

idOil[®]-20

Oil Separator Alarm Device



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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

The idOil 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 labelled as the unit's isolating switch. The external switch must adhere to the standard IEC/EN 60947-1 or IEC/EN 60947-3.

UL/CSA: Supply cable 3 x 1,5-2,1 mm² (AWG16-AWG14). Supply voltage max fuse size 10 A.

Other areas: Supply cable 3 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.
-  Due to the overvoltage protection, the protective earth wire (PE) must be connected to the supply voltage connector (see Section Connections).
-  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 both relays must be in the same voltage class (ELV/LV), considering the maximum values listed in the technical specifications.
-   The idOil 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 A 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

idOil® is an alarm system intended for monitoring liquid levels particularly in oil and sand separators. The system consists of the idOil 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)
- Sludge layer detection (idOil-SLU sludge sensor)

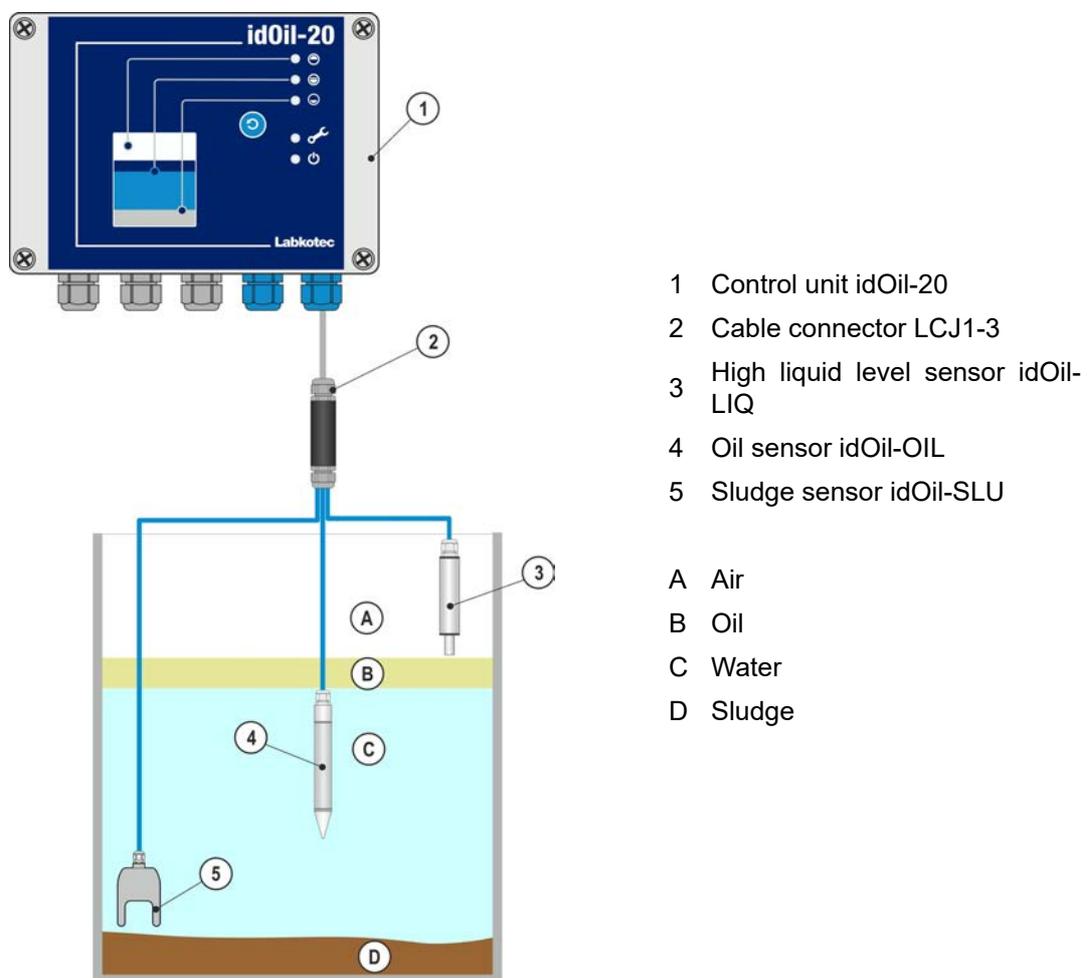


Figure 1. System description; idOil control unit, sensors and cable extension

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
idOil-20	Control unit, 100-240 V AC

Sensors:

Type name	Description
idOil-LIQ	High liquid level sensor to sense excessively high liquid level
idOil-OIL	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 idOil control unit

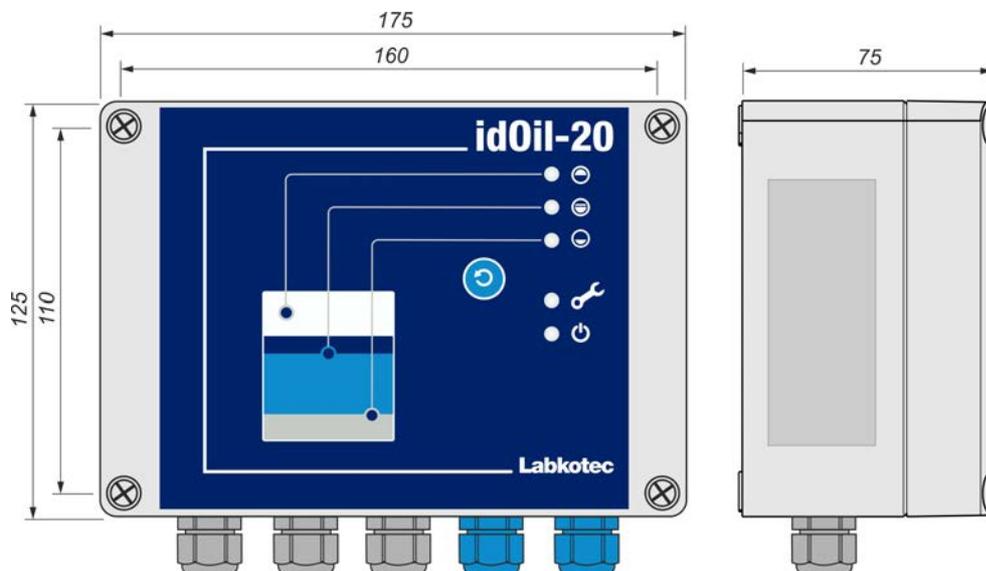


Figure 2. Dimensions of the idOil control unit (mm)

3.3.2. Dimensions idOil-LIQ high liquid level sensor

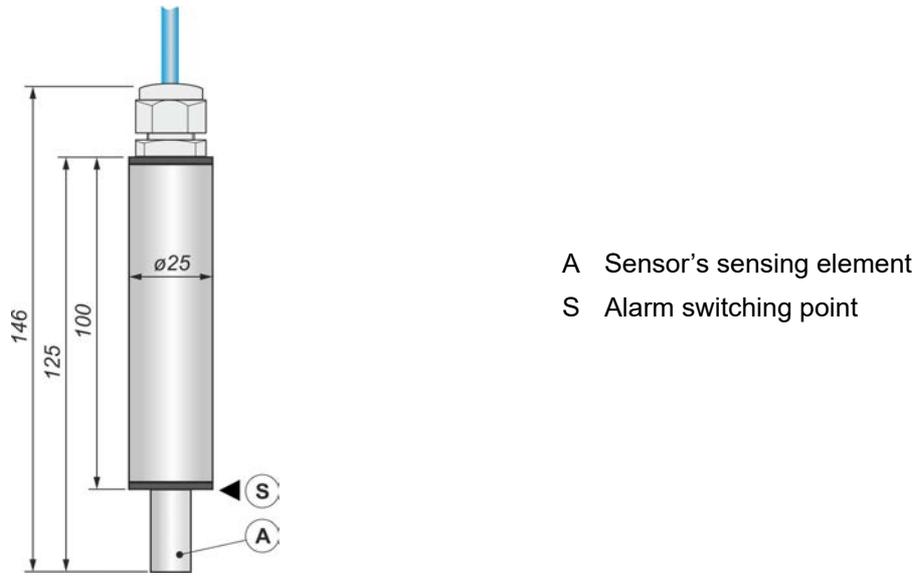


Figure 3. High liquid level sensor idOil-LIQ – structure and dimensions (mm)

3.3.3. Dimensions of the idOil-OIL oil sensor

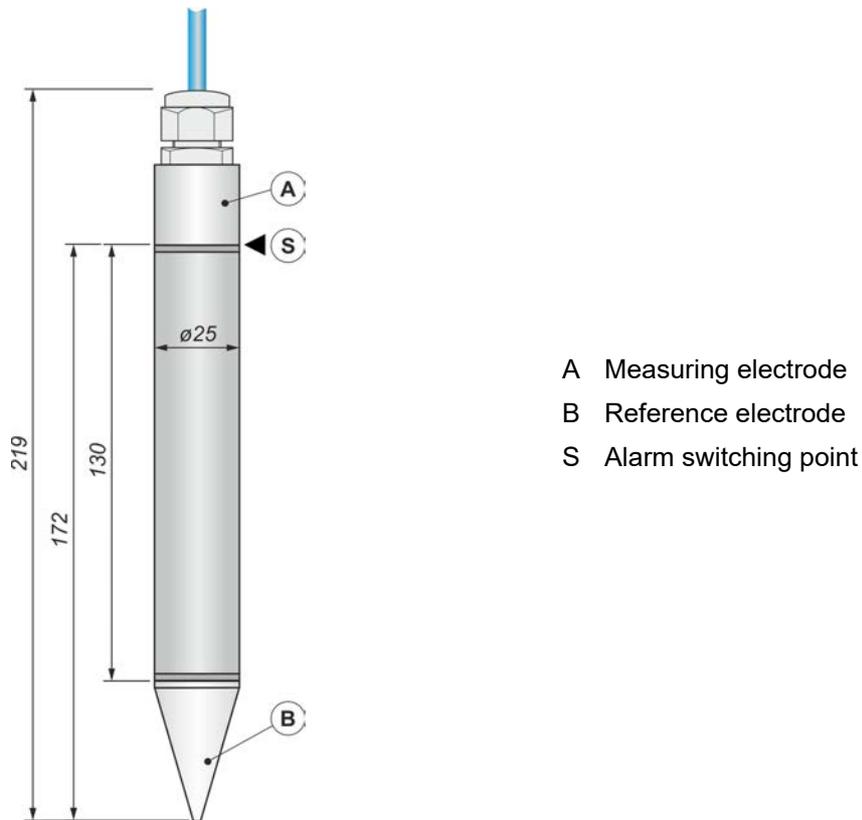


Figure 4. Oil sensor idOil-OIL – structure and dimensions (mm)

3.3.4. Dimensions idOil-SLU sludge sensor

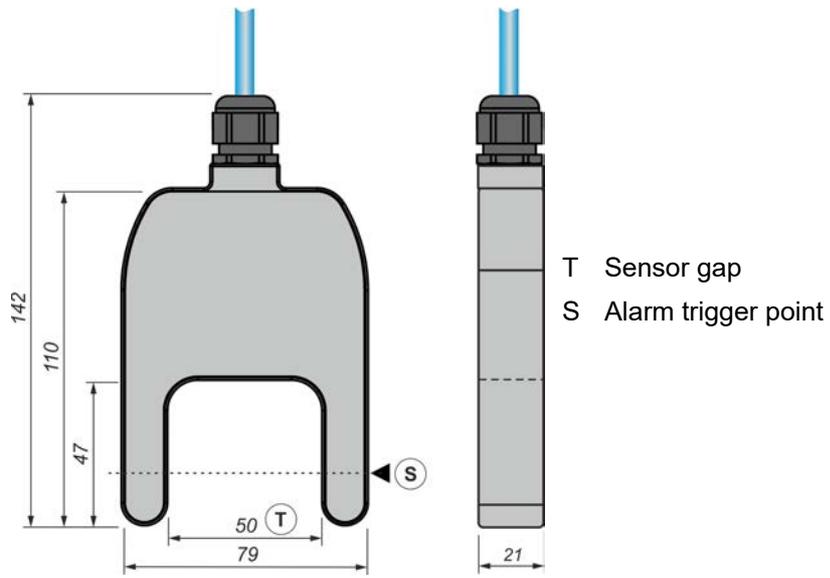


Figure 5. Sludge sensor idOil-SLU – structure and dimensions (mm)

4. Installation

4.1. Installing the control unit

The idOil control unit is wall mounted. Installation holes are located at the bottom part of the box under the mounting holes for the cover.

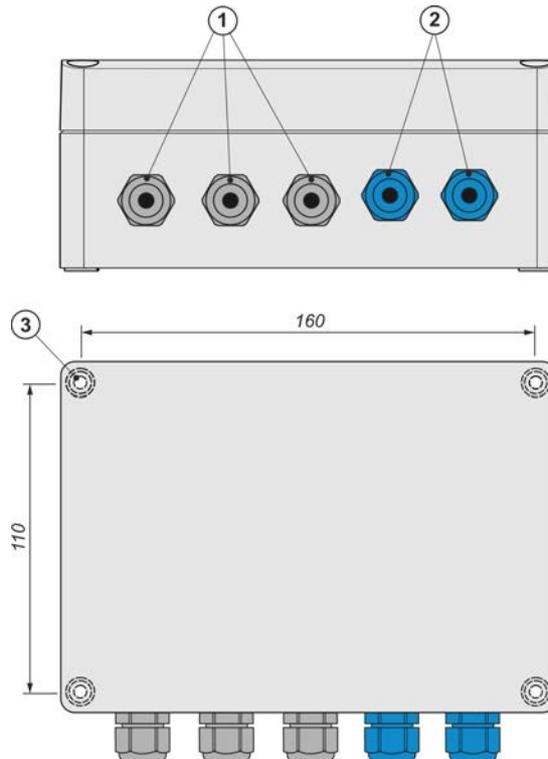
The cover of the box must be tightened so that the edge touches the bottom part. This ensures that the reset and test button functions well and the enclosure is tight.



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



Read Section General safety instructions before installation.



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

Figure 6. Installing the idOil control unit

4.2. Sensor installation



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.

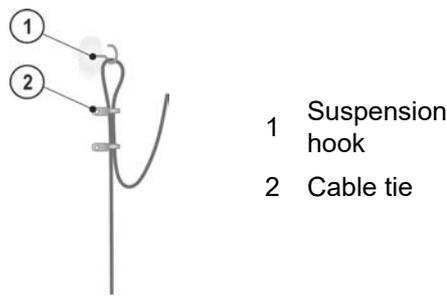


Figure 7. Sensor suspension example



Figure 8. 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

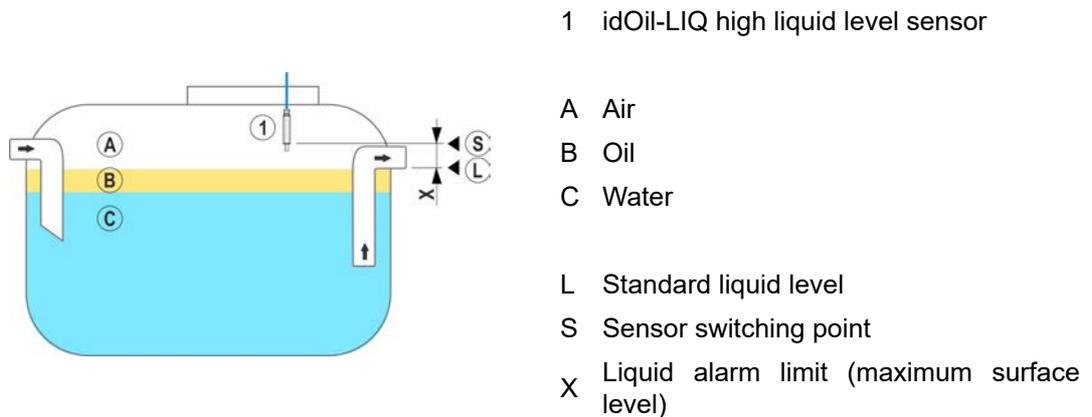


Figure 9. Installing the idOil-LIQ high liquid limit sensor

4.2.2. Installing the idOil-OIL sensor

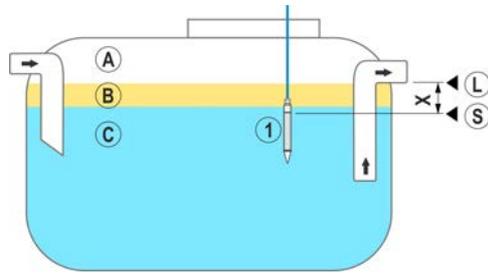
The sensor must be submerged at the desired installation depth when the liquid is at the separator’s standard liquid level (L).

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.

i 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 oil sensor

- A Air
- B Oil
- C Water

- L Standard liquid level
- S Alarm switching point
- X Maximum allowed oil layer thickness

Figure 10. Installing the idOil-OIL sensor

4.2.3. Installing the idOil-SLU sludge sensor

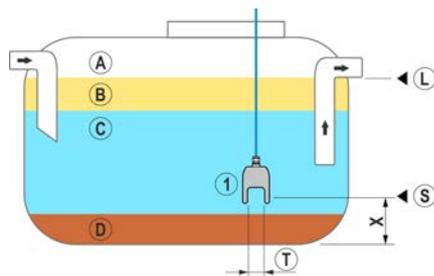
The sensor issues an alarm on sludge, sand or other solids accumulated at the bottom of the separator.

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).

i 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 11. 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

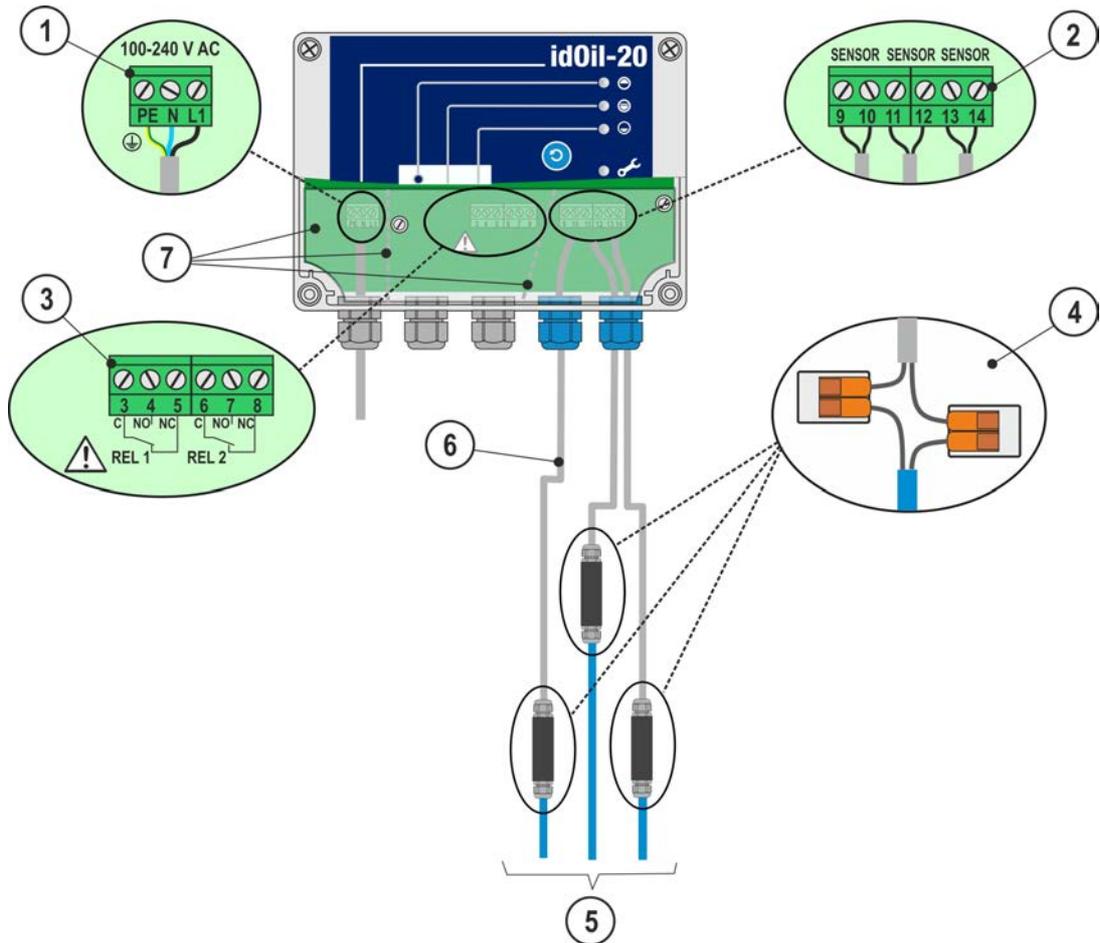


Figure 12. Connection with a single-sensor cable connector

5.1.2. Connection with a two-sensor cable connector

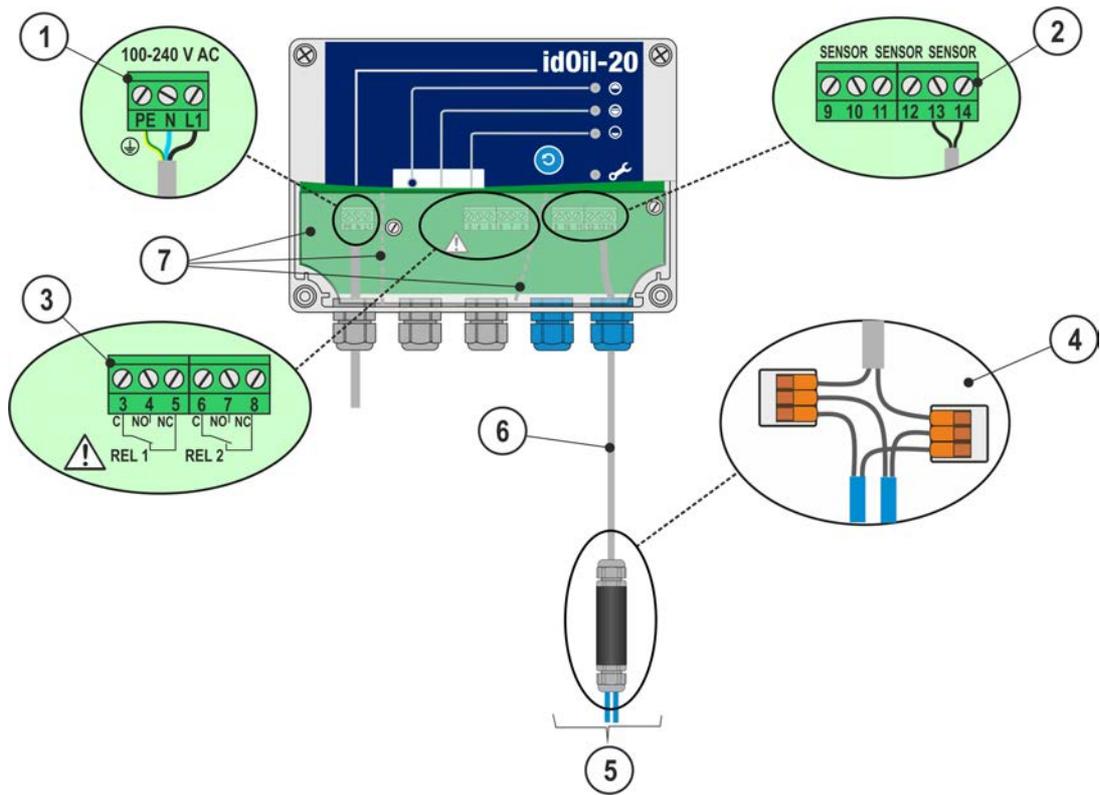


Figure 13. Connection with a two-sensor cable connector

5.1.3. Connection with a three-sensor cable connector

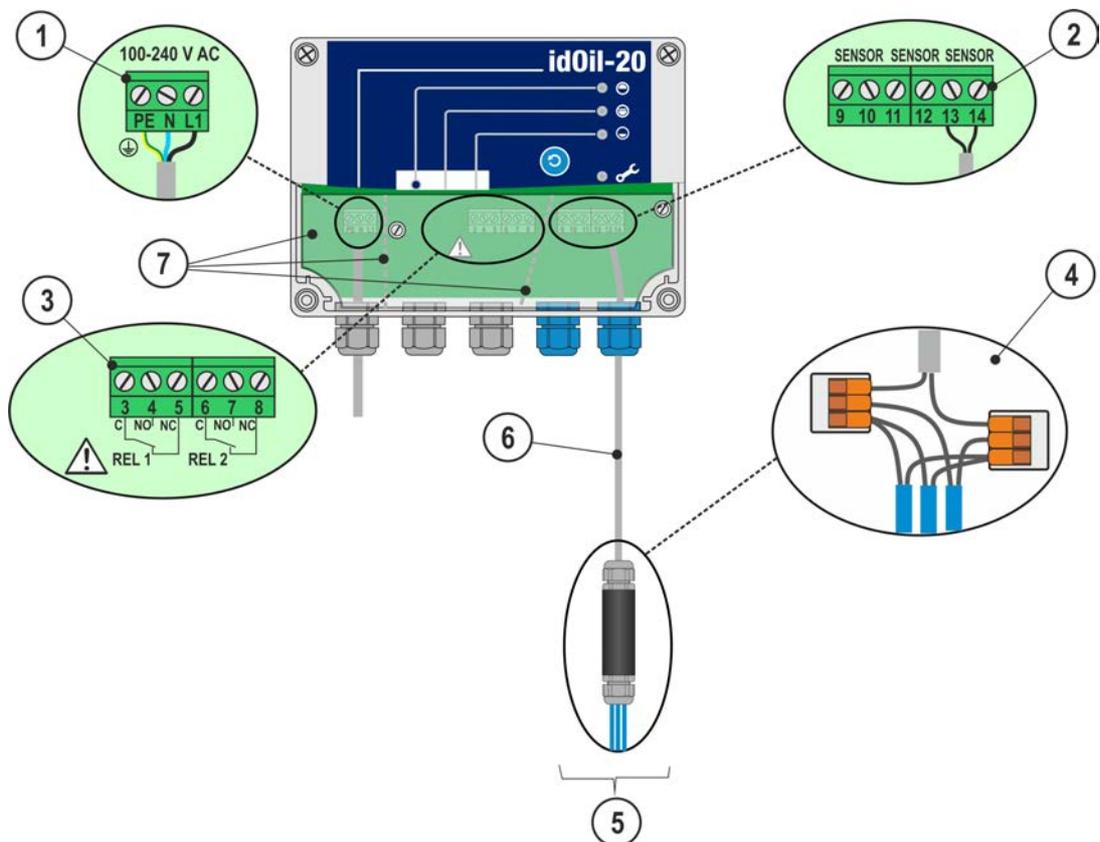


Figure 14. Connection with a three-sensor cable connector

5.2. Explanations of connection diagrams

- 1 Supply voltage 100–240 V AC
(N.B. The device does not include a mains switch, see Section General safety instructions)

PE = protective earth connector

N = neutral connector

L1 = phase connector

UL/CSA: Supply cable 3 x 1,5-2,1 mm² (AWG16-AWG14). Supply voltage max fuse size 10 A.



Other areas: Supply cable 3 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 connectors
 - 9 = sensor 1, connection 1
 - 10 = sensor 1, connection 2
 - 11 = sensor 2, connection 1
 - 12 = sensor 2, connection 2
 - 13 = sensor 3, connection 1
 - 14 = sensor 3, connection 2



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
 - 3 = Relay common contact
 - 4 = Contact that opens in an alarm situation
 - 5 = Contact that closes in an alarm situation
 - RELAY 2
 - 6 = Relay common contact
 - 7 = Contact that opens in an alarm situation
 - 8 = 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
 - LCJ1-1 for two sensors
 - LCJ1-3 for three sensors
- 5 Sensors
- 6 Extension cable, e.g. protected, twisted-pair 2 x 0.5 mm², maximum resistance 68 Ohm.
Extra wires and shield must be cut and isolated carefully.

7 Protection plate



The connectors for the external connections are separated with separator walls on the protection plate. 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).

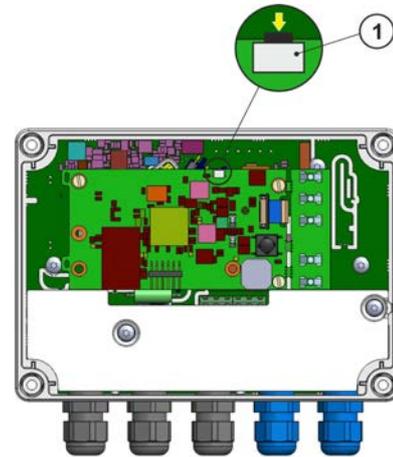


Figure 15. Sensor identification button.

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.

▶ 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 idOil control unit

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	All sensors connected to the control unit
		function	function upon sensor alarm
		relay is restored when alarm is reset	no
	Relay 2	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 idOil 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.

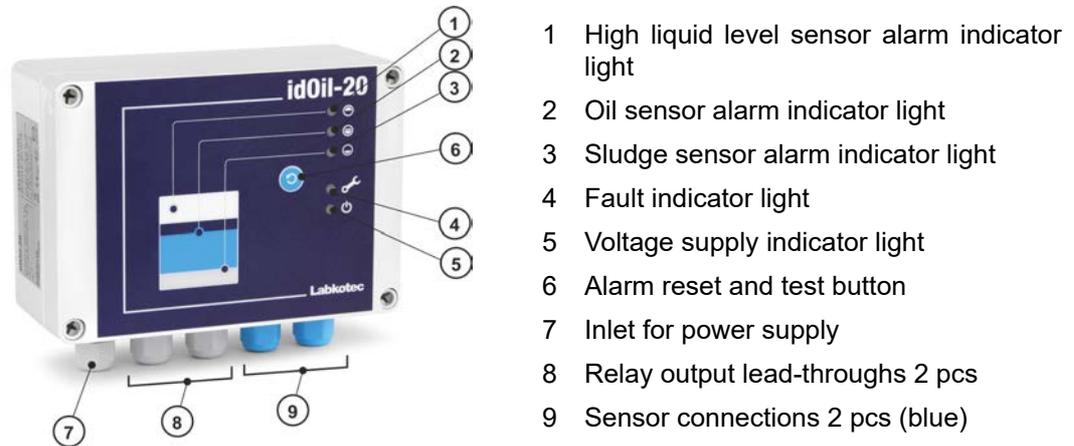


Figure 16. Features of the idOil control unit

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 alarm situation and relay 2 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 and 2 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 1 is de-energised after a 10 second delay. Relay 2 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 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 1 is de-energised after a 10 second delay. Relay 2 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 stays energised. Relay 2 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 stays energised. Relay 2 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 for 10 s every 24 hours until the cause for the alarm is eliminated.

-  The relays do not change their state when an 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.

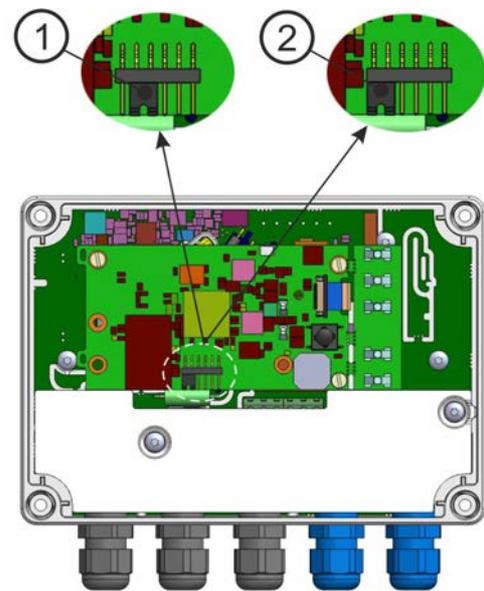


Figure 17. Changing the buzzer settings

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 idOil alarm device with the test function and sensor (see Section Functional test)
- sensor cleaning (see Section Maintenance measures)

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

The device does not include replaceable fuses.

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 idOil 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.

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 idOil device and 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):
 - ▶ Immerse the sensor in oil or water.
2. idOil-OIL (oil):
 - ▶ Immerse the sensor in oil. If this is not possible, lift the sensor into the air.
3. idOil-SLU (sludge):
 - ▶ Immerse 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 (factory setting: 10 s).

8.2. Maintenance measures

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.

8.3. Troubleshooting

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:	<ol style="list-style-type: none">1. First check that the voltage has not been cut by the mains switch.2. Measure the voltage from connectors N and L1. It should be 100–240 V AC.



DANGER OF ELECTRICAL SHOCK!
Adhere to the electrical safety regulations!

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:	<ol style="list-style-type: none">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.3. Reconnect the disconnected wire after the measurement.



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



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.

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

9. Technical specifications

9.1. Technical specifications for the idOil control unit

TECHNICAL SPECIFICATIONS idOil-20	
Dimensions	175 mm x 125 mm x 75 mm (w x h x d)
Enclosure	IP 65, material: polycarbonate
Weight	750 g
Operating environment	Temperature: -30°C...+60°C Max. elevation above sea level 3,000 m Relative humidity RH 100%
Operating voltage	100–240 V AC \pm 10%, 50/60 Hz The device does not have a mains switch. UL/CSA: Supply cable 3 x 1,5-2,1 mm ² (AWG16-AWG14). Supply voltage max fuse size 10 A. Other areas: Supply cable 3 x 1,5-2,5 mm ² (AWG16-AWG13). Supply voltage max fuse size 16 A. The internal fuses cannot be replaced.
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 I, CAT II UL 61010-1 CAN/CSA-C22.2 NO. 61010-1-12
EMC	IEC/EN 61000-6-2 IEC/EN 61000-6-3
ATEX and IECEx	VTT 16 ATEX 018X IECEX VTT 16.0005X
Ex classification	⊕ II (1) G [Ex ia Ga] IIB
Special terms (X)	Ta = -30 °C...+60 °C
Exi connection values	U _o = 14.5 V, I _o = 78 mA, P _o = 367 mW, R = 243 Ω Output voltage's characteristic curve is trapezoidal
Maximum values in explosion group IIB	Co = 4.0 μ F, Lo = 16.7 mH
See system diagram Appendix A	
Manufacturing year:	xxxxxxx x xxx xx YY x where YY = manufacturing year
Please see the serial number on the type plate.	(e.g. 18 = 2018)

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	300 g (incl. 5 m cable)
Temperature	Operation: 0°C...+60°C Environment: -30°C...+60°C
Supply voltage	approx. 12 V DC
Cable	2 x 0.75 mm ² PUR
EMC	IEC/EN 61000-6-2 IEC/EN 61000-6-3
ATEX and IECEx	VTT 17 ATEX 005X IECEx VTT 17.0003X
Ex classification Special terms (X)	⊕ II 1 G Ex and IIB T5 Ga Ta = -25°C...+60°C
Exi connection values Maximum values in explosion group IIB	Ui = 16 V, Ii = 80 mA, Po = 400 mW Ci ≤ 5.2 nF, Li ≤ 1.6 mH
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. 18 = 2018)

9.3. Technical specifications idOil-OIL oil sensor

TECHNICAL SPECIFICATIONS idOil-OIL	
Operating principle	Conductance
Enclosure	Enclosure class: IP 68 Materials: PVC, AISI 316, PA, CR, NBR
Weight	500 g (incl. 5 m cable)
Temperature	Operation: 0°C...+60°C Environment: -30°C...+60°C
Supply voltage	approx. 12 V DC
Cable	2 x 0.75 mm ² PUR
EMC	IEC/EN 61000-6-2 IEC/EN 61000-6-3

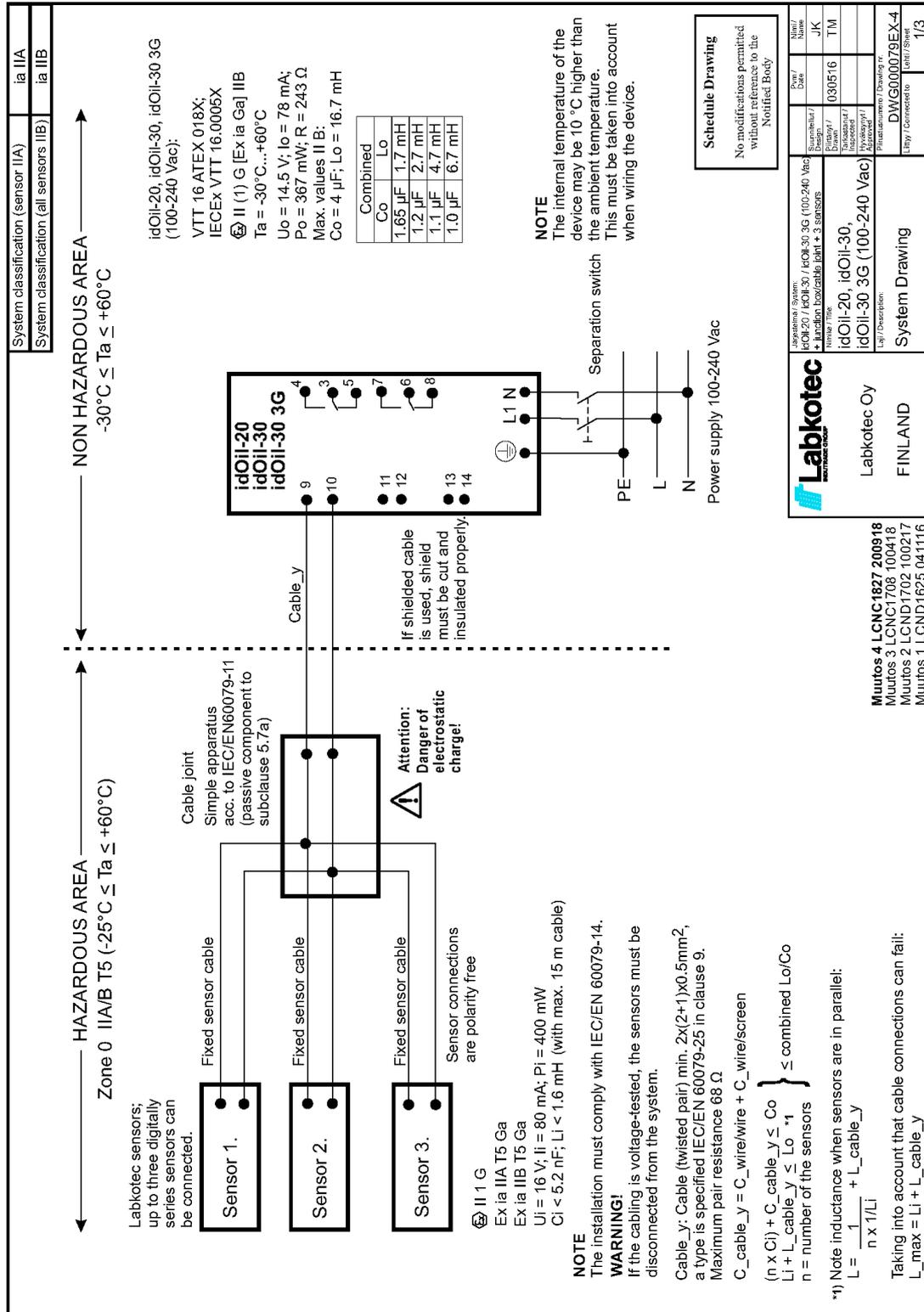
ATEX and IECEx	VTT 17 ATEX 004X IECEx VTT 17.0002X
Ex classification Special terms (X)	⊕ II 1 G Ex ia IIA T5 Ga Ta = -39°C...+60°C
Exi connection values Maximum values in explosion group IIB	Ui = 16 V, li = 80 mA, Po = 400 mW Ci ≤ 5.2 nF, Li ≤ 1.6 mH
See system diagram Appendix A	
Manufacturing year: Please see the serial number on the type plate.	xxxxxxx x xxx xx YY x where YY = manufacturing year (e.g. 18 = 2018)

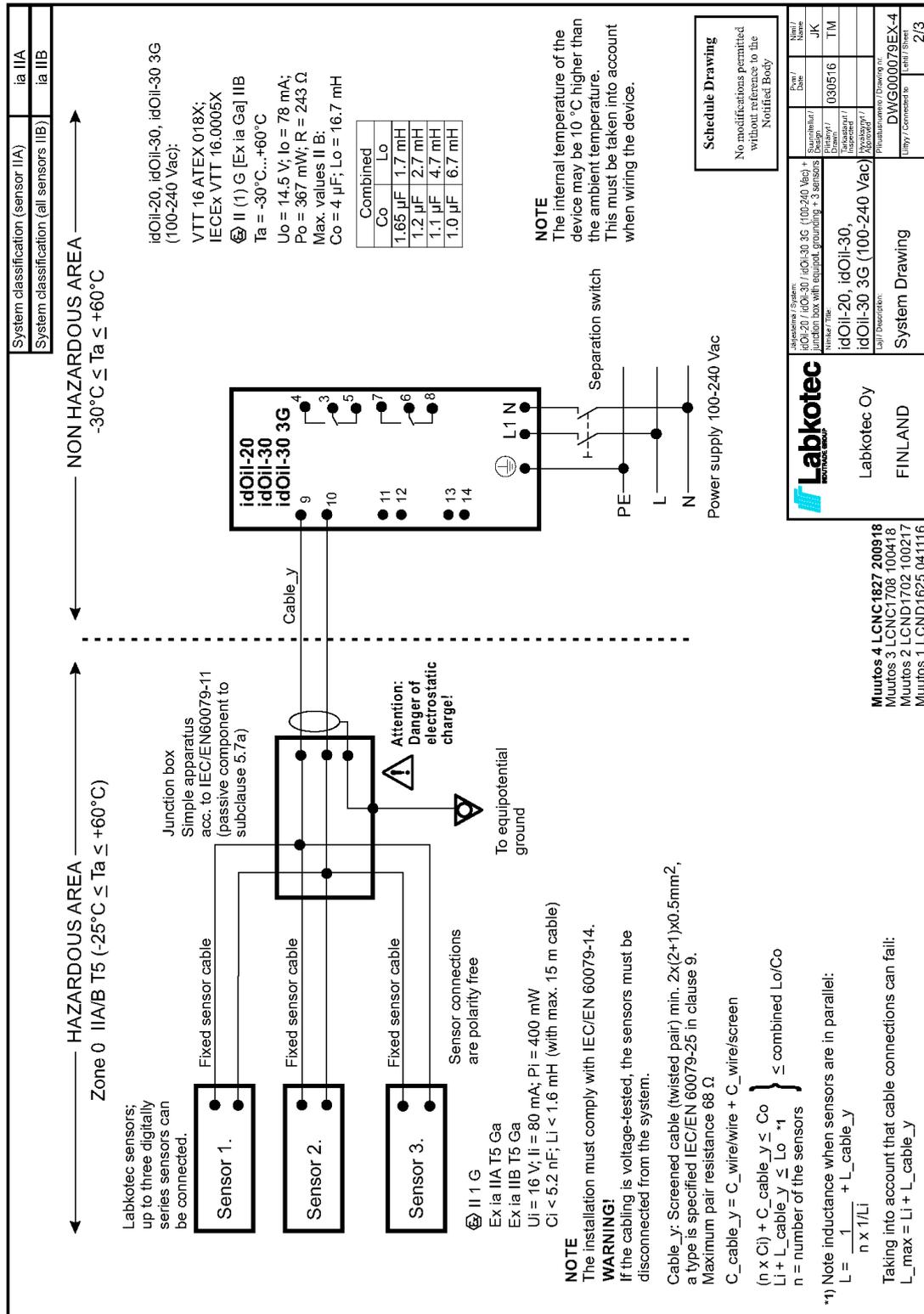
9.4. Technical specifications idOil-SLU sludge sensor

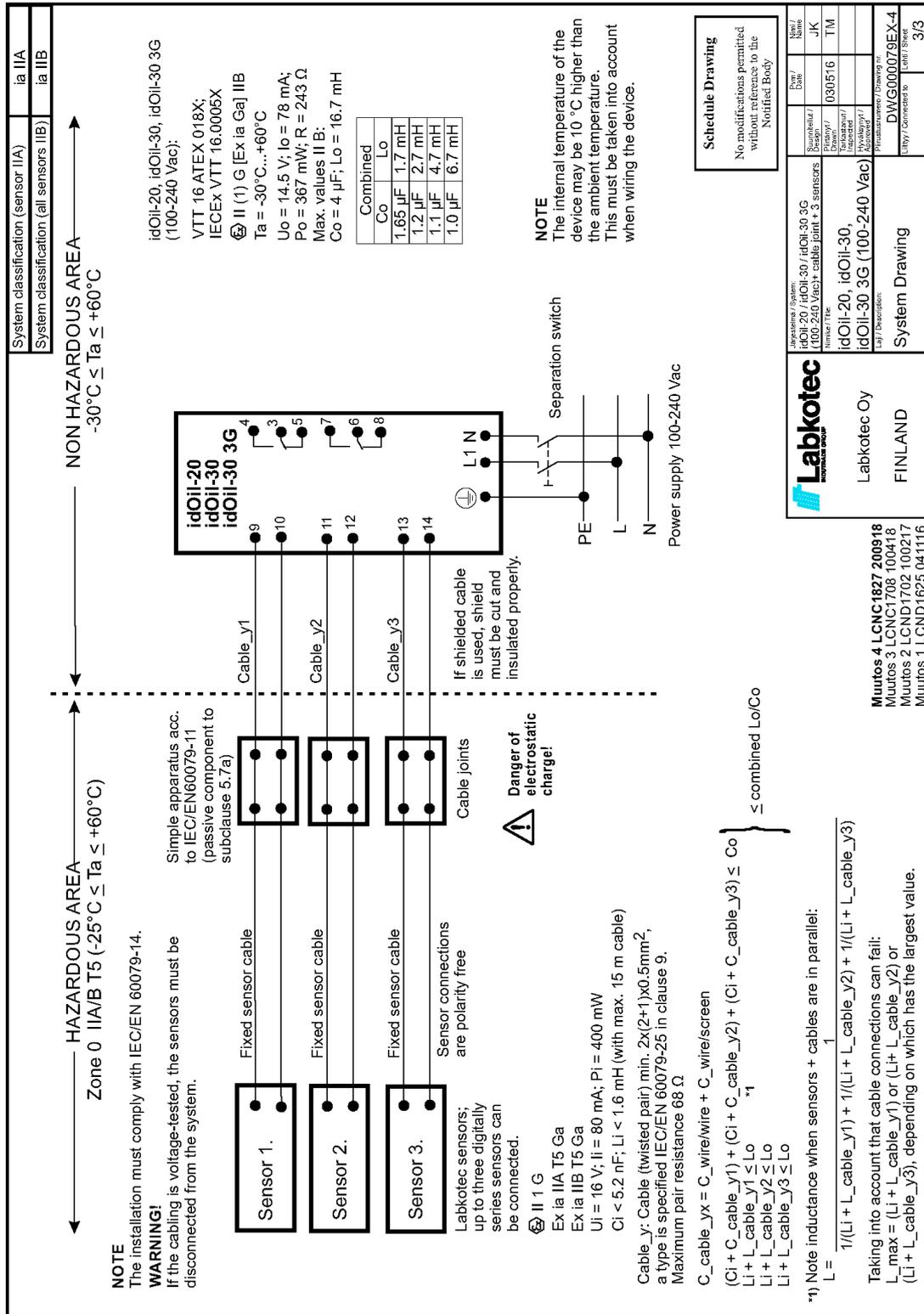
TECHNICAL SPECIFICATIONS idOil-SLU	
Operating principle	Ultrasound
Enclosure	Enclosure class: IP 68 Materials: PP, AISI 304/316, PA, NBR, CR, Silicon
Weight	900 g (incl. 5 m cable)
Temperature	Operation: 0°C...+60°C Environment: -25°C...+60°C
Supply voltage	approx. 12 V DC
Cable	2 x 0.75 mm ² PUR
EMC	IEC/EN 61000-6-2 IEC/EN 61000-6-3
ATEX and IECEx	VTT 17 ATEX 006X IECEx VTT 17.0004X
Ex classification Special terms (X)	⊕ II 1 G Ex and IIB T5 Ga Ta = -25°C...+60°C
Exi connection values Maximum values in explosion group IIB	Ui = 16 V, li = 80 mA, Po = 400 mW Ci ≤ 4.0 nF, Li ≤ 1.6 mH
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. 18 = 2018)

10. Appendices

10.1. APPENDIX A System digram





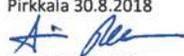


10.2. APPENDIX B EU Declaration of Conformity



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	idOil Control Units: idOil-20 idOil-30, idOil-30 3G, idOil-30 Battery, idOil-30 Battery 3G idOil-D30 idOil Solar
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) 2014/53/EU Radio Equipment Directive (RED) 2014/35/EU Low Voltage Directive (LVD) 2011/65/EU Restriction of Hazardous Substances Directive (RoHS)
Standards	The following standards were applied: EMC: EN 61000-6-2:2005/AC:2005 EN 61000-6-3:2007/A1:2011/AC:2012 EN 61000-3-2:2014 EN 61000-3-3:2013 ATEX: EN 60079-0:2012/A11:2013 EN 60079-11:2012 EN 60079-25:2010 EU-type examination certificate: VTT 16 ATEX 018X. Notified Body: Eurofins Expert Services Ltd, Notified Body number 0537. RED: EN 301 511 v12.5.1 EN 301 908-1 v11.1.1 EN 301 908-2 v11.1.2 EN 300 328 v2.1.1 LVD: EN 61010-1:2010 RoHS: EN 50581:2012 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 30.8.2018  Ari Tolonen, 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 61000-6-2:2005/AC:2005
EN 61000-6-3:2007/A1:2011/AC:2012
ATEX: EN 60079-0:2012/A11:2013
EN 60079-11:2012
EU-type examination certificate: VTT 17 ATEX 004X.
Notified Body: VTT Expert Services Ltd, Notified Body number 0537.
RoHS: EN 50581:2012

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 30.8.2018

Ari Tolonen, 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 61000-6-2:2005/AC:2005 EN 61000-6-3:2007/A1:2011/AC:2012 ATEX: EN 60079-0:2012/A11:2013 EN 60079-11:2012 EU-type examination certificate: VTT 17 ATEX 005X. Notified Body: VTT Expert Services Ltd, Notified Body number 0537. RoHS: EN 50581:2012 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 30.8.2018  Ari Tolonen, 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 61000-6-2:2005/AC:2005 EN 61000-6-3:2007/A1:2011/AC:2012 ATEX: EN 60079-0:2012/A11:2013 EN 60079-11:2012 EU-type examination certificate: VTT 17 ATEX 006X. Notified Body: VTT Expert Services Ltd, Notified Body number 0537. RoHS: EN 50581:2012 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 30.8.2018  Ari Tolonen, CEO Labkotec Oy