.

## **5 OPERATION CONDITIONS**

Operating temperature:  $-5^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$

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 char-

acteristics, 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 RKF-31, RKF-34, RKF-37 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

EHF



v3

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# EKF