EKF



TECHNICAL MANUAL

ATS controller for 2 inputs with sectioning AVR-3 EKF

1 DESCRIPTION

ATS controllers AVR-03 EKF are designed to control contactor-based automatic transfer switches (ATS) used in power supply systems with primary and secondary inputs and two outgoing lines connected via sectionalizing contactor.

ATS controller monitors voltage in two three-phase mains inputs — if the voltage is within the set limits, the controller supplies power to the coils of both contactors and the load is powered from the corresponding input. When the voltage at the either input is out of bounds, after the time delay Toff the controller switches off the connected contactor and after the time delay Tp the sectioning contactor is switched on.

After power supply values are restored, the controller switches off the sectioning contactor after the time delay Ton and after the time delay Tp the primary line contactor is switched on.

When switching the contactors, the controller monitors the voltage of the outgoing line through the Uk1, Uk2, Uk3 inputs to prevent the primary and secondary lines from switching on together. It is recommended to provide additional electrical and mechanical interlocking of the contactors.

Controllers comply with IEC 60947-1.

2 TECHNICAL DATA

Table 1

Characteristics	**Values**
Input terminals	N, A1,B1, C1,/N, A2,B2, C2
Output contacts	3 NO
Rated supply voltage, V AC	220–240
Operating voltage range, V AC	50–400
Rated frequency, Hz	50 / 60

Table 1 continued

Characteristics	**Values**
Overvoltage limit, V	270 (hardcoded)
Undervoltage range, V	150-210
Return delay	5 sec. to 10 min.
Tripping time, sec	0,3–15
Switching delay, sec.	0,3–5
Voltage hysteresis, V	5
Voltage asymmetry, V	80
Voltage measurement error, %	⩽2
Relay contacts current rating, A	8 (AC-1)
Electrical endurance, cycles	100 000
Mechanical endurance, cycles	1 000 000
Degree of protection	IP20
Max. altitude above sea level, m	2000
Operating temperature, °C	-5 to +50
Storage temperature °C	-25 to +55
Max. conductor cross-section, mm^2	2,5
Tightening torque, N•m	0,5

The product must be operated under the following ambient conditions:

- non-explosive environment;
- no corrosive gases and vapors in concentrations damaging to metals and insulation;
- no saturation with conductive dust and vapors;
- no direct exposure to ultraviolet radiation.

The product housing is made of flame retardant ABS plastic.

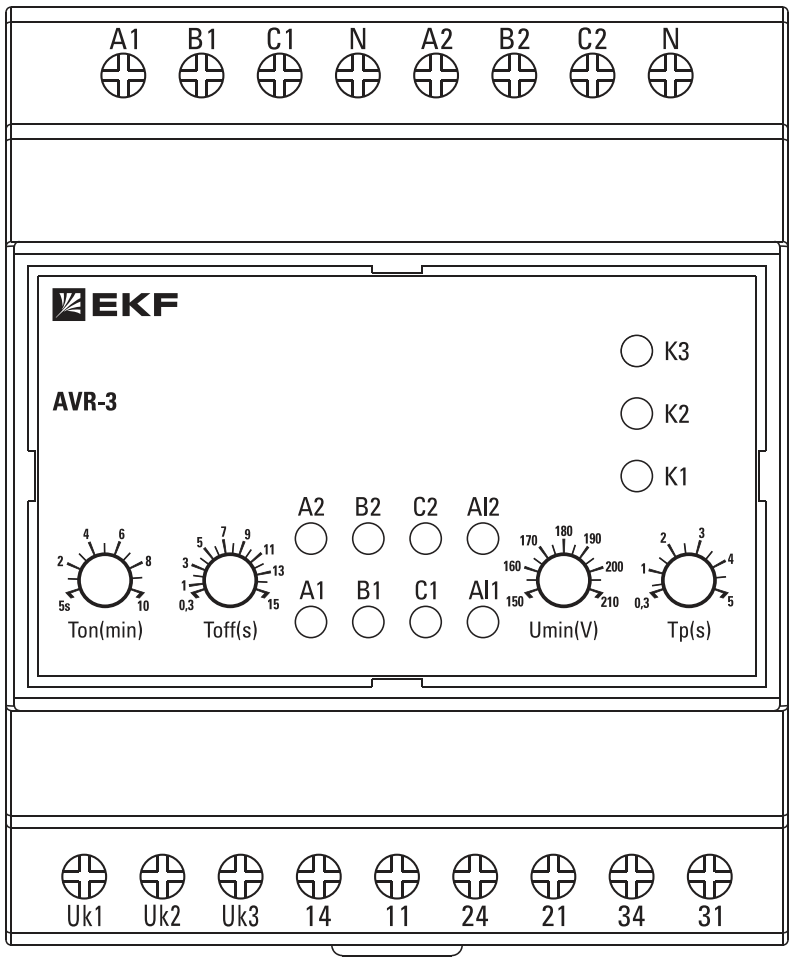


Figure 1. Device front panel

A1, B1, C1, N – Input 1 terminals
A2, B2, C2, N – Input 2 terminals
Uk1, Uk2, Uk3 – Voltage measuring terminals
11, 14 – Relay output 1 contacts
21, 24 – Relay output 2 contacts
31, 34 – Relay output 3 contacts

Table 2

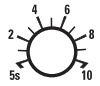
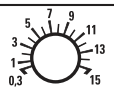
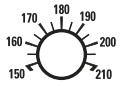
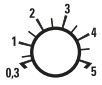
	Return delay to priority phase setting dial
	OFF delay setting dial
	Undervoltage setting dial
	Transfer delay setting dial

Table 3

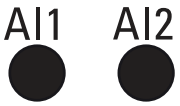
LED status	Description
	Input 1 status LEDs
	Input 2 status LEDs
	Relay 1 status LED
	Relay 2 status LED
	Relay 3 status LED
	Input 1 fault LED
	Input 2 fault LED
	Undervoltage LEDs

Table 3 continued

LED status	Description
Al1 Al2	Overvoltage LEDs (blinking every 2 seconds)
	Delay countdown LEDs (blinking every second)
	Asymmetry LEDs (blinking every 4 seconds)

● LED is lit ○ LED is off ◐ LED is blinking

3 OPERATION DIAGRAM

Switching delay, s
Toff - trip time delay
Ton - return to priority phase delay
Tkm - contactor trip time delay
KM1 - relay 1 contacts status
KM2 - relay 2 contacts status
KM3 - relay 3 contacts status

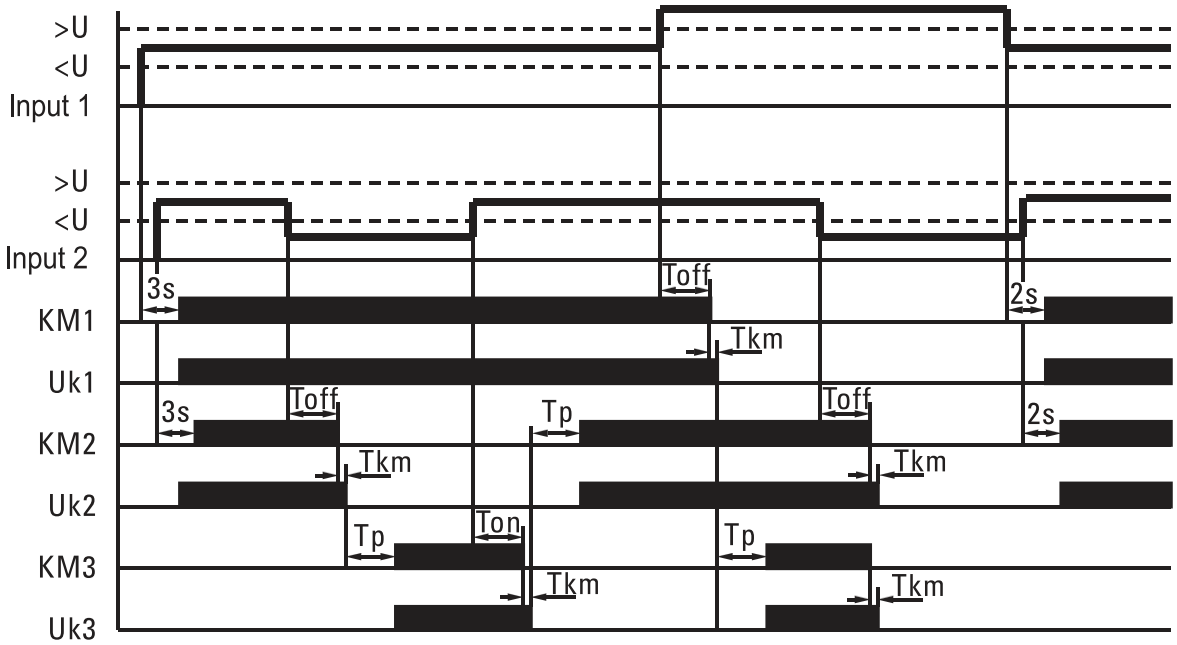


Figure 2. Operation diagram

When voltage appears at the inputs, relay outputs No. 1 and 2 are activated after 3 seconds, which in turn closes the power supply circuits of contactors KM1 and KM2. In the event of voltage loss at one of the inputs, the corresponding relay output opens after the time Toff, and after the time Tkm the corresponding contactor opens, then, after the time Tp, the relay output No. 3 is energized and the contactor KM3 is switched on, which ensures that both busbar sections are supplied from one input. When voltage is restored at the input, relay output No. 3 is switched off after the time Ton, then during the time Tkm the contact group of the sectioning contactor is opened and the primary input contactor is switched on after the time Tp, once the sectioning contactor is switched off. In the event of voltage loss at both inputs, contactors KM1 and KM2 are switched off after the time Toff; when voltage is restored at least at one of the inputs, contactors are switched on after 2 seconds.

4 INSTALLATION AND OPERATION

1. Installation must be carried out by qualified electrical personnel.
2. The device is mounted onto a standard 35mm DIN rail.
3. All inputs must be de-energized before connection.
4. Follow Figure 3 to connect the relay.
5. Adjust the relay settings as required.
6. Turn on the power and check the correct operation of the relay.
7. The output voltage must be constant.

5 WIRING DIAGRAM

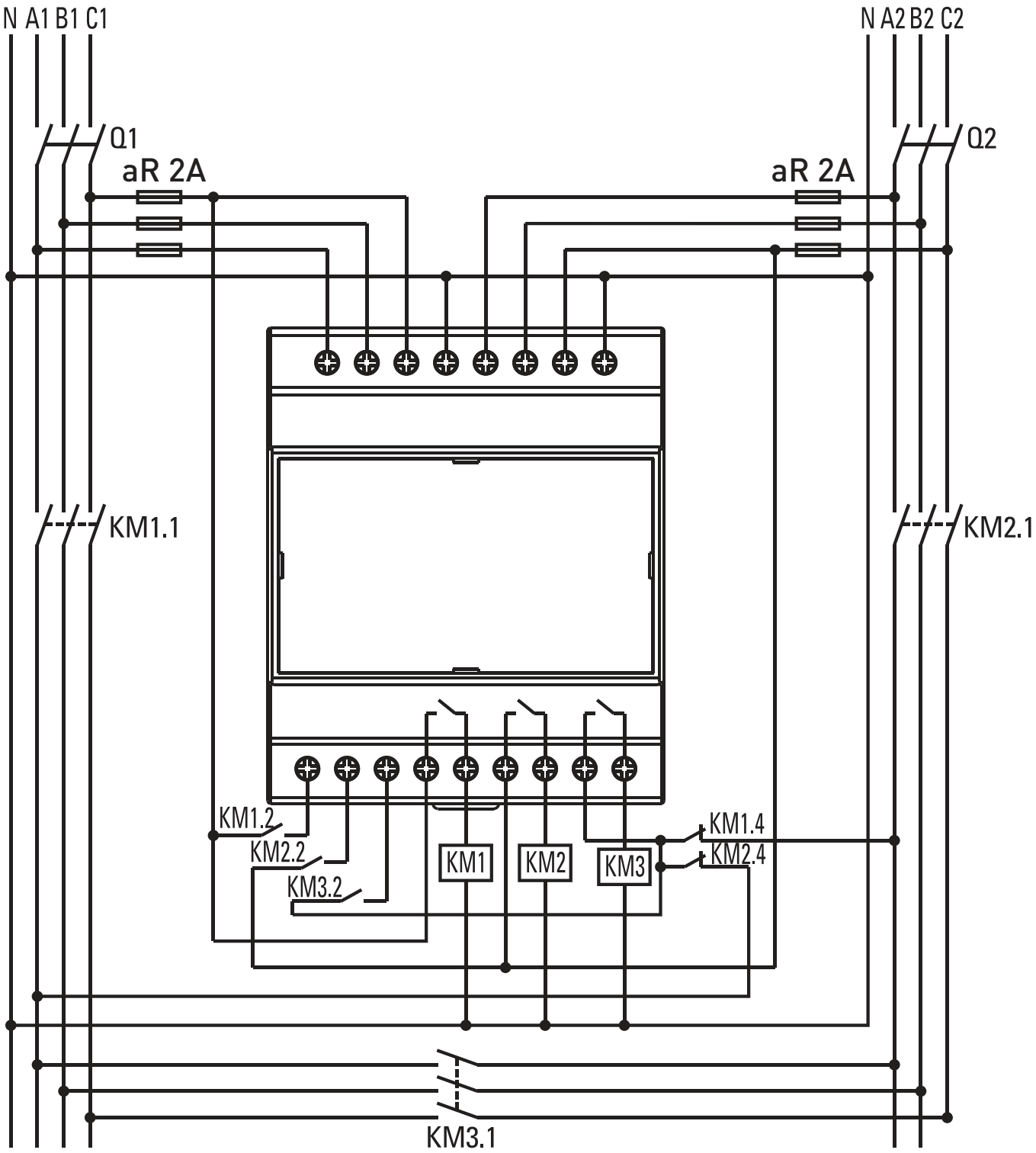


Figure 3. Wiring diagram

6 OVERALL AND INSTALLATION DIMENSIONS

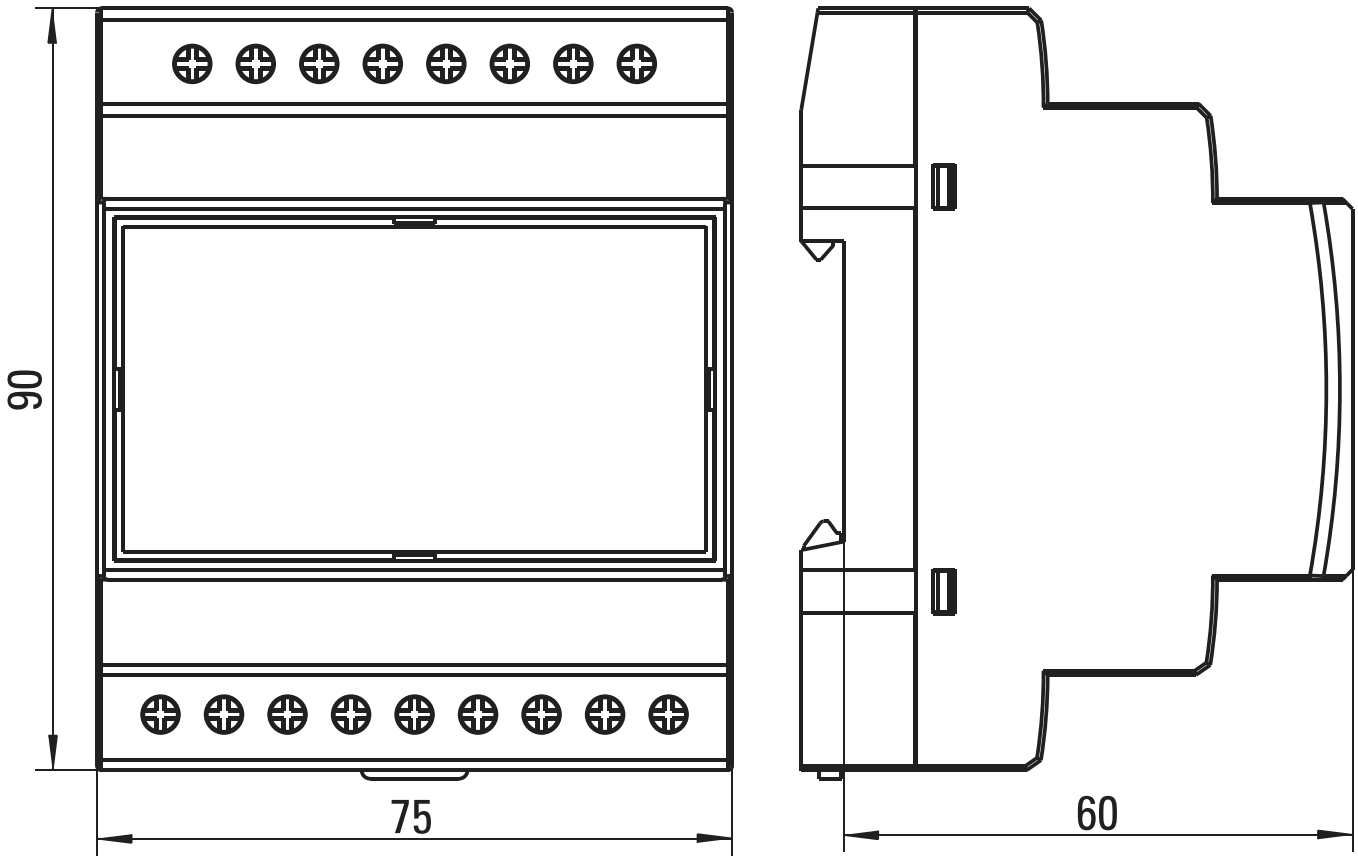


Figure 4. Overall and installation dimensions

7 DELIVERY SCOPE

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

8 SAFETY REQUIREMENTS

Do not install the product if any damage found.

Do not operate products with visible mechanical damage.

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

Do not operate devices with damaged housing.

9 TRANSPORTATION AND STORAGE

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

Controllers shall be stored indoors in the original package at the ambient temperature from -25 °C to +55 °C and relative humidity of max. 50 % at +40 °C.

10 MANUFACTURER'S WARRANTY

The manufacturer guarantees the products comply with the declared characteristics, provided that the consumer follows the operation, transportation and storage conditions.

Service life: 10 years.

Shelf life: 7 years from the date of manufacture specified on the product package or housing.

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

Manufacturer: OOO Electroresheniya, Otradnaya st., 2b/9, 127273, Moscow, Russia, tel. +7 (495) 788-88-15.
MEA regional headquarters: EKF ELECTRICAL SOLUTION FZCO, Office 249, Techno Hub-2, Dubai Silicon Oasis, P.O. box 341079, Dubai, United Arab Emirates, tel. +9 (714) 547-06-18.
Importer and EKF trademark service representative ln the territory of the Republic of Kazakhstan: TOO «Energoresheniya Kazakhstan», Kazakhstan, Almaty, Bostandyk district, Turgut Ozal st., 247, apt 4.

11 CERTIFICATE OF ACCEPTANCE

ATS controllers AVR-3 EKF have been manufactured in compliance with the effective laws and regulations and have been approved for operation.

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

Quality control stamp



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EAC

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