


SET/V


High level sensor

OPERATION AND INSTALLATION MANUAL



SYMBOLS

 To be considered in installations in potentially explosive atmospheres.

 Warning/Attention

1. GENERAL

SET/V is a level switch sensor that is to be connected to analogical and digital SET control units of Labkotec. Operating principle of the sensor is based on the measurement of the vibration of the sensor.

Sensor is suitable to be used as a high level alarm for liquid tanks, for example. Typical applications of SET/V sensor include oil and grease separators.

The SET/V has been certified according to the ATEX Directive (94/9/EC) in equipment category 1 and it can be installed in potentially explosive atmospheres in zoned areas 0, 1, and 2.

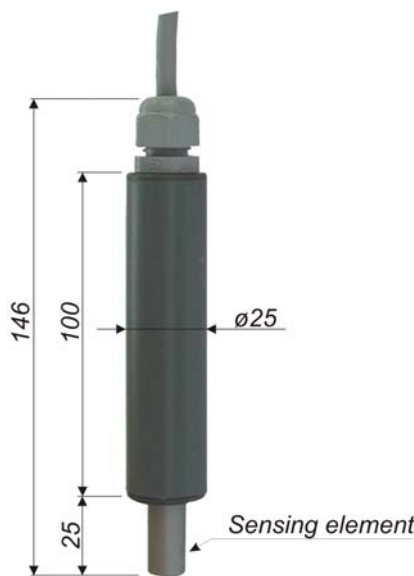


Figure 1. Dimensional drawing of the SET/V sensor

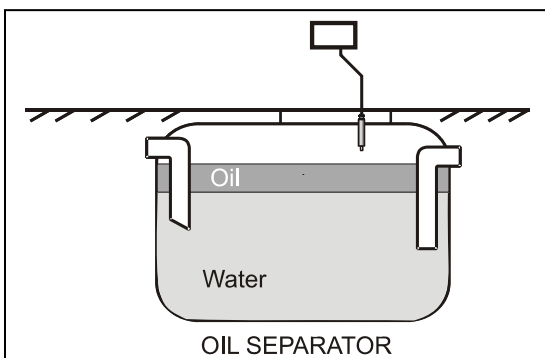





Figure 2. Application: high level alarm for an oil separator

2. TECHNICAL DATA

Control unit	LevelSET S and SET control units by Labkotec Oy
Signal	Digital and analogical 7mA/13mA
Operating voltage	8V...16V (DC)
Cable	Shielded oil-proof cable 2 x 0.75 mm ² . Standard length 5 m. Other lengths optional. The max. length of the fixed cable is 15 m. Can be extended with a shielded cable. The recommended maximum cable loop resistance is 75 Ω.
Materials	PA, PVC, aluminum, NBR
Temperature range	Operation: 0...+60°C Safety: -30...+60°C
EMC	
Emissions	EN 61000-6-3
Immunity	EN 61000-6-2
IP-classification	IP68
Ex-classification	 II 1 G Ex ia IIB T5 Ga VTT 09 ATEX 025X IECEx VTT 10.0006X Ui = 16 V li = 80 mA Pi = 400 mW Ci = 3500 pF Li = 85 μH
Operating principle	Vibration
Manufacturing year: Please see the serial number on the type plate.	xxx x xxxxx xx YY x where YY = manufacturing year (e.g. 10 = 2010)
	The sensor may be installed in potentially explosive atmospheres of zones 0, 1, and 2 with the following special conditions (X): – The ambient temperature is –30...+60°C. – The risk of electrostatic charge must be observed!
	Standards to be considered in the installation: IEC/EN 60079-25 Intrinsically-safe electrical systems "i", and/or IEC/EN 60079-14 Electrical installations in hazardous areas. If the cabling is voltage-tested, the sensor must be detached from the system.

3. CONNECTIONS AND INSTALLATION

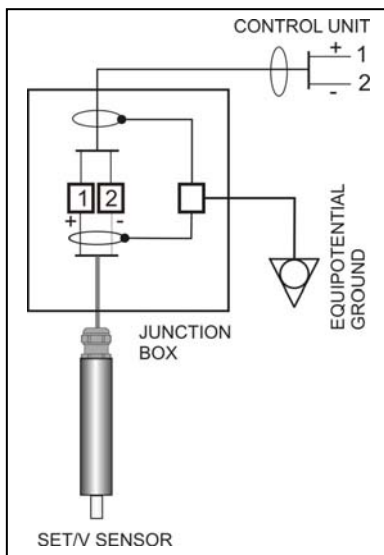


Figure 3. Connection example 1

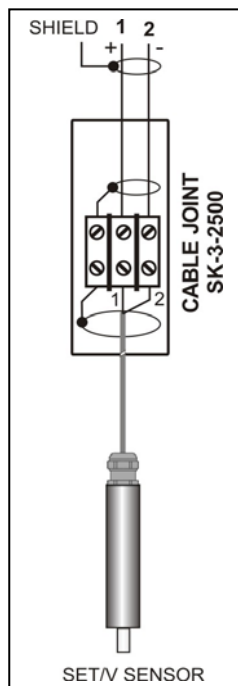


Figure 4. Connection example 2

The SET/V sensor is equipped with a shielded 2-wire cable. The numbered wires 1 and 2 of the cable are connected to the corresponding connectors (1 = +, 2 = -) in the control unit. Always check the connections from the installation and operation manual of the control unit as well.

In the example shown in figure 3, an LJB2-78-83 junction box has been used to connect the cabling to the equipotential bonding.

In figure 4, equipotential bonding is not available. The shield is connected to the appropriate connector in the supply device.

In these kinds of arrangements, it must be ensured that the electrostatic charges do not cause a hazard. Make sure in the installation that the device and cabling are not close to a strong current or other installations and that they are not exposed to strong stream flows, mechanical abrasions, or impacts.

The cable may be shortened or extended with a junction box, if necessary.

The sensor is installed by hanging it from its cable at a suitable height so that the switch data is received as the surface level reaches the sensing element.

The example in figure 5 shows an oil separator application.

Write down the 5 digit address from the **Code field of the sensor type plate** in the installation phase for later use. This address is required if the sensor has to be re-connected to the LevelSET S system or another control unit.

SET/V	VTT 09 ATEX 025X	
CE 0537	IECEX VTT 10.0006X	
Labkotec Oy Finland	S.No	Ex II 1 G Ex ia IIB T5 Ga
	Code	Ui=16.0 V Ii=80 mA Pi=400 mW Li and Ci see tech. documents

4. OPERATION

This chapter provides a general description of the operation of the alarm in different situations. For a more detailed description, please refer to the manual of the control unit in use.

Normal mode

The SET/V high level sensor is entirely in the air.
The alarm indicator lights are off.
The relays are energized.

Tank full

The sensing element of the SET/V sensor is immersed in liquid.
The Overfill indicator is on.
The buzzer sounds
The relays are de-energized.

Once the alarm is off, the alarm indicator lights switch off, the buzzer stops, and the relays are energized.

Fault alarm

The sensor is broken, there is a sensor cable break or a short circuit, or the sensor signal current is not recognized (digital system).
The sensor circuit Fault indicator is on.
The buzzer sounds
The relays are de-energized.

5. OPERATION TEST

Always check the correct operation of the alarm after the installation and after making the connections. You should also check the operation every time the separator is emptied or at least once a year.

Testing the operation

1. The sensor is in the air. The device should be in normal mode (see chapter 4).
2. Lower the sensing element of the sensor into the water or oil. The "Tank full" alarm should be issued (see chapter 4).
3. Lift the sensor in the air. The alarm should stop after a while. Clean the sensor before installing it into the separator.

If the sensor does not function as described, check the device settings from the control unit manual or contact the representative of the manufacturer.

6. SERVICE AND REPAIR

The sensor must be cleaned and tested when emptying the storage chamber and in connection with the annual maintenance. A mild detergent (e.g. washing-up liquid) and a scrubbing brush can be used for cleaning the sensor, if necessary.

During maintenance procedures (such as servicing the oil/fuel separator systems), the sensor should not be lifted out of the separator tank or installed back until there is water in the tank.



The instructions concerning the inspection and maintenance of Ex equipment contained in standards IEC/EN 60079-17 and IEC/EN 60079-19 should be observed when executing service, inspection, or repair procedures.

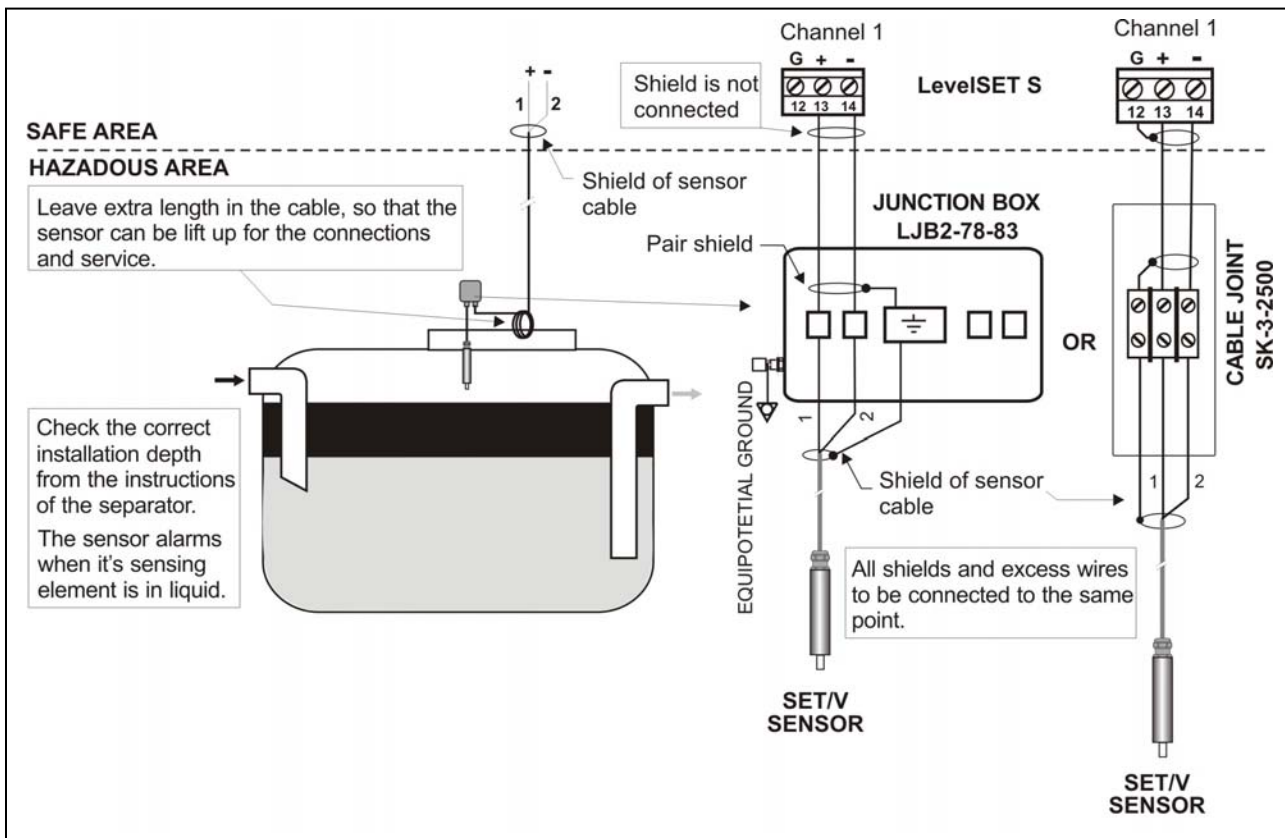


Figure 5. Installation example in an oil separator.