EKF

TECHNICAL MANUAL

Phase monitoring relay RKF-23/24 EKF

1 DESCRIPTION

Phase monitoring relay RKF-23/24 EKF is a microprocessor-based device used in automated control circuits 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, delayed response time;
- overvoltage, delayed response time;
- voltage asymmetry with delayed response time;
- phase sequence.

The relay has easy to read LED indicators and front dials to adjust user settings.

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

2 TECHNICAL DATA

Table 2 – Main characteristics

Characteristics	**rkf-24**	**rkf-23**
Supply voltage Ue, V	127 / 132 / 138 / 220 / 230 / 240 / 254 / 265	220 /230 / 240 / 380 / 400 / 415 / 440 /459
Rated frequency, Hz	45–65	
Overvoltage range	(1,02–1,3)*Ue	
Undervoltage range	(0,7–0,98)*Ue	
Voltage asymmetry adjustment range, %	5–40	
Voltage hysteresis, %	2	
Response time delay range (asymmetry, overvoltage or undervoltage), s	0,1–10	

Table 2 continued

Characteristics	**rkf-24**	**rkf-23**
Trip time at phase loss, phase sequence fault, s	⩽0,2	
Re-closing delay, s	0,1–10	
Voltage measurement accuracy, %	<1 (full scale)	
Trip delay accuracy, %	±10	
Set-point accuracy, %	1 (full scale)	
Rated insulation voltage Ui, V	690	
Contacts	2 C/O (change-over)	
Degree of protection	IP20	
Pollution degree	3	
Electrical endurance, cycles	100 000	
Mechanical endurance, cycles	1 000 000	
Rated contact current, A	8 (AC-1)	
Rated load current, A	2 x 8 at 250 V (AC-1)	
Maximum power consumption, VA	2	
Max. altitude above sea level, m	2000	
Operating temperature, °C	-20 to +55	
Storage temperature	-35 to +75	
Max. conductor cross-section, mm^2	2,5	

3 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, relay contacts open and the controlled device is de-energized. The relay trips with an adjustable time delay (0,1–10 seconds) to prevent accidental load drop due to short duration changes in supply voltage. The relay will automatically re-close after the supply voltage returns to the normal range.

FUNCTION DIAGRAM

Phase loss and phase sequence (no-delay tripping).

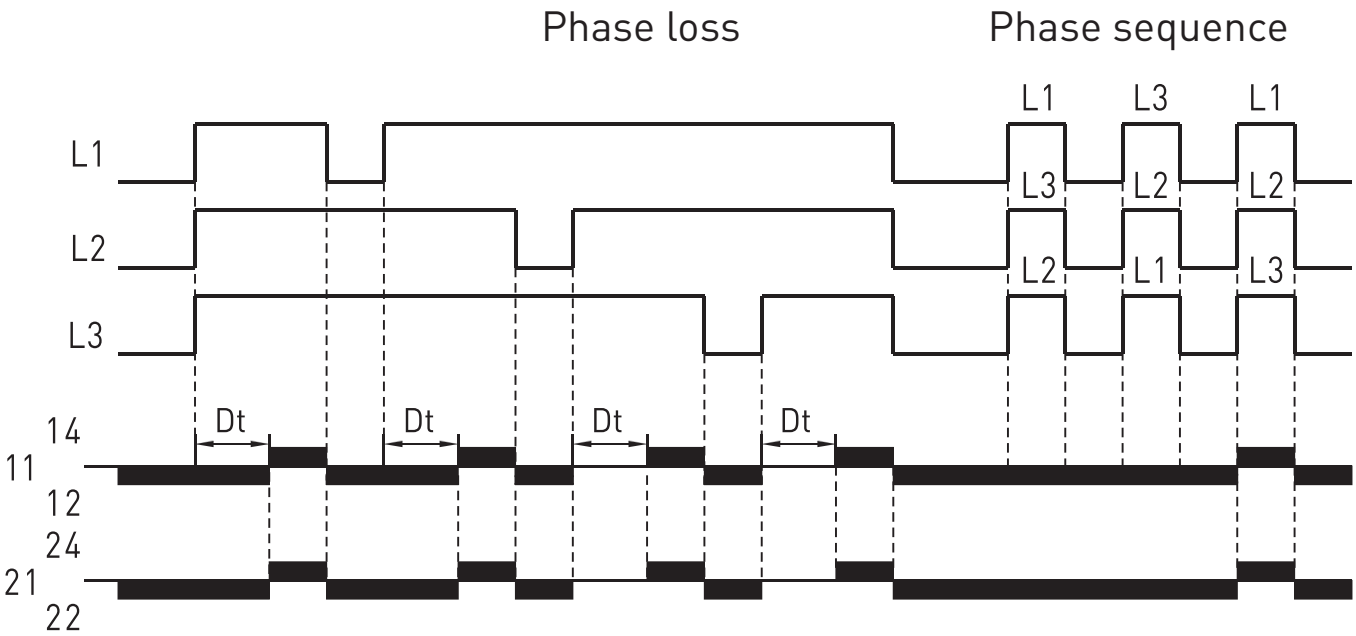
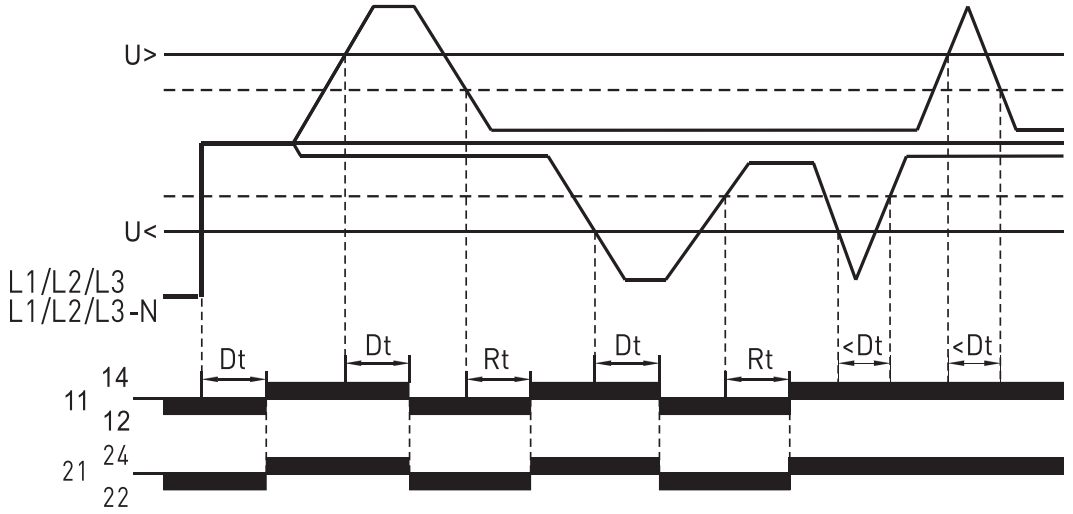


Fig. 1 – Principles of relay operation during phase loss / sequence fault

WARNING! Phase failure and phase sequence faults will trip the relay with no delay.

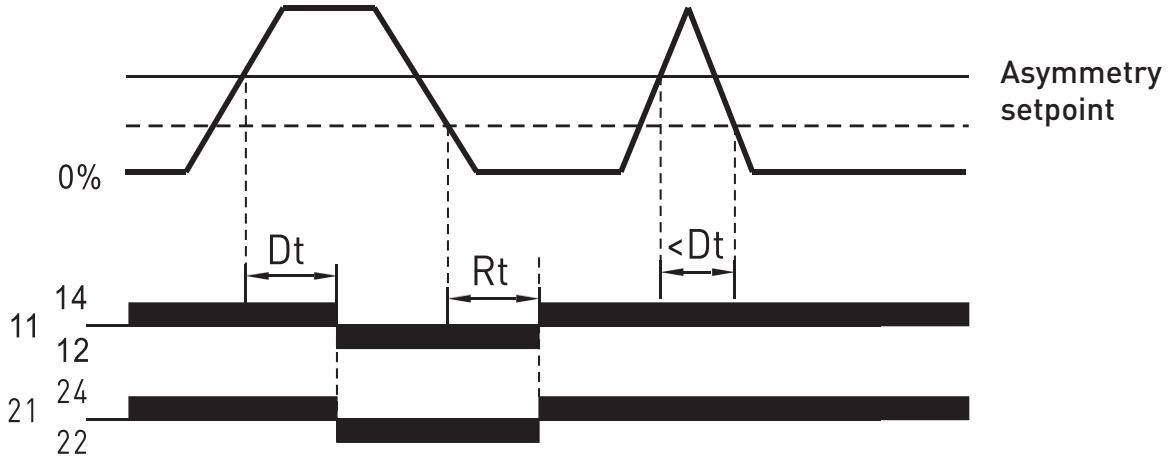
Over- and undervoltage (time delay trip).



Dt — response (trip) delay
Rt — re-closing delay

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

VOLTAGE ASSYMETRY (WITH DELAYED RESPONSE)



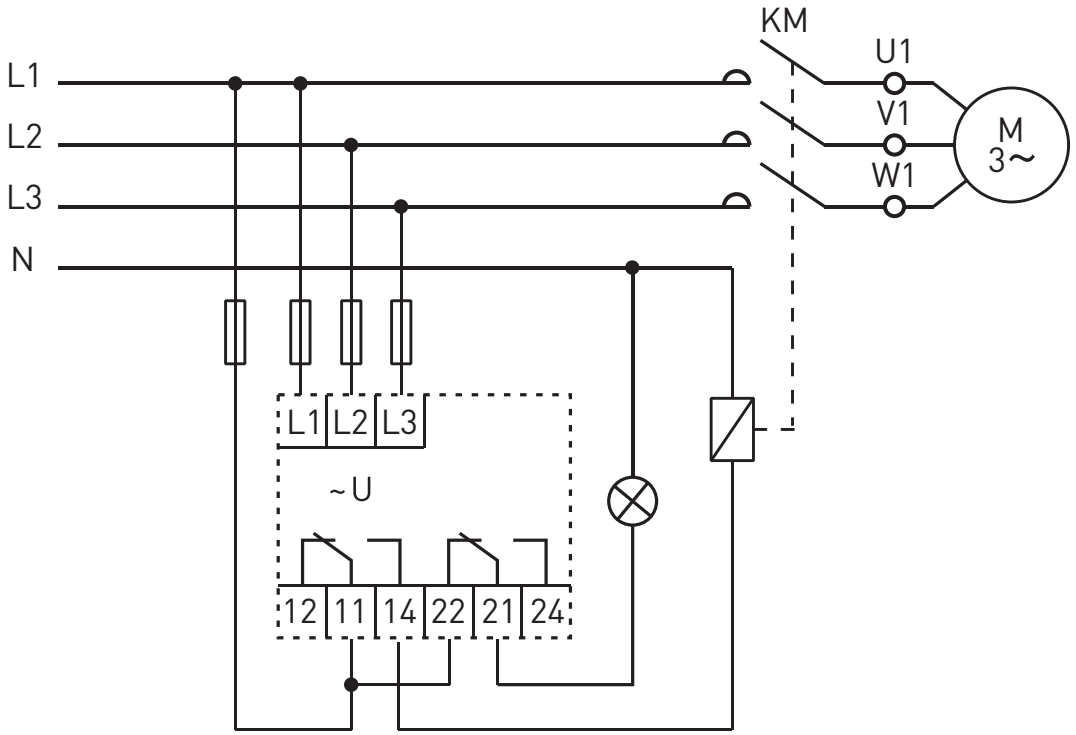
Dt — response (trip) delay
Rt — re-closing delay

Fig. 3 – Principles of relay during voltage asymmetry

4 INSTALLATION AND OPERATION

SETUP:

1. Install and secure the relay.
2. Connect the relay as per wiring diagram (Fig. 4).
3. Set the desired voltage setpoints.
4. Set the desired trip delay.
5. After the relay is energized and no faults are detected, a yellow LED will light up and the output contacts will be switched: 11–12 and 21–22 will open, 11–14 and 21–24 will close. If the relay does not switch, check the LED indicators for active fault.
6. At phase loss or phase sequence fault the relay will trip immediately, ignoring trip delay timer.
7. If the circuit voltage is ⩽0,5 Ue, the relay will trip with phase loss.
8. If the mains voltage is ⩾1,5 of nominal, the relay operates without time delay.



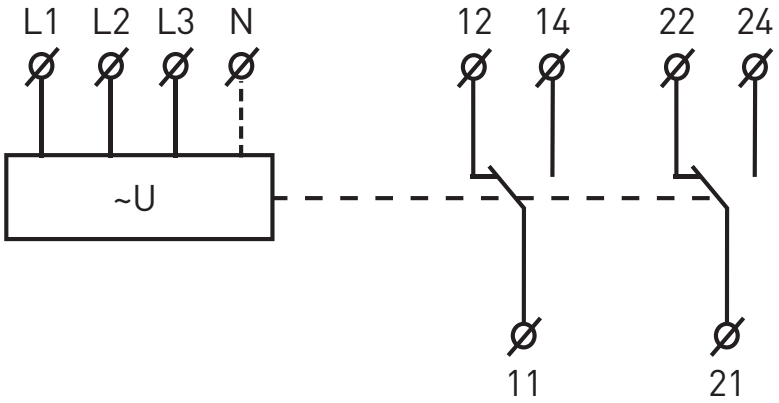


Fig. 4 – Relay wiring diagram

CONTROL PANEL

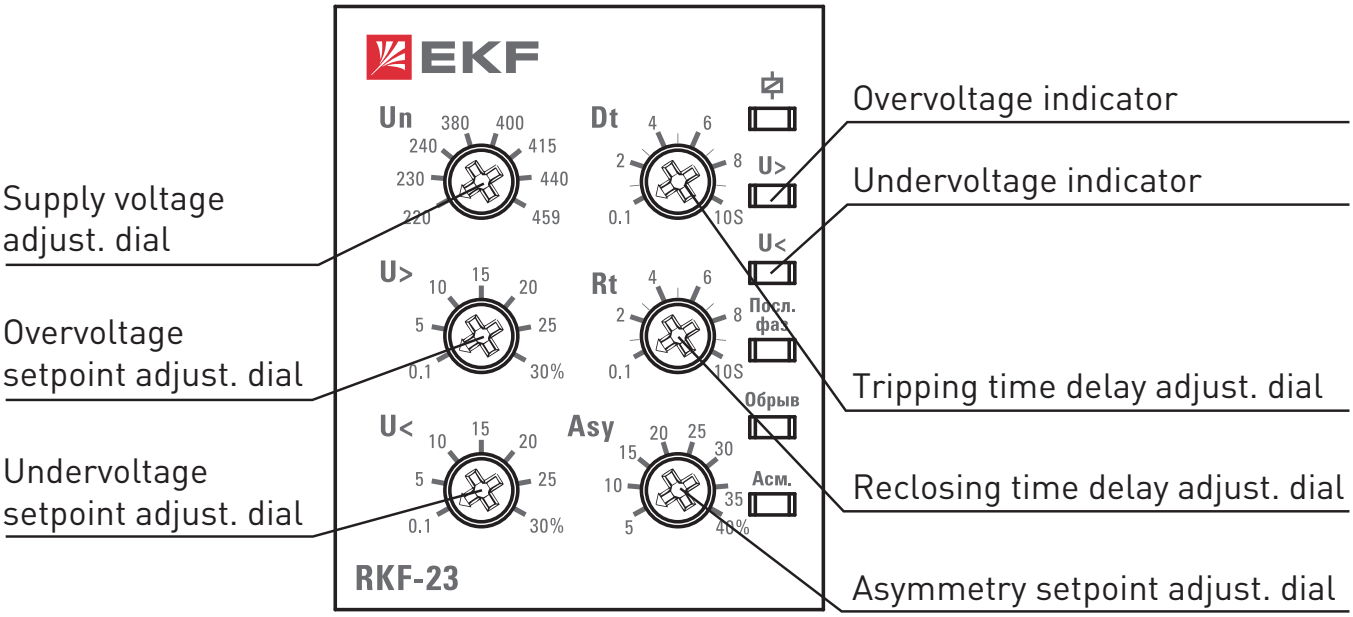
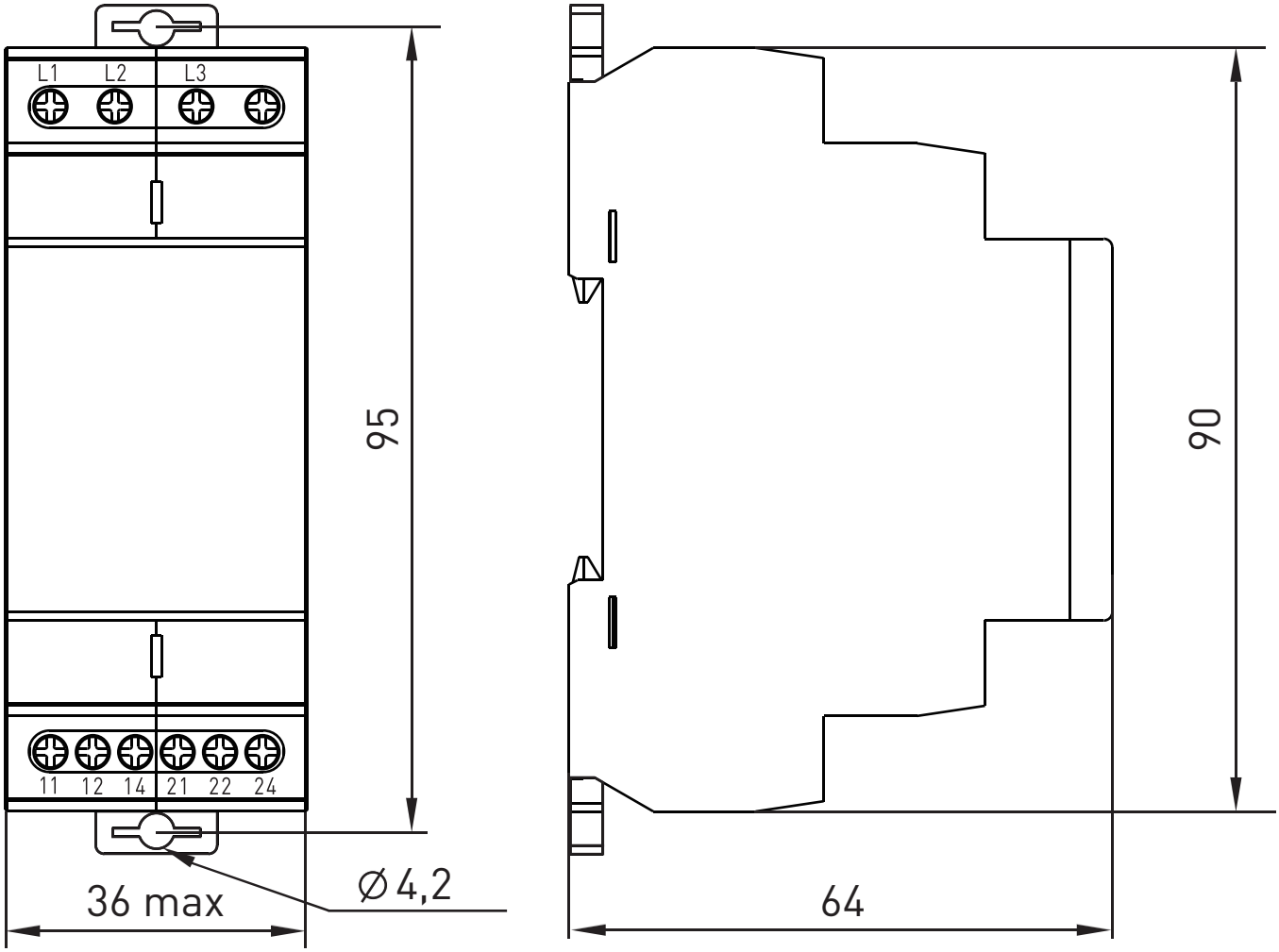


Fig. 5 – Main control elements of the relay

5 OVERALL DIMENSIONS



6 OPERATION CONDITIONS

Operating temperature: -5°C to +50°C
Max. altitude above sea level: 2000 m.

7 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.

8 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.

9 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.

10 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.

11 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.

12 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: ООО 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:
ТОО «Energoresheniya Kazakhstan», Kazakhstan, Almaty,
Bostandyk district, Turgut Ozal st., 247, apt 4.

13 CERTIFICATE OF ACCEPTANCE

Phase monitoring relay RKF-23/24 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

ekfgroup.com

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