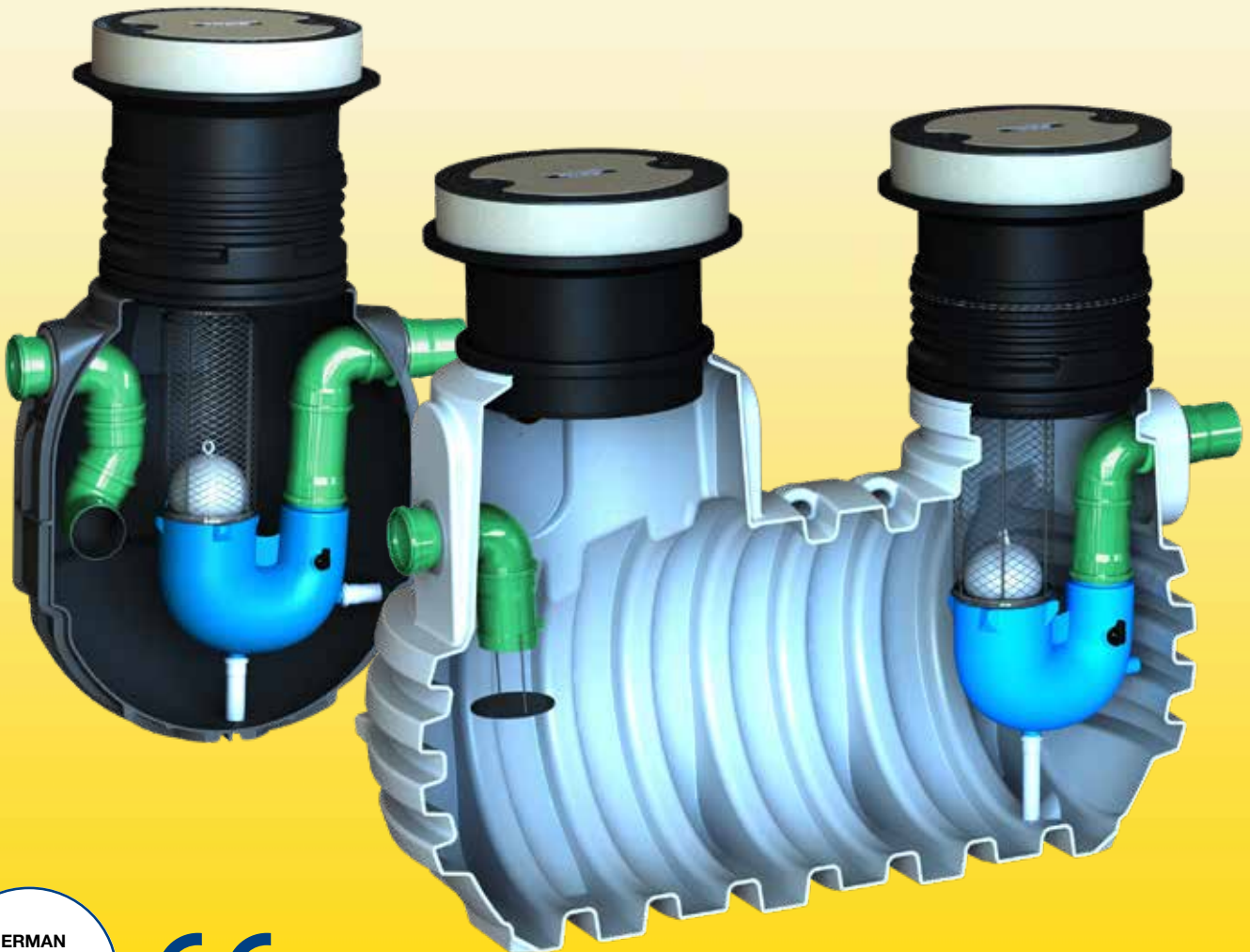


# KLARO

## KLARO light fluid separator KLsepa.compact+

We provide clear water

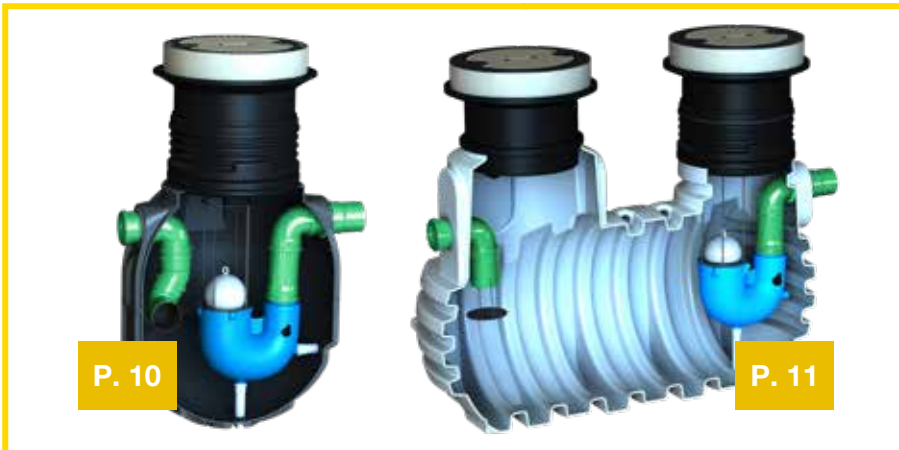


# 2018

Item no. 106-EN-0318

## Light fluid separator **KLsepa.compact**

KLsepa.compact (Petrol separator)



KLsepa.compact+ (Coalescence separator)



## Advantages of the KLARO ...

### ... Separator

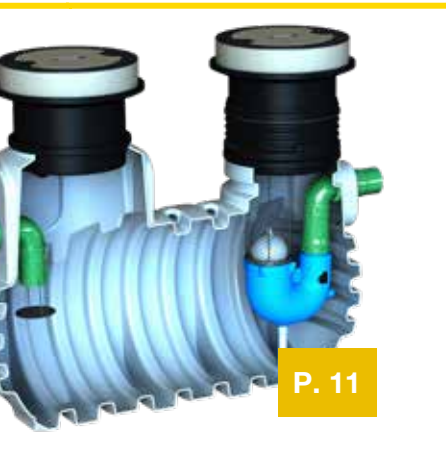
- Volume-optimised compact separator
- Tank independent separation module
- Expandable with additional upstream sludge collector
- Available as petrol separator (class II) or as coalescence separator (class I)

### ... Plastic tanks

- Seamless tank, manufactured in one piece
- Low transportation costs
- Attachment parts in plastic with variable height and level adjustment
- Low maintenance costs with easy-clean internal surfaces
- No degradable inner lining



separator)



## Accessories

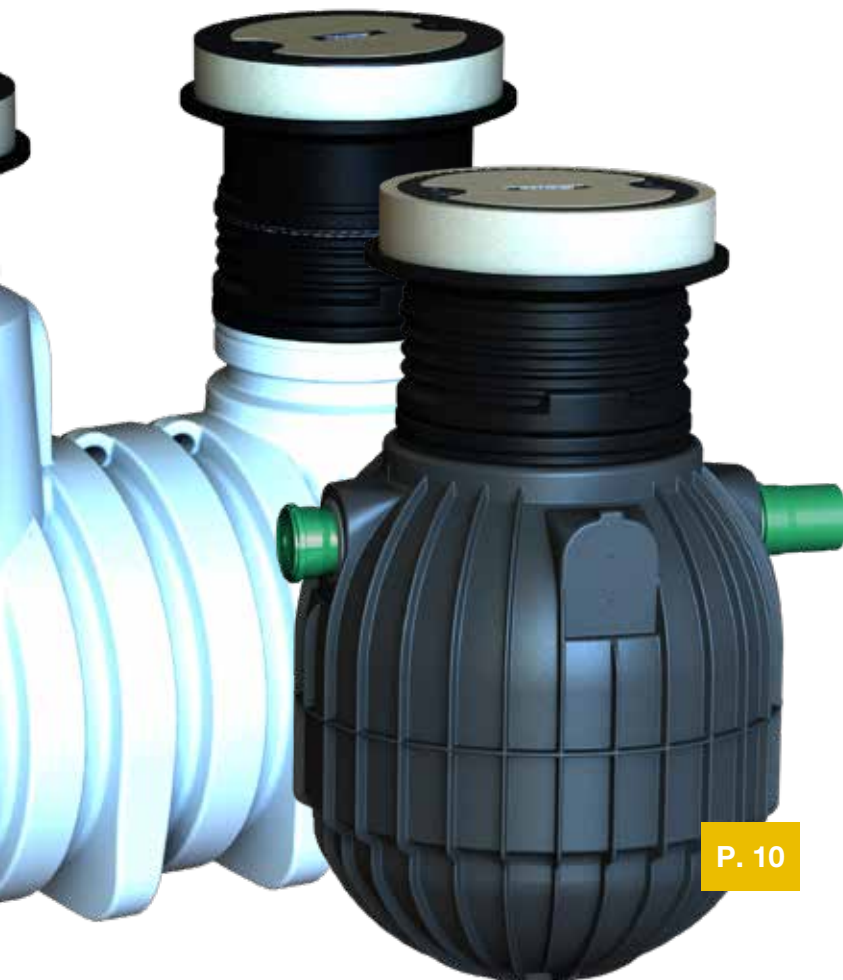


**Dome assembly and cover** 14

**Sampling shaft** 15

**Warning systems** 16

**Maintenance case** 16



## **i** Information

**KLARO GmbH in Bayreuth** 4

**Separator systems** 5

**Areas of application** 6

Petrol stations 6

Workshops 7

Car wash facilities 7

Vehicle fleets 7

**Coalescence unit** 12

**Check list - road map for separator** 17

**Inspection and maintenance** 18

**CE declaration** 19

KLsepa.compact 19

KLsepa.compact+ 19

## KLARO GmbH in Bayreuth



KLARO company in Bayreuth

KLARO GmbH, in Bayreuth, has been ensuring clear water since 2001. The staff, consisting of around 30 employees from different areas, always finds an optimised and practicable solution for your requirements. Through our experience and continuous development we have established a portfolio of high quality, clarification solutions for decentralized wastewater treatment. Worldwide there are already 500,000 people who rely on proven KLARO technology.

Further innovations are the KLARO separator systems that used to be manufactured from concrete. Nowadays, these are sold on the market as easy to handle plastic tanks with a number of benefits. We offer two sophisticated, class I and class II light fluid separators with the KLsepa.compact. The range of separators is complemented by the KLsepa.pop grease separator.

### A company of the GRAF group

Since 2014 KLARO has been part of the GRAF group. The GRAF brand has been synonymous with high quality plastic products in the field of water resource management for over 50 years. GRAF is well-known to KLARO as a long-standing customer and supplier of septic tanks. The high-quality separator containers are manufactured in the GRAF facilities. Therefore you benefit from the expertise and quality of two established brands when you buy a KLARO product.



GRAF company in Teningen

## Separator systems

Just a single drop of petrol is enough to pollute 1 m<sup>3</sup> of water. And today every responsible person knows just how precious our water resources are. Pure, clean water is one of the most important fundamentals of life, yet it is exposed to multiple hazards.

One of the greatest dangers, is pollution from light mineral liquids.

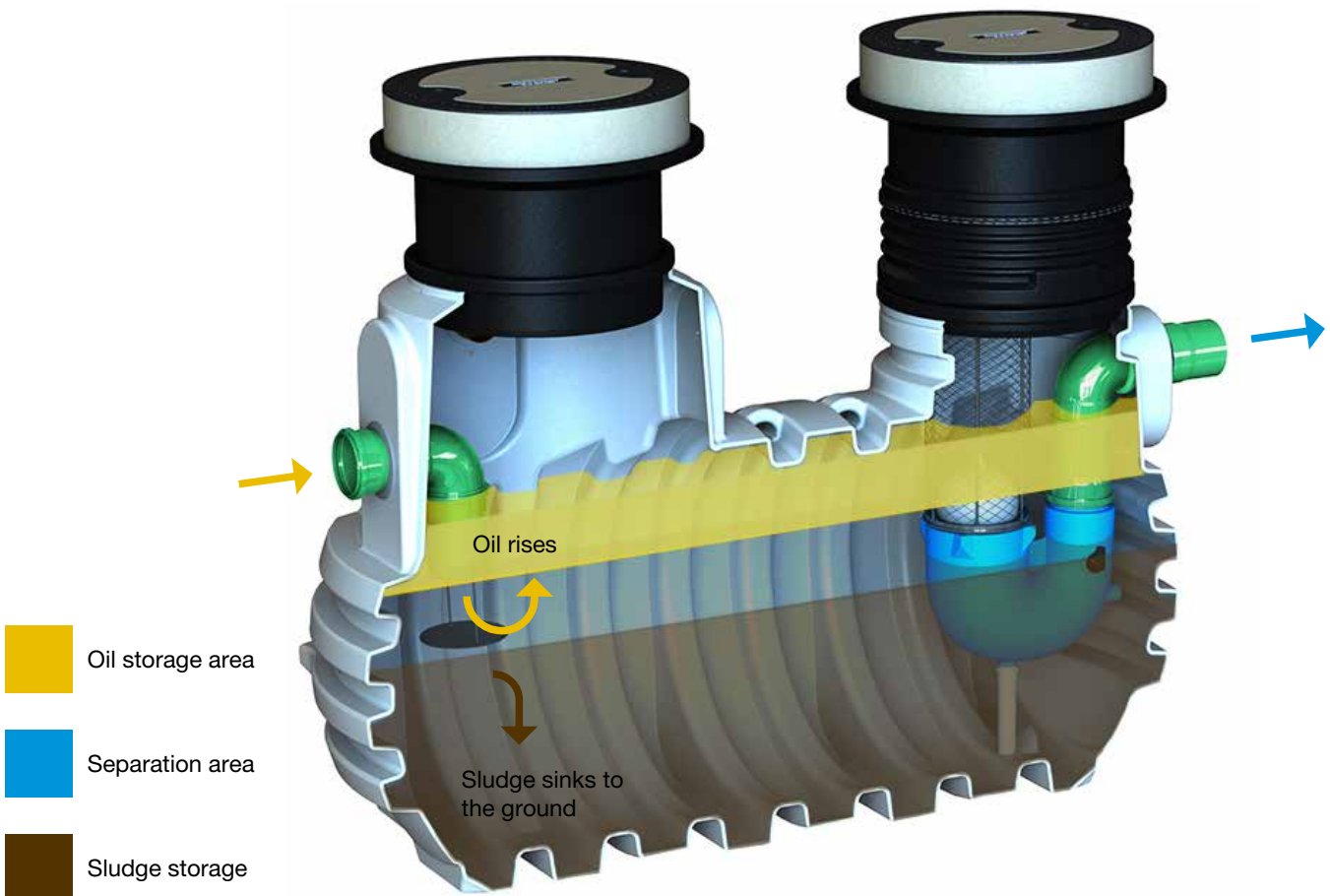
These include oils, petrols and lubricants, i.e. petroleum products. These have become indispensable in our world of high technology. But inevitably as a result they come into contact with water and are mixed. To prevent environmental damage caused by the uncontrolled discharge of oil-containing wastewater, effective and safe methods of separation technology must be used everywhere where light liquids come into contact with water.

**The separator technology is based on a simple principle:**

As the wastewater is slowed down at the inlet of the separator, a natural separation process is initiated resulting from the physical features of the different substances.

Oils and fats, also known as light liquids, are of a lower density than water and thus rise to the water surface, where they combine to form a layer. The solids, however, are heavier and collect at the bottom of the tank.

This behaviour can be observed with solids in any body of water as well as with oils, for example, whenever you add oil to water when cooking. This is already the first step to clear water, which is supported and optimized by KLARO technology in the further separation process to achieve an even higher clarification performance.



## Areas of application



Petrol station

A light fluid separator must be installed wherever water is contaminated with oil. Separation systems are classified according to the NS (norm size). As soon as you inquire for a separator system from us, we will calculate the required

norm size which indicates the flow rate in litres/second. Factors such as the water temperature and the use of cleaning agents must be included in the calculations. Operators of the following facilities must ensure that a suitable, functioning separator is installed.

### Petrol stations

Separators for light fluids are not only used as treatment facilities for wastewater containing petroleum (rain water, wastewater, condensate), but also as retaining equipment in case of leakage.



## Workshops

If wastewater is drained into the sewer system, the wastewater must be pretreated with a light fluid separator. The thresholds of the local wastewater regulations must be observed, which can be realised by using further equipment such as a coalescence separator.



## Car wash facilities

In car wash facilities or washing locations, it is not just the visible dirt that is removed from the car, but also small droplets of oil, which might adhere to vehicles. Through high-pressure cleaning this oil is dispersed into even smaller particles. The wastewater of these particles must be separated in a separator, before it can be fed to the drainage system.



## Vehicle fleets

Companies from the construction or logistics sector often have large fleets. The surfaces on which these vehicles are moved or parked must also be equipped with a separator system, if need be.

### Other areas of application:

Hazardous goods locations places, tank storage



# Description of system

## KLsepa.compact system overview

The KLsepa.compact system is the basic version of the KLARO light fluid separators. The system is also available with a coalescer in the KLsepa.compact+ version. The volumes for the integrated oil and sludge storage has been maximised so that the separator can also be used at petrol stations with high efficiency petrol pumps.

### KLsepa.compact

System versions from page 10.

### Optional sludge collector

Expansion possible through optional sludge collector Details from page 13.

### Dome assemblies (1)

Details on covers on page 14.

### Warning sensors (2)

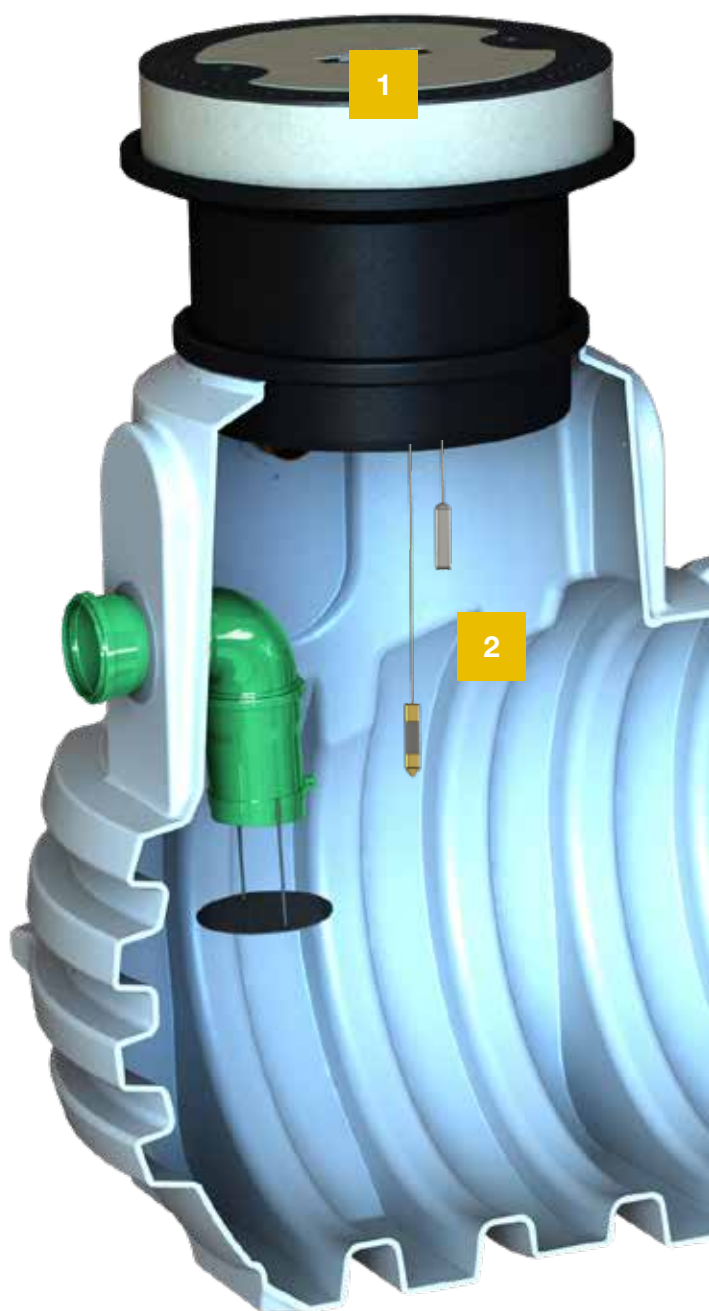
Different warning systems on page 16.

### Locks automatically (3)

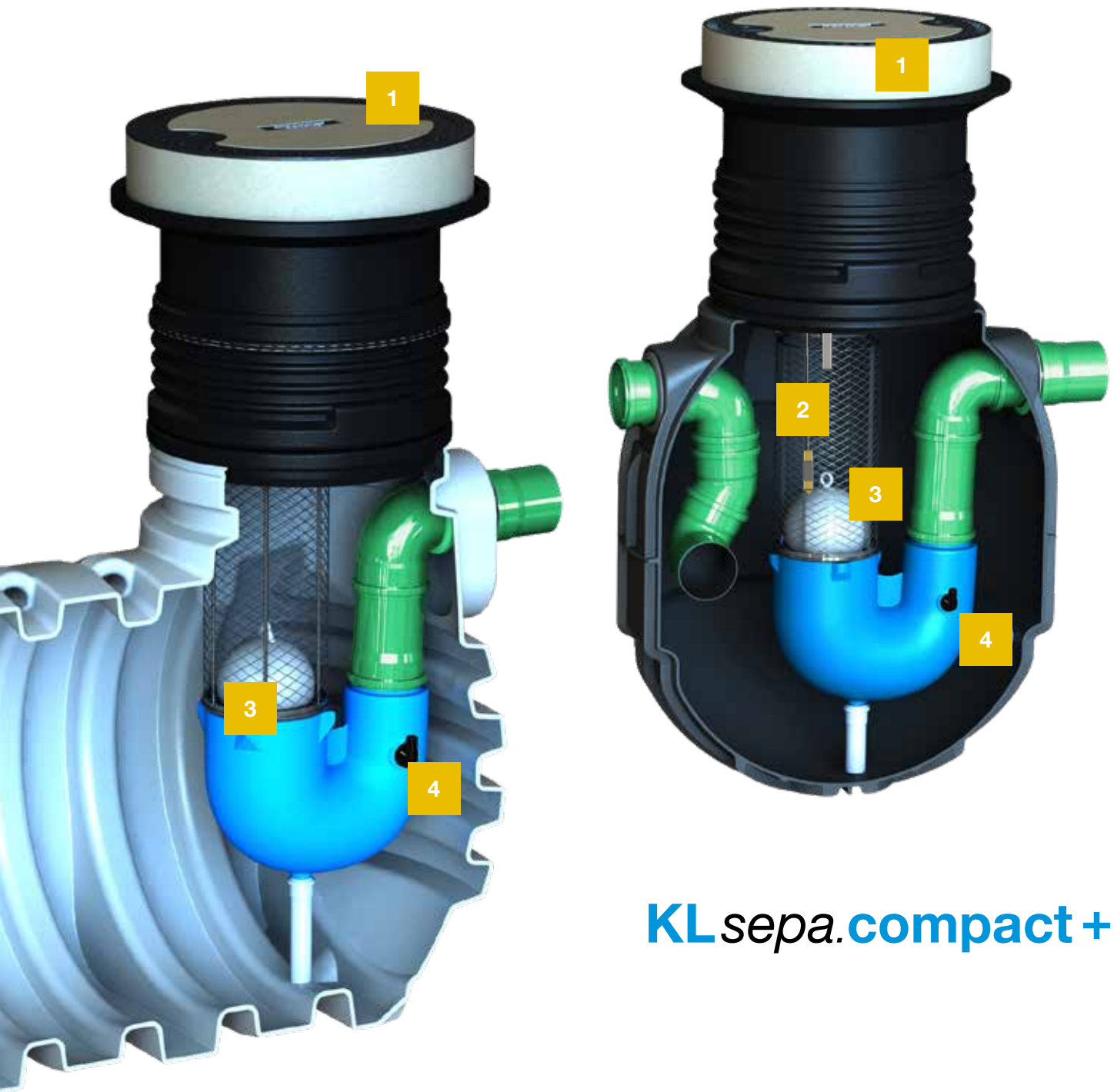
Coalescence unit only included with KLsepa.compact+ systems. Design according to norm size.

### Internal sampling point (4)

Details on page 15.







**KLsepa.compact+**

# Description of system

## KLsepa.compact / KLsepa.compact+ NS 3-6 Saphir



**KLsepa.compact**

Class II oil separator



**KLsepa.compact+**

Class I  
Coalescence  
separator

**Potential accessories:**

- Additional sludge collector
- Warning systems
- Sampling shaft

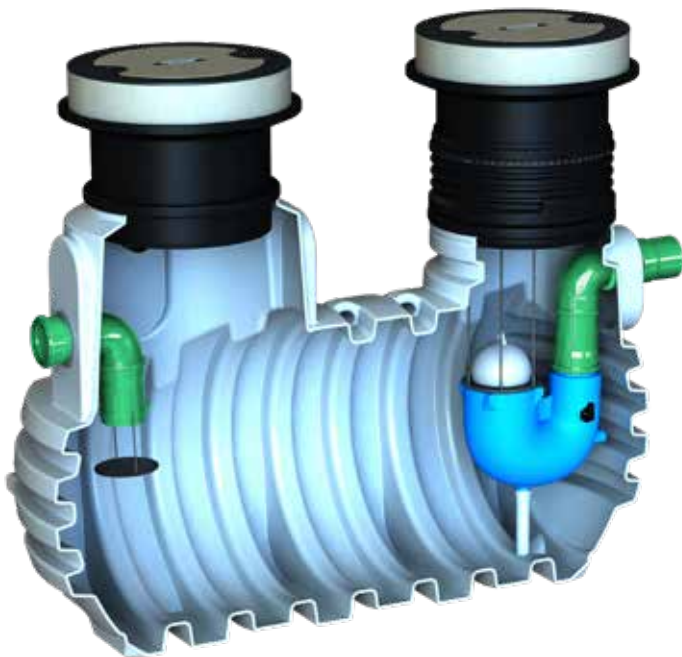
		Volume			Container geometry		Weight
NS	DN	Light fluids	Sludge	Total	Diameter	Height (Without cover)	approx.
[l/s]	[mm]	[l]	[l]	[l]	[m]	[m]	[kg]
3 - 300	160	300	300	770	1.16	1.35	80
3 - 400 T	160	500	400	1,100	1.16	1.67	110
3 - 600	160	300	600	1,080	1.16	1.67	110
6 - 600	160	300	600	1,080	1.16	1.67	110

T = Separator may be used with high efficiency dispensers with maximum flow rates of 150 l/min (according to the Technical Rule for Substances Harmful to Water (TRwS) A 781).  
Effectiveness tested according to EN 858 of the TÜV Rheinland.

## KLsepa.compact / KLsepa.compact+ NS 6-15 Diamant

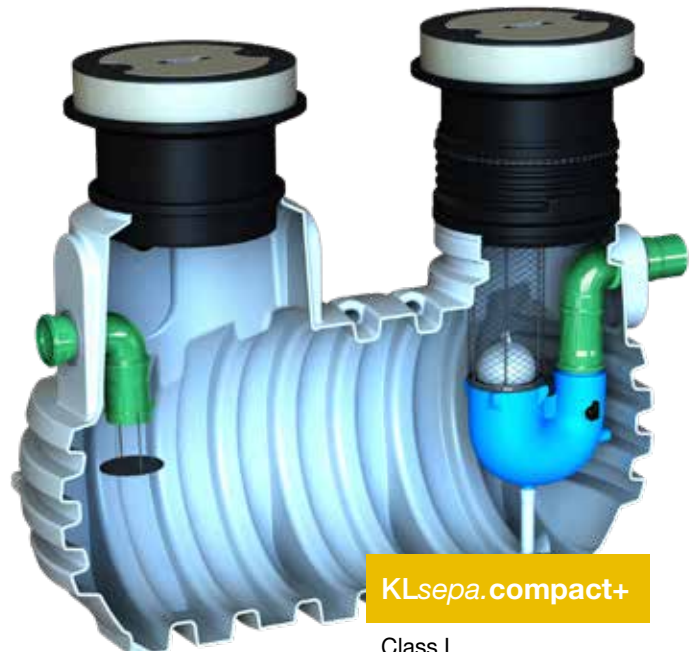
### KLsepa.compact

Class II oil separator



### KLsepa.compact+

Class I  
Coalescence separator



#### Potential accessories:

- Additional sludge collector
- Warning systems
- Sampling shaft

		Volume			Container geometry			Weight
NS	DN	Light fluids	Sludge	Total	Length	Width	Height (Without cover)	approx.
[l/s]	[mm]	[l]	[l]	[l]	[m]	[m]	[m]	[kg]
6 - 1300 T	160	500	1,300	2,210	2.45	1.15	1.66	165
10 - 1300 T	160	500	1,300	2,210	2.45	1.15	1.66	165
10 - 2000 T	200	660	2,000	3,330	2.45	1.40	1.90	250
15 - 2000 T	200	660	2,000	3,330	2.45	1.40	1.90	250

T = Separator may be used with high efficiency dispensers with maximum flow rates of 150 l/min (according to the Technical Rule for Substances Harmful to Water (TRwS) A 781).

Effectiveness tested according to EN 858 of the TÜV Rheinland.

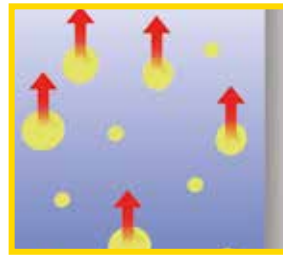
# Description of system

## Coalescence unit

The KLARO separator KLsepa.compact+ is a coalescence separator. This means that they are extended by a coalescence unit, which allows a significantly higher degree of separation. While the target limit of the separation efficiency of a petrol separator is less than 100 mg of residual oil per litre of water, with the help of a coalescence unit this value can be reduced to a residual oil level below 5 mg/l.

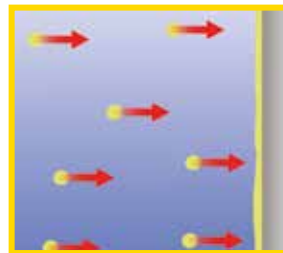
### 1. Step

In addition to readily separable oil drops in a light fluid separator, very small oil droplets arise, whose density difference to water is too small to make them rise to the surface in the time available. Therefore, they remain in the effluent water.



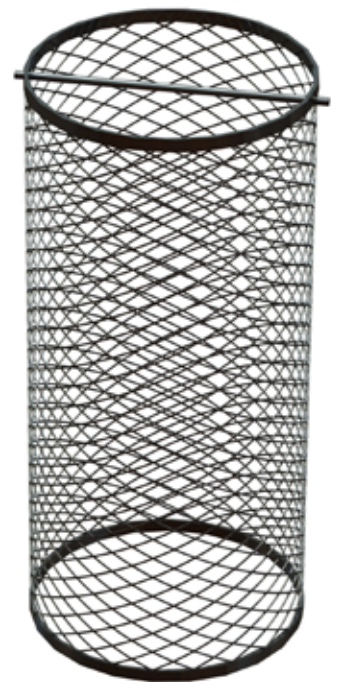
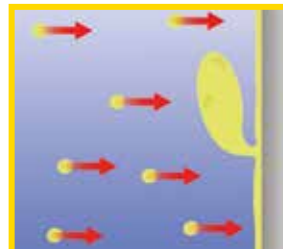
### 2. Step

In order to precipitate out these smaller oil droplets, a material is positioned before the discharge, which the droplets adhere to and together form an oil film.



### 3. Step

Through the flow of further oil, the thickness of the oil film increases, until the adhesion of the oil film is exceeded. Individual droplets work free, whose size is sufficient to rise to the surface, due to the difference in density, and therefore they are also deposited.



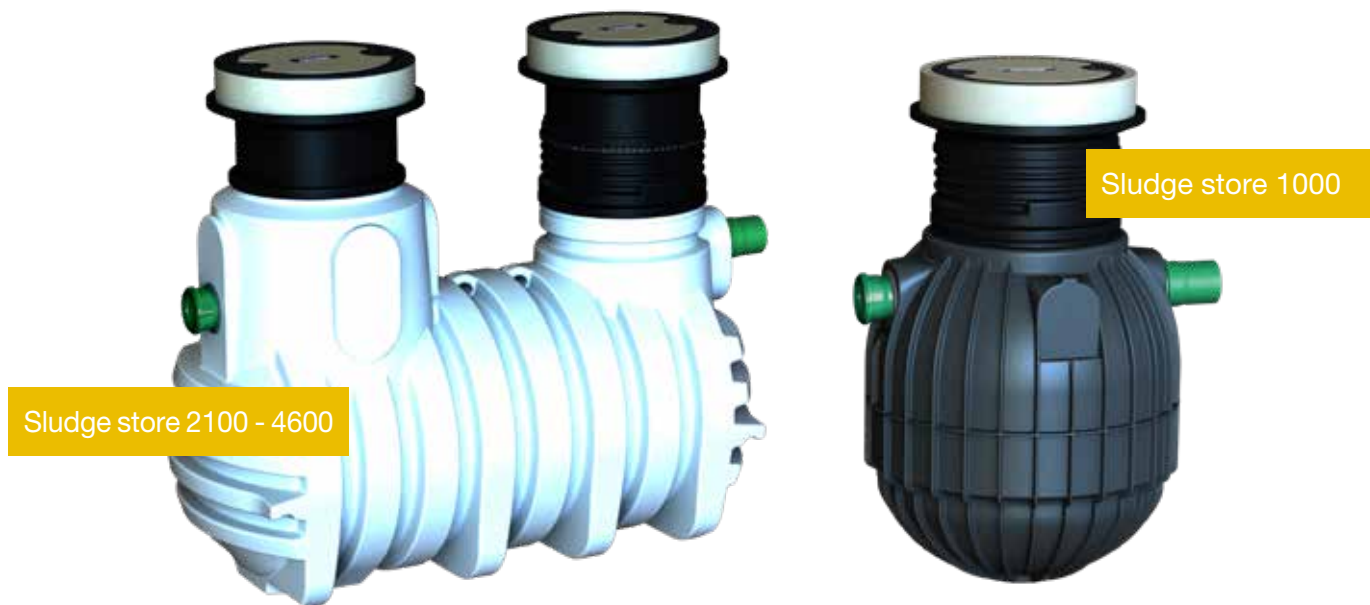
### KLARO coalescence unit

- No wear
- No clogging
- Easy to clean
- Low weight

## Optional sludge collector

All KLARO separator systems can be expanded with an upstream sludge collector. Additional sludge collectors are used for pre-filtration of contaminants contained in the water, whose density is greater than that of water. The contaminants are deposited on the bottom. In addition, larger floating material is already stopped here. The efficiency of the sludge collector is dependent on the surface area, the dwell time, the flow path and the volume.

Freed of coarse sediments and floating debris, the wastewater flows into the separator. The incoming volume flow is regulated by a flow baffle and directed into the container with an optimized flow. This optimises the sedimentation process. Additional sludge traps are useful and necessary with increased accumulation of dirt in the oil-containing wastewater, for example: Washing areas for construction vehicles, construction machinery, agricultural machinery, truck wash stalls and automatic vehicle wash systems, e.g. gantry car washes or drive-through car washes.



		Container geometry			Weight
Volume	DN	Length	Width	Height (without dome assembly)	approx.
[l]	[mm]	[m]	[m]	[m]	[kg]
1000	160	1.16	1.16	1.67	95
2100	160/200	2.45	1.15	1.66	155
3200	160/200	2.45	1.40	1.90	240
4600	160/200	2.45	1.70	2.20	370

# Description of system

## Dome assembly and cover

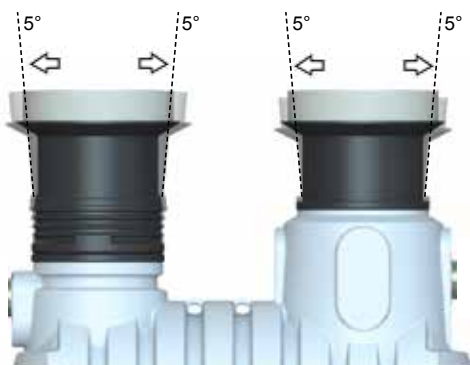
- Including standard lip seals for easy connections
- Sealed to ground level
- Easily adapted to ground level with telescopic/tilting dome shaft
- Excellent stability due to modern technology
- Unique precision fit of the components through new production process
- Suitable for car/truck traffic with standard concrete rings and covers
- Fully adjustable ground level cover, 5° tiltable (ideal for asphalt surfaces)



- 1 Dome shaft with cover
- 2 Adaptor
- 3 KLsepa.compact Saphir

### Adjustable in height and tiltable

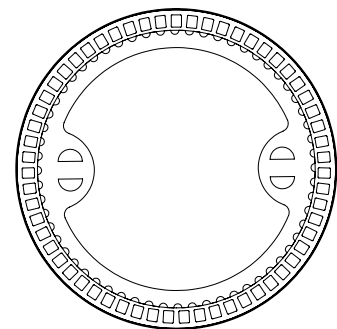
The dome assemblies are fully adjustable for height and tilt (up to 5 %) providing a high degree of flexibility in installation.



### Attention:

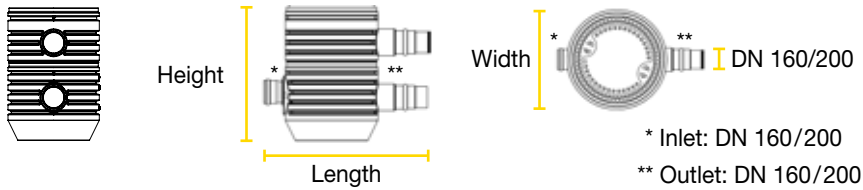
To ensure permanent suitability for car/truck traffic an outer concrete slab is required round the shaft. Further information is available in the installation instructions.

Diameter:  
78 cm



## External sampling shaft

The KLARO separator can be expanded with an external sampling point. The sampling shaft is connected downstream of the separator tank. It is used, in addition to the prescribed collection of wastewater samples, for the control, maintenance and cleaning of the system.



External sampling	Dimensions			Weight (Without cover)
	Length	Width	Height	approx.
	[cm]	[cm]	[cm]	[kg]
DN 160/200 connection	101	69	100	19

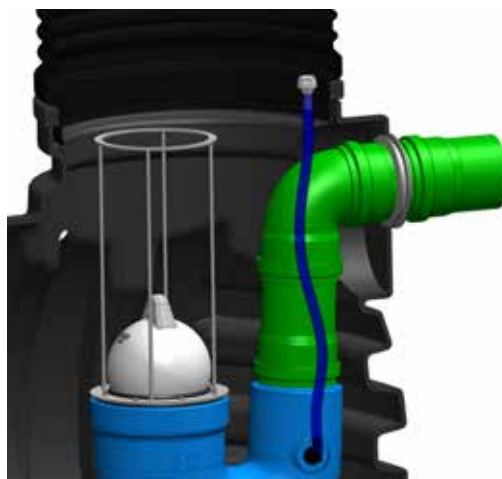


Sampling shaft

## Internal sampling point

The KLsepa.compact separator system also provides the option of integrated sampling. A sampling port is installed before the discharge so that it is accessible from the riser shaft.

**Attention:** In many countries and regions an external sampling point is stipulated.

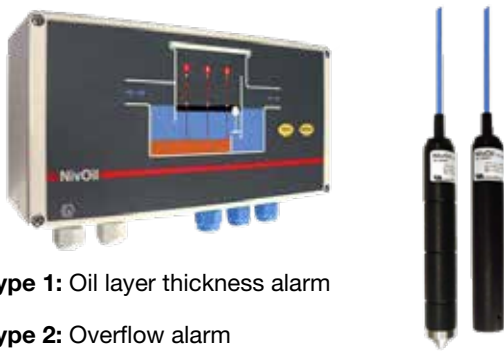


# Description of system

## Warning systems

According to EN 858-1 the separator must be equipped with automatic warning devices. If an elevation is not feasible, automatic warning systems must be put in place; and in addition, for potential overflow caused by backwater appropriate equipment to prevent backwater must be installed.

### Available sets



**Type 1:** Oil layer thickness alarm

**Type 2:** Overflow alarm

**Type 3:** Oil layer thickness and overflow alarm

### Mode of operation

Using sensors that are mounted in the separator, the following functions can be monitored:

- Monitoring of the layer thickness, i.e. alert if a defined threshold for the maximum collection capacity of oil/petrol has been reached.
- Detection of backwater, i.e. if the general fluid level rises, e.g. due to a clogged float or an automatically locked outlet.

## Maintenance case

The KLARO maintenance case for separator systems contains everything necessary to perform self-monitoring. The operator of a light liquid separator should carry out a monthly check of the system. For further information please refer to page 18.

### Separator maintenance case

#### Contents:

- Float to measure the oil level
- Tape measure with snap hooks
- Indicator strips on a roll
- Measuring cup
- Pointy solder / Short solder with plate to measure the sludge level
- Manhole cover lifting tool



Maintenance case



## Check list - road map for separator

### 1. Replacement or new installation?

The operator must first determine whether the separator is a completely new installation or whether it is a replacement of an older existing separator system. This makes a difference in so far as a new installation in general must be approved by the relevant authority (water authority, environmental agency, town council etc.). If it is a replacement, the operator only needs to report the planned new separator.

### 2. Assessment

Next, an assessment is made by KLARO to find the optimum system to meet the needs of the operator. An assessment is also required for a replacement system as well as a new installation, as the external conditions, such as the rainfall surface area, water connections and the light fluids present, can change over the years.

## The following steps may differ according to the region/country:

### 3. Specification

After the assessment has been completed by KLARO, it must be submitted by the operator or the construction company contracted by the operator, as required, to the relevant authority.

### 4. Installation

Once the design has been approved, construction work can begin. The commissioned construction company must be certified in compliance with the Water Resources Act (WHG) 19 L 57/58.

### 5. General inspection

After the completion of the separator, a general inspection in accordance with DIN 1999/100 should be carried out. A specialist in separator technology should check the installation, the sealing of the container and the operation of the system.

### 6. Commissioning

After successful completion of the general inspection the system can be commissioned after being filled with water.



## Inspection and maintenance

### Monthly self-monitoring

The monthly self-inspection must be carried out by a qualified specialist or a person trained by him/her.

**The following steps are carried out at the monthly self-monitoring:**

- Measure oil layer and sludge layer
- Test float for proper function
- Visual inspection
- Sign in the log book

The KLARO separator maintenance case (see page 16) contains all the measurement tools necessary.

A simple inspection of the warning system is **not** sufficient in this case!

### Oil extraction

If biodiesel is present the oil separator must be emptied by a waste disposal company once a year.

### Six monthly maintenance

The operator, or a qualified specialist, must perform the following steps at the semi-annual maintenance:

- Clean float (remove sludge layer)
- Clean coalescence material (if installed)
- Clean channel in the sampling shaft
- Sign in the log book



### 5-yearly General Inspection

Every five years, the separator must be given a general inspection in accordance with EN858, as with commissioning, by a person qualified in separator technology.

## CE declaration (KLsepa.compact / KLsepa.compact+)

### Declaration of performance ...

... according to REGULATION (EU) no. 305/2011

Construction product **Separator system for light fluids, consisting of a separator class I and a sludge trap**

Product type **KLsepa.compact+**

Primary technical specifications

Designation	NS [l/s]	Sludge trap [l]	Oil Storage [l]	Diameter	
				Length [mm]	Width [mm]
KLsepa.compact+ 3-300	3	300	300	1130	
KLsepa.compact+ 3-400	3	400	500	1130	
KLsepa.compact+ 3-600	3	600	300	1160	
KLsepa.compact+ 6-600	6	600	300	1160	
KLsepa.compact+ 6-1300	6	1300	500	1150	2450
KLsepa.compact+ 10-1300	10	1300	500	1150	2450
KLsepa.compact+ 10-2000	10	2000	660	1400	2450
KLsepa.compact+ 15-2000	15	2000	660	1400	2450

Intended use **Separation and containment of light fluids from mineral sources from waste water**

Manufacturer **KLARO GmbH  
Spitzwegstrasse 63  
D-95447 Bayreuth**

Harmonised technical specification	Key features	Performance	Assessment and review of the constancy of performance
EN 858-1:2002 + A1:2004	Fire behaviour	E	System 3*
	Liquid tightness	passed	System 4
	Effectiveness	passed	
	Load carrying capacity	passed	
	Durability	passed	

\*Test facility: Institute for Testing (Prüfinstitut) Hoch, Lerchenweg 19, 97650 Fladungen

We confirm that the named construction product type KLsepa.compact+ complies with the declared performances.

Bayreuth, 19 January 2017 11:53:27

## Address



KLARO GmbH  
Spitzwegstraße 63  
95447 Bayreuth

## Telephone



+49 (0) 921 16279-0  
**Technical hotline:**  
+49 (0) 921 16279-330

## Website



Further information can  
be found under:  
**[www.klaro.eu](http://www.klaro.eu)**

## Message



Email:  
**[info@klaro.eu](mailto:info@klaro.eu)**

