

# INSTALLATION AND OPERATING INSTRUCTIONS

## KESSEL – Oil / Fuel separator KESSEL – Coalescence separator

PE Separators according to Euro-norm EN 858 NS 3-20

Oil / Fuel separator *EasyOil*  
Coalescence separator *EasyOil*  
According to EN 858  
NS 3-20 for underground installation

99 403 - 99 620  
(.10/.15/.30/.80) (B/D)  
99 503 - 99 715  
(.10/.15/.30/.80) (B/D)  
99 703 (.04/.10) (B/D)  
99706.10 (B/D)

### Product advantages

- Easy on-site mobility without the need for heavy machinery
- Simple and quick installation and hook up
- Recyclable material
- Seamless body due to monolith construction – 100% watertight
- Approval number:  
Z-83.8-55 Oil / Fuel separator  
Z-83.8-54 Coalescence separator



Installation     Commissioning     Instruction

The installation and service of this unit should be carried out by a licensed professional servicer

Name \_\_\_\_\_

Date \_\_\_\_\_

Town \_\_\_\_\_

Company - Telephone No. \_\_\_\_\_

2020/09

 **KESSEL**

ID number 010-222EN

Subject to technical amendment

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Dear Customer,

Before the KESSEL Oil / Fuel or Coalescence separator is installed and placed in operation please carefully read and follow all of the instructions contained in this Installation, Maintenance and User's Manual.

Upon delivery of the KESSEL separator please thoroughly inspect the separator to make sure that it has not been damaged during shipping.

# Safety Instructions



Personnel used for installation, assembly, operation, maintenance and repair must have the corresponding qualifications for such work. Areas of responsibility and the supervision of personnel must be clearly specified by the operator.

The operating safety of the system supplied is only ensured in the event of proper use. The limit values specified in the technical data must not be exceeded under any circumstances.

Accident prevention regulations and the applicable standards and directives must be observed at all times during installation, assembly, operation, maintenance and repair of the system!

These include:

- Accident prevention regulations
  - Construction work, BGV C22
  - Waste water systems, GUV-V C5
- Safety regulations for work in enclosed areas of waste water systems, GUV-R 126
- Handling of biological materials in waste water systems, GUV-R 145
- Directives for work in tanks and restricted areas, BGR 117
- Standards
  - Construction pits and ditches - Embankments, shoring, working area widths, DIN 4124
  - Laying and testing of waste water pipes and channels, DIN EN 1610
- Work aids for safety and health protection in waste water systems.



## ACCESS:

NO SMOKING! Smoking is strictly prohibited near or around the separator at all times !  
All sources of ignition or sparks are prohibited near or around the separator at all times !

SLIPPERY WHEN WET! Take caution when standing / walking near the separator. During disposal, cleaning and maintenance the surrounding area can become extremely slippery due to spilled oil / fuel.



- Dangers from gases and vapours such as the danger of suffocation, poisoning or explosion
- Danger of falling
- Danger of drowning
- Fecal pollution in waste water containing faeces
- High physical and psychic stresses of work in deep, restricted or dark areas
- Avoid open flames and fire near the separator system

Failure to observe these operating instructions may result in substantial material damage, physical injuries or fatal accidents.



The system constitutes one component of an overall system. The operating instructions of the overall system and the individual components must therefore also be observed. During all assembly, maintenance, inspection and repair to any of the components, the overall system must be shut down and secured against restarting.

Conversion or modifications to the system must only be made after consultation with the manufacturer. Original spare parts and accessories approved by the manufacturer must be used in order to ensure safety. The use of other parts may invalidate liability for the resulting consequences.

## 2. General

### 2.1 Area of application

The separators are intended for use under specified conditions, see the Chapter "Installation and assembly", for installation underground or below the foundation slab in well-ventilated areas.

The stability of the tank is only guaranteed for its own weight, for transport and for the described installation in accordance with the intended use (e.g. load class, road construction build-up). Additional loads from single or strip footings or other external actions must be avoided. If such actions are to be expected, it may be necessary to take special measures.

#### 2.1.1 Oil-fuel separators to Separator System B

The separators can be used:

- a) for the treatment of rainwater contaminated with light fluids from surfaced areas, e.g. filling stations, oil storage and handling areas, parking areas and streets in water protection areas
- b) as a retaining system for light fluids from systems and areas where light fluids are handled, e.g. filling stations, oil storage and handling areas
- c) for preliminary separation of light fluids from waste water before further treatment in subsequent internal waste water treatment plants.

In cases a) and b), the discharged water from the separators is intended to be fed back into the public drainage system.

If the discharged water is to be returned into waters, this is only possible in individual cases following clarification with the local water authority.

In the treatment of dirty water contaminated with light fluids (commercial waste water) or waste water from the applica-

tion areas of Appendix 49 of the waste water regulations, the observation of a limit value for hydrocarbons of 20 mg/l cannot be considered to have been observed.

#### 2.1.2 Coalescence separator to Separator system A

Separators for light fluids with coalescence device can be used:

- a) for the treatment of rainwater contaminated with light fluids from surfaced areas, e.g. filling stations, oil storage and handling areas, parking areas and streets in water protection areas,
- b) as a retaining system for light fluids for the safety of systems and areas where light fluids are handled, e.g. filling stations, oil storage and handling areas,
- c) for the treatment of dirty water contaminated with light fluids (commercial waste water) produced taking into account the operating conditions of industrial processes, the cleaning of parts contaminated with oil and the cleaning of floor areas contaminated with oil (except workshop floors),
- d) for the treatment of waste water produced taking into account the operating conditions of automatic vehicle cleaning (partial flow: outlet from the closed circuit into the drainage system), manual cleaning (vehicle washing, engine washing, underbody washing, chassis cleaning in washing bays, self-service or commercial washing bays - except for the cleaning of workshop floors contaminated with oil and for the drainage of areas used for the receipt, storage, drying, dismantling and crushing of old vehicles,
- e) for preliminary separation of light fluids from waste water before further treatment in subsequent internal waste water treatment plants.

# Installation

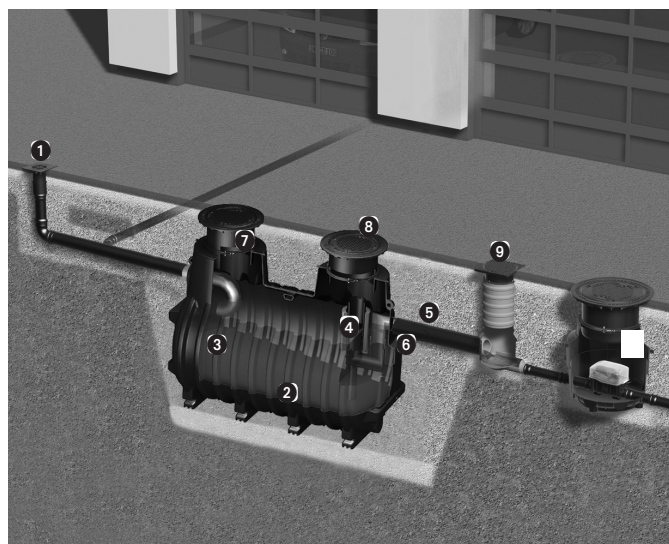
In cases a) to d), the discharged water from the separators is intended to be fed back into the public drainage system. If the discharged water is to be returned into waters, this is only possible in individual cases following clarification with the local water authority.

Separators used in case d) are used in systems for the restriction of hydrocarbons in waste water containing mineral oil in the sense of Part E Paragraph 2 of Appendix 49 of the waste water regulations.

The level of hydrocarbons required by regulations in cases c) and d) of 20 mg/l is considered to have been observed.

## 2.2 System description

The illustration shows a coalescence separator cistern installed in the ground of Class A/B.



- ① Drain without odour trap
- ② Light fluid separator
- ③ Inlet with odour trap
- ④ Outlet with self-actuating closure
- ⑤ Guide tube
- ⑥ Floater
- ⑦ Upper section
- ⑧ Cover
- ⑨ Sampling chamber
- ⑩ Backwater valve

## 2.3 Functional description

The separators separate light fluids and sludge out of the waste water by means of gravity. Light fluids refers to fluids of mineral origin with a density of  $\leq 0.95 \text{ g/cm}^3$ , which are insoluble or only slightly soluble in water, and which are non-saponifiable. These do not include stable emulsions, fats and oils of vegetable or animal origin. Light fluids float up in the separation chamber and collect at the surface. Sludges, which are heavier than water, sink to the bottom and form a sludge layer.

Coalescence separators, like oil-fuel separators, work on the principle of gravity. To increase the separation performance, the tank also contains a coalescence insert. This cylindrical insert has two functions. Firstly, it affects the flow in the separator, and secondly it “filters” all the waste water through the coalescence material.

When waste water containing oil flows through this filter fabric, very fine oil droplets that can no longer be separated out by gravity collect on the coalescence material, and combine to form large oil droplets. When these reach a sufficient size to create buoyancy, they detach themselves from the filter material and rise to the surface.

Light fluid separators are equipped as standard with a self-actuating closure.

When the maximum oil storage volume is exceeded, this device closes the outlet into the drainage system. This prevents the escape of light fluids into the drainage system. This safety device consists of a guide tube full of water, which houses a float.

The float is carefully designed with regard to its weight, so that it floats in water, and sinks in light fluid (up to a density of  $0.95 \text{ g/cm}^3$ ). When the maximum oil storage quantity is reached, oil flows through the lateral openings into the float guide tube. The float then sinks, reliably shutting off the outlet of the separator.

The self-actuating closure of a separator is an “emergency closure valve”. When actuated in an emergency, the separator must be taken out of service and maintained.



# Installation

## 3.1 Installation example: KESSEL Oil / Fuel Separator

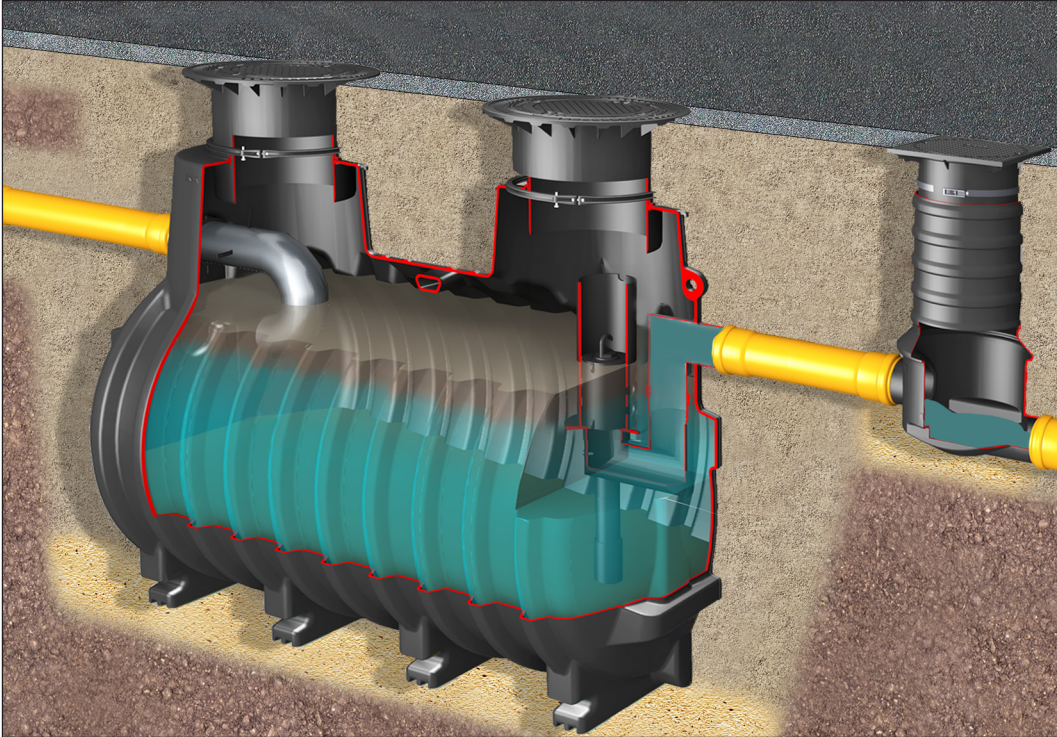
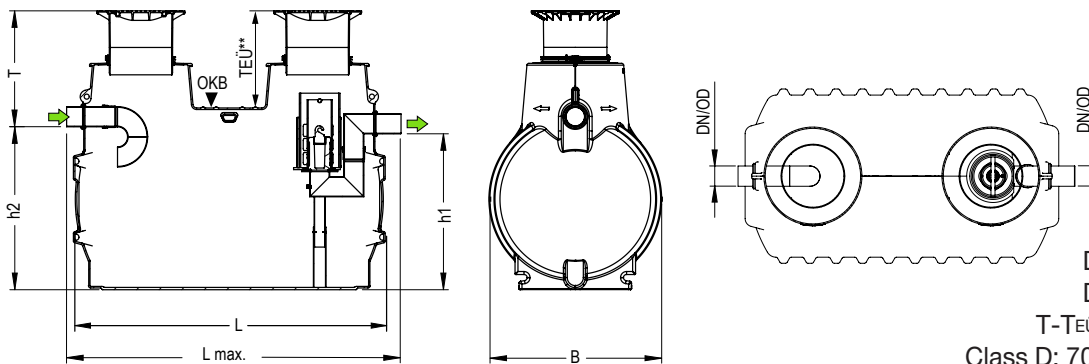


Illustration shows KESSEL-oil-/fuel separator System B with cover class B and sampling chamber.

## 3.2 Dimensioned drawing



DN 150: T-TEÜ = 155 mm  
 DN 200: T-TEÜ = 180 mm  
 T-TEÜ = Height above ground  
 Class D: 700 mm ≤ TEÜ ≤ 1.500 mm  
 Class A/B: 700 mm ≤ TEÜ ≤ 1.800 mm

NS	DN	Sludge trap	L	B	T		h2	h1	Oil storage	Overhang	Weight	Lmax mm	Total volume
					min	max							
NS 3	150	1000 l	2390	1200	840	1240	1100	1070	215 l	90 mm	379 kg	2642	1800
NS 6	200 <sup>2)</sup>	2500 l <sup>1)</sup>	2590	1760	850	1230	1630	1600	380 l	120 mm	519 kg	2940	4300
NS 6	200 <sup>2)</sup>	5000 l	3110	1760	870	1250	1630	1600	470 l	130 mm	594 kg	3460	5800
NS 10	150	1500 l	2910	1200	840	1240	1100	1070	267 l	100 mm	424 kg	3162	2600
NS 10	200 <sup>2)</sup>	2500 l <sup>1)</sup>	2590	1760	850	1230	1630	1600	380 l	120 mm	519 kg	2940	4300
NS 10	200 <sup>2)</sup>	5000 l	3110	1760	870	1250	1630	1600	470 l	130 mm	594 kg	3460	5800
NS 15	200	5000 l	3110	1760	870	1250	1630	1600	470 l	130 mm	594 kg	3460	5800
NS 20	200	4000 l	3110	1760	870	1250	1630	1600	470 l	130 mm	600 kg	3460	5800

1) Comparable total sludge trap volume according to dimensioning of DIN EN 858

2) Eccentric reduction of inlet/outlet to DN 150 possible on site, fitted through DN 150 sample removal shaft

# Installation

## 3.3 Installation example: KESSEL Coalescence separator

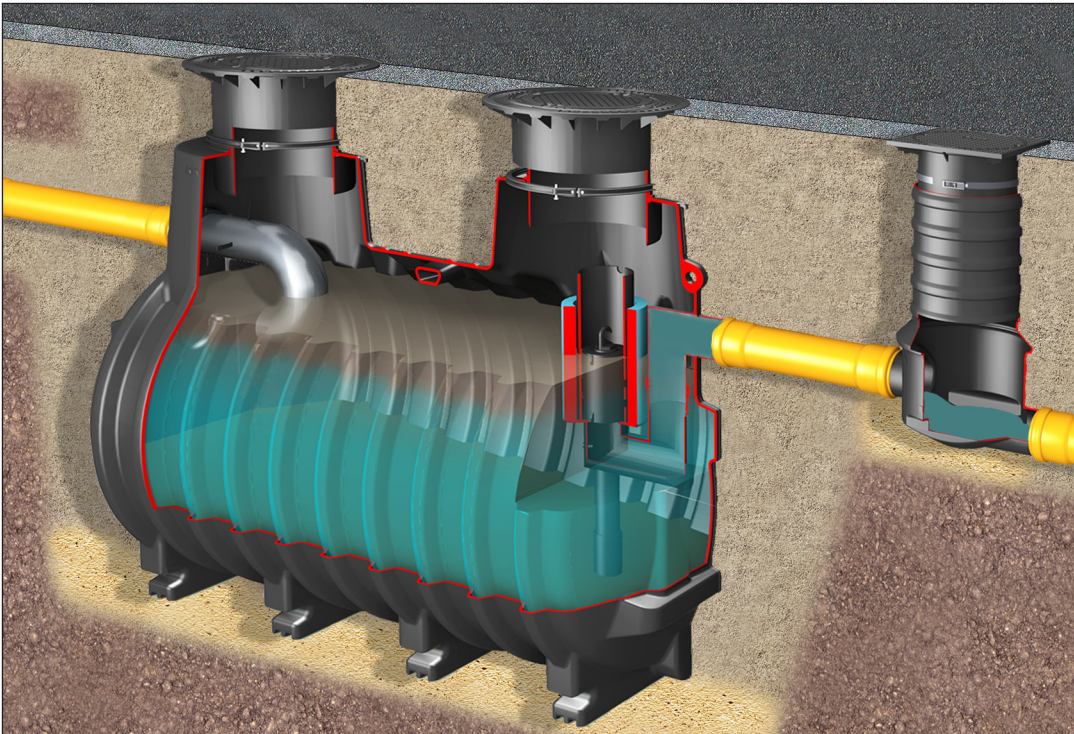
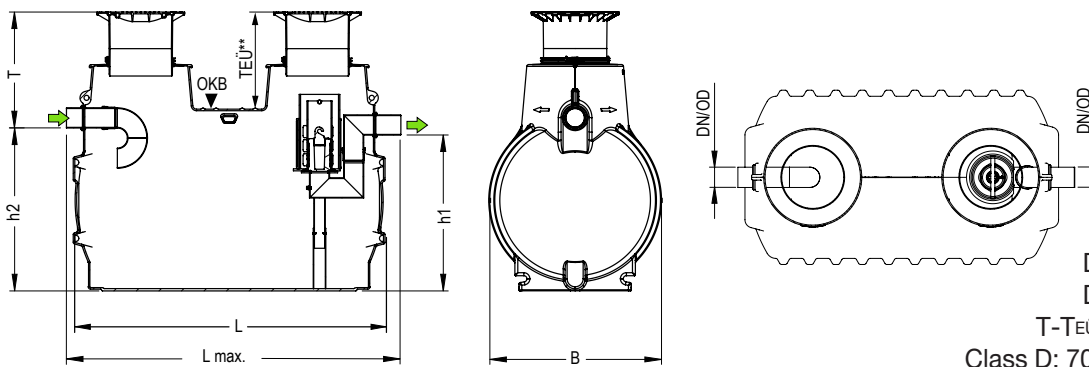


Illustration shows KESSEL-coalescence separator system A with cover class B and sampling chamber.

## 3.4 Dimensioned drawing



DN 150: T-T<sub>EÜ</sub> = 155 mm  
 DN 200: T-T<sub>EÜ</sub> = 180 mm  
 T-T<sub>EÜ</sub> = Height above ground  
 Class D: 700 mm ≤ T<sub>EÜ</sub> ≤ 1.500 mm  
 Class A/B: 700 mm ≤ T<sub>EÜ</sub> ≤ 1.800 mm

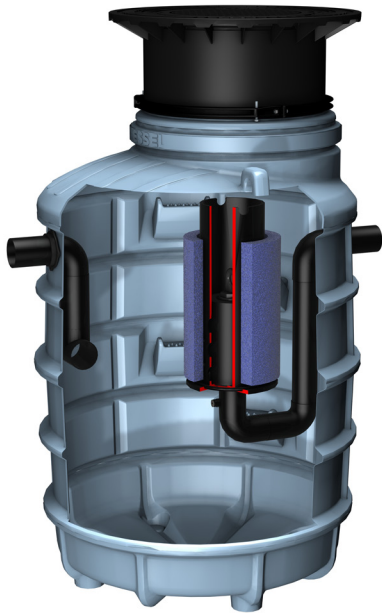
NS	DN	Sludge trap	L	B	T		h2	h1	Oil storage	Overhang	Weight	L <sub>max</sub> mm	Total volume
					min	max							
NS 3	150	1000 l	2390	1200	840	1240	1100	1070	215 l	90 mm	395 kg	2642	1800
NS 6	200 <sup>2)</sup>	2500 l <sup>1)</sup>	2590	1760	850	1230	1630	1600	380 l	120 mm	535 kg	2940	4300
NS 6	200 <sup>2)</sup>	5000 l	3110	1760	870	1250	1630	1600	470 l	130 mm	610 kg	3460	5800
NS 10	150	1500 l	2910	1200	840	1240	1100	1070	267 l	100 mm	440 kg	3162	2600
NS 10	200 <sup>2)</sup>	2500 l <sup>1)</sup>	2590	1760	850	1230	1630	1600	380 l	120 mm	535 kg	2940	4300
NS 10	200 <sup>2)</sup>	5000 l	3110	1760	870	1250	1630	1600	470 l	130 mm	610 kg	3460	5800
NS 15	200	5000 l	3110	1760	870	1250	1630	1600	470 l	130 mm	610 kg	3460	5800

1) Comparable total sludge trap volume according to dimensioning of DIN EN 858

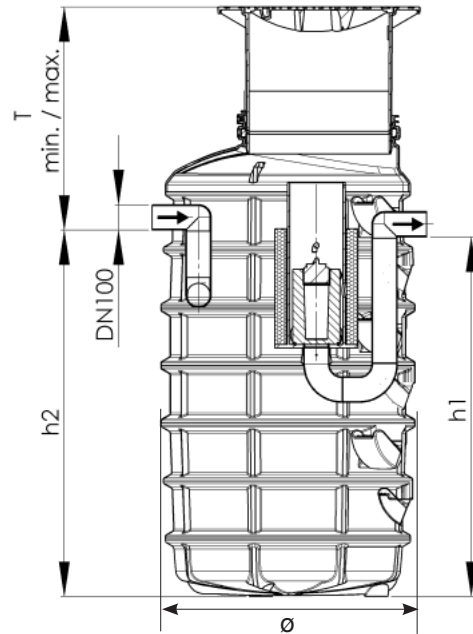
2) Eccentric reduction of inlet/outlet to DN 150 possible on site, fitted through DN 150 sample removal shaft

# Installation

3.5 Illustration: KESSEL coalescence separator shaft LW 1000, NS 3

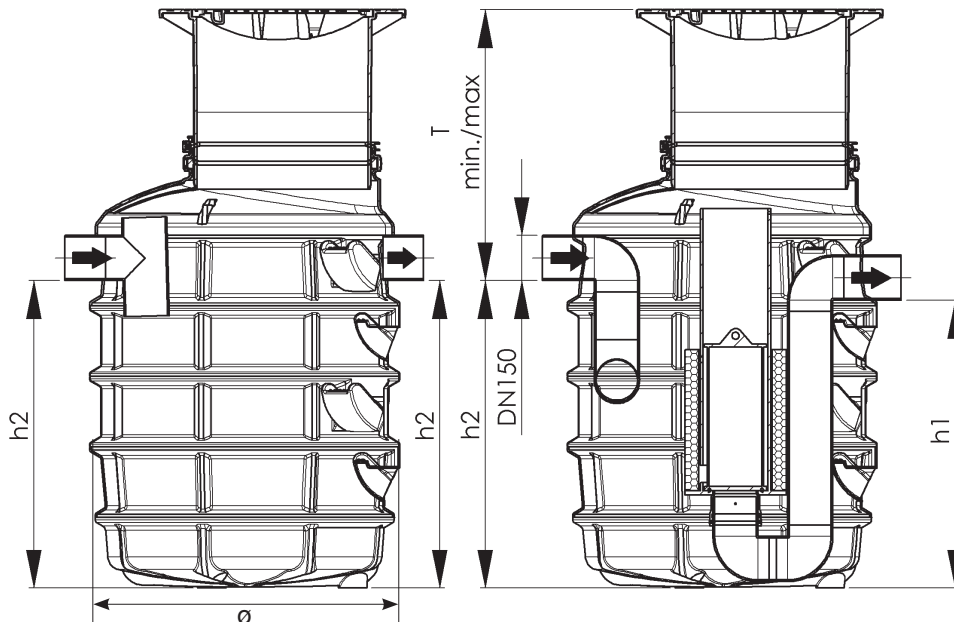


3.6 Dimension drawing of KESSEL coalescence separator shaft LW 1000, NS 3



NS	Sludge trap (l)	DN	Ø	T in mm min max	h2 in mm	h1 in mm	Total volume (l)	Oil storage (l)	Overstand (mm)	Weight (Kg)	Cover class	Art No.
3	800	100	1100 Ø	545 995	1105	1055	790	200	110	175	B	99703.04B
3	800	100	1100 Ø	545 995	1105	1055	790	200	110	205	D	99703.04D
3	1600	100	1100 Ø	545 995	1605	1555	1390	200	110	190	B	99703.10B
3	1600	100	1100 Ø	545 995	1605	1555	1390	200	110	220	D	99703.10D

3.7 Dimensioned Drawing KESSEL-coalescence separator LW 1000, NS 6 (with upstream sludge trap)



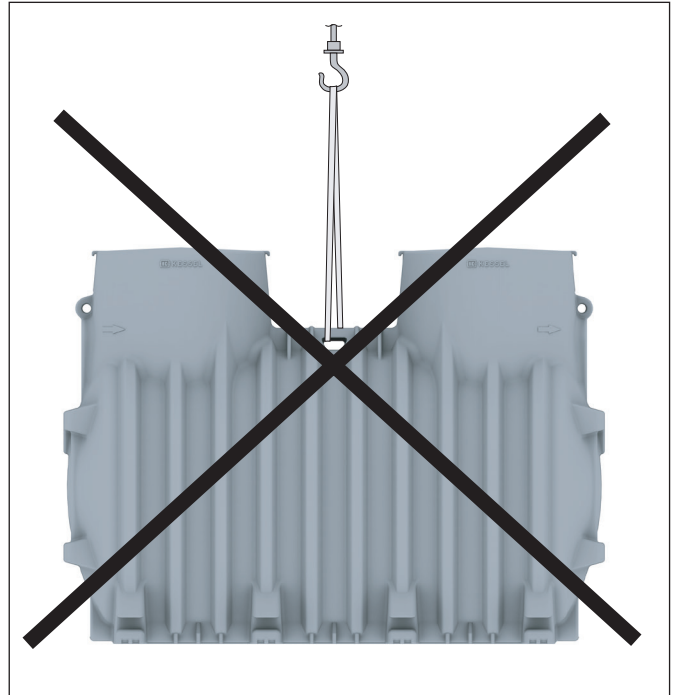
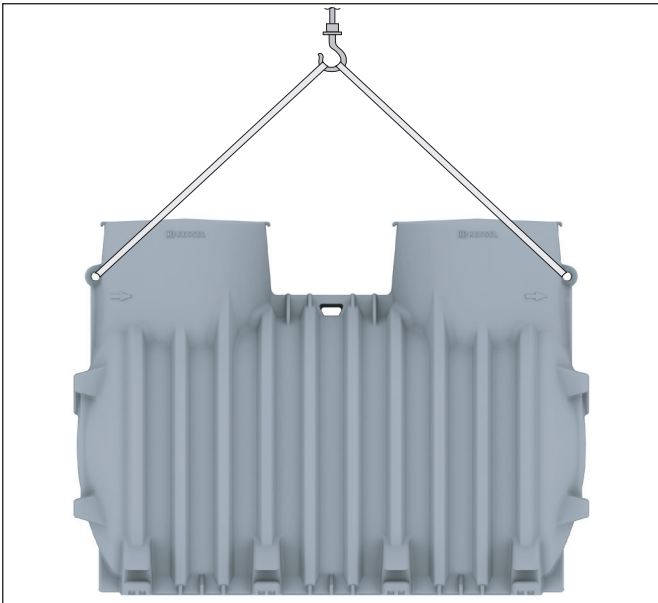
NS	Sludge trap (l)	DN	Ø	T in mm min max	h2 in mm	h1 in mm	Total volume (l)	Oil storage (l)	Overstand (mm)	Weight (Kg)	Cover class	Art No.
6	/	150	1100 Ø	560 1010	1090	1020	650	200	110	180	B	99706.02B
6	/	150	1100 Ø	560 1010	1090	1020	650	200	110	200	D	99706.02D
6	1000	150	1100 Ø	560 1010	1090	1020	1580	200	110	305	B	99706.10B
6	1000	150	1100 Ø	560 1010	1090	1020	1580	200	110	338	D	99706.10D



## Transport and Storage

Transportation of the KESSEL separator should be handled only by a transporter who has the proper knowledge, equipment and employees to handle such a product. During transport the separator must be firmly fixed into position and must not be allowed to move or shift in place. It also must be protected from other objects coming in contact with the separator during transport.

If and when the separator is lifted it is important to follow the following correct procedures: The separator is not to be lifted with the use of steel cables or chains. Proper equipment are heavy duty cloth or hemp straps designed to handle the corresponding loads. The separator should be lifted by placing the proper straps beneath the inlet and outlet of the separator as seen in the illustration. Do not lift the separator by the small holes between the two manhole covers as illustrated on this page. In instances where a forklift is used, secure the separator to the forklift with appropriate cloth / hemp securing straps.



In cases where the separator needs to be temporarily stored before installation, it is important that the separator is placed on firm level ground and in an area where it is protected from coming in contact with other objects. Storing the separator outdoors will not cause any problems.



# Installation and assembly

**During the intermediate storage of the separator and until completion of the installation work, suitable safeguarding measures must be taken at the building site to prevent accidents and damage to the separator.**

**The chapter "Safety instructions" must be heeded!**

## 5.1 Installation conditions

Installation must only be carried out by companies who are in possession of the technical experience, suitable implements and equipment as well as adequately trained personnel.

A measurement of the soil conditions with a view to its structural suitability must have been carried out (soil classification for structural purposes DIN 18196). The maximum groundwater level that can occur must be established. A sufficient drainage of seepage water is compulsory for soils that are impermeable to water. The types of loads occurring such as maximum travelling loads and installation depth must be clarified.

The separator for underground installation should be installed outside the building as close to the drains as possible. If necessary, the inlet connection pipes to the separator should be routed heat-insulated or heated. The necessary frost-free installation depth is achieved using telescopic upper sections and adaptation to the inlet and outlet pipe (sewer). The covers for the load classes A / B / D are odour-tight and correspond to DIN EN 124.

Wastewater pipes and fittings made of the following materials may be connected to the inlet and outlet of the separator system:

- Polyvinyl chloride (PVC-U) acc. to DIN EN 1401-1 in connection with DIN 19534-3,
- Polyethylene (PE) acc. to DIN EN 12666-1 in connection with DIN 19537-3 or
- Polypropylene (PP) acc. to DIN EN 1852-1

The specifications in DIN EN 124 and DIN EN 473 must always be fulfilled.

In- and outlet must be easily accessible for cleaning and maintenance. The use of locked or ventilated covers is prohibited. Pumping or lifting stations may not be installed in the inlet pipe to the separator. If these are necessary, they must be installed downstream from the separator.

KESSEL recommends providing an overhang for safe operation of the system, as well as mounting a warning system. The necessary installation conditions should be created before the excavation pit is backfilled.

Separator systems must be installed in such a way that the upper edge of the covers is sufficiently high compared with the decisive level of the surface to be drained (see Fig. 1).

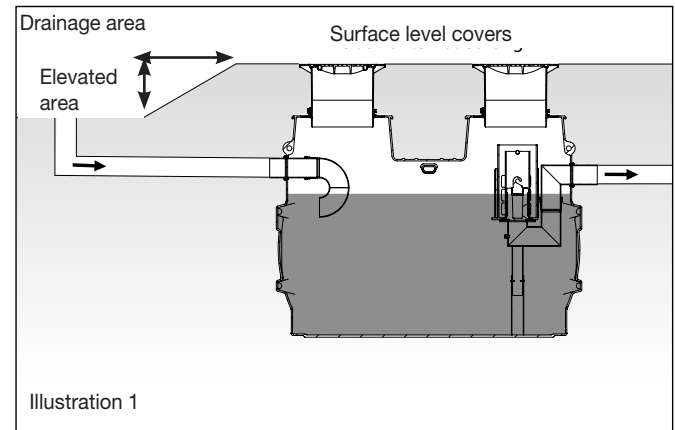
On account of the difference in density between light liquids and water, the level of liquid in the separator is always higher than the water level in the draining system.

The decisive level is the maximum rainwater storage level when washwater and rainwater are discharged together.

If only washwater is discharged, the upper edge of the lowest drain installed is applicable as the decisive level. The necessary

overhang depends on the nominal size of the separator (see the Technical Data chapter).

If this overhang condition cannot be met, a warning system must be installed for light liquids.



## Separator system ready for operation

Light liquid separators must be protected on site from backwater from the sewer.

KESSEL recommends taking the following precautions:

Drainage point	Separator	Backwater protection
Inside a building	Overhang available	Backwater valve
Inside a building	No overhang	Backwater valve
Outside a building	Overhang available	Backwater valve
Outside a building	No overhang	Lifting station

## Please note:

Weather-related influences or cooling of the tanks during the installation phase (caused by filling with cold water) can lead to deviations in dimensions from the catalogue specifications in the case of cisterns, separators installed in the ground and septic systems. For this reason, please check the height specifications in particular for their actual size before installation.

# Installation and assembly

## 5.2 Filling material

Subbase: Crushed stone (graining 0-16mm)

Tank base: Sand

Tank encasing: Crushed stone (graining 0-16mm)

Area outside tank encasing: Material of suitable consistence

Top layer: Topsoil or similar

## 5.3 Excavation pit

### Prerequisites for the ground to be used

The foundation soil must guarantee sufficient load-bearing capacity According to ATV-DVWK-A 127, the separator system may only be installed in soils of

- Group G1 or G2 or
- Group G3 or G4 compacted with at least  $D_{pr} = 97\%$ , whereby in this case provision must be made for the sufficient drainage of seepage water.

### Preparation of the excavation pit

The foundation soil must be horizontal and level so that full-surface set-up is possible. Compacted crushed stone 0/16 (at least 30 cm deep,  $D_{pr}=97\%$ ) must be planned as the subbase, and must be compacted layer by layer with a maximum layer thickness of 30 cm/layer. 3-10 cm sand are required for the bed, compacted to  $D_{pr}=97\%$ . The clearance between excavation pit wall and tank must be at least 50 cm. The requirements of DIN 4124 must be fulfilled with regard to the slope angle. The depth of the excavation pit must be dimensioned in such a way that the limits of soil cover are not exceeded.

$MIN \leq DSC \leq MAX$  (see "Dimensional drawing" chapter).

### Inserting and connecting the tank

The tank must be inserted into the prepared excavation pit, aligned opposite the designated drainage pipe, levelled and connected permanently watertight to the drainage pipes.

### Backfilling of the excavation pit and filling the tank

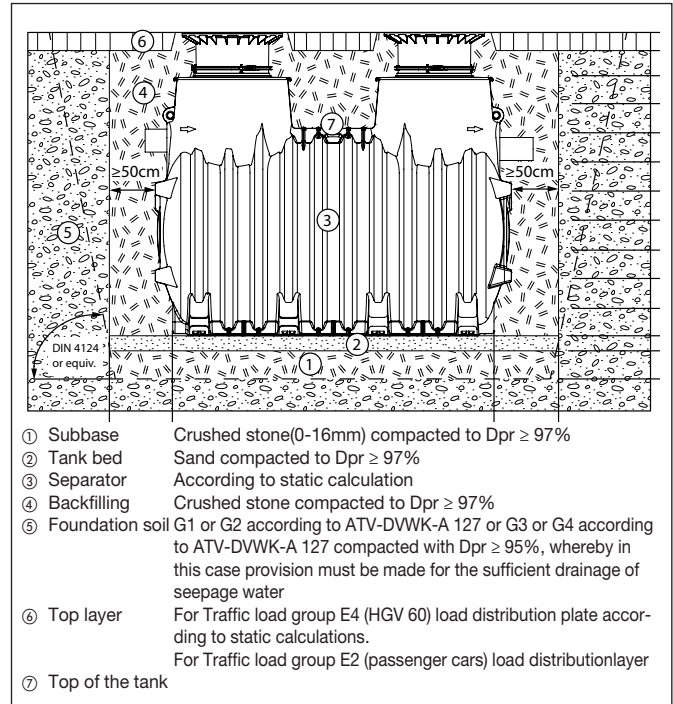
The excavation pit should be backfilled with crushed stone 0/16, which must be compacted to  $D_{pr}=97\%$  in layers of max. 30 cm/layer using a light compactor. Parallel to this, the tank must be filled with water to such an extent that there is a maximum difference of 30 cm between the level of the liquid in the tank and the filling material.

### Root ingrowth

If installed near trees, shrubs and bushes, root ingrowth has to be safely prevented.

### Installation in terrain with a sloping location

When installing the separator in sloped terrain, care must always be taken that the laterally thrusting soil pressure of disturbed ground is absorbed by a correspondingly designed retaining wall.



### Frost-free depth for use all year round

When installing the separator it is imperative to pay attention to the locally determined frost-free depth. To guarantee problem-free operation in winter, too, the inlet and outlet pipes must also be routed at a frost-free depth when the rainwater storage tank is installed. Unless otherwise specified by the authorities, the frost-free depth is usually approx. 80 cm.

## 5.4 Tests before installation

Immediately before placing the tank into the excavation pit, the technical expert of the company that has been commissioned to carry out the installation has to check and certify the following:

- The sound condition of the tank wall;
- The proper condition of the excavation pit with a view to its dimensions and base bedding;
- Consistence of the filling material graining.

### Cistern design:

Installation in the groundwater is possible providing the groundwater level does not exceed the top edge of the tank ⑦.

### Inspection chamber design:

Handles groundwater depths up to 500 mm, measured from the lower edge of the inspection chamber.

## 5.5 Installation

### Placement

The tanks must be placed without impact into the excavation pit with the aid of suitable equipment and set down onto the base bedding (see also chapter "Transport").

# Installation and assembly

## Tank connection

Any transportation safety devices must be removed. Make sure that the connection pipe sections are protected from damage to guarantee permanent watertightness. In order to confirm correct installation, a watertightness test must be carried out and documented before the base course is prepared. To make connection easier, the connection sections and counter-pieces must be sufficiently greased.

The transition from downpipes to horizontal pipes must be executed with two 24° curved fittings and a connecting piece at least 250 mm long. A stilling section, the length of which corresponds to at least the tenfold of the inlet pipe's nominal width, must be provided upstream separator system.

Depending on the installation situation, a load distribution layer that is capable of bearing a sufficient load must be prepared:

- For Group E2 to standard roadbuilding regulations acc. to annex 3 and 4
- For Group E4 with a load distribution plate acc. to annex 5 and 6

## Connecting the sampling chamber

Sampling devices must be located directly downstream of the separator in the direction of flow. The sampling device in the separator system must be freely accessible and arranged so that only wastewater that has passed through the separator system can be removed.

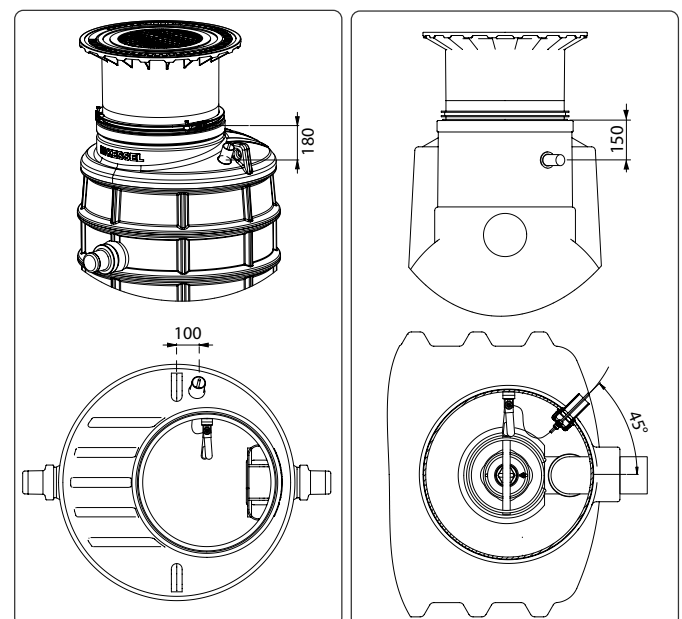
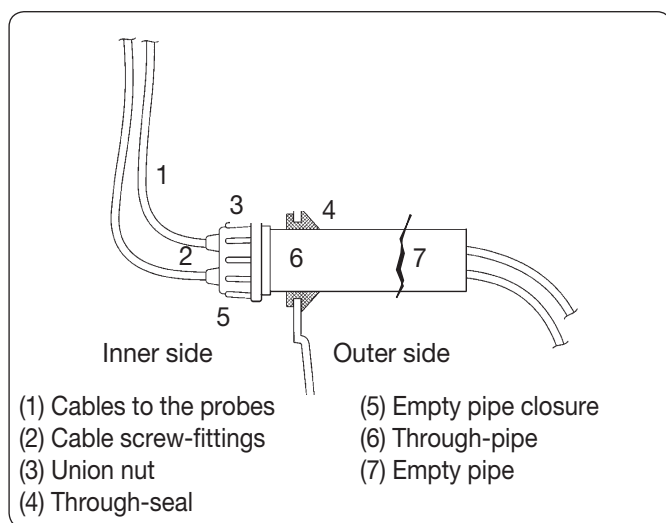
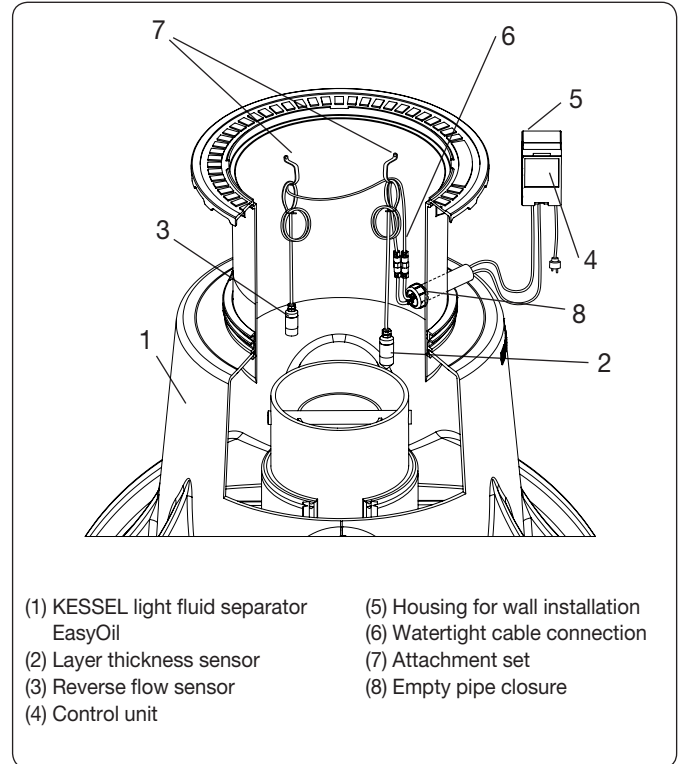
Note related to the warning system: connection cables or conduit pipes must be routed during the ground-moving work.

## Connecting the conduit pipe for the warning system

The connection distance between separator and control unit must be kept as short as possible.

Unnecessary changes of direction, particularly ones at angles greater than 45° must be avoided.

The cable conduit must have a continuous gradient to the separator. Condensation inside the cable conduit can be minimised through an airtight seal on the conduit on the control unit side. A cable pull wire can be included for any later cable installation.





# Installation and assembly

## Lipseal

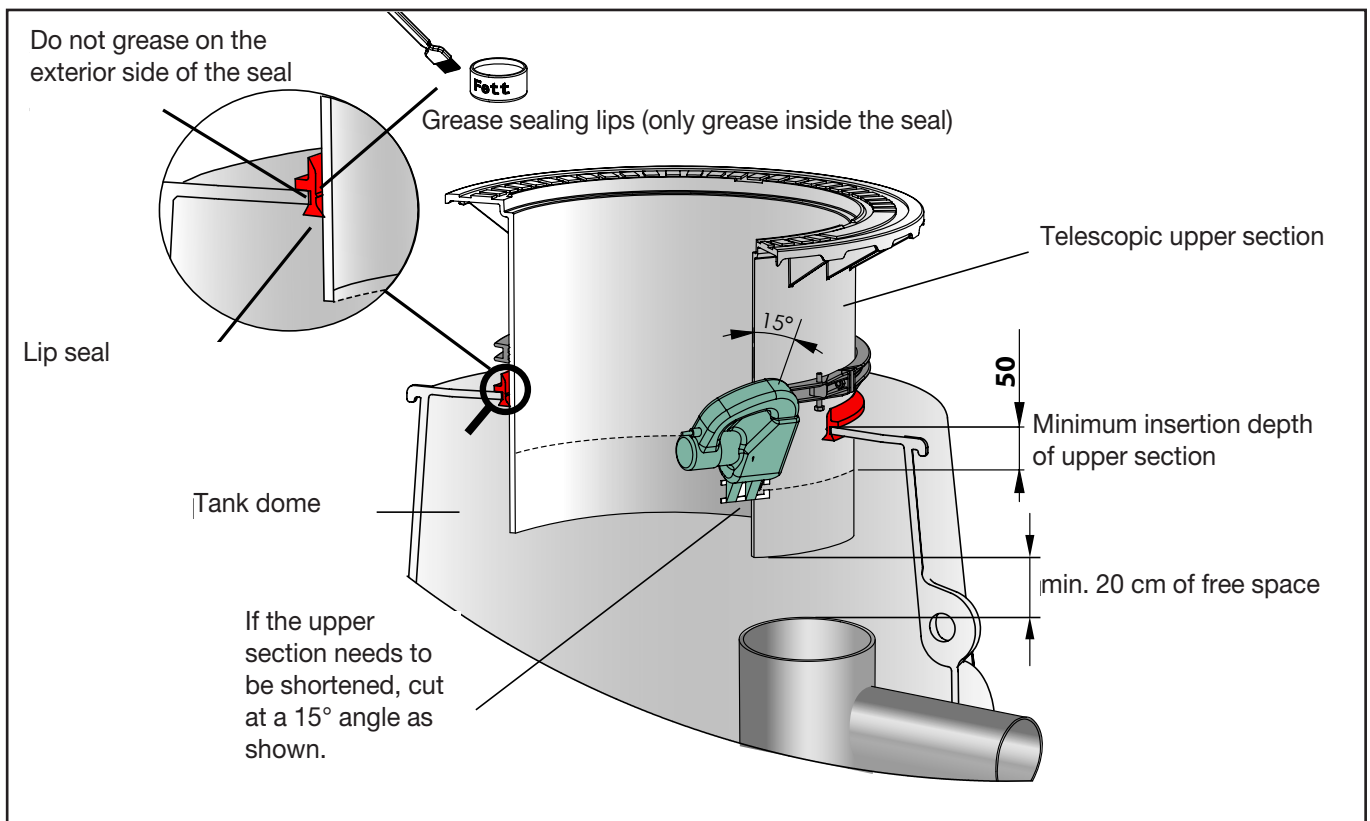
Insert lip seal DN 600 into the bore hole of the dome and lubricate it. Check the sealing faces for cleanness and damage before installation.

## The telescopic KESSEL upper section

must be shortened to such an extent that all installed parts are easy to service. Before insertion, chamfer by  $15^\circ$  to avoid damage to the sealing gasket, the upper section can be inclined by up to  $5^\circ$ . Then insert the upper section into the opening of the separator and move it to the required position. With the aid of the existing clamping ring it is now possible to fasten the upper section in the desired position (alignment with the top ground surface). The fine adjustment to the final height is then effected with the adjusting screws. A ground slope can be compensated for with the continuously height-adjustable and up to  $5^\circ$  inclinable upper section. The upper section must be lined sufficiently and made flush with the ground level using a flat-bed vibrator and a steel plate placed over the upper section.

## Remaining filling

For installation in areas driven over by trucks (cover Class D), a reinforced concrete plate must be designed as the uppermost layer. A respective formwork plan and reinforcement drawing can be provided by KESSEL.



## Installation and assembly

### 5.6 Oil and sludge extraction (for chamber LW 1000 only on request)

During standard disposal, the hose from the disposal vehicle is held into the light liquid separator and the entire contents are pumped out.

However, the quantity of light liquid is significantly lower than the total volume of the separator. Disposal can be carried out as required using the oil suction system.

The suction hose is coupled to the oil suction system for disposal of the light liquid. Thus the disposal vehicle can only dispose of the volume that corresponds to the maximum quantity of light liquid.

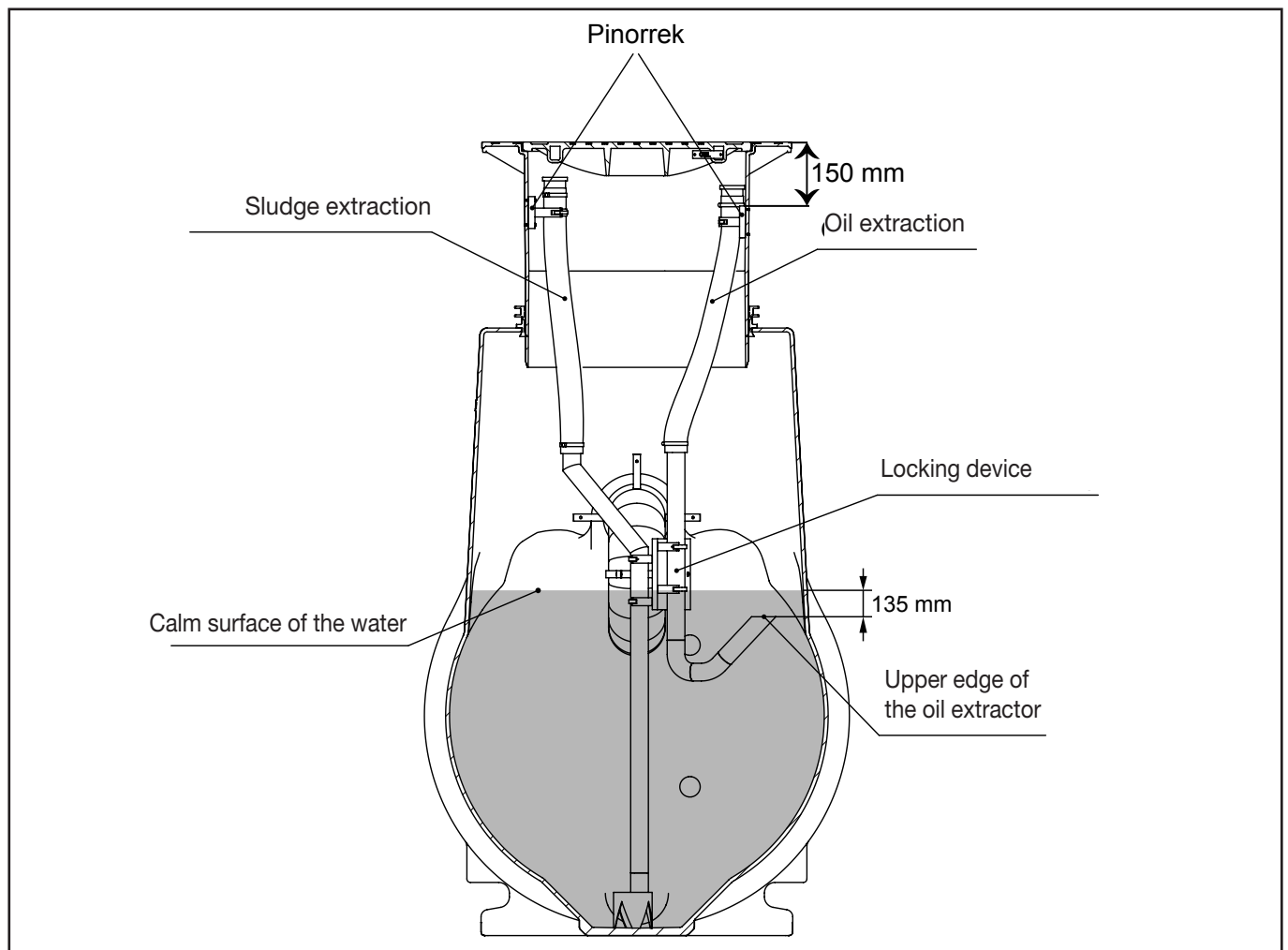
This means a significant reduction in disposal quantity. This saves time during disposal and reduces disposal costs. In the same way, the sludge suction system can be used to significantly reduce the disposal quantity too.

This is an advantage for companies with high sludge occurrence in particular. It goes without saying that the whole separator can also be emptied using the sludge suction system.

If both systems are used during disposal, care must be taken that the oil is disposed of first, then the sludge. The locking mechanism is attached to the inlet pipe using the pipe clamp as shown in the drawing. Mount the oil suction system on the locking mechanism in such a way that it keeps the distance given shown in the drawing from the calm surface of the water to the upper edge of the connecting piece, then set and fix it in place. Mount the sludge suction system on the locking mechanism, guide it to the base and then fix it in place.

Use the stainless steel screws included to fit the stub connection in the upper section as shown in the drawing.

Only a drill with diameter 3.5 mm may be used for the drill hole. Use the stub connection as a drilling template. Fit the knuckle coupling to the end of the hose and fix in place using the hose clamp. Hook the hose with the knuckle coupling upwards in the stub connection, route it to the suction system and cut to a suitable length. Connect the hose and suction system and fix in place using hose clamps. These must not touch the knuckle coupling when the cover is closed.



# Commissioning

The chapter "Safety instructions" must be heeded.

## 6.1 Setting up for operation

Before the separator is put into operation, please make sure that:

- the separator is clean and the interior is free from any objects which may have been placed inside during shipping or installation.
- the separator is completely filled with clean cold water. Completely filling the separator is complete when water begins to drain from the outlet.
- Lift the floater in the guide tube and check floating position and movability. For light fluid separators: Push coalescence insert in the designated guide.

## 6.2 Initial Instructions

Placing the separator into full operation is normally handled by a licensed tradesman although upon request can be handled by a KESSEL representative.

The following personnel should be on hand when the initial instructions for placing the separator into operation are given:

- Building facilities manager
- Building maintenance workers
- Contracted plumber / tradesman
- Contracted disposal company

### What to do:

- Check to make sure the separator is completely watertight. Check to make sure that during transport and installation that no damage to the separator was caused. Check to make sure all connections to the separator (inlet, outlet, refill, rinse pipes etc.) are in perfect working order.
- Representative should discuss all necessary information regarding the disposal.
- Representative should take the customer step by step through all stages of a separator disposal.
- After the separator has been emptied (disposed) all necessary paperwork and documentation should be handed over to the customer.
- The separator should be returned to service by filling the separator with fresh, cold water.

## 6.3 Commissioning report (see attachment)

The commissioning form is to be filled out complete and signed by the customer's representative and their client."

# Disposal

## **Disposal intervals:**

The fuel / oil collected in the separator should be collected / disposed when the level has reached 80% of the maximum storage capacity. Disposal of collected sludge in the base of the separator should be collected / disposed when the level has reached 50% of the maximum sludge storage capacity.

**Important:** Timely disposal of the separator is mandatory to insure proper function and operation of the separator.

A licensed disposal company should be contracted to handle disposal of the separator. Disposal should take place when little or no wastewater is entering the separator.

## **Emptying intervals:**

The light fluid retained in the separator must be removed at the latest when the quantity of separated light fluid reaches 80% of the maximum storage quantity, or the level is below the retained volume. For separators simultaneously or exclusively used for the drainage of systems or areas where light fluids are handled (e.g. fuelling areas), the retained volume required under state regulations must also be provided. The separated light fluid must also be removed at levels below this retained volume if the quantity of separated light fluids has not yet reached 80 % of the maximum storage quantity.

The disposal of the sludge contained in the sludge trap must be removed at the latest when the separated sludge quantity

reaches half of the sludge trap volume.

**Note: Light fluids and sludge must be removed as specified above in order to ensure the correct operation of the system.**

For this reason, a disposal contract should be concluded with a specialist disposal company. The disposal work should be carried out if possible when the system is not in operation.

Expected disposal volumes in accordance with the filling level can be estimated by means of the following table.

The figures contained in the table are approximate figures only for the purposes of estimating quantities when contracting a specialist disposal company.

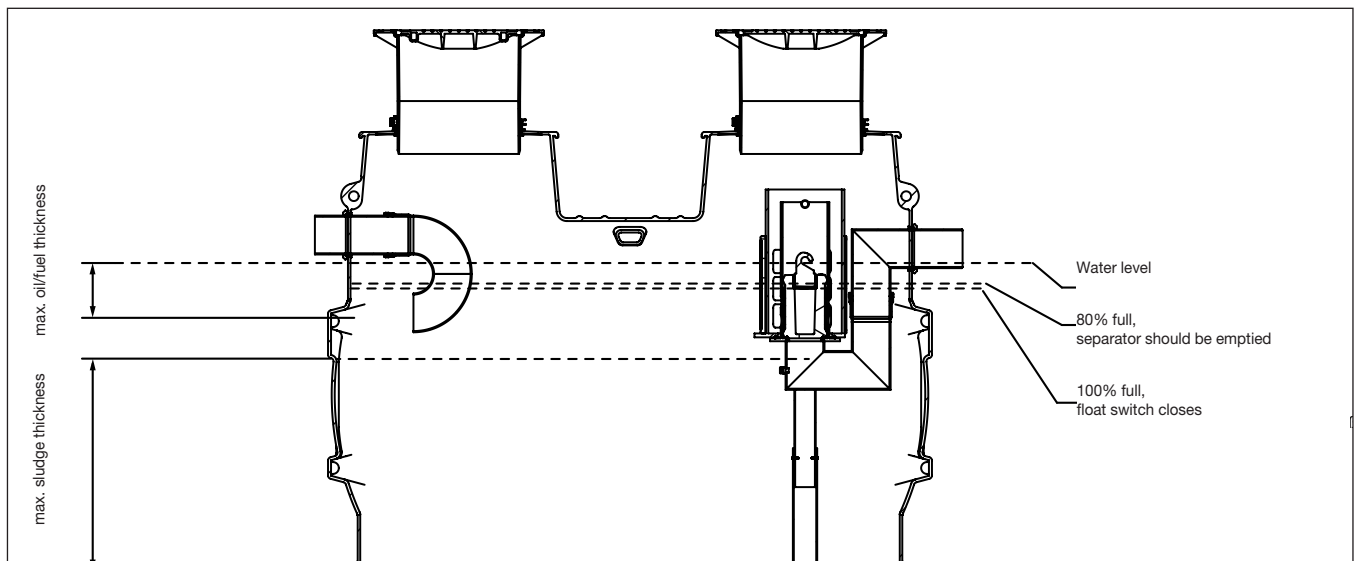


# Disposal

Oil-/fuel Separator Art.-Nr.:	Sludge			Oil-/Fuel		
	1)	Measured	Disposal	2)	Measured	Disposal
	Filling level in %	layer thickness in mm	volume in litres	Filling level in %	layer thickness in mm	volume in litres
99403.10B 99403.10BEX 99503.10B 99503.10BEX 99403.10D 99403.10DEX 99503.10D 99503.10DEX	50	650	1000	100	131	187
	40	530	800	80	105	150
	30	430	600	60	79	112
	20	330	400	40	52	75
	10	210	200	20	26	37
99610.15B 99610.15BEX 99710.15B 99710.15BEX 99610.15D 99610.15DEX 99710.15D 99710.15DEX	50	650	1500	100	131	262
	40	550	1200	80	105	210
	30	450	900	60	79	157
	20	340	600	40	52	105
	10	220	300	20	26	52
99606.30B 99606.30BEX 99706.30B 99706.30BEX 99606.30D 99606.30DEX 99706.30D 99706.30DEX	50	1100	3000	100	138	265
	40	930	2400	80	110	212
	30	760	1800	60	83	159
	20	580	1200	40	55	106
	10	370	600	20	28	53
99606.80B 99606.80BEX 99706.80B 99706.80BEX 99606.80D 99606.80DEX 99706.80D 99706.80DEX	50	1100	4000	100	138	380
	40	910	3200	80	110	304
	30	740	2400	60	83	228
	20	560	1600	40	55	152
	10	350	800	20	28	76
99610.80B 99610.80BEX 99710.80B 99710.80BEX 99610.80D 99610.80DEX 99710.80D 99710.80DEX 99615.80B 99615.80BEX 99715.80B 99715.80BEX 99615.80D 99615.80DEX 99715.80D 99715.80DEX 99620.80B 99620.80D	50	1100	4000	100	138	380
	40	910	3200	80	110	304
	30	740	2400	60	83	228
	20	560	1600	40	55	152
	10	350	800	20	28	76
99703.04B 99703.04D	50	400	550	100	235	200
	40	320	369	80	188	160
	30	240	305	60	141	120
	20	160	241	40	94	80
	10	80	177	20	47	40
99703.10B 99703.10D	50	800	1050	100	235	200
	40	640	815	80	188	160
	30	480	587	60	141	120
	20	320	369	40	94	80
	10	160	241	20	47	40
99706.10B 99706.10D	50	400	550	100	235	200
	40	320	369	80	188	160
	30	240	305	60	141	120
	20	160	241	40	94	80
	10	80	177	20	47	40

1) The sludge retained in the separator must be disposed of at the latest at a filling level of 50%.

2) The light fluid retained in the separator must be disposed of at the latest at a filling level of 80%, or when the retained volume is exceeded.



# Maintenance and Controls

	INSTALLATION	SELF-CHECK	MAINTENANCE	DISPOSAL	GENERAL INSPECTION	REPAIR
Who	Specialist company	Specialist	Specialist company or works customer service <sup>1</sup>	Disposal company	Qualified body	Specialist company
What	Measurement of the layer thickness of : <ul style="list-style-type: none"> <li>· light fluid</li> <li>· of the sludge layer</li> </ul> Check of the self-actuating closure and warning device	Measurement of the layer thickness of : <ul style="list-style-type: none"> <li>· light fluid</li> <li>· of the sludge layer</li> </ul> Check of the self-actuating closure and warning device	Measurement of the layer thickness of : <ul style="list-style-type: none"> <li>· light fluid</li> <li>· of the sludge layer</li> </ul> Check of the self-actuating closure and warning device  <ul style="list-style-type: none"> <li>· Emptying and cleaning, if necessary</li> <li>· Cleaning of the sample removal device</li> <li>· Check of the operating logbook</li> </ul>	Removal of light fluid and sludge  The waste disposal regulations must be observed!	Complete emptying Cleaning Check for proper condition and proper operation, and at least however: - Safety against the escape of light fluids from the separator system or the shaft units (excess height) - Structural condition and integrity of the separator system - Condition of the installed parts and the electrical equipment - Calibration of the self-actuating closure device - Completeness and plausibility of the records in the operating logbook - Disposal confirmations of the materials removed - Availability and completeness of the required approvals and documentation If the separator system is also used for the treatment of commercial waste water or waste water from the cleaning of vehicles, the following points must also be checked: - Actual volume of waste water (origin, quantity, contents, cleaning agents, operating materials, avoidable of stable emulsions) - Dimensioning, suitability and performance of the separator systems.	-As required
When	monthly	6-monthly	Light fluid 80% is reached or the level is below the retained volume Sludge collection chamber is full	Before commissioning, then every 5 years	operating logbook	
Documentation	Installation certification	operating logbook	Maintenance report	operating logbook Maintenance report	Test report	operating logbook

\* If the general inspection is carried out at shorter intervals than 5 years, the maintenance must be carried out by a specialist.

# Maintenance and Controls

**The Chapter “Safety instructions” must be observed!**

## 9.1 Maintenance

- The separator system must be maintained semiannual by a specialist 1).

In addition to the removal of materials, the following work must also be carried out:

- Check of the inner wall surfaces of the sludge trap and the grease separator,
- Functional check of the electrical devices and installations, if fitted.
- The findings and work carried out must be recorded in the operating logbook and evaluated.

- If fitted, electro-mechanical assemblies such as pumps, valves, shut-off devices etc. must be maintained twice yearly in accordance with the manufacturers’ instructions.

## 9.2 Checking (general inspection)

Before commissioning, and then at regular intervals of no more than 5 years, the separator system must be completely emptied and cleaned, and then checked by a specialist 2) for proper condition and operation.

The following points at least must be checked and recorded:

- Assessment of the separator system
- Structural condition and integrity of the separator system
- Condition of the inner wall surfaces of the installed parts and the electrical equipment, if fitted
- laying of the feed pipe of the separator system as a ventilation pipe over the roof
- Completeness and plausibility of the records in the operating logbook
- Confirmation of the proper disposal of the materials removed from the separator system
- Availability and completeness of the required approvals and documentation (approvals, drainage plans, operating and maintenance instructions)

A checking report must be compiled on the checks performed, noting any existing faults. If faults are discovered, these must be rectified immediately.)

1) A “specialist” in this sense refers to personnel of the operator or other company, who by means of their training, skills and experience obtained from practical work, ensure that they carry out assessments or checks in the relevant specialised field to the required standard.

A specialist can acquire the specialist knowledge required for the operation and maintenance of separator systems in a training course with the following on-site instruction, which is offered for example by the corresponding manufacturers, professional trade associations, chambers of commerce and expert organisations in the field of separator technology.

2) A “specialist” in this sense refers to personnel of business other than the operator, experts or other institutions which demonstrably have the specialist skills required for the operation, maintenance and checking of separator systems. In individual cases, such as larger operating units for example, these checks can also be carried out by internally independent specialists of the operator not bound by instructions with regard to their area of responsibility, who have equivalent qualifications and technical equipment.

Qualified bodies are specialist businesses independent of the operator or similar institutions, whose employees demonstrably have the specialist skills required for the operation, maintenance and checking of separator systems to the extent specified here, together with the technical equipment for the checking of separator systems.

In individual cases, such as larger operating units for example, these checks can also be carried out by internally independent specialists of the operator not bound by instructions with regard to their area of responsibility, who have equivalent qualifications and technical equipment.

KESSEL recommends, in order to to facilitate leak tightness tests (placement of shut-offs), to incorporate a revision chamber shortly before the separator.

Article	Order No.
<b>General inspection of oil/coalescence separator</b>	<b>917 411/L</b>
<b>Operating logbook of oil/coalescence separator</b>	<b>917 812</b>
<b>Leaktightness of the pipe runs</b>	<b>917 417</b>






# INSTRUCTIONS FOR INSTALLATION, OPERATION AND MAINTENANCE


## KESSEL Sampling Chambers for Separators DN 100/150/200

for set-up in frost-protected rooms and installation in the ground



### Product advantages

- Easy to clean
- Easy operation
- Permanently airtight



Installation  Commissioning  Instructional briefing  
for the system was carried out by your specialist company:

\_\_\_\_\_  
Name/signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
City

\_\_\_\_\_  
Stamp of specialist company

**KESSEL**

## 1 Safety

### 1.1 Correct use

The system must not be used in a potentially explosive environment.

Any

- conversions or attachments
- use of non-genuine spare parts
- carrying out of repairs by companies or persons not approved by the manufacturer

which has been carried out without the express and written permission of the manufacturer can lead to a loss of warranty.

### 1.2 Staff selection and qualification

People who operate and/or fit the sampling device must be

- at least 18 years old.
- have been sufficiently trained for the respective tasks.
- be familiar with and follow the respective technical rules and safety regulations.

The owner-operator decides on the required qualifications for the

- operating staff
- maintenance staff
- repair staff

The operator must ensure that only qualified staff work on the sampling device. Qualified staff are members of staff who, on the basis of their training and experience as well as their knowledge of the relevant instructions, valid standards and accident prevention regulations, can carry out the required tasks and both recognise and avoid any possible hazards.

### 1.3 Organisational safety measures

The operating and maintenance instructions must always be kept near to the sampling device.

### 1.4 Risks caused by the product



During cleaning work, greasy liquid and/or grease can wet the floor. This results in a slipping hazard. Always eliminate any liquid and/or grease that has leaked immediately, and wear suitable footwear.

### 1.5 Danger of slipping when the system is emptied



The wastewater contains bacteria. There is a risk of infection in the event of contact with mucous membranes, eyes, wounds or when absorbed in the body. Any parts of the body which come into contact with wastewater should be cleaned immediately, change soiled clothing. Wear personal protective equipment.

## 2 Installation

- A sampling spot should be installed directly after the separator's drain and before mixing with other wastewater, in parallel systems after the merger of the partial flows.
- The sampling spot or device in the separator system must be freely accessible and arranged so that only wastewater that has passed through the separator system can be removed.
- The principles of DIN 4040-100 apply for sampling so as to obtain representative test results.
- The sampling chamber has to be aligned with a spirit level so as to guarantee its optimum function.

Before attachment to the draining pipe, open the required supply and drain connection ( $\emptyset$ ) using a saw at the cutting lines shown.



Fig. 1

2.1 You may have to shorten the sampling chamber to the desired height for installation in the ground

- Saw off the inlet and outlet connecting pipes according to the required nominal width (DN 100 / 150 / 200)
- Insert the lip seal in the groove, the lips have to be facing downwards (see section enlargement in the Fig. 2).

2.2 Grease the lip seal

- Insert the attachment piece, adjust the height, shorten if necessary and fix in place using the clamping ring.
- Ground slopes up to a max. 5° can be compensated for with the continuously height-adjustable and inclinable attachment piece.

- ① Attachment piece
- ② Lip seal
- ③ Tank wall

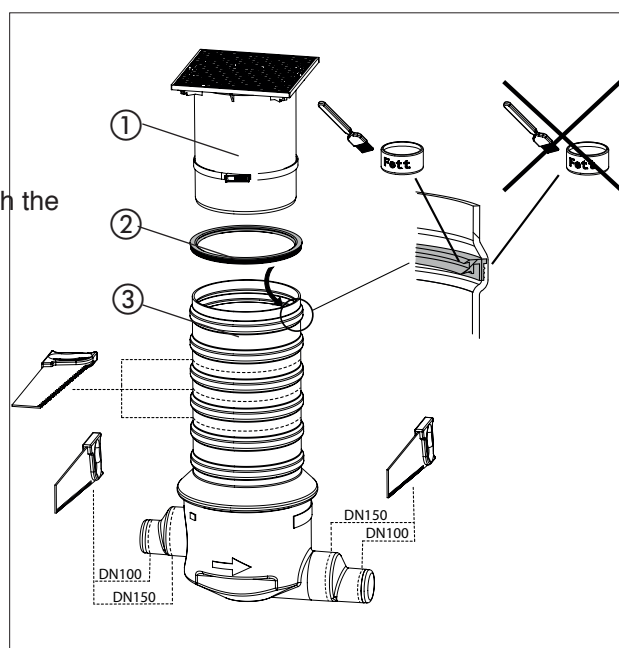


Fig. 2

# Installation

## 1.1 Tests before installation

Immediately before placing the tank into the excavation pit, the technical expert of the company that has been commissioned to carry out the installation has to check and certify the following:

- The sound condition of the tank wall;;
- The proper condition of the excavation pit with a view to its dimensions and base bedding;
- Consistence of the filling material graining
- For oil/fuel separators ensure regulatory compliance by using a ventilated cover plate.

## 1.2 Excavation pit

The foundation soil must be horizontal and level, so that the system can be put down onto its full surface, in addition, the foundation soil must guarantee a sufficient load bearing capacity. As subbase a compacted round-grain gravel (max. graining 0/16, thickness minimum 30 cm, Dpr=95%) and on top of that 3 - 10 cm compacted sand are necessary. The clearance between excavation pit wall and tank must be at least 70 cm. The slopes must comply with DIN 4124.

### Root ingrowth

If installed near trees, shrubs and bushes, root ingrowth has to be safely prevented.

### Installation in terrain with a sloping location

When installing the sampling vessel in terrain with a sloping location, care must always be taken that the laterally thrusting soil pressure of disturbed ground is absorbed by a correspondingly designed retaining wall.

### Frost-free depth for use all year round

When installing the grease separator it is imperative to pay attention to the locally determined frost-free depth. To guarantee problem-free operation in winter, too, the inlet and outlet pipes must also be routed at a frost-free depth when the rainwater storage tank is installed. Unless otherwise specified by the authorities, the frost-free depth is as a rule located at approx. 80 cm.

## 1.3 Backfilling

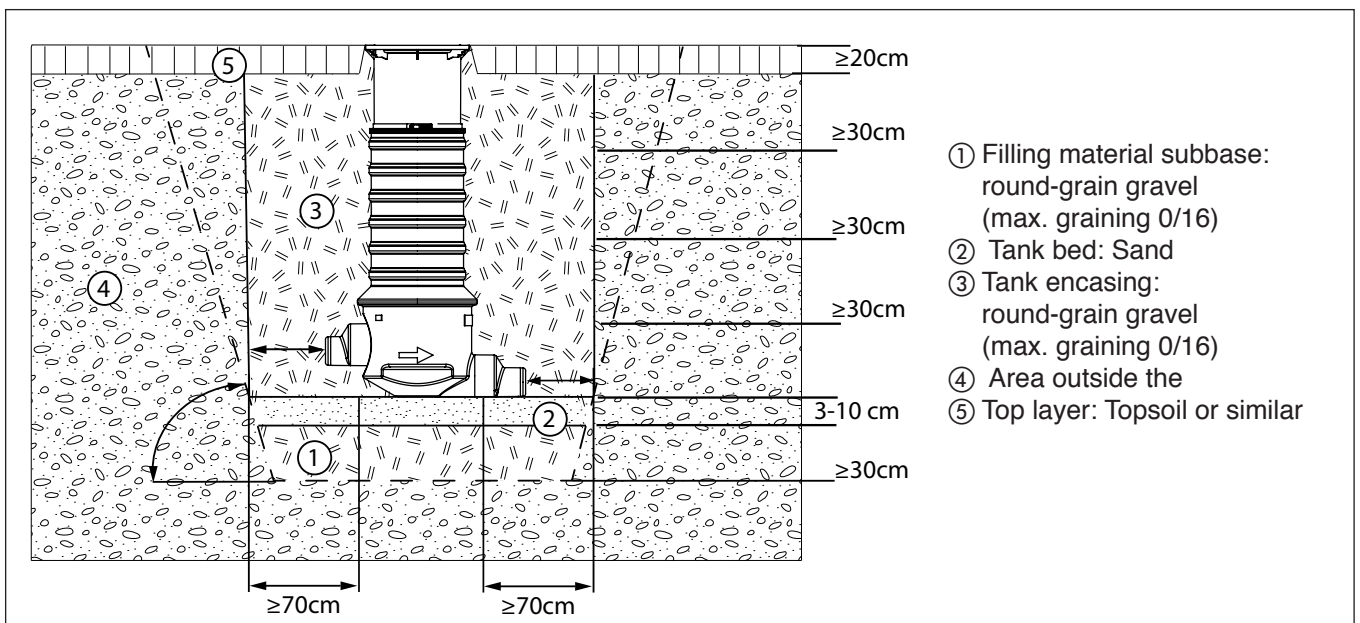


Fig. 3



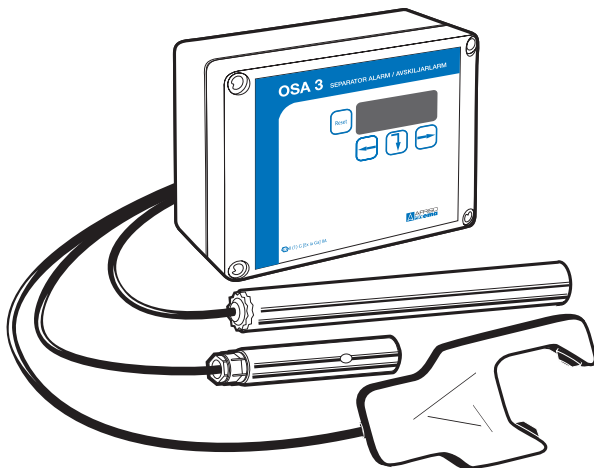
# OSA 3

Level alarm for oil separator

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*Retain these instructions for future use.*



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Sweden

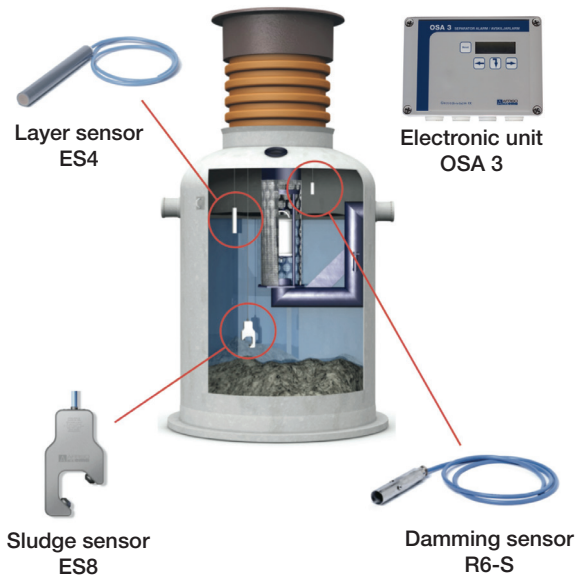
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[www.afriso.se](http://www.afriso.se)



## Functional description



OSA 3 is an Intrinsically Safe (Ex) grease and oil separator alarm comprising of a central alarm control unit that can accept up to three independent alarm sensors from three separate alarm points.

The IP65 enclosure housing the alarm control is designed to be mounted onto a wall or a suitably flat surface.

**Note:** This central alarm unit must only be mounted in a “safe-area” and never installed in an area where there is a risk of an explosion.

- **ES4** Capacitance type layer (Ex) sensor for raising the alarm when the layer of oil or grease exceeds the alarm value.
- **ES8** Ultrasonic type sludge (Ex) sensor for raising the alarm when sand or particles in the separator exceed a predefined level.
- **R6-S** Thermistor type (Ex) damming sensor for indication of a high level.

**OSA 3** is an Intrinsically Safe (Ex) central alarm control unit approved for use with the listed Ex sensors. The central alarm control unit has two individually programmable voltage free relay outputs (R1 and R2) that can be used to provide remote alarm monitoring or activation of secondary external alarms.

The central alarm control unit is programmable by navigation of the membrane keypad and displays the settings and alarms in a text format.

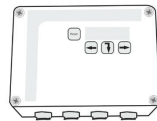
**OSA 3** is supplied boxed and in the following variants:

- |       |  |
|-------|--|
| 1316  | OSA 3 Level sensor                     |
| 1318  | OSA 3 Level and damming sensor         |
| 1319  | OSA 3 Level, damming and sludge sensor |
| 13347 | OSA 3 Level and sludge sensor          |
| 13345 | OSA 3 Sludge sensor                    |

*Subject to design modifications.*

**COMPONENT PARTS**

OSA 3 level sensor  
Art nr: 1316

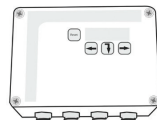


Central unit  
OSA 3, 1 x



Level sensor ES4, 1 x

OSA 3 Level and damming alarm  
Art no: 1318



Central unit  
OSA 3, 1 x

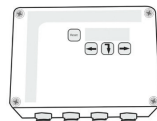


Level unit ES4, 1 x



Damming sensor R6-S, 1 x

OSA 3  
Level, damming and sludge alarm  
Art no: 1319



Central unit  
OSA 3, 1 x



Level sensor ES4, 1 x



Damming sensor R6-S, 1 x

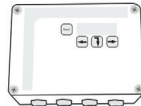


Sludge sensor ES8, 1 x

*Subject to design modifications.*

### COMPONENT PARTS

OSA 3 Level and damming alarm  
Art no: 13347

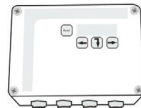


Central unit  
OSA 3, 1 x



Level sensor ES4, 1 x  
Sludge sensor ES8, 1 x

OSA 3 Slamgivare  
Art nr: 13345



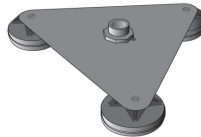
Central unit  
OSA 3, 1 x



Sludge sensor ES8, 1 x

### OPTIONS

Float  
Float for level sensor ES4 where  
the surface is not constant  
Art no: 1236



*Subject to design modifications.*

**SPARE PARTS**

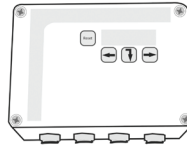
**INSTALLATION PARTS, SENSOR**

Hook, grommet, cable tie, coupling sleeve  
Art no: 1053



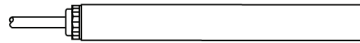
**CENTRAL UNIT OSA 3**

Electronic unit  
Art nr: 1310



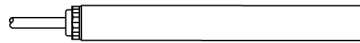
**LEVEL SENSOR ES4, 5 meters**

Capacitive sensor ES4. Emits alarm if thick layer of oil/grease in separator  
Art nr: 1147



**LEVEL SENSOR ES4, 20 meters**

Capacitive sensor ES4. Emits alarm if thick layer of oil/grease in separator  
Art nr: 1147



**DAMMING SENSOR R6-S, 5 meters**

Thermistor sensor. Emits alarm if high level in separator.  
Art nr: 990143



**DAMMING SENSOR R6-S, 20 meters**

Thermistor sensor. Emits alarm if high level in separator.  
Art nr: 990144



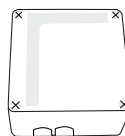
**SLUDGE SENSOR ES8**

Ultrasound sensor. Emits alarm if high sludge level in separator.  
Art nr: 990143



**SMS-ALARM**




GSM dialler for alarm transmission.  
Art nr: 1324






*Subject to design modifications.*

## Safety regulations:

### Safety symbols

SYMBOL	DESCRIPTION
	<b>Critical warning, risk of injury</b>
	<b>Warning: risk of injury or damage to equipment</b>
<b>Note:</b>	<b>Attention required</b>
	<b>To note when there is a risk of explosion.</b>

### Regulations applicable to OSA 3

SYMBOL	DESCRIPTION
<b>Note:</b>	<b>Read instructions before installation</b>
	<b>Installation may only be carried out by a qualified installation engineer</b>
	<b>The intrinsically safe circuit must not be earthed</b>
	<b>Observe regulatory requirements when connected in an EX-classified area</b>

*Subject to design modifications.*



## Checklist:

### Before installation

- Do you have the knowledge necessary to carry out electrical installation? Note relevant EX regulations and regulatory requirements: EN60079-14 and EN60079-17 are particularly important.
- All pole switches should never be installed so as to prevent the disconnection of the alarm function.
- Extension cables to sensor, 2 x 1.5 mm<sup>2</sup> or 6 x 1.0 mm<sup>2</sup>, max. 200 metres
- Remember to check regulations and installation instructions for your specific system

### After installation

- Check the connection of the electronic unit, cable area and use of poles
- Flat strip for cover fitted on electronic unit, and cover closed
- Check installation position of sensor as per the separator manufacturer's recommendations
- Make sure the separator is filled with water as per the manufacturer's recommendation before carrying out a sensor function control
- Switch on the power and check sensor signals
- Carry out a function control as shown in the commissioning instructions

*Subject to design modifications.*

## Installation

### Wiring the system using multi-core cables

**Note:** Read the installation instructions



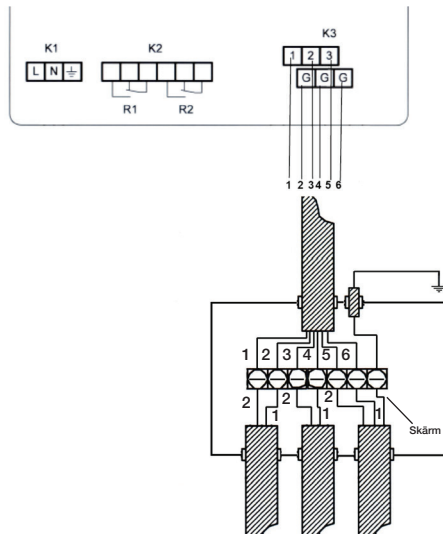
Installation should only be carried out by a suitably qualified Installation Engineer.



The intrinsically safe circuit must not be earthed

When connecting more than 1 sensor it is recommended that a junction box is used. If a junction box is not used all cable joints should be sealed using heat shrink tubing. When connecting an ES8 sludge sensor an external junction box should be used that allows the shielded cable to be grounded to earth.

When making connections between the central control unit and a junction box this should be interconnected using a multi-core cable (6-core 1.0mm<sup>2</sup>) with connections made as shown in the following diagram.



*Subject to design modifications.*

### Terminals

K1: 230 VAC, 4 VA

K2: R1 Voltage free relay output (Symbols on the circuit board are indicated in the alarm condition)

K2: R2 Voltage free relay output (Symbols on the circuit board are indicated in the alarm condition)

K4: Terminal contact for membrane keypad ribbon cable (not shown)

K3: 1-G Capacitive sensor ES4

K3: 2-G Thermal sensor R6-S

K3: 3-G Sludge sensor ES8

### Recommended cable

Power supply: 3 x 1.5 mm<sup>2</sup>

Multi-core cable to junction box: 6 x 1 mm<sup>2</sup>

### Wiring the system using individual cables



When fitting an ultrasonic sludge sensor a junction box should always be used that allows the equalisation of the earth potential outside of the alarm control unit.

When connecting more than 1 sensor it is recommended that a junction box is used. If a junction box is not used all cable joints should be sealed using heat shrink tubing. When connecting an ES8 sludge sensor an external junction box should be used that allows the shielded cable to be grounded to earth.

### Terminals

K1: 230 VAC, 4 VA

K2: R1 Voltage free relay output (Symbols on the circuit board are indicated in the alarm condition)

K2: R2 Voltage free relay output (Symbols on the circuit board are indicated in the alarm condition)

K4: Terminal contact for membrane keypad ribbon cable (not shown)

K3: 1-G Capacitive sensor ES4

K3: 2-G Thermal sensor R6-S

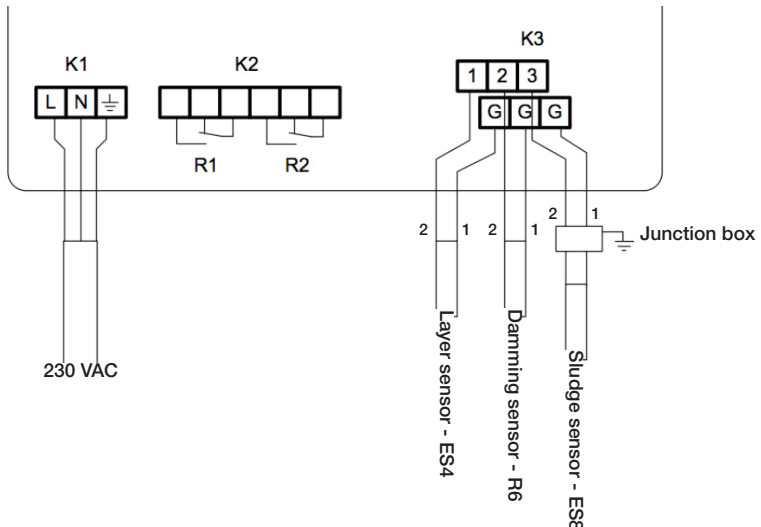
K3: 3-G Sludge sensor ES8

### Recommended cable

Power supply: 3 x 1.5 mm<sup>2</sup>

Separate cable for sensor ES4 and R6-S: 2 x 1 mm<sup>2</sup>

Separate cable for sensor ES8: 3 x 1 mm<sup>2</sup> or 2 x 1 mm<sup>2</sup> with shielding



*Subject to design modifications.*

## Assembly



The electronic must not be positioned in any area where there is a risk of explosion



All cables laid within the hazardous area zones should be mechanically protected.

OSA 3 should be wall mounted in an appropriate safe-area. It is always recommended that the power supply should be connected so as to prevent accidental isolation of the system that may result in separator alarm conditions being inactive and missed. of fitting. The exact appearance of separator types will vary from manufacturer to manufacturer. Check with your separator manufacturer for more details.

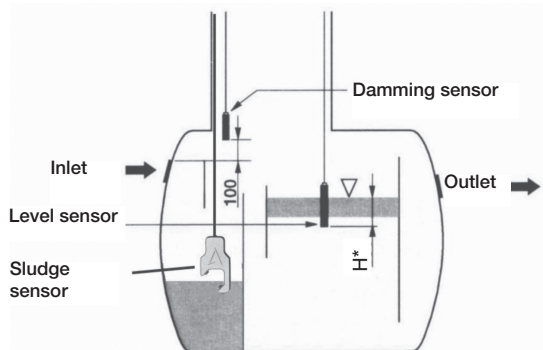


### The following recommendations apply:

**Level sensor ES4** is fitted so that its underside H\* is fixed approx. 100-500 mm below the static water level. The precise installation depth H\* below the static water level is specified in the separator manual. The underside of the level sensor must be in water so as NOT to trigger an alarm, see the illustration below.

**Damming sensor R6-S** is fitted approx. 100 mm above the top of the separator's intake pipe. The damming sensor must be in air so as NOT to trigger an alarm, see the illustration below.

**Sludge sensor ES8** is fitted so that its underside is located at the recommended emptying height for sludge, specified in the separator manual.



*H\*:* the precise installation depth is specified in the separator manual.

*Subject to design modifications.*

## Commissioning

**Note:** For the oil/petrol/grease warning device to trigger an alarm, a marked layer must form between the water and the oil/grease/petrol. The equipment will not work in an emulsion or where grease or oil has been dissolved by chemicals

### Operation on startup

The following buttons can be found on the unit: < = arrow left, > = arrow right, v = arrow down and reset to reset.

- The “<” and “>” buttons are used to increase and decrease input values in the display
- “v” down is used to acknowledge the input values and to move forwards through input menus

### Backlight in display:

Flashes when an alarm or an error message has been triggered. Use the reset button to acknowledge alarms.

### Buzzer:

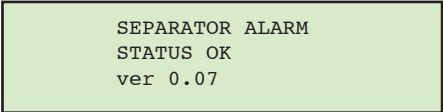
A built-in buzzer makes a noise when an alarm or an error message has been triggered. The buzzer sound is repeated automatically after 20 hours if R1 is not set for an acknowledgeable function.

### Checks when starting the electronic unit

Check that all connections and installation are completed correctly before connecting to a power supply.

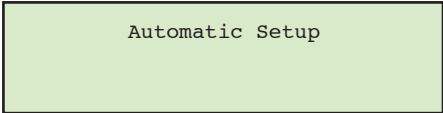
- Switch on the power supply to the electronic unit

This screen is displayed for approx. 15 seconds, after which the current program version can be viewed on screen.



```
SEPARATOR ALARM
STATUS OK
ver 0.07
```

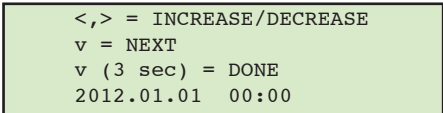
The automatic setup function then commences. The first step involves setting the date and time, then the unit carries out a check of sensor inputs on startup and registers automatically connected sensors



```
Automatic Setup
```

### •Set date/time

Use the arrow keys on the electronic unit to move the cursor and set the date and time. The **V** key moves from the first digit in the date and forwards every time it is pressed. To reduce a value, press <, and to increase a value, press >. When you have finished, hold down **V** for 3 sec and the unit will switch to scanning sensors.



```
<, > = INCREASE/DECREASE
v = NEXT
v (3 sec) = DONE
2012.01.01 00:00
```

- Scanning of sensors

*The unit now starts automatically scanning the sensor inputs, after which the following screens are shown. If the unit finds a correctly connected sensor, it automatically continues searching on the next channel, i.e. 1, 2 and 3.*

```

  searching for sensor
                1
```

- Sensor not detected

If an input does not have a connected sensor, this can be confirmed in this routine. The **V** key is used to approve the response marked **-YES-**.

```

  searching for sensor
                1
  Not connected. OK ?
  -YES-                No
```

*If a sensor is not detected at an input despite the sensor being connected, the same message as the one shown above will appear on screen, and in this instance it is necessary to correct any incorrect connection (see Troubleshooting).*

```

  SEPARATOR ALARM
  STATUS OK
  2012.01.01  16:00
```

*When automatic startup is complete and all sensors have been detected, the unit is ready to use and the following appears in the display.*

### Sensor function control

All connected sensors should be tested after installation. The following must be done in order to test the various sensors:

- Capacitive layer sensor type ES4 is lifted up out of the water in order to trigger an alarm.
- Damming sensor type R6-S is dipped in water in order to trigger an alarm.
- Sludge sensor type ES8 is lifted up into air or pushed into sand/sludge in order to trigger an alarm.

Note that it may take up to approx. 60 seconds to trigger an alarm. This is because the unit requires a number of scans in line with the alarm status of the sensors in order to trigger an alarm. This is done to minimise the risk of false alarms when the alarm level is close to the sensor.

- Testing of layer sensor ES4

*Lift the layer sensor up into the air and wait.*

*The following screen should be displayed within approx. 60 sec.*

```

  Layer alarm triggered
  Press [Reset] to
  acknowledge sound
```



Press the reset button, the following should then be displayed.

Layer alarm triggered

When this has been displayed, lower the sensor into the separator again. The sensor should then return to “Normal operation screen” after up to 60 seconds.

- Testing of damming sensor R6-S

*Lower the damming sensor into water, e.g. water, and wait. The following screen should be displayed within approx. 60 sec.*

Press the reset button, the following should then be displayed.

High level alarm triggered  
press [Reset] to  
acknowledge sound

High level alarm triggered

When this has been displayed, remove the sensor from the water and wait for up to 2 minutes. The unit should then return to “Normal operation screen”.

- Testing of sludge sensor ES8

*Lift the sludge sensor up into the air and wait.*

*The following screen should be displayed within approx. 60 sec.*

Sludge alarm triggered  
press [Reset] to  
acknowledge sound

Press the reset button, the following should then be displayed.

Sludge alarm triggered

When this has been displayed, suspend the sensor in the water again and wait for up to 2 minutes. The unit should then return to “Normal operation screen”.

Once all tests have been carried out, the unit is ready to use.

## Operation

### Normal operation

If after commissioning the functional controls no alarms appear on the display the level alarm is now ready to use. No special operation is required other than to ensure the power supply to the alarm is continually maintained in order for the sensors to detect an alarm condition. Under normal operation, the text **STATUS OK** appears in the display.

```

SEPARATOR ALARM
STATUS OK
2012.01.01 16:00
```

### In the event of an alarm

In the event of an alarm, text appears in the display indicating which sensor has been actuated

**Layer alarm:** LAYER ALARM appears in the display and the buzzer sounds.

```

Layer alarm triggered
press [Reset] to
acknowledge sound
```

**Action:** This normally means it is time to order emptying of the separator.

**High level alarm:** HIGH LEVEL ALARM appears in the display and the buzzer sounds.

**Action:** This is a **critical alarm** and means that the shut-off valve in the separator has been closed or there is a blockage in the outlet to the tank. Check the instructions from the separator manufacturer to find out what action is recommended.

```

High level alarm triggered
press [Reset] to
acknowledge sound
```

*Subject to design modifications.*

**Sludge alarm:** SLUDGE ALARM appears in the display and the buzzer sounds.

**Action:** This normally means that the sludge layer in the tank is too thick, this normally results in impairment of the efficiency of the separator. Separator emptying should be ordered.

```

Sludge alarm triggered
press [Reset] to
acknowledge sound
```

**Sensor error:** In the event of a problem with a sensor connection, SENSOR ERROR appears in the display along with an indication of which sensor has triggered the alarm, and the buzzer sounds.

Check the sensor and its connection (see the Troubleshooting section).

```

Sensor error at
input 3 (sludge)
see manual for
rectification [Reset]=Silent
```

# Maintenance

The function of the separator alarm must be tested as described in SS-EN 1825 and SS-EN 858.

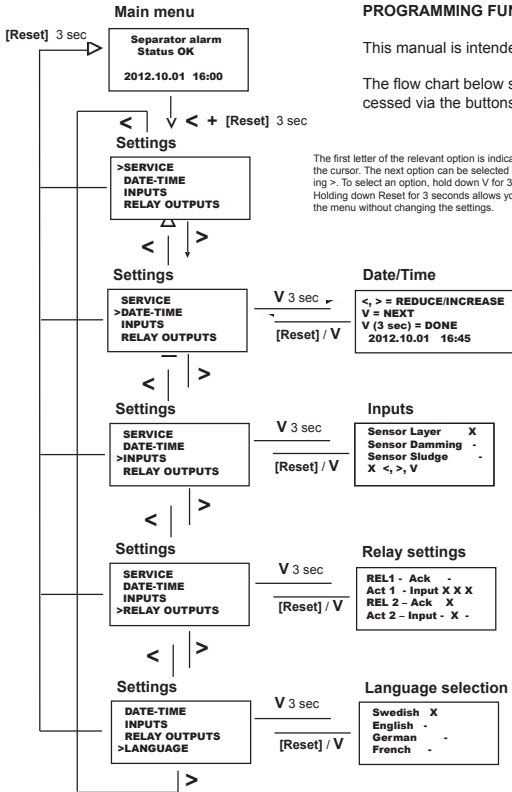
maintenance instructions for the separator. The sensors may need to be periodically cleaned or wiped so as to prevent excessive deposits building up that may cause the triggering of false alarms.

For more details, see the operation and

## PROGRAMMING FUNCTIONS IN OSA 3

This manual is intended for authorised service personnel only.

The flow chart below shows all the possible functions which can be accessed via the buttons on the unit.



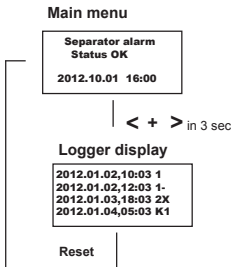
The first letter of the relevant option is indicated with the cursor. The next option can be selected by pressing >. To select an option, hold down V for 3 seconds. Holding down Reset for 3 seconds allows you to leave the menu without changing the settings.

V moves from the first digit in Date and forwards every time it is pressed. To reduce a value, press <, and to increase a value, press >. When you have made your change, hold down V for 3 sec, or cancel your change by holding down Reset for 3 seconds.

It is possible to select or disable a sensor by calling the input menu. The sensor input status is displayed and < and > are used to select the relevant sensor input. X = active, - = inactive. To change values, press V. When you have made your change, hold down V for 3 sec, or cancel your change by holding down Reset for 3 seconds.

Possible settings are for R1 and R2. Act = Acknowledge/Non-acknowledgeable, ACT = Selection of which input(s) enables (enable) the relay output. > moves to the right between the various options, X = active, - = inactive. To change values, press V. When you have made your change, hold down V for 3 sec, or cancel your change by holding down Reset for 3 seconds.

Calling the settings menu allows you to display Languages. Selectable languages, and you can select a language using the < and > keys. To make your choice, the v key has to be held down for at least 3 sec, or you can cancel your change by holding down Reset for 3 seconds.



The unit automatically logs all alarm changes with date/time in the background. Alarms are saved with the date and time of each status change. Storage takes place cyclically. This means that when the memory is "full", the oldest values are overwritten with new ones. To display the alarm log, hold down < and > together for 5 seconds. This opens the alarm log. Pressing < or > allows you to scroll through the various events. In the example below, each status change is shown along with an indication of the time and which sensor was changed. 1=layer, 2=damming, 3=sludge, X means that the alarm has been triggered and - means that the alarm has been reset. If an acknowledgeable alarm has been acknowledged, this is indicated by the letter K and the relevant digit to indicate whether it relates to R1, R2 or both. To stop scrolling, hold down Reset for 3 seconds. The unit then returns to its normal display.

Subject to design modifications.

## Troubleshooting

**Note:** If an input did not have a sensor installed when the system was installed, this will not be scanned. To activate an inactive output, see the Maintenance section.

**Note:** Sensors are activated in a sequence: Sensor 1 (layer sensor ES4 ) active in 4 sec -> sensor 2 (thermistor sensor R6-S) active in 45 sec -> sensor 3 (sludge sensor ES8) active in 4 sec. This sequence is repeated continuously.

### Checks when alarms appear in the display

Problem	Check	Cause/action
<b>Layer alarm</b>		
"Layer alarm triggered" alarm appears in the display	Check the thickness of the oil/grease layer	Order emptying
"Sensor error at input 1 (layer)" alarm appears in the display	Measure voltage at sensor	Error in sensor circuit to sensor (e.g. cable failure/short-circuit) / Replace faulty component
<b>Damming alarm</b>		
"High level alarm triggered" alarm	Blockage at outlet to separator (critical alarm)	Clear blockage or find out cause
"Sensor error at input 2 (high level)" alarm appears in the display	Measure voltage at sensor	Error in sensor circuit to sensor (e.g. cable failure/short-circuit) / Replace faulty component
<b>Sludge alarm</b>		
"Sludge alarm triggered" alarm	The sludge level has reached a set alarm level (normal alarm)	This normally means that the sludge layer in the tank is too great, this normally results in impairment of the efficiency of the separator. Separator emptying should be ordered.
"Sensor error at input 3 (sludge)" alarm appears in the display	Measure voltage at sensor	Error in sensor circuit to sensor (e.g. cable failure/short-circuit) / Replace faulty component

*Subject to design modifications.*

**Voltage measurements of the sensors**

In the event of a fault occurring in any of the sensor circuits an error message will be displayed on OSA 3 indicating which sensor output is detecting an error. The output voltage to the sensor in question can be measured in order to check what is wrong.

Sensors are scanned in the following sequence, and sensors can only be checked when they are active: Sensor 1 (layer sensor ES4 ) active in 4 sec -> sensor 2 (thermistor sensor R6-S) active in 45 sec -> sensor 3 (sludge sensor ES8) active in 4 sec. This sequence is repeated continuously.

**Note:** Measure the voltage and use a multimeter showing decimals in order to measure the difference in voltage.

The illustration below shows an example for connection for troubleshooting of sensor 1

Terminals 1, 2 and 3 and + feed to sensor and Terminal G is the relevant output feed.

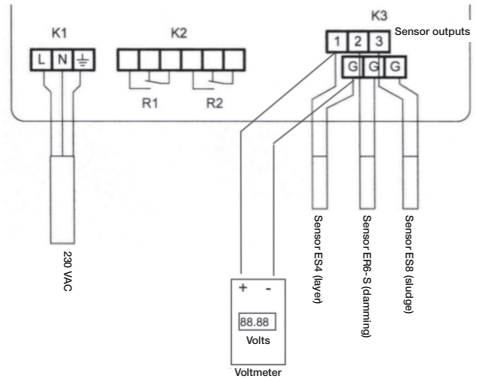


Table for check measurement of sensors

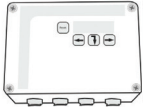
Sensor	Measurement	Error/status	Action
<b>1 Layer sensor</b>	19 V	Sensor not connected or cable failure	Connect sensor/troubleshoot cable
	19 V	Sensor is connected incorrectly	Check polarisation
	0.2 V	Sensor circuit short-circuited	Check sensor circuit
	13.2 V	Sensor in air or oil/grease (alarm status)	Empty separator, or if sensor
	15.3 V	Sensor in water (normal operation)	
<b>2 Damming sensor</b>	19 V	Sensor not connected or cable failure	Connect sensor/troubleshoot cable
	0.2 V	Sensor circuit short-circuited	Check sensor circuit
	7.5 - 12.3 V	Sensor in fluid (alarm status)	Empty/check separator
	14.2 - 16.5 V	Sensor in air (normal operation)	
<b>3 Sludge sensor</b>	19 V	Sensor not connected or cable failure	Connect sensor/troubleshoot cable
	19 V	Sensor connected incorrectly	Check polarisation
	0.2 V	Sensor circuit short-circuited	Check sensor circuit
	13.1 V	Sensor in air or sludge (alarm status)	Empty/check separator
	15.3 V	Sensor in water (normal operation)	


When the sensor output is inactive, the voltage at the output is 0 volts.

*Subject to design modifications.*

**TECHNICAL DATA**


Central element  
 OSA 3



Intrinsically safe design   
 Intrinsically safe circuit is galvanically isolated from earth.  
 Intrinsically safe circuit sensor  
 $C_0$ : 0.60  $\mu$ F,  $L_0$ : 2.0 Mh  
 $I_0$ : 170 mA  $U_0$ : 24.9 V P0: 1.1 W  
 Operating voltage 230 V, 50 Hz  
 Relay outputs, contact data Um 250 V, Im 5A, max 100 VA (AC)  
 Ambient temperature, electronics  $\pm 0 - +40^\circ\text{C}$   
 Enclosure class IP 65


Level sensor ES4



Intrinsically safe design   
 Sensor type Capacitive type ES4  
 Must be connected to a barrier which is galvanically isolated from earth.  
 Electrical parameters  
 $C_i$ : 500 nF,  $L_i$ : 10  $\mu$ H,  $l_i$ : 170 mA  
 $U_i$ : 25.0V;  $P_i$ : 1.1 W


Damming sensor R6-S



Intrinsically safe design   
 Sensor type Thermistor sensor type R6-S  
 Must be connected to a barrier which is galvanically isolated from earth  
 Electrical parameters  
 $C_i$ : 1 nF,  $L_i$ : 10  $\mu$ H,  $l_i$ : 200 mA  
 $U_i$ : 30.0 V,  $P_i$ : 1.0 W  
 Ambient temperature sensor  $-25 - +50^\circ\text{C}$

Sludge sensor ES8



Intrinsically safe design   
 Sensor type Ultrasound type ES8  
 Must be connected to a barrier which is galvanically isolated from earth.  
 Electrical parameters  
 $C_i$ : 750 nF,  $L_i$ : 10  $\mu$ H,  $l_i$ : 170 mA  
 $U_i$ : 25.0V;  $P_i$ : 1.1 W  
 Ambient temperature sensor  $0 - +50^\circ\text{C}$

**DEFINITIONS**

Level sensor Capacitive sensor ES4. Emits an alarm if there is a thick layer of oil/grease in the separator.

Damming sensor Thermistor sensor R6-S. Emits an alarm if there is a high fluid level in the separator.

Sludge sensor Ultrasound sensor ES8. Emits an alarm if there is a high sludge level in the separator.

Static level Fluid level when the separator is full so that water runs out through the outlet pipe.

*Subject to design modifications.*



## Manufacturer declaration

**Manufacturer:** Afriso Ema AB,  
Kilvägen 2, SE-232 37 Arlöv

**Product:** Separator alarm

**Technical details:** AC 230V, 4VA, IP65

The above-mentioned product is compliant with the following European directives and standards.

**Electromagnetic Compatibility Directive:**

- EN 61000-6-4 (2001), EN 61000-6-3 (2007)
- EN 61000-6-2 (2005), EN 61000-3-3 + A1:2001 + A2:2005

**Low Voltage Directive:**

- EN 61010-1 (2001)

**ATEX Directive:**

- EN 60079-0 (2006), IEC 60079-0 (2007)
- EN 60079-11 (2007) Intrinsic safety in - EN 60079-26 (2007)
- EC Type approval: SP 11ATEX3620X - Labelling: Ex II (1) G [EEx ia Ga] IIA, Ta 0..+40°C

Sign.



Urban Nilsson

Technical Manager

Date: 2012-11-28

## Notes



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