



TECHNICAL MANUAL

Three-phase current and
voltage monitoring relay
with display MRVA 63A EKF

1 DESCRIPTION

Three-phase voltage and current monitoring relay MRVA 63A EKF is designed to trip and disconnect downstream load if the supply voltage or current is out of bounds. An embedded microcontroller constantly monitors supply voltage and current and outputs them on integrated LCDs. Switching is performed by an electromagnetic relay. The relay can disconnect all downstream devices (synchronous mode) and selected devices (asynchronous mode). Trip setpoints and reset time delay can be set using the buttons on the front panel of the device. Setpoints are saved in non-volatile memory.

2 TECHNICAL DATA

Table 1 - Main characteristics

Characteristics	Values
Rated phase-to-neutral supply voltage U_n , V AC	220-240
Operating voltage, V	50-450
Rated frequency, Hz	50 / 60
Overvoltage range, V	220-280
Undervoltage range, V	80-210
Max. current range I_a , A	1-63
Asymmetry range, V	20-99
Max. current error, %	2
Voltage measurement error, %	1
Undervoltage tripping time, sec.	<0,5 (80 V); <0,02 (>80 V)
Overvoltage tripping time, sec.	<0,06 ($U_s < U_{mea} < 300$ V); <0,02 (≥ 300 V)

Table 1 continued

Asymmetry tripping time, s	10 A
Overcurrent tripping time, s	0-600 ($I_s < I_{mea} < 9\text{ A}$); 0,02-5,0 ($I_{mea} \geq 80\text{ A}$)
Reset time delay range, sec.	5-600
Short circuit tripping type (over 90 A), sec.	0-5,0
Hysteresis, overvoltage and asymmetry, V	5
Hysteresis, undervoltage, V	3
Rated insulation voltage, V	450
Output contacts	3NO
Degree of protection	IP20
Pollution degree	3
Electrical endurance, cycles	100 000
Mechanical endurance, cycles	1 000 000
Max. altitude above sea level, m	2 000
Operating temperature, °C	- 25 to + 55
Max. relative humidity at 40°C, %	50 (non-condensing)
Storage temperature, °C	- 40 to + 55
Mounting	DIN rail
Automatic reset attempts	1-20, with manual off

Table 2 - User-set parameters

Characteristics	Range	Step	Factory settings
Overvoltage, V	220 to 280	1	250
Undervoltage, V	80 to 210	1	170
Delay On, sec.	5 to 600	1	5
Overcurrent, A	1 to 63	1	63
Overcurrent delay off, sec.	0 to 600	1	15
Short circuit tripping delay time (over 90 A), sec.	0-5,5	0,1	0,2
Voltage asymmetry, V	20 to 99	1	50
Automatic reset attempts	OFF-1...20	1	3
Operating mode*	000 - 0 ⁰ 0		000
Phase sequence protection	ON-OFF		OFF
Automatic fault reset	ON-OFF		ON

*000 - Synchronous mode 0⁰0 - Asynchronous mode

For relay operation under fault voltages, refer to Figure 1.

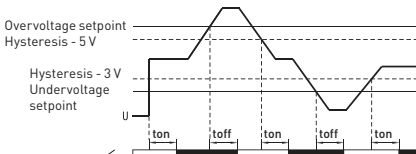


Fig. 1 - Relay voltage chart

For relay operation under overcurrent, refer to Figure 2.

Ton - Reset time delay

tA - Overcurrent tripping time

tSd - Short circuit tripping time (over 90 A), sec.

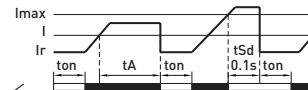


Fig. 2 - Relay current chart

For relay operation under asymmetry, refer to Figure 3.

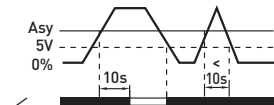


Fig. 3 - Relay asymmetry chart

3 INSTALLATION AND OPERATION

Mount the device onto a 35 mm DIN rail. Connect the wires as per wiring diagram, refer to Figure 13. The cross-section of the wires must correspond to the maximum load current. To protect against overload and short circuit, install a circuit breaker before the relay. Circuit breaker tripping current must be in-line with the power limit of the relay. To avoid damaging stranded wire conductors by the terminal screws, use the appropriate cord end terminals.



Synchronous mode



Asynchronous mode

Fig. 4 - Operation display

If the voltage is out of bounds, the relay will remain off until the voltage stabilizes within the set range. In synchronous mode, no phase will be connected if the voltage is out of bounds at least at one phase. In asynchronous mode, functional phases will be connected and faulty phases will be disconnected. In case of phase sequence fault, the relay will display the L1-L3-L2 in the second line (Figure 5). Swap the two phase conductors or disable the protection against phase sequence faults.



Fig. 5 - Phase sequence protection

Follow Flowchart 1 instructions to change the default settings. The buttons are located on the front panel, to the right of the display. For control elements, refer to Figure 6.

Flowchart 1. Configuring default settings



SETTING OVERVOLTAGE

Press the Menu button to start setting overvoltage.



SETTING UNDERVOLTAGE

Press the Menu button to confirm the overvoltage and start setting the undervoltage.



SETTING OVERCURRENT

Press the DOWN button to confirm the undervoltage and start setting overcurrent.



SETTING RELAY RESET TIMER

Press the DOWN button to confirm the overcurrent value and start setting the delay time (Ton).



SETTING OVERCURRENT TRIPPING TIME

Press the DOWN button to confirm the overcurrent value and start setting overcurrent tripping timer.



SETTING SHORT CIRCUIT TRIPPING TIME

Press the DOWN button to confirm the overcurrent tripping time and start setting short circuit tripping time.



SETTING MAX. ASYMMETRY

Press the DOWN button to confirm the short circuit tripping time and start setting max. asymmetry.



SETTING AUTOMATIC RESET ATTEMPTS

Press the DOWN button to confirm the max. asymmetry voltage value and start setting automatic reset attempts.



SELECTING OPERATING MODE

Press the DOWN button to confirm the automatic reset attempts value and start selecting operating mode (refer to Table 2).



SETTING PHASE SEQUENCE PROTECTION

Press the Menu button to save the selected operating mode and enable/disable phase sequence protection.



SETTING AUTOMATIC FAULT RESET

Press the Menu button to confirm the phase sequence protection is ON and start setting automatic reset attempts.

If function is enabled, the relay will restart automatically after the voltage fault. If function is disabled, the relay will not restart automatically and must be switched on manually.



RESETTING TO FACTORY SETTINGS

Press the DOWN button to confirm automatic reset attempts and reset to factory settings.



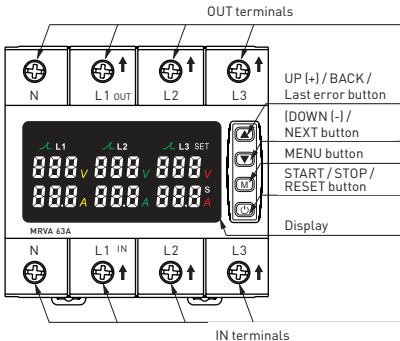


Fig. 6 - Control and indication

Symbol	Function
	Relay status
L1/L2/L3	Phase L1/Phase L2/Phase L3
SET	Setting active
V	Voltage
A	Current
S	Time delay

You can adjust this value higher or lower as needed. To save the setpoints, pass all setting steps.

The device will automatically exit setting mode 60 seconds after the last button press, saving any changes made.

Press the  button to switch the relay on/off or reset faults.

If overcurrent persist after the set reset attempts, the relay will fail safe and display an error. Refer to Figure 7. In order to continue operation, eliminate the overcurrent fault and manually reset the relay.



Synchronous mode



Asynchronous mode

Fig. 7 - Out of automatic reset attempts

To check the values during the last error, press the UP button and the display will show the voltage and current values during the last error (Figure 8).



Fig. 8 - Voltage and current during the last error



Synchronous mode



Asynchronous mode

Fig. 9 - L1 phase overvoltage



Synchronous mode



Asynchronous mode

Fig. 10 - L1 phase undervoltage



Synchronous mode



Asynchronous mode

Fig. 11 - L1 phase overcurrent



Fig. 12 - Phase asymmetry

4 WIRING DIAGRAM

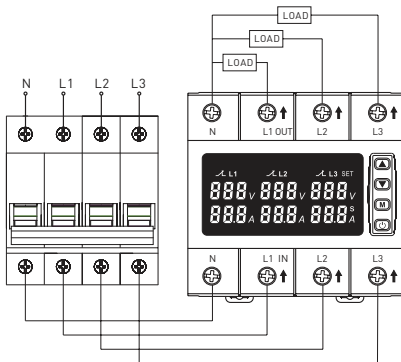


Fig. 13 - Wiring diagram

5 OVERALL AND INSTALLATION DIMENSIONS

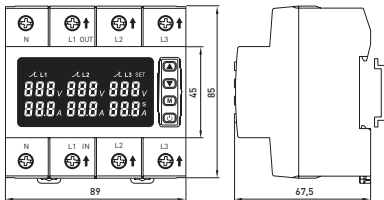


Fig. 14 - Overall and installation dimensions

6 DELIVERY SCOPE

Relays are supplied in an individual package. For all available documentation, scan the QR-code on the insert or on the inside of the package.

7 SAFETY REQUIREMENTS

WARNING! Hazardous voltage.

The device conforms to IEC 61140 Class 0 for protection against electrical shock.

The devices must be installed and serviced by qualified electrical personnel only.

Do not operate relays with visible mechanical damage.

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

Do not operate the relays with damaged housing.

8 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 -40 to +55°C and max. relative humidity of 80% at +25°C.

9 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.

10 MANUFACTURER'S WARRANTY

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

Warranty period: 7 years from date of sale specified in the sales receipt.

Shelf life: 7 years from the date of manufacture.

Service life: 10 years.

11 CERTIFICATE OF ACCEPTANCE

Three-phase voltage and current monitoring relay MRVA 63A EKF has been manufactured in compliance with the laws and regulations in effect and has been approved for operation.

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

Quality control stamp

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

**Importer and EKF trademark service representative:
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