

idSET-34

Oil Separator Alarm Device (230 VAC)



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1 General information about the manual

This manual is an integral part of the product.

- Please read the manual before using the product.
- Keep the manual available for the entire duration of the product's life span.
- Provide the manual to the next owner or user of the product.
- Please report any errors or discrepancies related to this manual before commissioning the device.

1.1 Markings and symbols

Safety-related markings and symbols



This marking warns of a possible hazard. Failing to observe the safety instructions in question may result in injury or death.



This marking warns of a fault or hazardous situation. Failing to observe the safety instructions in question may result in injury or device breakage.



This marking warns of a possible fault. Failing to observe the safety instructions in question may result in device or system breakage or erroneous operation.



This marking emphasises an issue that requires special attention during installation and when using the device in an explosive atmosphere.

Informative markings and symbols



This marking highlights essential information.



This marking refers to a user measure.

1.2 Conformity of the product

The EU declaration of conformity and the product's technical specifications are integral parts of this document.

All of our products have been designed and manufactured with due consideration to the essential European standards, statutes and regulations.

Labkotec Oy has a certified ISO 9001 quality management system and ISO 14001 environmental management system.

1.3 Limitation of liability

Due to continuous product development, we reserve the right to change these operating instructions.

The manufacturer cannot be held liable for direct or indirect damage caused by neglecting the instructions provided in this manual or directives, standards, laws and regulations regarding the installation location.

The copyrights to this manual are owned by Labkotec Oy.

2 Safety and the environment

2.1 General safety instructions

The plant owner is responsible for the planning, installation, commissioning, operation, maintenance and disassembly at the location.

Installation and commissioning of the device may be performed by a trained professional only.

Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended purpose.

Laws and regulations applicable to the usage or the intended purpose must be observed. The device has been approved for the intended purpose of use only. Neglecting these instructions will void any warranty and absolve the manufacturer from any liability.

2.2 Intended use

idSET-34 alarm system is intended for monitoring liquid levels particularly in oil and sand separators.

The system consists of a control unit and connected sensors that have been installed in the oil or sand separator. The sensors can be placed in a zone 0 explosive atmosphere, but the control unit must be positioned in a safe area.

A more specific description of the product's operation, installation and use is provided later in this manual.

The device must be used in accordance with the instructions provided in this document. Other use is counter to the product's purpose of use. Labkotec cannot be held liable for any damage caused by using the device in violation of its purpose of use.

2.3 Transport and storage

Check the packaging and its content for any possible damage.

Ensure that you have received all the ordered products and that they are as intended.

Keep the original package. Always store and transport the device in the original packaging.

Store the device in a clean and dry space. Observe the permitted storage temperatures. If the storage temperatures have not been presented separately, the products must be stored in conditions that are within the operating temperature range.

2.4 Installation and commissioning



The device does not have a mains switch and therefore the supply voltage wires near the device should be fitted with an isolating switch (250 VAC/12 VA), which disconnects the wires (L1, N), in order to facilitate service and repair procedures. The switch must be in the immediate proximity of the device and easily reached by the user. The switch must be labelled as the unit's isolating switch. The external switch must adhere to the standard IEC/EN 60947-1 or IEC/EN 60947-3.

Supply cable 2 x 1,5-2,5 mm² (AWG16-AWG13). Supply voltage max fuse size 16 A.

The supply voltage and local supply voltage tolerances must be taken into account with regard to the cable's maximum voltage.



If the temperature in the installation environment is expected to exceed +40°C, the temperature tolerance of the supply voltage and relay connection cable must be at least +80°C. Otherwise, any cable that meets the applicable electrical regulations can be used as the supply voltage and relay connection cable.



The internal temperature of the device can be 10°C higher than the ambient temperature. This must be taken into account in the cabling of the device.



The voltage connected to the contacts of relays must be in the same voltage class (ELV/LV), considering the maximum values listed in the technical specifications.



The idSET-34 control unit must not be installed in potentially explosive areas, but a sensor connected to it may be installed in potentially explosive atmospheres of zones 0, 1 and 2.

In potentially explosive area installations, the national regulations and appropriate standards IEC/EN 60079-25 Intrinsically safe electrical systems "i" and/or IEC/EN 60079-14 Explosive atmospheres - Electrical installations design, selection and erection must all be followed.



If it is possible that static electricity can cause hazards in the measurement environment, equipotential bonding must be attended according to the regulations concerning potentially explosive atmospheres. Equipotential bonding is done by connecting all conductive parts to the same potential e.g. in a junction box. Equipotential bonding system must be grounded.



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



See Technical specifications; Connection values and Appendix; System diagram.

2.5 Repair

The device may not be repaired or modified without the manufacturer's permission. If the device exhibits a fault, it must be delivered to the manufacturer and replaced with a new device or one repaired by the manufacturer.

2.6 Decommissioning and disposal

The device must be decommissioned and disposed of in compliance with local laws and regulations.

3 Product description

3.1 Device operation

idSET-34 is an alarm system intended for monitoring liquid levels particularly in oil and sand separators. The system consists of the idSET-34 control unit and the idOil sensors installed in the separator. The sensor cables can be extended with a cable connector or connection box.

One to three different types of digital idOil sensors can be connected to the control unit. The sensors can be used to monitor the following:

- High liquid level (idOil-LIQ high liquid level sensor)
- Oil layer detection (idOil-OIL oil sensor is for class IIA explosive liquids and idOil-OIL-S oil sensor is for class IIB explosive liquids)
- Sludge layer detection (idOil-SLU sludge sensor)

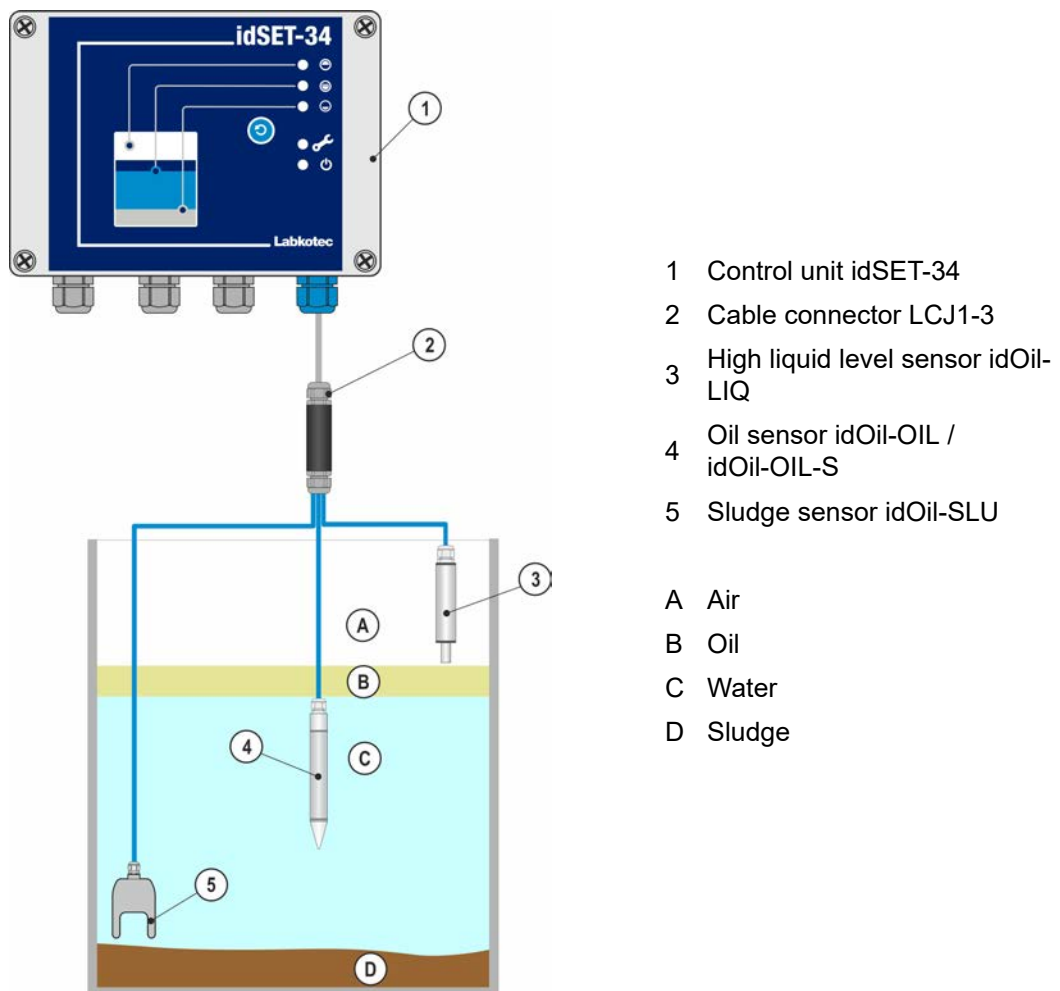


Figure 1. System description; idSET-34 control unit, sensors and cable extension

The device's indicator lights present sensor alarms and faults.

In alarm and fault situations, the buzzer sounds an alarm and the relays are switched to the alarm position.

The relays are of the failsafe type, which means that they also enter the alarm state when operating power is lost.

The operation of the product is described in more detail in the section Operation.

3.2 Products

Control unit:

Type name	Description
idSET-34	Control unit, 230 V AC

Sensors:

Type name	Description
idOil-LIQ	High liquid level sensor to sense excessively high liquid level
idOil-OIL / idOil-OIL-S	Oil sensor to detect the thickness of the oil layer
idOil-SLU	Sludge sensor to detect the thickness of the sludge layer

Accessories:

Type name	Description
LCJ1-1	Cable connector for one sensor
LCJ1-2	Cable connector for two sensors
LCJ1-3	Cable connector for three sensors
LMS-SAS2	Mounting kit for control unit
LMS-SAS5	Mounting kit for sensor

3.3 Dimensions

3.3.1 Dimensions of the idSET-34 control unit

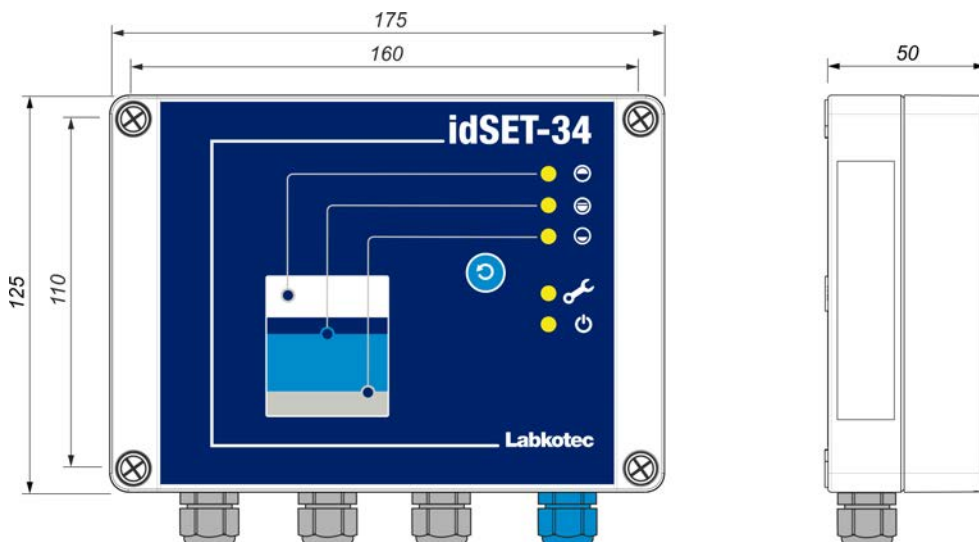


Figure 2. Dimensions of the idSET-34 control unit (mm)

3.3.2 Dimensions idOil-LIQ high liquid level sensor

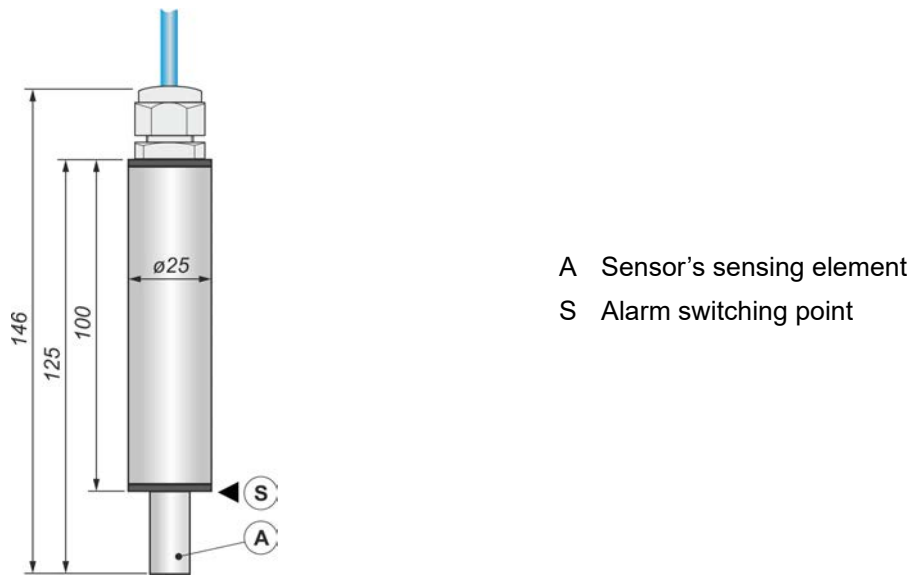
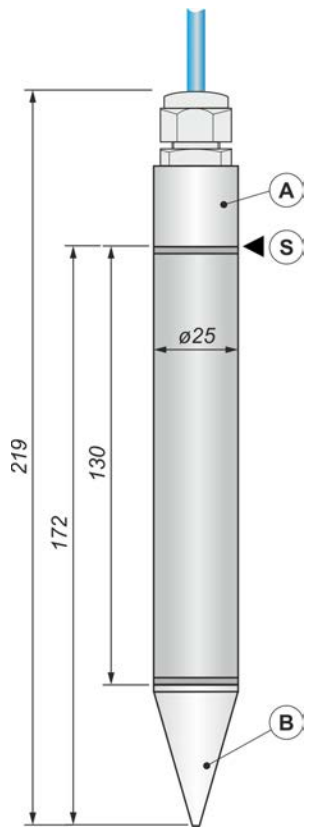


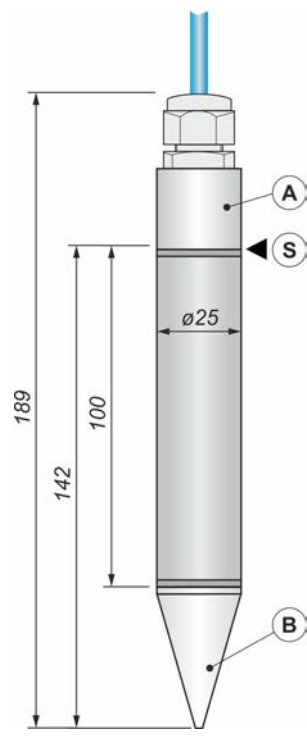
Figure 3. High liquid level sensor idOil-LIQ – structure and dimensions (mm)

3.3.3 Dimensions of the idOil-OIL / idOil-OIL-S oil sensor



- A Measuring electrode
- B Reference electrode
- S Alarm switching point

Figure 4. Oil sensor idOil-OIL – structure and dimensions (mm)



- A Measuring electrode
- B Reference electrode
- S Alarm switching point

Figure 5. Oil sensor idOil-OIL-S - structure and dimensions (mm)

3.3.4 Dimensions idOil-SLU sludge sensor

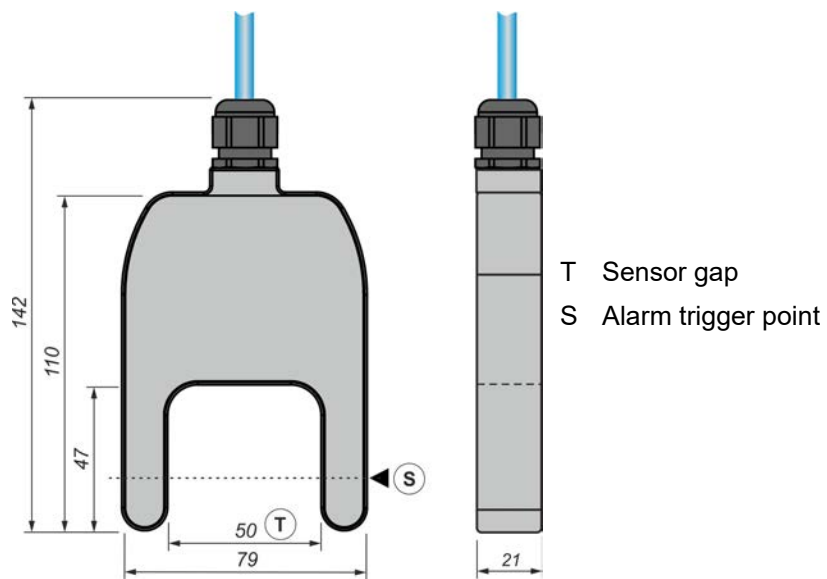


Figure 6. Sludge sensor idOil-SLU – structure and dimensions (mm)

4 Installation

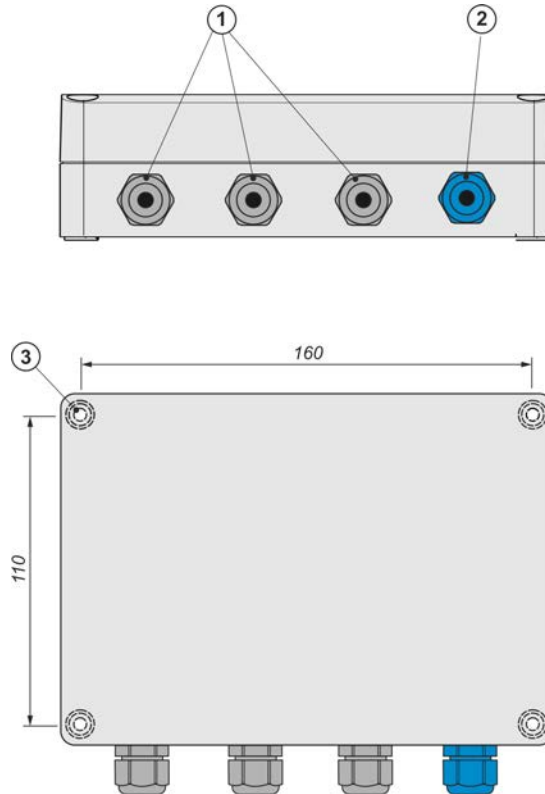
4.1 Installing the control unit



The control unit must be installed in a safe (non-Ex) space.



Read Section *General safety instructions* before installation.



- 1 Gable glands M16 grey, 3 pcs
 - 2 Gable glands M16 blue, 1 pcs
 - 3 Fastening holes $\varnothing 4.5$ mm, 4 pcs
- Installation dimensions 160 x 110 mm

Figure 7. Installing the idSET-34 control unit

4.2 General installation instructions for sensors



idOil sensors can be installed in zone 0 explosive atmospheres. Do not remove the sensor markings from the cables or sensor frames.



Read Section *General safety instructions* before installation.



Check the correct installation depth of the sensor in the instructions of the separator in question.

For example, sensors can be installed suspended from their cable (see next figure). Leave a sufficient length of the sensor or extension cable coiled inside the service well, so that you can easily lift the sensor out for inspection and cleaning.

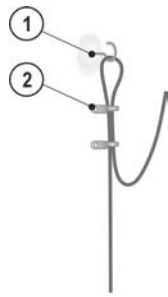


Figure 8. Sensor suspension example

- 1 Suspension hook
- 2 Cable tie



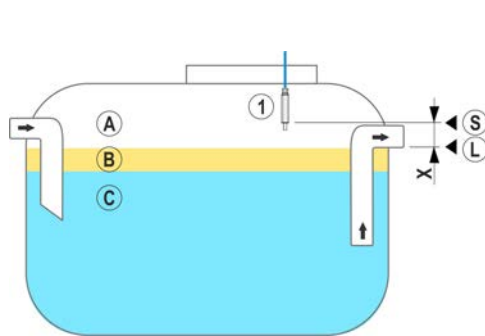
Figure 9. Sensor mounting supplies LMS-SAS5

4.2.1 Installing the idOil-LIQ high liquid level sensor

The sensor is normally in air, and it issues an alarm when the sensing element is submerged in liquid. The sensor is installed at a suitable height above the standard liquid level (L) so that the overflow alarm is activated once the liquid level reaches the sensing element.

Overflow is possible in the following cases, for example:

- if the filter is dirty
- if the automatic closure device is blocked
- or if some other situation causes blockage in the discharge pipe



- 1 idOil-LIQ high liquid level sensor

- A Air
- B Oil
- C Water
- L Standard liquid level
- S Sensor switching point
- X Liquid alarm limit (maximum surface level)

Figure 10. Installing the idOil-LIQ high liquid limit sensor

4.2.2 Installing the idOil-OIL / idOil-OIL-S sensor

The sensor must be submerged at the desired installation depth when the liquid is at the separator's standard liquid level (L).

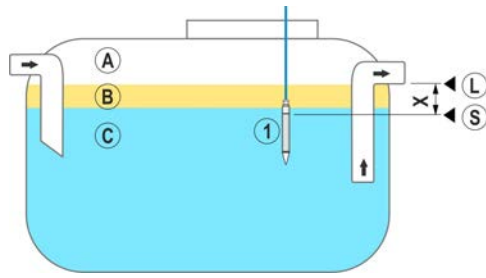
The exact installation depth depends on the following:

- separator type
- separator shape
- volume and height of the separator's oil compartment

The sensor must always be immersed in liquid. The alarm is activated when the lower surface of the oil layer reaches the alarm switching point (S), i.e. when the sensor's measuring electrode is covered in oil.



The sensor activates the alarm when it is in contact with air. For this reason, the separator must always be filled with water after draining.



1 idOil-OIL / idOil-OIL-S oil sensor

- A Air
- B Oil
- C Water
- L Standard liquid level
- S Alarm switching point
- X Maximum allowed oil layer thickness

Figure 11. Installing the idOil-OIL / idOil-OIL-S sensor

4.2.3 Installing the idOil-SLU sludge sensor

The sensor issues an alarm on sludge, sand or other solids accumulated at the bottom of the separator.

The sensor's exact installation depth depends on the following:

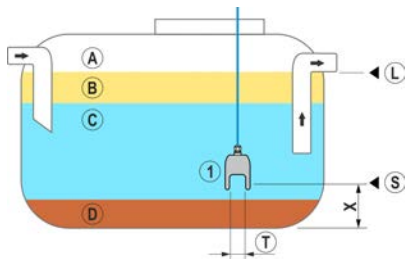
- separator type
- separator shape
- maximum allowed sludge layer thickness

The sensor must always be immersed in liquid. The alarm is activated when the sludge layer reaches the alarm switching point (S), which is located inside the sensor gap (T).



The sensor activates the alarm when it is in contact with air. For this reason, the separator must always be filled with water after draining.

1 idOil-SLU sludge sensor



- A Air
- B Oil
- C Water
- D Sludge
- L Standard liquid level
- S Alarm switching point
- X Maximum allowed sludge layer height
- T Sensor gap

Figure 12. Installing the idOil-SLU sludge sensor

5 Connections



Read Section *General safety instructions* before installation.



Make the connections when the device is de-energised.



The legends for the connection diagrams can be found in the section following the diagrams.

5.1 Connection diagrams

5.1.1 Connection with a single-sensor cable connector

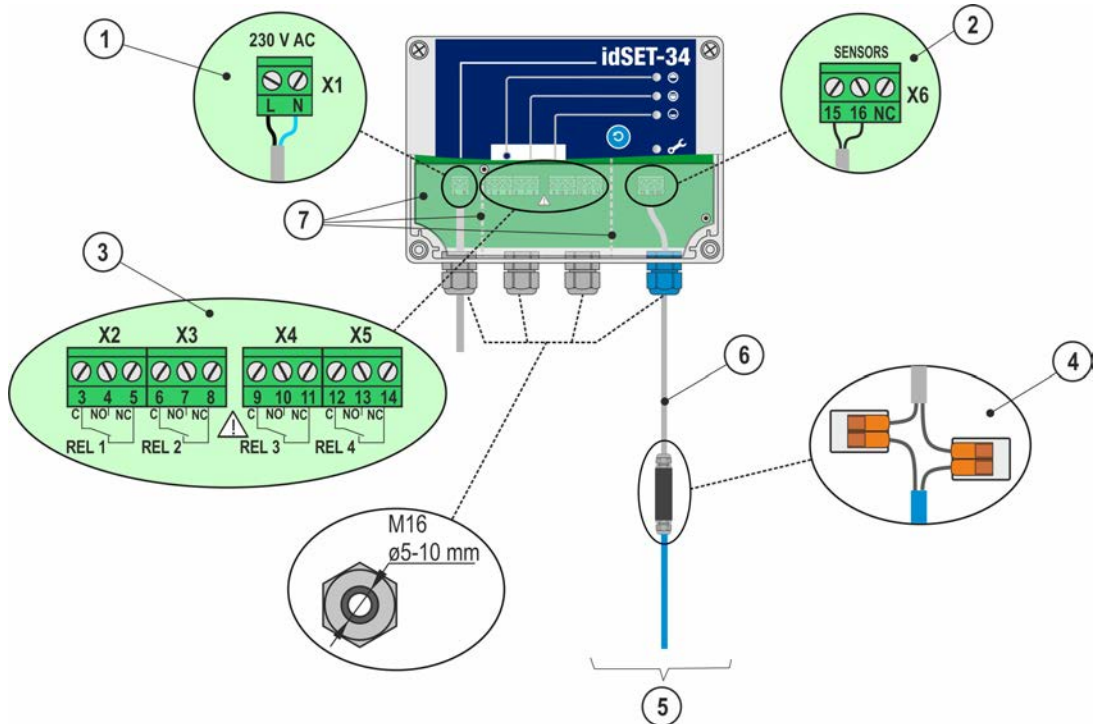


Figure 13. Connection with a single-sensor cable connector LCJ1-1

5.1.2 Connection with a two-sensor cable connector

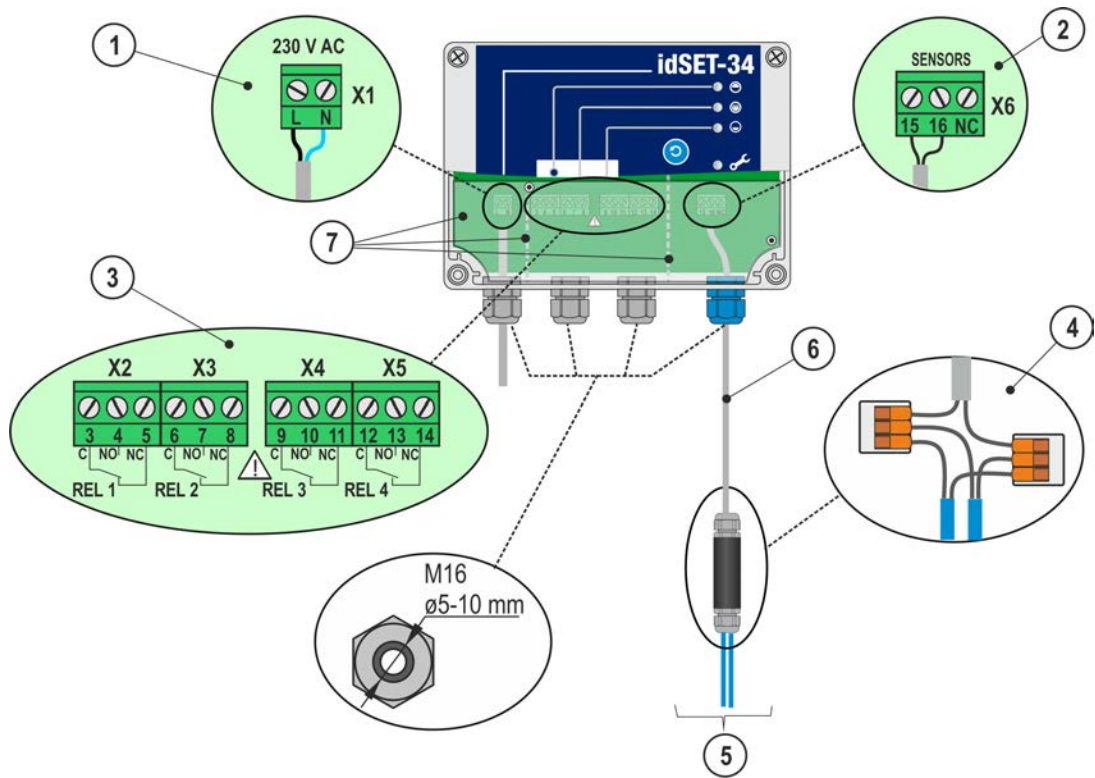


Figure 14. Connection with a two-sensor cable connector LCJ1-2

5.1.3 Connection with a three-sensor cable connector

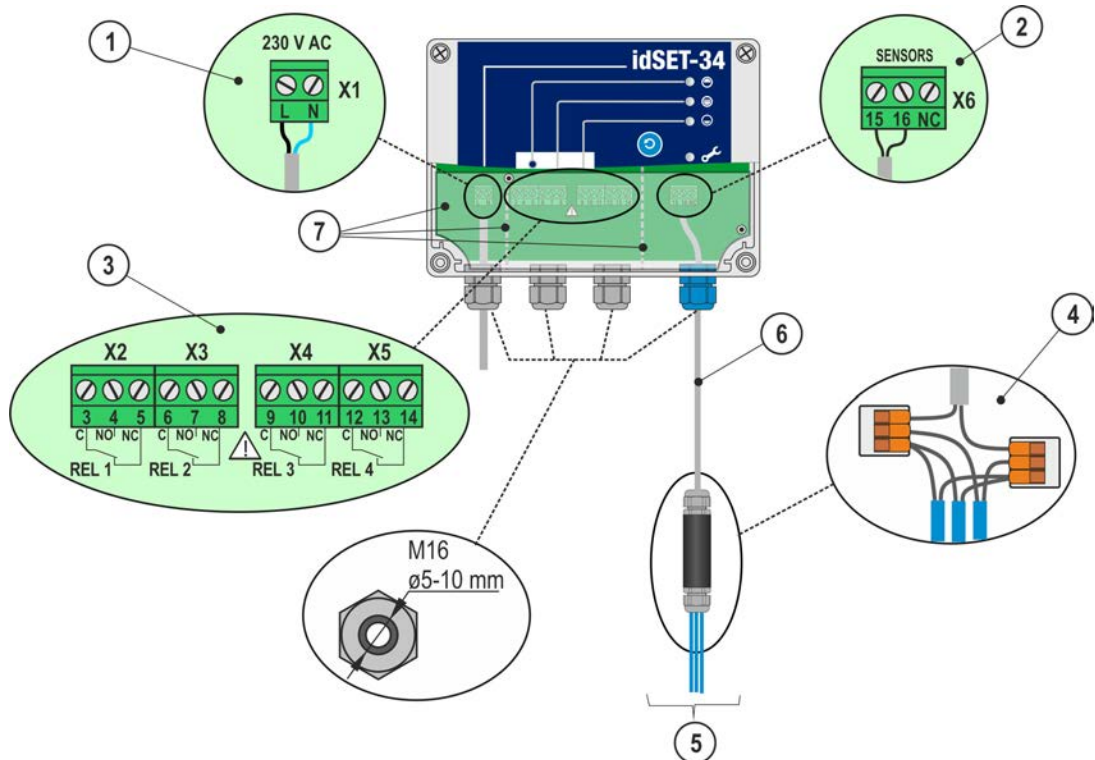


Figure 15. Connection with a three-sensor cable connector LCJ1-3

5.2 Explanations of connection diagrams

1 Supply voltage 230 V AC (X1)

(N:B. The device does not include a mains switch, see Section *Safety and the environment*)

N = neutral connector

L = phase connector



Supply cable 2 x 1,5-2,5 mm² (AWG16-AWG13). Supply voltage max fuse size 16 A.

The supply voltage and local supply voltage tolerances must be taken into account with regard to the cable's maximum voltage.

2 Sensor connector (X6)

15 = sensor 1, connection 1

16 = sensor 1, connection 2

NC = Not electrically connected. Possible shields and extra wires can be ended to this connector.



The sensor connection is a polarity-free digital bus, which means that it does not matter which sensor terminal the wires are connected to.

3 Relay outputs

RELAY 1 oil sensor alarms (X2)

3 = Relay common contact

4 = Contact that opens in an alarm situation

5 = Contact that closes in an alarm situation

RELAY 2 high liquid level sensor alarms (X3)

6 = Relay common contact

7 = Contact that opens in an alarm situation

8 = Contact that closes in an alarm situation

RELAY 3 sludge sensor alarms (X4)

9 = Relay common contact

10 = Contact that opens in an alarm situation

11 = Contact that closes in an alarm situation

RELAY 4 fault alarms (X5)

12 = Relay common contact

13 = Contact that opens in an alarm situation

14 = Contact that closes in an alarm situation



The maximum values presented in the technical specifications must be taken into account.

4 Cable connector

LCJ1-1 for a single sensor

LCJ1-2 for two sensors

LCJ1-3 for three sensors

5 Sensors

- 6 Extension cable**, e.g. protected, twisted-pair 2 x 0,5 mm², maximum loop resistance 68 Ohm.

The cable can be extended up to 800 meters long by using a suitable cable whose loop resistance does not exceed 68 Ohm, see more information in appendix A.

EMC disturbances caused by the environment must be taken into account when choosing the cable and cable route.

Possible shields and extra wires need to be cut off and insulated carefully. At the control unit shields and extra wires can be connected to the connector X6/NC.

- 7 Protection plate**



The connectors for the external connections are separated with protection plate and separator walls. The separator walls must not be removed. The protection plate covering the connectors must be reinstalled after connecting the cables.

6 Commissioning

6.1 Sensor identification

Ensure that the sensors have been installed and connected in the control unit in accordance with the instructions in the previous paragraphs.



DANGER OF ELECTRICAL SHOCK! Please observe the safety instructions below!

► Open the cover of the control unit and ensure that the protection plate is in place!

► Connect power to the control unit.

The voltage supply and fault indicator lights (see Section Operation) are lit in green.

The sensor indicator lights are off.

► Press the sensor identification button briefly (1).

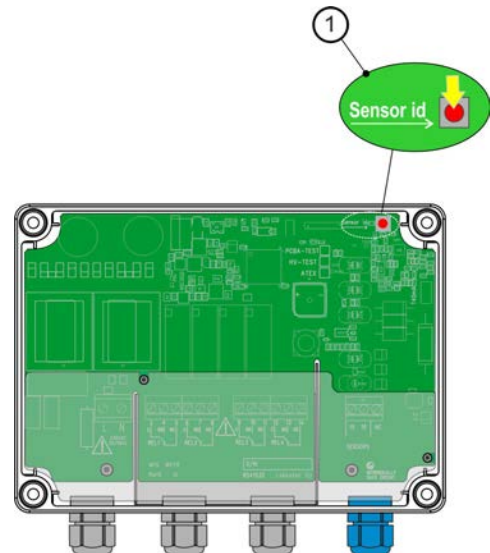


Figure 16. Sensor identification button.

The sensor identification function is initiated and the fault indicator light flashes green.

Once a sensor has been identified, the indicator light of the sensor in question becomes green.

When all connected sensors have been identified, the lights of the connected sensors are green and the fault indicator light stops flashing.

► Close the cover of the enclosure.

The separator alarm system is now operational.

If the control unit does not identify all connected sensors.

► Check the sensor connections.

► Reset the system by turning the power off and back on.

► After the check, press the sensor identification button again.



The control unit will look for the sensors for approx. 2 minutes, unless it has already found three sensors.



The sensor identification can be stopped by pressing the sensor identification button for 5 seconds.

6.2 Factory settings of the idSET-34

Alarm settings	Alarm buzzer		on
	Alarm repeat (24h)		on
	Alarm delay for all sensors		10 s
	Alarm reset button		on
Relay settings	Relay 1	connected sensors	oil sensor
		function	function upon oil sensor alarm
		relay is restored when alarm is reset	no
	Relay 2	connected sensors	high liquid level sensor
		function	function upon high liquid level sensor alarm
		relay is restored when alarm is reset	no
Relay settings	Relay 3	connected sensors	sludge
		function	function upon sludge sensor alarm
		relay is restored when alarm is reset	no
	Relay 4	connected sensors	All sensors connected to the control unit
		function	function upon sensor fault
		relay is restored when alarm is reset	no

7 Operation

After installation and commissioning, the idSET-34 separator alarm system functions entirely independently and does not require constant monitoring.

The alarm information can be connected to automation systems through relays.

All of the system's connections and functions are described in the figure below and in more detail in the following sections.

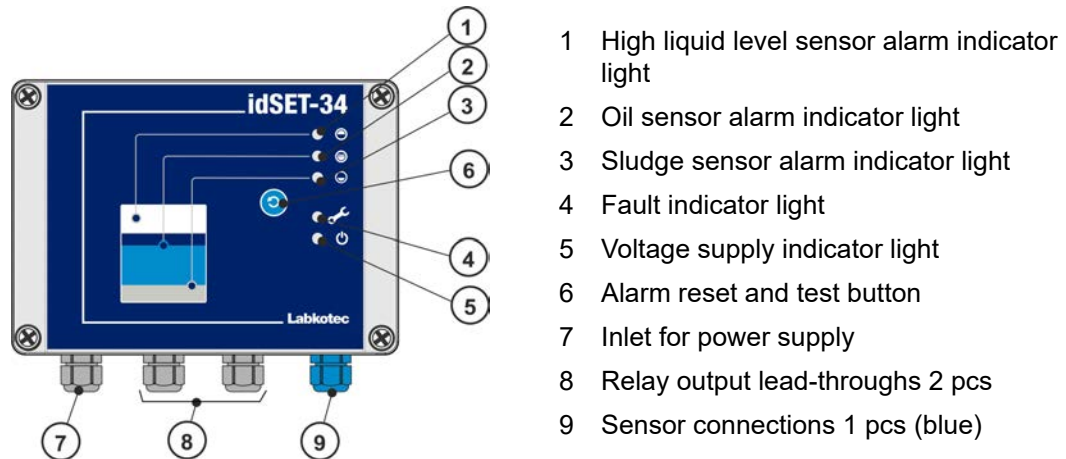


Figure 17. Features of the idSET-34 control unit

7.1 Local display and alarms

Local display

The device features LED lights for indicating alarms and faults.

Alarms

In alarm and fault situations:

- The indicator lights for alarm and/or fault situations are switched on.

After the alarm delay (10 s):

- The buzzer lets out an alarm sound.
- The relays are switched to the alarm position. Relay 1 is de-energised in an oil sensor alarm situation, relay 2 is de-energised in a high liquid level sensor alarm situation, relay 3 is de-energised in a sludge sensor alarm situation and relay 4 is de-energised in a fault situation. The relays are of the failsafe type, which means that they also enter the alarm state when operating power is lost.

The alarms can be divided into two groups: level and fault alarms.

- In a level alarm the sensor in the separator has detected that the liquid level being monitored has reached the alarm limit (high liquid level, oil or sludge).
- In a fault alarm the control unit has detected a fault in the sensor circuit. The monitoring covers the communication between the control unit and sensor as well as short circuits and breaks.

The indicator lights are used to indicate the status of the control unit and sensors. The section below presents the operation of the indicator lights, buzzer and relays in various situations:

Normal situation	<p>The level of the liquid being measured is below the high level sensor (idOil-LIQ), the oil sensor (idOil-OIL) is in water and the sludge sensor (idOil-SLU) is in water.</p> <p>The indicator lights for voltage supply, sensor alarms and faults are green. Relays 1, 2, 3 and 4 are energised.</p>
High liquid level alarm	<p>The liquid level has reached the high liquid level sensor (idOil-LIQ).</p> <p>The alarm light of the high liquid level sensor is red. The other indicator lights are green. The buzzer sounds after an approximately 10 second delay. Relay 2 is de-energised after a 10 second delay. Relay 1, 3 and 4 stays energised.</p>
Oil alarm	<p>The oil layer has reached the idOil-OIL sensor's alarm switching point.</p> <p>The alarm light of the oil sensor is red. The other indicator lights are green. The buzzer sounds after an approximately 10 second delay. Relay 1 is de-energised after a 10 second delay. Relay 2, 3 and 4 stays energised.</p>
Sludge alarm	<p>The sludge level has reached the idOil-SLU sensors's alarm switching point.</p> <p>The alarm light of the sludge sensor is red. The other indicator lights are green. The buzzer sounds after an approximately 10 second delay. Relay 3 is de-energised after a 10 second delay. Relay 1, 2 and 4 stays energised.</p>
Fault alarm 1	<p>There is a fault in the sensor or sensor cabling.</p> <p>The voltage supply indicator light is green. The indicator light of a faulty sensor circuit alarm blinks red and the fault indicator light is red. The buzzer sounds after an approximately 10 second delay. Relay 1, 2 and 3 stays energised. Relay 4 is de-energised after a 10 second delay.</p>
Fault alarm 2	<p>There is a short circuit in the sensor or sensor bus.</p> <p>The voltage supply indicator light is green. The sensor alarm and fault indicator lights are red. The buzzer sounds after an approximately 10 second delay. Relay 1, 2 and 3 stays energised. Relay 4 is de-energised after a 10 second delay.</p>
Alarm has stopped	<p>Once the alarms have stopped, the sensor alarm indicator lights are green, the buzzer goes silent and the relays are energised after a 10 second delay.</p>

7.2 Resetting an alarm

An alarm can be reset by pressing the test button in the cover.

Resetting an alarm deactivates the buzzer. However, the buzzer is always reactivated every 24 hours until the cause for the alarm is eliminated.



The relays do not change their state when alarm is reset with the reset button.

7.3 Changing the buzzer settings

The buzzer operation can be switched on and off as follows:



DANGER OF ELECTRICAL SHOCK! Please observe the safety instructions below!

- ▶ Cut off the control unit's voltage supply.
- ▶ Open the cover of the control unit.
- ▶ Install the jumper as shown in the figure:
 1. The buzzer is operational (factory setting)
 2. The buzzer is off
- ▶ Close the cover of the control unit.
- ▶ Connect the voltage supply.

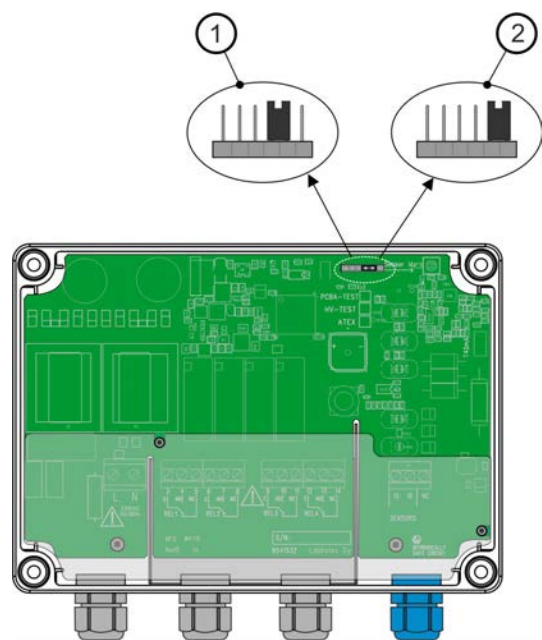


Figure 18. Changing the buzzer settings

8 Maintenance



The operation of the separator system and alarm device must be checked at least every 6 months by experienced personnel.

The following is recommended in conjunction with the inspection:

- functional check of the idSET-34 alarm device with the test function and sensor (see Section *Functional test*)
- sensor cleaning (see Section *Maintenance measures*)

The idSET-34 control unit and idOil sensors do not have wearing or replaceable parts.

The device has replaceable fuse (see Section *Maintenance measures*).

8.1 Functional test

8.1.1 Test function

The test function creates a test alarm, which is used to ensure the appropriate functioning of the idSET-34 device and any other possible devices or systems controlled by its relays in an alarm situation.

The function can only be executed if no alarms are active. If this is the case, all indicator lights are green.

Activating the test function:

- ▶ Press the reset/test button continuously for 3 seconds. Release the button, the test function turns on for a few seconds.

To indicate the activation of the test, the indicator lights are red to indicate the sensor's alarm and fault state, the relays are switched to the alarm state and the buzzer is on.

8.1.2 Functional test with sensors

The operation of the idSET-34 device and idOil sensors can be checked comprehensively by simply simulating an actual alarm situation.

Depending on the sensor type, the functional test can be conducted as follows:

1. idOil-LIQ (high liquid level sensor):
 - ▶ Immerse the sensor in oil or water.
2. idOil-OIL / idOil-OIL-S (oil sensor):
 - ▶ Immerse the sensor in oil. If this is not possible, lift the sensor into the air.
3. idOil-SLU (sludge sensor):
 - ▶ Immers the sensor in sand or sludge. If this is not possible, lift the sensor into the air.



The alarm will be activated after the delay (10 s).

8.2 Maintenance measures

The sensor must be cleaned in conjunction with maintenance inspections. You can clean the sensors with washing up liquid and a washing up brush, for example.



Do not use corrosive substances to clean the sensors.

The mains fuse (marked 160 mAT) can be replaced with another 5 x 20 mm / 160 mAT glass tube fuse according to IEC / EN 60127-2 / 3. The device must be de-energized when replacing the fuse. Other repairs related to the device may only be performed by a person trained in Exi devices with the authorization of Labkotec Oy.

If problems occur, contact Labkotec Oy's service department.

8.3 Troubleshooting



DANGER OF ELECTRICAL SHOCK!

Adhere to the electrical safety regulations!

PROBLEM:

The voltage supply indicator light is not on.

Explanation:

The voltage received by the device is too low, or the fuse has blown.

Action:

1. First check that the voltage has not been cut by the mains switch.
2. Measure the voltage from connector N and L. It should be 230 V AC \pm 10 %.



EXPLOSION HAZARD!

Observe the installation and maintenance instructions for explosive atmospheres!

The measuring device must be Exi classified if the sensor is in an explosive area.

PROBLEM:

Fault alarm on - The sensor alarm indicator light is flashing red and the fault indicator light is red (cable cut or loose) or the alarm indicator lights of all sensors and the fault indicator light are red (short circuit).

Explanation:

The sensor cable is short-circuited, cut or disconnected from the connector. The sensor could also be damaged.

Action:

1. Measure voltage separately from that sensor's sensor connectors. The voltage should be 9,0 - 11,5 V.
2. If the voltage is correct, measure the current received by the sensor. It should settle between 6,0-8,0 mA within 10 seconds. If the current is measured from a bus with several sensors, the current value is the total value of all sensors.
3. Reconnect the disconnected wire after the measurement.





The sensor cable wires are not numbered because the voltage polarity (+ or -) makes no difference.

If problems occur, contact Labkotec Oy's service department.

9 Technical specifications

9.1 Technical specifications for the idSET-34 control unit

TECHNICAL SPECIFICATIONS idSET-34	
Dimensions	175 mm x 125 mm x 50 mm (w x h x d)
Enclosure	IP 65, material: polycarbonate
Gable glands	4 pcs M16, cable diameter 5-10 mm
Weight	635 g
Operating environment	Temperature: -30 °C...+50 °C Max. elevation above sea level 2 000 m Relative humidity RH 100 % Suitable for indoor and outdoor use (protected from direct rain)
Operating voltage	230 V AC \pm 10 %, 50/60 Hz The device does not have a mains switch. Supply cable 2 x 1,5-2,5 mm ² (AWG16-AWG13). Supply voltage max fuse size 16 A.
Power consumption	Max. 8 VA
Sensors	Digital Labkotec idOil sensors
Relay outputs	5 A, 250 V AC / 30 V DC, 100 VA Potential-free changeover contacts.
Indicator lights	LED lights for alarm and fault states
Electrical safety	IEC/EN 61010-1 Class II  , CAT II, POLLUTION DEGREE 2
EMC	EN IEC 61000-6-2 EN IEC 61000-6-3
ATEX IECEX UKEX Ex classification Special terms (X) Exi connection values	EESF 22 ATEX 031X IECEX EESF 22.0037X CML 23UKEX2225X  II (1) G [Ex ia Ga] IIB Ta = -30 °C...+50 °C Uo = 14,5 V, Io = 78 mA, Po = 367 mW, R = 243 Ω , Co = 4,0 μ F, Lo = 15,0 mH Output voltage's characteristic curve is trapezoidal.
See system diagram Appendix A	
Manufacturing year: Please see the serial number on the type plate.	xxxxxxx x xxx xx YY x where YY = manufacturing year (e.g. 21 = 2021)

9.2 Technical specifications idOil-LIQ high liquid level sensor

TECHNICAL SPECIFICATIONS idOil-LIQ	
Operating principle	Vibration
Enclosure	Enclosure class: IP 68 Materials: PVC, aluminium, PA, CR, Viton
Weight	240 g (incl. 5 m cable)
Temperature	Operation: 0 °C...+60 °C Environment: -30 °C...+60 °C
Supply voltage	7,5...16 V DC
Cable	2 x 0.75 mm ² PUR, Ø5 mm
EMC	EN IEC 61000-6-2 EN IEC 61000-6-3
ATEX IECEX UKEX	EESF 19 ATEX 002X IECEX EESF 19.0002X CML 21UKEX21346X
Ex classification Special terms (X)	⊕ II 1 G Ex ia IIB T5 Ga Ta = -30 °C...+60 °C
Exi connection values	Ui = 16 V, Ii = 80 mA, Pi = 400 mW Ci ≤ 5.2 nF, Li ≤ 1.6 mH
Manufacturing year: Please see the serial number on the type plate.	xxxxxxx x xxx xx YY x where YY = manufacturing year (e.g. 18 = 2018)

9.3 Technical specifications idOil-OIL / idOil-OIL-S oil sensor

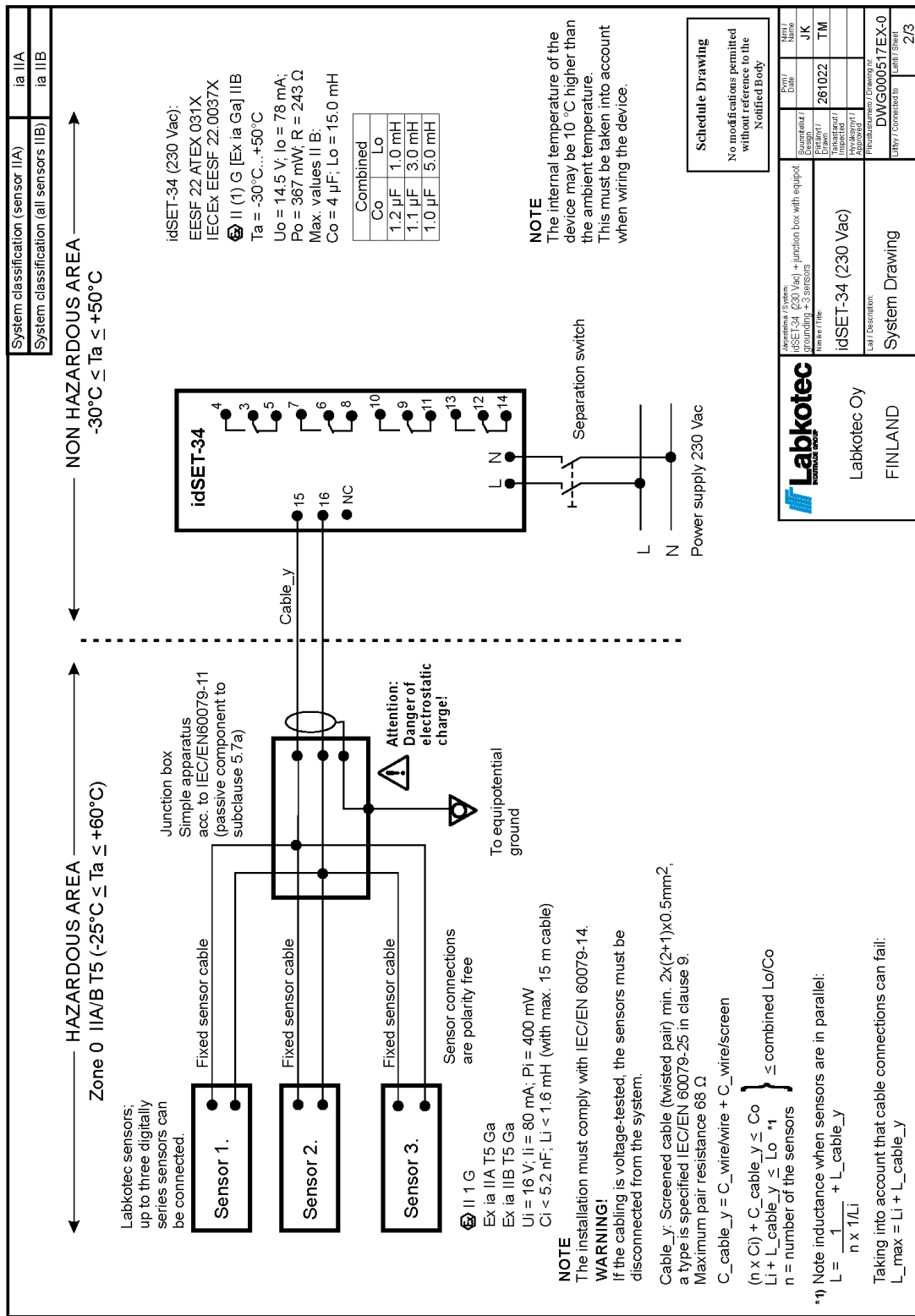
TECHNICAL SPECIFICATIONS idOil-OIL / idOil-OIL-S	
Operating principle	Conductance
Enclosure	Enclosure class: IP 68 Materials: PVC, AISI 316, PA, CR, NBR
Weight	idOil-OIL: 395 g (incl. 5 m cable) idOil-OIL-S: 360 g (incl. 5 m cable)
Temperature	Operation: 0 °C...+60 °C Environment: -30 °C...+60 °C
Supply voltage	7,5...16 V DC
Cable	2 x 0.75 mm ² PUR, Ø5 mm
EMC	EN IEC 61000-6-2 EN IEC 61000-6-3

ATEX IECEX UKEX	EESF 19 ATEX 001X IECEX EESF 19.0001X CML 21UKEX21345X
Ex classification	⊕ II 1 G Ex ia IIA T5 Ga (idOil-OIL) ⊕ II 1 G Ex ia IIB T5 Ga (idOil-OIL-S)
Special terms (X)	Ta = -30 °C...+60 °C
Exi connection values	Ui = 16 V, li = 80 mA, Pi = 400 mW Ci ≤ 5.2 nF, Li ≤ 1.6 mH
Manufacturing year: Please see the serial number on the type plate.	xxxxxxx x xxx xx YY x where YY = manufacturing year (e.g. 18 = 2018)

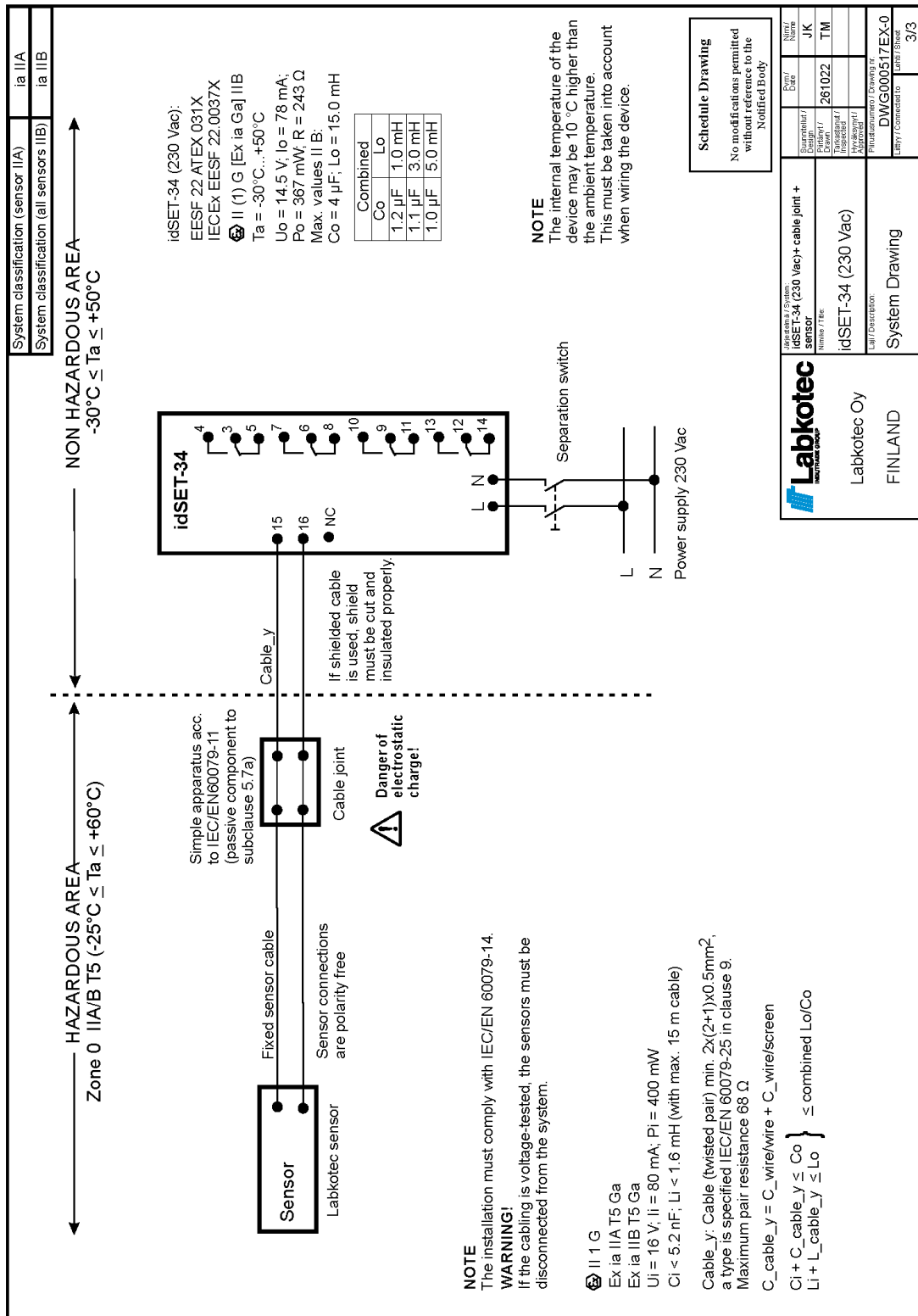
9.4 Technical specifications idOil-SLU sludge sensor

TECHNICAL SPECIFICATIONS idOil-SLU	
Operating principle	Ultrasound
Enclosure	Enclosure class: IP 68 Materials: PP, AISI 304/316, PA, NBR, CR, Silicon
Weight	530 g (incl. 5 m cable)
Temperature	Operation: 0 °C...+60 °C Environment: -25 °C...+60 °C
Supply voltage	7,5...16 V DC
Cable	2 x 0.75 mm ² PUR, Ø5 mm
EMC	EN IEC 61000-6-2 EN IEC 61000-6-3
ATEX IECEX UKEX	EESF 19 ATEX 003X IECEX EESF 19.0003X CML 21UKEX21347X
Ex classification	⊕ II 1 G Ex ia IIB T5 Ga
Special terms (X)	Ta = -25 °C...+60 °C
Exi connection values	Ui = 16 V, li = 80 mA, Pi = 400 mW Ci ≤ 4.0 nF, Li ≤ 1.6 mH
Manufacturing year: Please see the serial number on the type plate.	xxxxxxx x xxx xx YY x where YY = manufacturing year (e.g. 18 = 2018)

10.1.2 idSET-34 (230 VAC) + junction box with equipotential grounding + 3 sensors



10.1.3 idSET-34 (230 VAC) + cable joint + sensor



10.2 APPENDIX B EU Declaration of Conformity



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	idSET-34
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
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) 2014/35/EU Low Voltage Directive (LVD) 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 EN IEC 61000-3-2:2019 EN 61000-3-3:2013/A1:2019 ATEX: EN IEC 60079-0:2018 EN 60079-11:2012 EN 60079-25:2010/AC:2013 EU-type examination certificate: EESF 22 ATEX 031X. Notified Body: Eurofins Expert Services Ltd, Notified Body number 0537. LVD: EN 61010-1:2010/A1:2019/AC:2019-04 RoHS: EN IEC 63000:2018 The product is CE-marked since 2022.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy. Pirkkala 26.10.2022  Janne Uusinoka, CEO Labkotec Oy



EU DECLARATION OF CONFORMITY

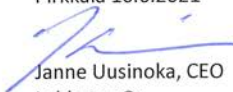
We hereby declare that the product named below has been designed to comply with the relevant requirements of the referenced directives and standards.

Product	Level sensor idOil-OIL, idOil-OIL-S
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
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 EU-type examination certificate: EESF 19 ATEX 001X. Notified Body: Eurofins Expert Services Oy, Notified Body number 0537. RoHS: EN IEC 63000:2018 The product is CE-marked since 2017.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy. Pirkkala 16.6.2021  Janne Uusinoka, CEO Labkotec Oy



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 sensor idOil-LIQ
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
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 EU-type examination certificate: EESF 19 ATEX 002X. Notified Body: Eurofins Expert Services Oy, Notified Body number 0537. RoHS: EN IEC 63000:2018 The product is CE-marked since 2017.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy. Pirkkala 16.6.2021  Janne Uusinoka, CEO Labkotec Oy



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 sensor idOil-SLU
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
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 EU-type examination certificate: EESF 19 ATEX 003X. Notified Body: Eurofins Expert Services Oy, Notified Body number 0537. RoHS: EN IEC 63000:2018 The product is CE-marked since 2017.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy. Pirkkala 16.6.2021  Janne Uusinoka, CEO Labkotec Oy




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(s)	LCJ1-1 cable connector for one sensor LCJ1-2 cable connector for two sensors LCJ1-3 cable connector for three sensors
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
Directives	The product is in accordance with the following EU Directives: 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: ATEX: EN IEC 60079-0:2018 EN 60079-11:2012 The product is a simple apparatus according to EN 60079-11:2012 (Intrinsic Safety i). RoHS: EN IEC 63000:2018 The product is CE-marked since 2018.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy.

Pirkkala 16.6.2021


Janne Uusinoka, CEO
Labkotec Oy

10.3 APPENDIX C UK Declaration of Conformity



UK DECLARATION OF CONFORMITY

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

Product	idSET-34 (230 VAC and 115 VAC)
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
Regulations	The product is in accordance with the following UK Regulations: S.I. 2016/1091 Electromagnetic Compatibility Regulations S.I. 2016/1107 Potentially Explosive Atmospheres Regulations S.I. 2016/1101 Electrical Equipment (Safety) Regulations S.I. 2012/3032 Electrical and Electronic Equipment Regulations
Standards	The following designated standards were applied: EMC: EN IEC 61000-6-2:2019 EN IEC 61000-6-3:2021 EN IEC 61000-3-2:2019 EN 61000-3-3:2013/A1:2019 ATEX: EN IEC 60079-0:2018 EN 60079-11:2012 EN IEC 60079-25:2022 UK-type examination certificate: CML 23UKEX2225X. Approved Body: Eurofins CML, Approved Body number 2503. LVD: EN 61010-1:2010/A1:2019/AC:2019-04 RoHS: EN IEC 63000:2018 The product is UKCA-marked since 2023.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy. Pirkkala 11.5.2023  Janne Uusinoka, CEO Labkotec Oy



UK DECLARATION OF CONFORMITY


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

Product	Level sensor idOil-LIQ
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
Regulations	The product is in accordance with the following UK Regulations: S.I. 2016/1091 Electromagnetic Compatibility Regulations S.I. 2016/1107 Potentially Explosive Atmospheres Regulations S.I. 2012/3032 Electrical and Electronic Equipment Regulations
Standards	The following designated 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 UK-type examination certificate: CML 21UKEX21346X. Approved Body: Eurofins CML, Approved Body number 2503. RoHS: EN IEC 63000:2018 The product is UKCA-marked since 2022.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy. Pirkkala 10.1.2022  Janne Uusinoka, CEO Labkotec Oy



UK DECLARATION OF CONFORMITY

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

Product	Level sensor idOil-OIL, idOil-OIL-S
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
Regulations	The product is in accordance with the following UK Regulations: S.I. 2016/1091 Electromagnetic Compatibility Regulations S.I. 2016/1107 Potentially Explosive Atmospheres Regulations S.I. 2012/3032 Electrical and Electronic Equipment Regulations
Standards	The following designated 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 UK-type examination certificate: CML 21UKEX21345X. Approved Body: Eurofins CML, Approved Body number 2503. RoHS: EN IEC 63000:2018 The product is UKCA-marked since 2022.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy. Pirkkala 10.1.2022  Janne Uusinoka, CEO Labkotec Oy



UK DECLARATION OF CONFORMITY

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

Product	Level sensor idOil-SLU
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
Regulations	The product is in accordance with the following UK Regulations: S.I. 2016/1091 Electromagnetic Compatibility Regulations S.I. 2016/1107 Potentially Explosive Atmospheres Regulations S.I. 2012/3032 Electrical and Electronic Equipment Regulations
Standards	The following designated 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 UK-type examination certificate: CML 21UKEX21347X. Approved Body: Eurofins CML, Approved Body number 2503. RoHS: EN IEC 63000:2018 The product is UKCA-marked since 2022.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy. Pirkkala 10.1.2022  Janne Uusinoka, CEO Labkotec Oy



UK DECLARATION OF CONFORMITY

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

Product(s)	LCJ1-1 cable connector for one sensor LCJ1-2 cable connector for two sensors LCJ1-3 cable connector for three sensors
Manufacturer	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala Finland
Regulations	The product is in accordance with the following UK Regulations: S.I. 2016/1107 Potentially Explosive Atmospheres Regulations S.I. 2012/3032 Electrical and Electronic Equipment Regulations
Standards	The following designated standards were applied: ATEX: EN IEC 60079-0:2018 EN 60079-11:2012 The product is a simple apparatus according to EN 60079-11:2012 (Intrinsic Safety i). RoHS: EN IEC 63000:2018 The product is UKCA-marked since 2022.
Signature	This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Labkotec Oy.

Pirkkala 10.1.2022

A handwritten signature in blue ink, appearing to read "J. Uusinoka".

Janne Uusinoka, CEO
Labkotec Oy

10.4 APPENDIX D Commissioning and maintenance report



Labkotec Oy
 Myllyhaantie 6
 FI-33960 Pirkkala,
 Finland
 www.labkotec.fi

idSET-34 Separator alarm

COMMISSIONING REPORT

Customer

Contact name

Site name

Address

Central unit

Central unit S.No idOil-OIL sensor S.No

idOil-LIQ sensor S.No idOil-SLU sensor S.No

Has a junction box or cable extension been used in the installation? Yes No

Is the junction box or cable extension attached to the edge of the well? Yes No

Can the sensors be lifted up to the ground level for testing and cleaning? (2 m of slack recommended) Yes No

Are the sensors installed in the correct locations? Yes No

Sensor installation height X:

Sensor	mm	Installation height	Diagram	Legend	Notes
idOil-LIQ	<input type="text"/>	above the standard liquid level L		1 idOil-LIQ upper limit sensor A Air B Oil C Water	L Standard liquid level S Sensor connection point X Liquid alarm limit (maximum surface level)
idOil-OIL	<input type="text"/>	below the standard liquid level L		1 idOil-OIL oil sensor A Air B Oil C Water	L Standard liquid level S Alarm connection point X Maximum allowed oil layer thickness
idOil-SLU	<input type="text"/>	above the bottom		1 idOil-SLU sludge sensor A Air B Oil C Water D Sludge	L Standard liquid level S Alarm connection point X Maximum allowed sludge layer height T Sensor gap

Pressing the test button for longer than 3 seconds before releasing it turns on all lights and the centre gives an alarm Yes No

In case of an alarm, the indicator light must be lit within approximately 5–10 seconds and the buzzer as well as the relays must activate after 10 seconds.

idOil-LIQ

Has the sensor been installed? Yes No

Lower the sensor into the water, alarm turns on (LED, buzzer, relay) Yes No

Lift the sensor into the air, alarm turns off (LED, buzzer, relay) Yes No

idOil-OIL

Has the sensor been installed? Yes No

Lift the sensor from the water into the air, alarm turns on (LED, buzzer, relay) Yes No

Lower the sensor into the water, alarm turns off (LED, buzzer, relay) Yes No

idOil-SLU

Has the sensor been installed? Yes No

Lift the sensor from the water into the air, alarm turns on (LED, buzzer, relay) Yes No

Lower the sensor into the water, alarm turns off (LED, buzzer, relay) Yes No

Author of the report Date



Labkotec Oy
 Myllyhaantie 6
 FI-33960 Pirkkala,
 Finland
 www.labkotec.fi

idSET-34 Separator alarm

MAINTENANCE REPORT

The operation of the separator system and alarm device must be checked at least every 6 months by experienced personnel.

The sensors must be cleaned in conjunction with maintenance inspections. You can clean the sensors with washing up liquid and a washing up brush, for example.




Do not use corrosive substances to clean the sensors.

Customer	
Contact name	
Site name	
Address	

Central unit			
Central unit S.No		idOil-OIL sensor S.No	
idOil-LIQ sensor S.No		idOil-SLU sensor S.No	

Has a junction box or cable extension been used in the installation?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Is the junction box or cable extension attached to the edge of the well?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Can the sensors be lifted up to the ground level for testing and cleaning? (2 m of slack recommended)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Are the sensors installed in the correct locations?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Pressing the test button for longer than 3 seconds before releasing it turns on all lights and the centre gives an alarm	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

In case of an alarm, the indicator light must be lit within approximately 5–10 seconds and the buzzer as well as the relays must activate after 10 seconds.

	idOil-LIQ	Has the sensor been installed?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Has the sensor been cleaned?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Lower the sensor into the water, alarm turns on (LED, buzzer, relay)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Lift the sensor into the air, alarm turns off (LED, buzzer, relay)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
	idOil-OIL	Has the sensor been installed?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Has the sensor been cleaned?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Lift the sensor from the water into the air, alarm turns on (LED, buzzer, relay)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Lower the sensor into the water, alarm turns off (LED, buzzer, relay)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
	idOil-SLU	Has the sensor been installed?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Has the sensor been cleaned?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Lift the sensor from the water into the air, alarm turns on (LED, buzzer, relay)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
		Lower the sensor into the water, alarm turns off (LED, buzzer, relay)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

Comments:

Author of the report _____ Date _____/_____/_____