

LEVEL SENSOR FP-ELS-L

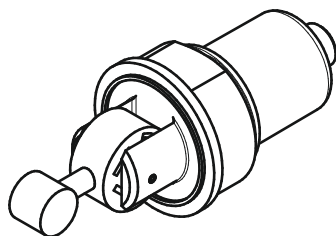


Fig. 1. General form

APPLICATION AREA

The FP-ELS-L level sensor (Fig. 1) is intended for use as an electronic gauge of the limit values of the levels (interfaces) of working media in capacitive equipment - vessels and apparatus working under pressure. To be installed to the connection ports of devices for visual level control (interfaces).

SAFETY INSTRUCTIONS

- ⚠ Please read this manual carefully. Failure to follow the instructions can lead to device failure, injury.
- ⚠ Installation, maintenance and operation must be carried out by qualified personnel with the necessary knowledge, skills and an electrical safety approval group.
- ⚠ Observe the ambient temperature requirements, do not exceed the maximum working pressure, check the operating voltage range given in the technical specifications of the device.
- ⚠ Observe the wiring diagram for the electrical connections of the level sensor.
- ⚠ Electromagnetic waves can affect the operation of the sensor; shield the system if necessary.
- ⚠ The device is not repairable; in case of failure, dismantle the device in accordance with the Dismantling and Disposal section of this manual.
- ⚠ Only use the sensor with HFC, HCFC compatible refrigerants.
- ⚠ The device is not intended for use with Nh3.

INSTALLATION INSTRUCTIONS

- Before installation, make sure that the pressure in the refrigerant circuit is equal to atmospheric pressure and remove the visual level control (interface).
- Replace the PTFE O-ring in the sight glass port if necessary
- Install the sensor into the sight glass port. Orientation of the sensor for low level control - arrow up. The orientation of the sensor for upper level control is with an arrow pointing down. Figure: 2, 3.
- Fasten the level sensor with the union nut from the dismantled sight glass, holding the sensor by the flats on the metal part of the sensor.
- Place the sensor case horizontally along the flats. Figure: 2, 3. The maximum possible deviation is $\pm 2^\circ$.
- If the port does not match the sensor, use the adapter supplied separately.
- Protect the output relay contacts with a circuit breaker or fuse rated at 1A for DC and 0.25A for AC, otherwise there is a high risk of burnout of the output relay contact circuit.
- It is not recommended to use power contactors as a load. Be sure to check the starting power consumption of the coil and compare the maximum power of the relay output contacts of the sensors (see table 2). If there is no starting power consumption in the technical specifications for the contactor to be connected, its value should be taken as a 12-degree holding power consumption. When connecting power contactors, we recommend using intermediate relays.

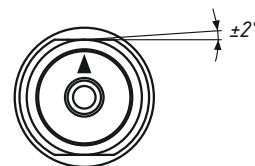


Fig. 2. Sensor orientation for low level control

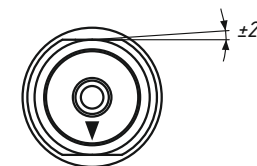
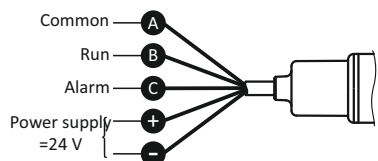


Fig. 3. Sensor orientation for top level control

- Make electrical connections in accordance with fig. 4.
- Observe the polarity of the power supply wires. Incorrect connection will lead to imminent sensor failure.
- During operation, it is recommended to keep the sensor connected to the power supply at all times, even if the system is in standby mode.
- During service work related to the removal of the sensor and adapter, when they are reinstalled, all O-rings must be replaced with new ones, using a repair set of seals. The seal repair kit is not included with the transmitter and is supplied separately.



A — gray (common relay contact)
 B — green (open in case of emergency)
 C — yellow (closed in case of emergency)
 + — brown ("+" power wire)
 - — white ("- power wire)

Fig. 4. Electrical connections

OPERATING PRINCIPLE

In the off state, the indicators are off, the contact of the alarm relay is closed. If during operation the level of the medium (interface) is within the limits that meet the requirements of the normal level (see table 1) i.e. when monitoring the upper level - the level of the medium is below the upper level of the sight glass, and when monitoring the lower level - above the lower level of the sight glass, then the green LED indicator "normal level" is on. The contact of the alarm relay is then opened. If the level of the monitored medium (media boundary) deviates beyond the sight glass to the area of the emergency level of the device, the green indicator turns off immediately and the red indicator "emergency" lights up, the contact of the alarm relay closes into the "emergency" state. To protect against frequent operations in the state of the limit alarm level, a level hysteresis is provided, which is about ½ part of the height of a standard sight glass.

Table 1. Level control

Condition	Level control		Indication	Relay
	Low	High		
Normal level. Contact "Work" closed.			 green	RUN
Emergency level. Contact "Emergency" closed.			 red	RUN
Sensor off or defective			 light off	RUN

TRANSPORTATION AND STORAGE

- Store the sensor in a closed, ventilated warehouse, in a dry, clean and chemically non-aggressive environment. If this is not possible, then it is necessary to protect the sensor from negative environmental influences.

DISMANTLING AND DISPOSAL

- Before dismantling, make sure that the pressure in the refrigeration circuit is atmospheric and disconnect the sensor
- Dispose of the sensor case separately from the printed circuit board, in accordance with national regulatory requirements (for countries of the CU GOST 1639-2009 "Scrap and waste of non-ferrous metals and alloys").

Table 2. Specifications

Parameter	Value
Model	ELS-L
Max. operating pressure PS	4,5 MPa
Max. test pressure PT	5,0 MPa
Burst pressure	20,0 MPa
Power supply	15...30 V direct current
Energy consumption	4 VA
Ambient temperature air / storage	-40...+50 °C
Working environment temperature	-40...+80 °C
Protection class	IP65
Alarm relay contacts	max. 1A 30VDC (30 W); 0,25A 250VAC (62,5 VA)
Electrical connection	Кабель PVC 5×0,25 (AWG23)
Power cable length	2 m
Orientation	Horizontal, ±2 °
Controlled environments	ГCFCs, HFCs and other refrigerants of group 2, do not use with Nh3

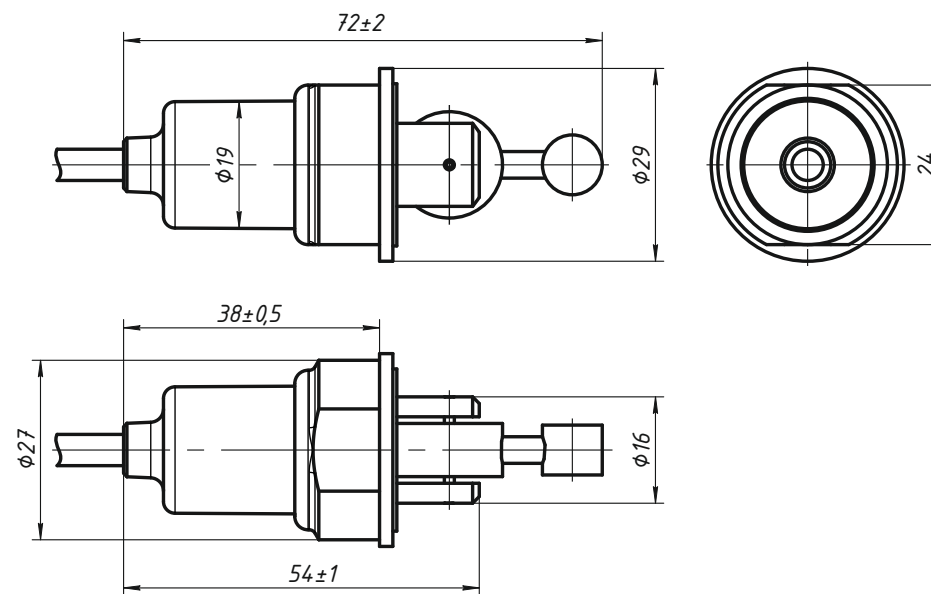


Fig. 5. Overall and connecting dimensions