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D25242EE-3

SET/TSSH2 and SET/TSSHS2

Capasitive level sensors

Installation and Operation Instructions

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SYMBOLS

Warning / Attention

Pay special attention to installations at explosive atmospheres

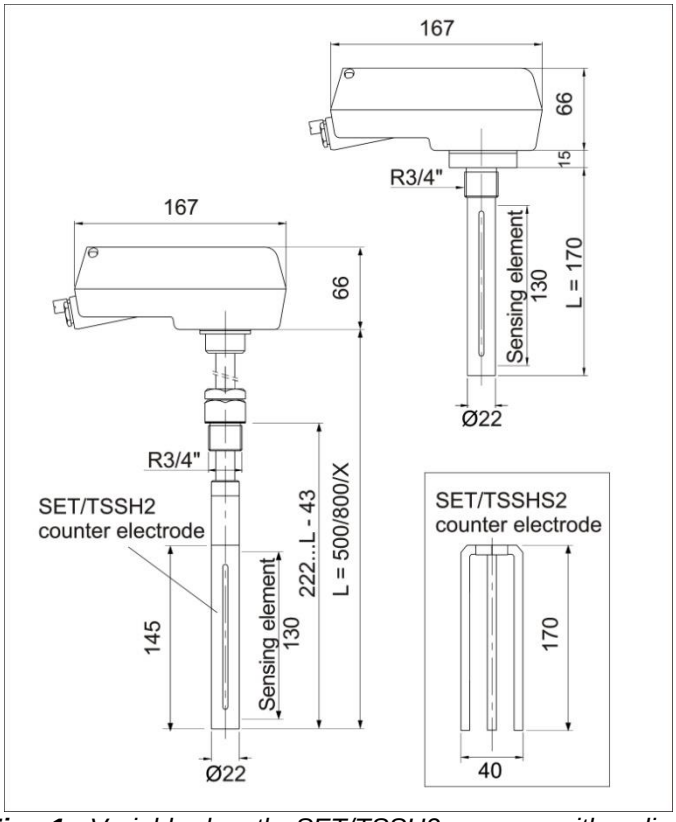

Fig. 1. *Variable length SET/TSSH2 sensor with adjustable process connection and with fixed length and counter electrode used with SET/TSSHS2 sensor.*

1 GENERAL

SET/TSSH2 is a special level sensor for liquids having temperatures up to 120 °C. The position of the sensor can easily be adjusted by changing the position of the adjustable R3/4" junction. It can be utilized as high or low level detector or for detecting the interface between two liquids in connection with Labkotec SET- series control unit.

The sensor is apparatus of equipment group II, category 1 G and can be installed in Zone 0/1/2 hazardous area.

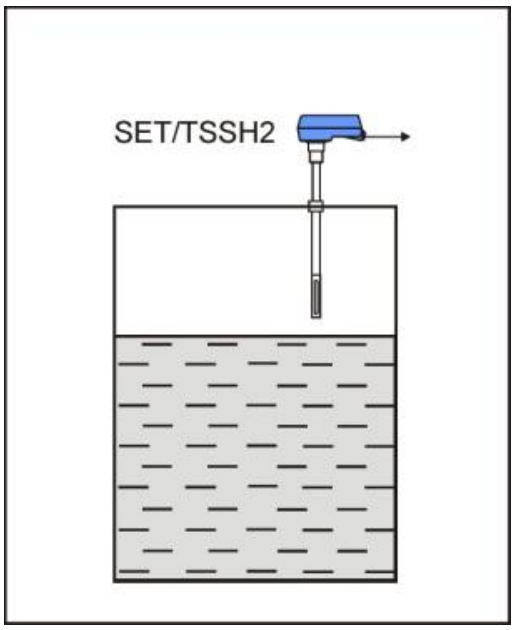

Fig. 2. *SET/TSSH2 as high level alarm in hot water container*

2 CONNETIONS AND INSTALLATION

SET/TSSH(S)2 sensor shall be installed it's adjustable R3/4" process connection to the vessel top.

WARNING! When installing in explosive atmosphere, notice, that the central electrode of the sensor is covered with plastic parts. There may be hazard of electrostatic charges if the plastic parts are subjected to friction or to flow of non-conducting media or material.

WARNING! Transmitter housing includes light alloy parts. When installing in explosive atmosphere, make sure, that the sensor is located so, that it can't be mechanically damaged or it will not be exposed to external impacts.

The cable between the sensor and the control unit is connected to the negative and positive connectors of the respective units - see control unit's operation manual. The cable shield and all unused wires are earthed only at the sensor end under the internal earthing screw. In case that cable includes various concentric shields, the outermost shield should be earthed under the internal earthing screw and inner shields should be connected straightly to the SHIELD connector of transmitter. Earthing of the outermost shield can also be done straight to equipotential ground, in which case it shall not be connected under the internal earthing screw. When the sensor is installed in an explosion-hazardous area, the external earthing screw of the transmitter enclosure must be connected to the equipotential ground, like it is represented in the Fig. 3. The base capacitance between environment and the electrode structure is compensated with external reference capacitor (max. 68 pF) between Cref -terminals, which is normally done beforehand at factory, if the product to be measured is known. The shield of the sensing element cable is connected to the GUARD connector of the transmitter. When measuring high conducting liquid the sensing element cable is connected to the Cx HIGH connector and in case of low conducting liquid to the Cx LOW connector.

If the connection is changed then the value of the reference capacitor may have to be changed too.

Make sure, that the supply voltage is connected to the control unit.

When installing the SET/TSSH(S)2 sensor into an explosion hazardous zone (0/1/2), the following standards need to be followed; EN IEC 60079-25 Intrinsically safe electrical systems "i" and EN IEC 60079-14 Electrical installations in hazardous areas.

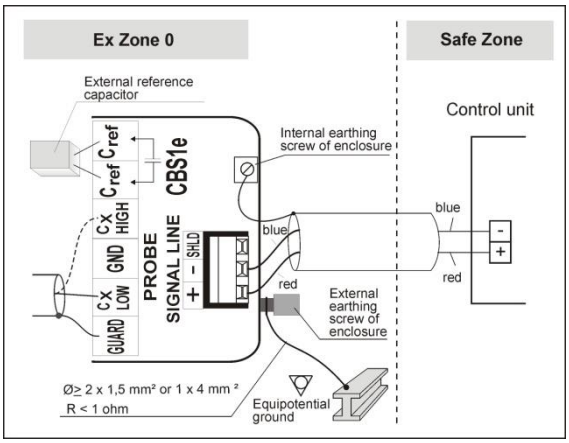

Fig. 3. *Connection example*

3 ADJUSTING THE SWITCHING POINT

1. Turn the SENSE trimmer of the control unit to the extreme clockwise position.

2. When the sensing element of the sensor is half immersed in the liquid to be measured (see Fig. 4), the control unit should operate. If it doesn't, adjust the SENSE trimmer slowly counter clockwise until the desired switching point is reached.

3. Check the function by lifting and immersing the sensor few times into the liquid.

A too sensitive setting can cause false alarms.

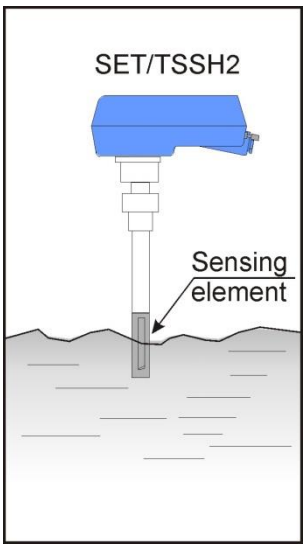

***Fig. 4**. Adjusting the switching point*

IN CASE SENSOR DOESN'T FUNCTION

If the sensor is located in a hazardous area an Exi-classified multimeter must be used and Ex-standards mentioned in 4. SERVICE AND REPAIR must be followed.

1. The sensor must be correctly connected to the control unit.

2. The supply voltage between connectors 1 and 2 should be 10,5...12 V DC.

3. If the sensor supply voltage is correct, connect mA-gauge to the sensor circuit according to the Fig. 5 by disconnecting wire nr. 1 from th control unit.

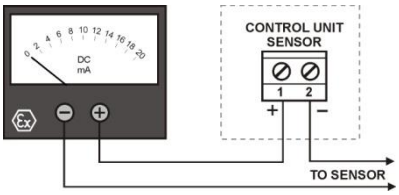

***Fig. 5.** Measuring the sensor current*

Sensor current in different conditions:
- clean and dry sensor in air 6 - 8 mA
- sensor in water 14 - 15 mA

4 SERVICE AND REPAIR

The sensor must always be cleaned down and tested when emptying the tank or separator and when carrying out annual maintenance. For cleaning, a mild detergent (e.g. washing-up liquid) and scrubbing brush can be used.

Defected sensor must be replaced by a new one

Service, inspection and repair of Ex-apparatus needs to be done according to standards EN IEC 60079-17 and EN IEC 60079-19.

5 TECHNICAL DATA

SET/TSSH2 sensor	
Control unit	Labkotec SET –control unit
Cabling	Shielded, twisted pair instrument cable, e.g. 2x(2+1)x0.5 mm^2 Ø 4-8 mm. Cable loop resistance max. 75 Ω.
Lengths **TSSH2 (TSSHS2)**	L= 170 mm, with adjustable junction L= 500 or 800 mm. Other lengths available on special order. Sensing element 130 mm.
Process connection	R3/4”
Operating temperature **Transmitter** **Sensing element**	 -25 ºC…+70 ºC -25 ºC…+120 ºC
Materials **Sensing element** **Housing**	 AISI 316, Teflon AlSi
EMC **Emission** **Immunity**	 EN IEC 61000-6-3 EN IEC 61000-6-2
Housing	IP65
Operating pressure	1 bar
Ex-classifiction **ATEX** **Special conditions (X)**	II 1 G Ex ia IIC T5 Ga VTT 02 ATEX 022X Transmitter (Ta = -25 °C…+70 °C) Sensing element (Ta = -25 ºC…+120 ºC) Transmitter housing must be connect to equipotential ground.
Ex-connection values	Ui = 18 V I = 66 mA Pi = 297 mW Ci = 3 nF Li = 0 µH
Operating principle	Capacitive
Manufacturing year: **Please see the serial number on the type plate**	xxx x xxxxx xx **YY** x where YY = manufacturing year (e.g. 19 = 2019)

Labkotec
INDUTRADE GROUP

EU DECLARATION OF CONFORMITY

We hereby declare that the product named below has been designed to comply with the relevant requirements of the referenced directives and standards.

Product Level sensors
SET/TSSH2, SET/TSSHS2, SET/SA2

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Directives The product is in accordance with the following EU Directives

2014/30/EU	Electromagnetic Compatibility Directive (EMC)
2014/34/EU	Equipment for Potentially Explosive Atmospheres Directive (ATEX)
2011/65/EU	Restriction of Hazardous Substances Directive (RoHS)

Standards The following standards were applied:

EMC:	EN IEC 61000-6-2:2019 EN IEC 61000-6-3:2021
ATEX:	EN IEC 60079-0:2018 EN 60079-11:2012
	EC-type examination certificate: VTT 04 ATEX 022X. Notified Body: VTT Expert Services Ltd, Notified Body number 0537.
	The revised harmonised standards have been compared to the previous standard versions used in the original type certification and no changes in the "state of the art" apply to the equipment.
RoHS:	EN IEC 63000:2018

The product is CE-marked since 2002.

Signature This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy.

Pirkkala 4.8.2021

Janne Uusinoka, CEO
Labkotec Oy