

REFRIGERANT LEVEL SENSOR FP-ELS

Application

The FP-ELS level sensor is intended for use as an electronic gauge of the limit values of the levels (interface boundaries) of working media in pressure equipment - pressure vessels and pressure apparatus. To be installed to the connecting ports of the visual level control devices (interface boundaries).

Safety instructions

- ⚠ Carefully read this instruction. Ignoring these rules may lead to malfunctioning of this device, staff injuries and malfunctioning of compressor.
- ⚠ Installation and service must be done by qualified staff with appropriate level of knowledge and skills as well as access to electrical works of relevant class.
- ⚠ Follow the instruction in part of air temperature, do not exceed maximum allowed working pressure, control working voltage range, mentioned in the technical characteristics of device.
- ⚠ Follow the electrical connection sketch of oil level regulator.
- ⚠ Electromagnetic waves may have a negative effect on device operation, shield it if necessary.
- ⚠ The device is not repairable in the event of a failure. Disassemble the device in accordance with dismantling and utilization of this manual.
- ⚠ Use the sensor only with HFC, HCFC compatible refrigerants. The device is not intended for use with NH₃.

Installation instruction

- Before installation, make sure that the pressure in the refrigeration circuit is equal to atmospheric pressure and disassemble the visual inspection device (interface boundaries).
- Connect adapter with sensor to equipment tightly using O-rings in the kit. Follow the tightening torque of 9 Nm for the sight glass bolts.
- Install the sensor case horizontally. The maximum possible deviation is $\pm 1^\circ$.
- The orientation of the sensor for monitoring the lower level is shown in Fig.1
- The orientation of the sensor for monitoring the upper level is shown in Fig.2

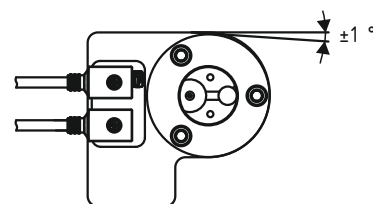


Fig.1. Sensor orientation for monitoring the lower level

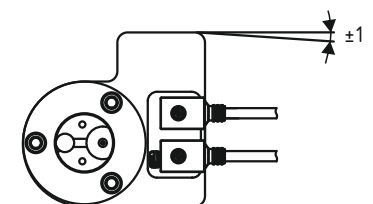
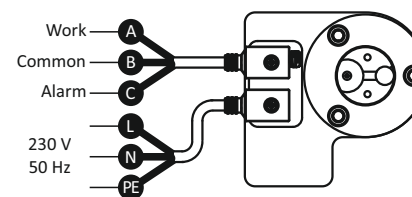


Fig.2. Sensor orientation for monitoring the upper level

- Switching electrical circuits, take into account the limiting current loads of the emergency relay.
- Electrical connections are made by connectors DIN43650. The electrical connections are shown in Fig. 3.
- During operation, it is recommended to keep the sensor permanently connected to the power supply, even if the system is in standby mode.



A — green (open in alarm)
B — white (common)
C — red (close in alarm)

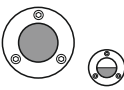
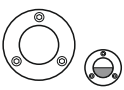




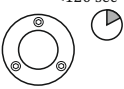
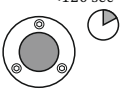




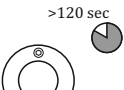
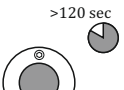



L — brown (line)
N — blue (neutral)
PE — yellow-green (protective earth)

Fig.3. Electrical connection

How it works

In the "off" state lights are off, the contact of the alarm relay is close. If during operation the level of the working media (interface boundaries) is in the range satisfying the requirements of the normal level (see Table 1), i.e. under the control of the upper level - the level below the upper medium level sight glass, while controlling the lower level - above the lower level of the sight glass - lighting green LED indicator "normal level" and the relay contact "Work" is closed. If deviation levels controlled working media (interface boundaries) outside the sight glass to dangerous level device green LED is switched "off" immediately and the yellow LED indicator "dangerous level" is switched "on", if the current level of working media is not returned from the outside to the normal level control requirements within 120 seconds, the red LED indicator "alarm" is switching "on" and the relay contact "Alarm" is closed.

Tab.1.Level control

State	Level control		Indication	Relay
	Lower	Upper		
Normal level. Contact «Work» is closed			 green  	Work 
Dangerous level. Contact «Work» is closed	 <120 sec	 <120 sec	 yellow  	Work 
Alarm level. Contact «Alarm» is closed	 >120 sec	 >120 sec	 yellow  red	Work 

Storage

Storage controller in closed ventilated warehouse, in dry, clean and chemically not aggressive environment. If this is not possible, it is necessary to protect the regulator from the negative effects of the environment.

Dismantling and utilization

- Prior to dismantling valve make sure that pressure in the refrigeration circuit equals the surrounding's.
- Utilization of regulator is done separately from the printed circuit board, in accordance with national regulations.

Tab.2. Technical data

Parameters	Value
Max.operating pressure PS:	9.0 MPa
Max.testing pressure PT:	10.0 MPa
Burst pressure	20.0 MPa
Power supply	230 V, 50/60Hz, 0.02A
Consumed power	5 VA
Ambient air/storage temperature	-20...+50 °C,
Operating environment temperature (oil)	-40...+80 °C,
Protection class	IP54
Delay alarm relay	120 sec
Alarm relay	max. 3A, 230V, 50/60Hz
Cable length	3 м
Orientation	Горизонтально, ±1 °
Alarm relay and power supply connection	DIN43650 C
Working media	HCFC, CFC and other refrigerants group 2, don't use with NH3

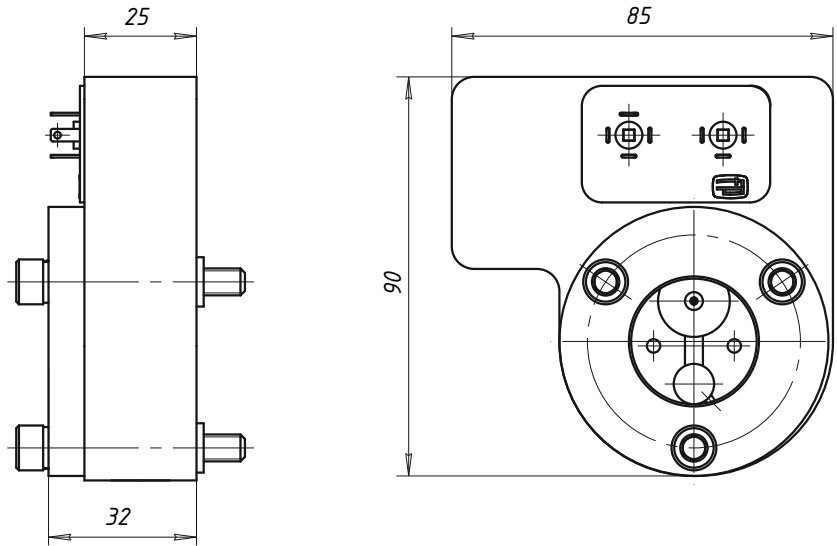


Fig.4. Dimensions