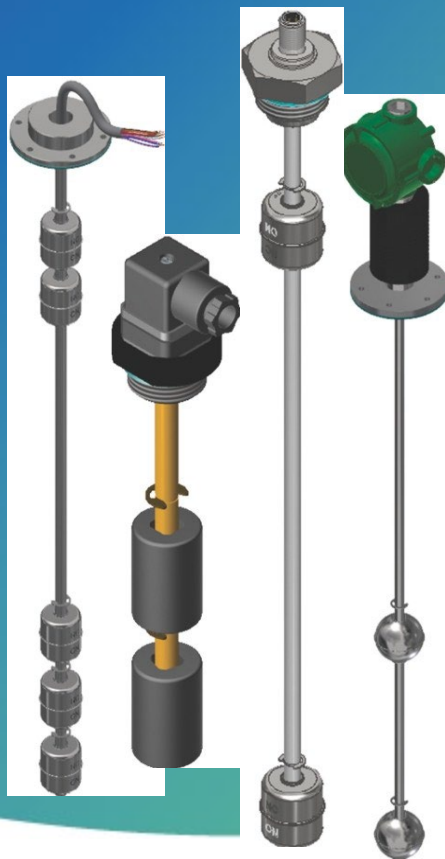


OPERATING MANUAL

ON - OFF LEVEL SWITCHES



X-000001-01-ENG 12/2023

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1 Certification

ISO 9001
UNI EN ISO 9001:2015



CESI 03 ATEX 272
CESI 03 ATEX 265



Further information:

Visti website: www.senseca.com

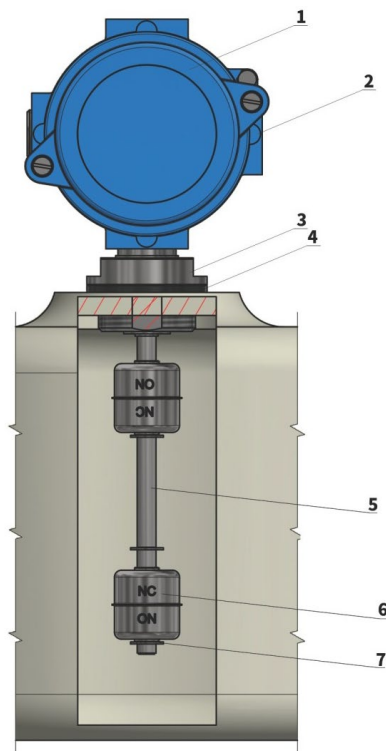
2 Design & functional description

THE ON-OFF LEVEL SWITCHES ARE ELECTROMECHANICAL INSTRUMENTS

The mechanical part is made up by a supporting stem, on which the float/s are inserted, a threaded or flanged process connection and an electrical connection.

SPECIFICATION

- 1 Connection housing
- 2 Cable exit
- 3 Mounting thread
- 4 Gasket
- 5 Rod
- 6 Float
- 7 Float stop (Benzing or bushes)



The electrical switch/es is/are sealed inside the supporting stem and is/are magnetically actuated by the float/s.

The positions of the switches are preventively defined and cannot be modified by the user.

The contacts are wired in according to a standard specification (see electrical wiring)

If a customised wiring is required, the wiring diagram will be included.

The electrical connection can be:

- Directly through cable.
- Through DIN-43650 socket and plug.
- Through terminal block located in a protection box.
- Special connector.

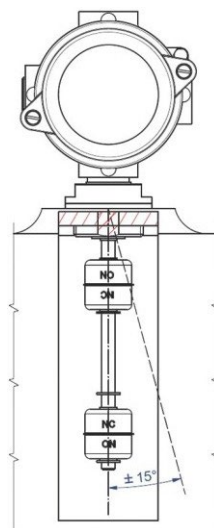
N° of switch point	1/6
Process connection	Threaded or flanged
Max. length	Up to 6m
Max. ambient temperature	-30° C - +55° C
Max. RH	90%
Stock	40° C - +65° C 90% RH

3 Installation

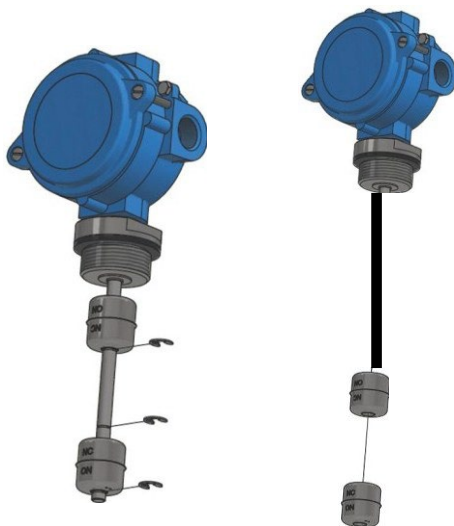
- The instruments have to be mounted in the tank in vertical position $\pm 15^\circ$ through an appropriate (threaded or flanged) mechanical connection, having care to interpose a proper gasket between the connections.
- The instruments manufactured to be sidely mounted are marked on the process connection to avoid uncorrect positioning.

! Attention!

Float level switches are usable with fluids having max viscosity up to 150 CST



- If the geometry of float does not fit through the process connection, the float must be removed before mounting
- After mount, the float should be re-attached within the inside the tank (be careful to float position)



Warning!

Only proper tools have to be used for installing and uninstalling the level switches.

- Do not use the electrical connection box for manual installation.

4 Electrical connections

There are several types of electrical wiring of the contacts. The standard wiring diagrams are shown on section 8.

For customised instruments the wiring diagram will be included to this manual.

The possible switch-types are: "SPST" (simple contact) or "SPDT" (switchover contact). The SPST contacts are predefined, in accordance with the customer, as NC (closed in lack of liquid) or as NO. (open in lack of liquid).

Electrical connection must be performed according the European standards and ground cable (green/yellow) must have 1,5 sqmm of section. Coupling torque of the ground screw must be 2Nm.

Always connect between power source and the device a safety switch to prevent the risk of electrical shocks.

If installation is performed with ambient temperature and/or process temperature very high (> 105°C) use exclusively siliconic cables.

Note

- ▶ In most of the instruments it is possible, by turning the float on the stem, to invert the switch-mode from NC. to NO. To obtain this you have to remove the blocking rings on the supporting stem, to take out the float/s and reinsert them in reversed way. For the instruments provided with nut on the bottom of the stem take particular care by unscrewing the nut.
- ▶ This nut have to be reassembled using a thread sealing-liquid to assure the mechanical sealing of the system. No warranty is given by VAL.CO for malfunctions occurred after this operation if not performed in his own workshop.
- ▶ The weatherproof "W" or explosionproof "E" junction boxes are provided with bilateral threaded inlets, to facilitate the electrical connection. If just one of this connections are used, take care to seal properly the unused one, to grant the characteristic protection grade (IP65) of the housing

Senseca declines all responsibilities for damages caused by improper installation of the instruments.

Electrical cables and zener barriers (Special note only for Exei-Eexd level controls)									
If Exei level switches are used, electrical connection between barriers and instruments must be made with cables (up to 12 conductors) having working voltage of 250 Vac, test voltage of 1500Vac and minimum thickness of insulation of 0,2 mm in according with EN-50039. Signal cables must be separate from power cables and installed in a fixed mechanical protection, such as conduit pipe. The label "EXI CIRCUITS" supplied with the instrument has to be applied on signal cables layout. Technical data of cables are below mentioned Maximum length: 300m for cable with capacitance 200 nF/Km 600m for cable with capacitance 100 nF/Km Minimum section: 0,22mm²	Cables for Eexd level switches must be installed in conduit pipe with blocking joint at the beginning and at the end of the pipe. We recommend to use a cable with a minimum section of 0,22 mm². Zener barriers (active or passive) and/or other devices such as insulation amplifiers or relays must be certified in according with EN-50020 (Eexia) IIC and installed in safe area. Technical data of barriers are below mentioned. <table> <tr> <td>U_{max}:</td><td>250V</td></tr> <tr> <td>Maximum voltage U_o:</td><td>16V</td></tr> <tr> <td>Maximum current I_o:</td><td>50mA</td></tr> <tr> <td>Maximum power P_o:</td><td>0,35</td></tr> </table> In case of multichannel barriers, technical data are referred to each channel.	U_{max}:	250V	Maximum voltage U_o:	16V	Maximum current I_o:	50mA	Maximum power P_o:	0,35
U_{max}:	250V								
Maximum voltage U_o:	16V								
Maximum current I_o:	50mA								
Maximum power P_o:	0,35								

5 Electrical characteristics

Electrical characteristics: (See table below).

- The contacts used in these instruments are "Reed" type, magnetically actuated. This kind of contacts can carry out up to 100.000.000 operations.
- The switch power is relatively low (30 - 100VA/W depending on the single types).
- It is recommended for a safe use of the contacts to drive the power-loads through auxiliary relays or to use transient suppressors.

TYPE	POWER		MAX: VOLTAGE		MAX:CURRENT	
	VA	W	AC	DC	AC	DC
3 (SPST)	70	50	300	300	0,5	0,7
4 (SPST)	80	80	250	250	1,3	1,3
*6-7 (SPOT)	60	60	230	230	1	1
*6D-7D (SPOT)	20	20	150	150	1	1

* 6-60 for ATEX EXO version

6 Maintenance

This type of instruments, if they are used in accordance with the specified mechanical and electrical characteristics, do not need particular maintenance. If they are used to control incrusting liquids we recommend to make periodic inspections and remove the incrustations, if they are present.

- Do not use any aggressive cleaning agents.
- Electrical connections must not come into contact with moisture.
- Repairs must only be carried out by the manufacturer.

7 Options

On request, a thermostat or PT-100/1000 - PTC - NTC temperature sensor is available. Sensor is installed at the bottom of the measure rod.

8 Electrical wirings

Type of output- DIN 43650 plug- Eexd case - IP65 case

Wiring of thermostat is always connected to the last terminals after standard wiring

The code (es. CA02... SA06) to identify the wiring is indicated on the instrument nameplate.

ON - OFF / SPST COMMON			
CA00	CA01	CA02	CA03
	CA04	CA05	CA06
	CA07	CA08	
ON - OFF / SPDT COMMON			
CB00	CB01	CB02	CB03
	CB04	CB05	CB06
	CB07	CB08	

ON - OFF / SPST SEPARATE

SA00	SA01	SA02	SA03
	SA04	SA05	SA06
	SA07		

ON - OFF / SPDT SEPARATED

SB00	SB01	SB02	SB03
	SB04	SB05	SB06
	SB07	SB08	

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