



TECHNICAL MANUAL

Level monitoring relay for two tanks RL-SA-2 EKF

1 DESCRIPTION

Level monitoring relay for two tanks RL-SA-2 EKF is an electronic switching device with an embedded microcontroller, designed to monitor the level of conductive liquids and to control electric pump motors in order to fill or drain reservoirs with a delay off timer. The relay can accept control signal from either two or three sensors (see wiring diagrams).

WARNING! Do not use the relay for flammable or explosive liquids.

The level monitoring relay complies with IEC 61000-4-4.

2 TECHNICAL DATA

Table 1

Characteristics	Values
Rated supply voltage U_n , V AC	220-240
Insulation voltage, V	415
Rated frequency, Hz	50 / 60
Power consumption, VA	≤1,5
Sensitivity, kOhm	1~200
Time delay adjustment, s	0,1-10
Set-point accuracy, %	≤5
Electrical endurance, cycles	100 000
Mechanical endurance, cycles	1 000 000
Contact	1 CO (one change-over)
Rated load current, A	8 (AC1)
Max. altitude above sea level, m	2000
Degree of protection	IP20
Pollution degree	3

Table 1 continued

Characteristics	Values
Operating temperature, °C	from -25 to + 50
Max. relative humidity at 40°C, %	50 (non-condensing)
Storage temperature, °C	From -30 to +75
Connection	Screw terminals, max. wire cross-section 2,5 mm ²

3 INSTALLATION AND OPERATION

Wiring diagrams

Setup:

1. Install and secure the relay in the intended location.
2. Select one of the two operating modes (two or three sensors), and desired operation type (fill or empty).
3. Wire the relay as per appropriate wiring diagram (in order to use two sensors, bridge contacts "C" and "P4/P2").
4. Energize the relay, the "U" LED will light up green.
5. Adjust sensitivity. Connect the electrodes, place them in the tank and fill it. Rotate the sensitivity dial until the "⚡" LED lights up.
6. Set the desired delay off timer value.

Single tank. Three sensors (fill)

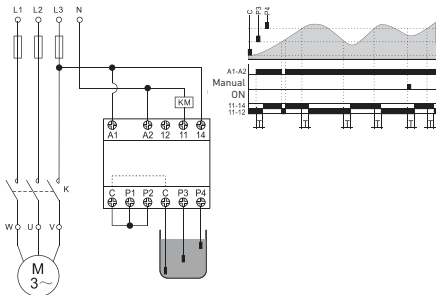


Fig. 1 - Single tank. Three sensors (fill)

Contacts "C", "P1" and "P2" are closed. Filling mode.

The relay measures the resistance between the common contact "C" and the contacts of the maximum "P4" and minimum "P3" levels. When the upper level is reached, the relay switches OFF, and the contacts switch to position 11-12. The relay is OFF, until the liquid level drops below the minimum. When the relay switches ON, the contacts switch to position 11-14, etc. When the relay is turned OFF and the water level is between P3 and P4, you can turn on the pump manually. The pump will operate, until the level rises to P4.

Single tank. Two sensors (fill)

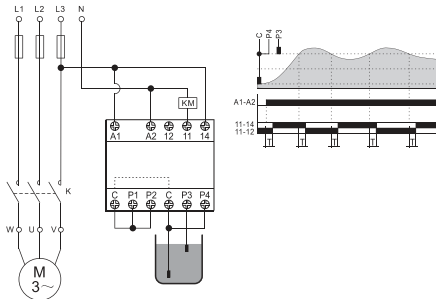


Fig. 2 - Single tank. Two sensors (fill)

When the contacts "C", "P1", "P2", "P4" are closed, the relay controls the level with the minimum contact "P3" (overflow protection).

When the "P3" level is reached, the relay switches OFF, and the contacts switch to position 11-12. The contacts remain in this position until the liquid level drops below the minimum, then the relay switches ON, and the contacts switch to position 11-14.

Single tank. Three sensors (empty)

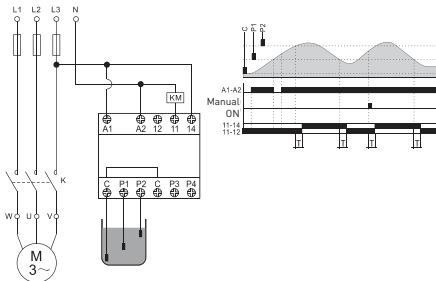


Fig. 3 - Single tank. Three sensors (empty)

Contacts "P3", "P4" and "C" are open. Emptying mode.

The relay measures the resistance between the common contact "C" and the contacts of the maximum "P2" and minimum "P1" levels. When the upper level is reached, the relay switches ON and the contacts switch to position 11-14. The relay is ON, until the liquid level drops below the minimum. When the relay switches OFF, the contacts switch to position 11-12, etc. When the relay is OFF and the water level is between P1 and P3, you can turn on the pump manually. The pump will operate, until the level drops to P1.

Single tank. Two sensors (empty)

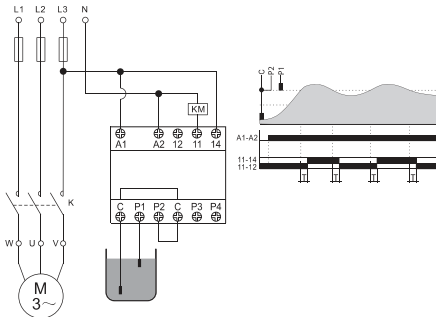


Fig. 4 - Single tank. Two sensors (empty)

When contacts "C" and "P2" are closed, the relay controls the level with the minimum contact "P1".

When the "P1" level is reached, the relay switches ON, and the contacts switch to position 11-14. The contacts remain in this position until the liquid level drops below the minimum, then the relay switches OFF, and the contacts switch to position 11-12.

Two tanks, three sensors

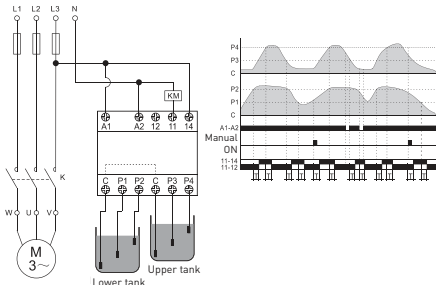


Fig. 5 - Two tanks, three sensors

The sensors for emptying the tank are connected to the contacts "P1", "P2" and "C"; the sensors for filling the tank are connected to the contacts "P3", "P4" and "C". The relay operates for filling one tank and emptying the other. When the upper level in the emptied tank and the lower level in the filled tank are reached, the relay switches ON, and the contacts switch to position 11-14. The relay is ON, until the liquid level drops below the minimum in the emptied tank or is above the maximum in the filled tank. When the relay switches OFF, the contacts switch to position 11-12.

Control panel

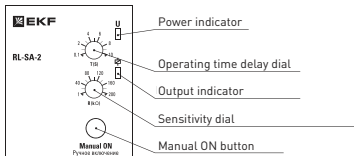


Fig. 6 - Control panel

4 OVERALL DIMENSIONS

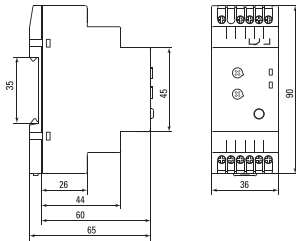


Fig. 7

5 OPERATING CONDITIONS

Operating temperature: -25 to +50°C.

Max. altitude above sea level: 2000 m.

6 DELIVERY SCOPE

Relays are supplied in an individual package.

Scan the QR-code on the insert or on the inside of the package for all available documentation.

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

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 clamping screws during the inspection, as they may become loose due to cyclical changes in the ambient temperature and material flow.

The relay must be installed and maintained by qualified personnel.

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 STORAGE AND TRANSPORTATION

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

Relays shall be stored in the original package indoors at the ambient temperatures from -30 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 national and local laws and regulations in force.

11 MANUFACTURER'S WARRANTY

The manufacturer guarantees the relays comply with the declared characteristics, provided that consumers observe 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

Level monitoring relay RL-SA-2 has been approved for operation.

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

Quality control stamp

v3

EHC



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EKF