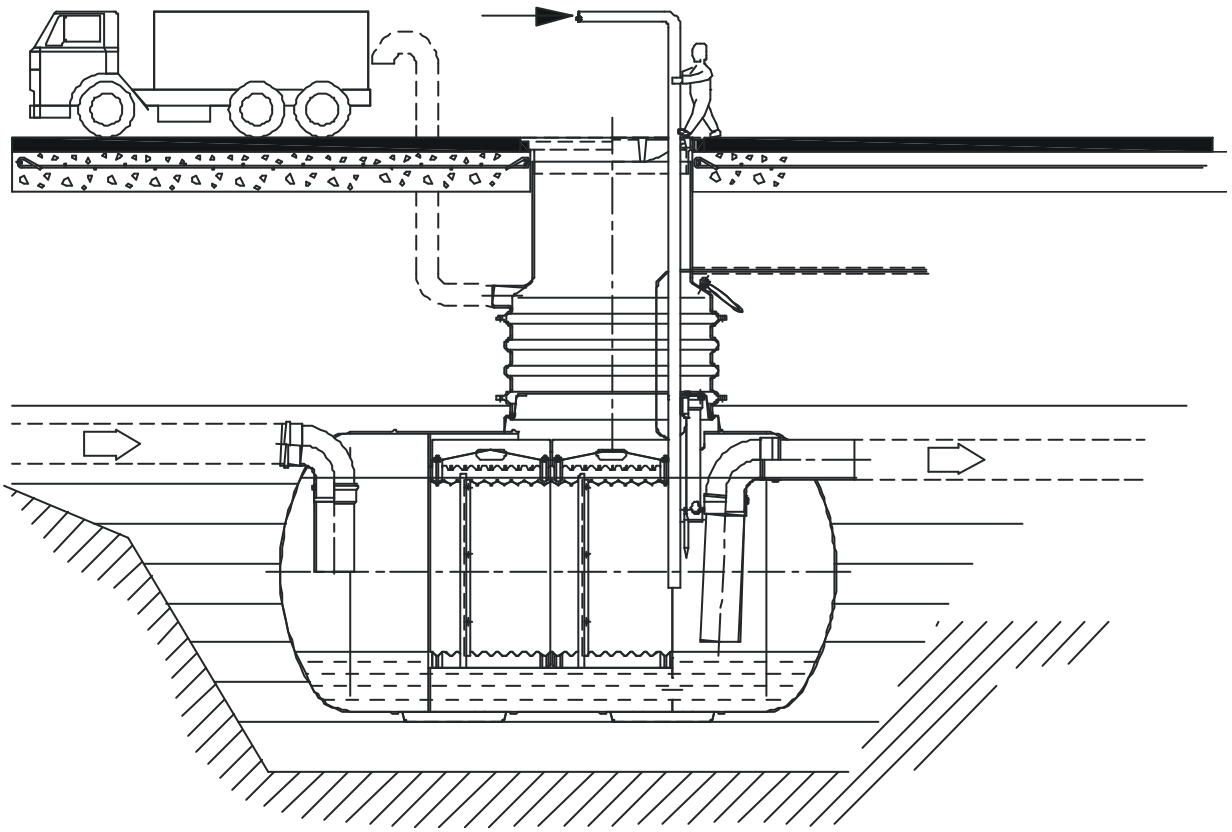
WAVIN-LABKO LTD
Labkotie 1
FIN-36240 KANGASALA
Tel: +358 20 1285 270
Fax: +358 20 1285 280
E-mail: tanks@wavin-labko.fi
www.wavin-labko.fi

01/04
24AI01ae

# EuroPEK Oil Separator

## Instructions for Installation, Operation and Maintenance



# Contents

# 1 GENERAL

## 1.1 Design parameters

These instructions contain a description of the operation, installation and maintenance of the EuroPEK oil separator conforming to the requirements of the European standard EN 858 (Separator system for light liquids). In the EN standard, oil separators are divided into classes I and II. According to the standard, the hydrocarbon content of the waste water, after being processed by a class I separator should in laboratory tests stay under 5 mg/l. The EuroPEK represents an oil separator of class I. In a class II oil separator, the hydrocarbon content should not exceed 100 mg/l. The cleaning effect of the separator is based on the coalescing unit. A separator system meeting the requirements of the standard includes a sand and sludge trap, oil separator as well as a sampling shaft.

The separate instructions contain a description of the operation, installation and maintenance of the PEK 3001 oil alarm unit included in the standard delivery of the EuroPEK oil separator. The PEK 3001 alarm unit is also available with an optional Labcom data transferring unit which enables the alarm signal to be automatically forwarded to the person or company responsible for emptying the separator.

## 1.2 Important when handling and installing the separator

- The separator must be handled with care and it must be fastened properly for the transport.
- Immediately after transport, at the installation site, the separator must be inspected for any damage that might have occurred during the transport.
- The maximum installation depth of the EuroPEK oil separator, from ground level to the lower edge of the input sewer, is 2.5 metres. If installed deeper, the separator should be ordered in a reinforced construction. In this case, please contact Wavin-Labko / Tanks.
- Anchor the separator to prevent it from floating; this is the buoyancy-effect caused by the groundwater or the rainwater that pours into the excavation. See further information in “Instructions for Mounting in the Ground”.
- In the area of heavy and medium weight traffic a traffic compensating slab must be laid on the separator to equalize the wheel loads. See further information in “Instructions for Mounting in the Ground”.

# 2 TEHCNICAL DATA

## 2.1 Operation

In a separator system a sand and sludge trap precedes the oil separator. In the sand and sludge trap (like EuroHEK) the solid matter is separated from the waste water. The operation of the sand and sludge trap is based on gravitation; the solid particles, heavier than water, settle on the bottom of the separator. This is an essential part of the separation process, since the trapping of the sand before its accessing the oil separator prevents the coalescing unit from being blocked by the heavier solids. Consequently, this contributes to a longer service-span of the oil separator.

In the oil separator EuroPEK, both the free and partially also the mechanically emulsified oils are separated from the waste water. The separator is used in the handling of different kinds of oily waste waters, e.g. rainwater from courtyard areas or waste water from vehicle washing sites. The operation of the oil separator is based on the differences in the densities of oil and water. The separator presents a gravitation-based processing system, in which the separation of oil is intensified by means of a coalescing unit. The PEK 3001 is an oil alarm unit, which activates an alarm whenever the oil storage space is full.

## 2.2 System components

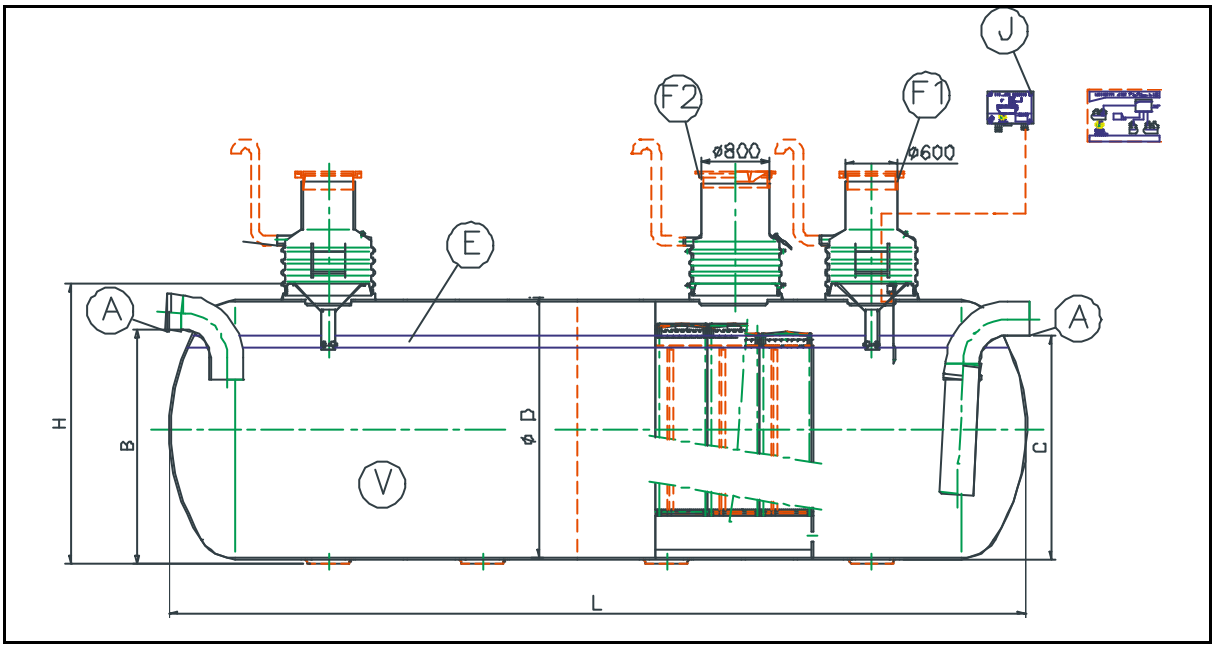



*Figure 1. Components of the oil separator EuroPEK*

| **EuroPEK oil separator** | **NS** | **3** | **6** | **10** | **15** | **20** | **30** | **40** | **50** | **65** | **80** | **100** | **125** | **150** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum rainwater flow | l/s | 3 | 6 | 10 | 15 | 20 | 30 | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
| Maximum waste water flow | l/s | 1,5 | 3 | 5 | 7,5 | 10 | 15 | 20 | 25 | 32 | 40 | 50 | 62 | 75 |
| A Inlet and outlet sewers | PVC | 110 | 160 | 160 | 200 | 200 | 250 | 315 | 315 | 315 | 315 | 315 | 400 | 400 |
| B Bottom/ inlet sewer | mm | 860 | 860 | 860 | 1300 | 1410 | 1410 | 1940 | 1940 | 2740 | 2740 | 2740 | 2740 | 2740 |
| C Bottom/ outlet sewer | mm | 790 | 790 | 790 | 1230 | 1340 | 1340 | 1870 | 1870 | 2670 | 2670 | 2670 | 2670 | 2670 |
| D Diameter | mm | 1000 | 1000 | 1000 | 1400 | 1600 | 1600 | 2200 | 2200 | 3000 | 3000 | 3000 | 3000 | 3000 |
| H Height | mm | 1300 | 1300 | 1400 | 1700 | 1900 | 1900 | 2500 | 2500 | 3300 | 3300 | 3300 | 3300 | 3300 |
| L Length | mm | 1950 | 2200 | 4100 | 2800 | 3000 | 4000 | 3600 | 4600 | 5500 | 7300 | 7500 | 8800 | 10000 |
| V Effective capacity | l | 860 | 1000 | 1950 | 2940 | 3930 | 5500 | 10000 | 13500 | 32200 | 41000 | 45300 | 52500 | 61600 |
| E Oil storage capacity | l | 250 | 290 | 550 | 610 | 770 | 900 | 1000 | 1500 | 1500 | 2000 | 2100 | 2200 | 2800 |
| Weight | kg | 180 | 235 | 355 | 450 | 600 | 810 | 1100 | 1705 | 2500 | 2900 | 3300 | 3600 | 4300 |
| F1 EuroHUK 600 | pcs | - | - | 1 | - | - | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 |
| F2 EuroHUK 800 | pcs | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| J PEK oil alarm | pcs | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

## 2.3 Accessories

### 2.3.1. Anchoring belts

The tank should be anchored by means of non-stretching polyester belts. The nominal capacity of the belt is determined by the tank size and the type of ratchets by the surrounding ground. You will need as many anchoring belts as the separator is long in metres. In demanding conditions, the security can be enhanced by increasing the amount of belts. Instructions for belt dimensioning can be found e.g. on the Wavin-Labko web pages www.wavin-labko.fi.

In easy corrosion environments (calcareous or sandy soil, gravel, loamy sand, soil layers above ground water surface which pass air well or relatively well), electroplated zinc coated ratchets can be used to tighten the belts.

In highly corrosive environments (clayey soil, humus, peat, slag, mud, sulphides, ground water level fluctuation zones as well as coast areas), stainless ratchets are recommended.

Tanks of diameter 1 m are anchored by tying the belts tightly onto the lugs on the slab. The nominal capacity of each belt should in this case be at least 2000 kg. Tanks the diameter of which exceeds 1 m should always be anchored with belts that are tightened by means of ratchets. In this case, also the nominal capacity of the belt should be higher:

- tank diameter 1,4...2,2 m, easy corrosion environments; nominal capacity 4000 kg, electroplated zinc coated ratchets and hooks,
- tank diameter 1,4...2,2 m, highly corrosive environments; nominal capacity 2500 kg, stainless ratchets and hooks,
- tank diameter 3,0 m; nominal capacity 4000 kg, stainless ratchets and hooks.

The anchoring belts are available as accessories at Wavin-Labko.

### 2.3.2. EuroHUK maintenance shaft

The maintenance shaft EuroHUK 600 and the cast iron cover and frame 5…40 t are available as accessories for the oil separator EuroPEK. The seals and the attachment locks enable a watertight installation of the maintenance shaft. The type of the maintenance shaft is selected according to the installation depth of the separator system, as presented in the following table:

*Table 1. Selection of maintenance shaft EuroHUK.*

| **EuroHUK maintenance shaft model** | **9-13** | **13-17** | **17-21** | **21-25** |
|---|---|---|---|---|
| Installation depth of the inlet to ground surface (mm) | 900-1300 | 1300-1700 | 1700-2100 | 2100-2500 |
| Weight (kg) | 25 | 42 | 60 | 84 |

2.3.3. Cast iron cover and frame

The cast iron cover and frame assembly which is available as an accessory of the maintenance shaft EuroHUK is selected according to the traffic load (5, 25 or 40 t) on the place of separator location. Depending on the separator's size class, in addition to the D800 mm cover and frame assembly, 0 to 2 D600 mm assemblies are needed for the separator.

2.3.4. Data transferring unit Labcom

The Labcom data transferring unit can be attached to the SET alarm system, e.g. oil alarm PEK 3001. The data transferring unit Labcom enables the alarm indicating the need to empty the oil storage space to be automatically forwarded to the person or company responsible for the task.

By using a user name and a password, the customers can read the data concerning their property on the Internet. The data can also be transferred as an SMS to a GSM phone or as an e-mail to a computer. The modem and phone line need not be kept open at the end being monitored.

## 3 INSTRUCTIONS FOR MOUNTING IN THE GROUND

These mounting instructions apply to oil separator system EuroPEK.

### 3.1 Mounting pit and anchoring slab

1. Excavate a soil area of sufficient size for the separator. The edges of the mounting pit should be estimated with 0.5 metres of extra space from both the sides and ends of the separator. This reserves the space for the stone free installation sand around the separator.

2. Compact a 30 cm levelled stone free sand layer on the bottom of the pit.

3. If necessary, cast an anchoring slab or slabs on the sand layer, inserting a necessary amount of RST lugs of min. diameter ∅10 mm to anchor the separator. We recommend that an undivided anchoring slab is cast for the whole separator system. If several slabs are to be cast, one must make sure that the slabs will not move as regards to one another, and that the seams between the slabs will not be under the separator.

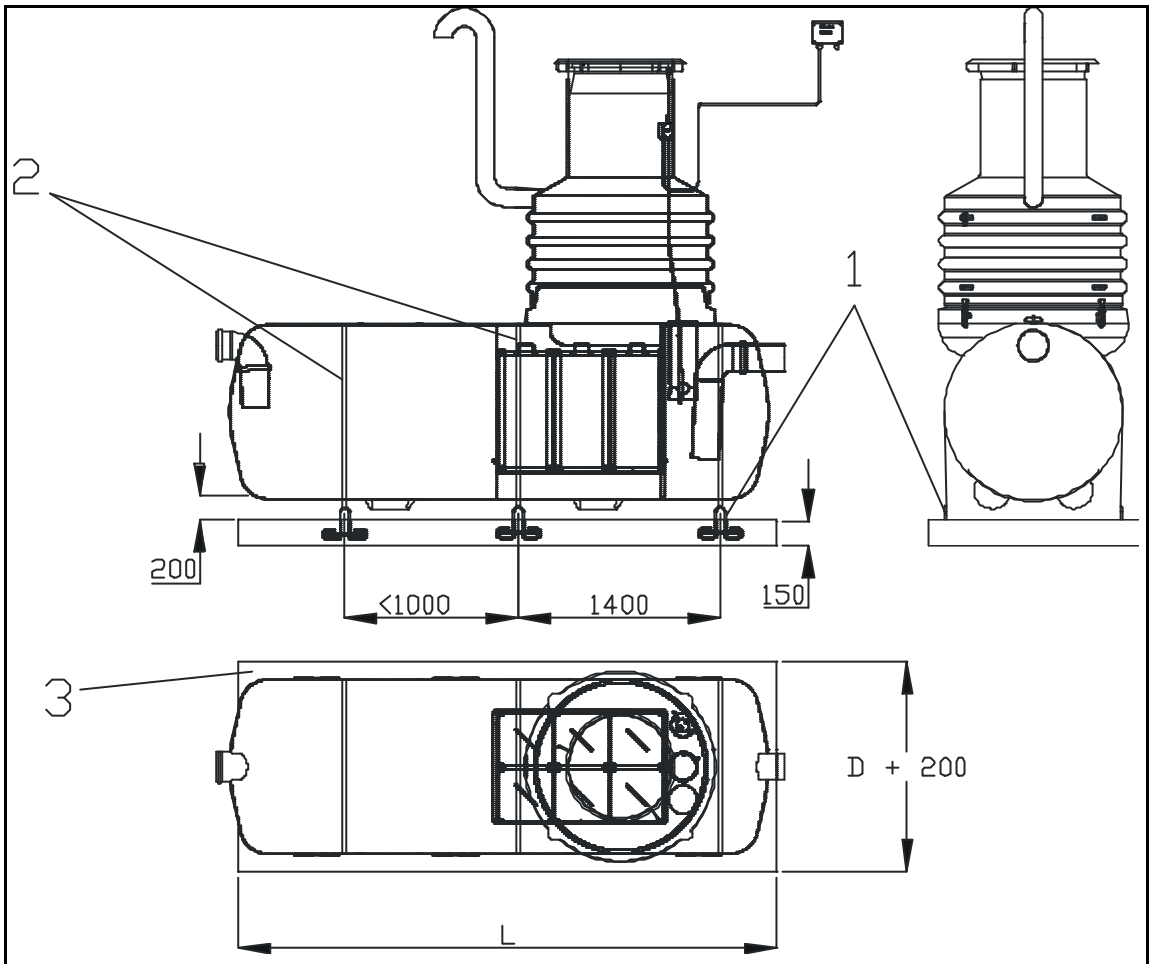
   The tanks should be anchored in order for the buoyant force of the water in the ground not to move the tank. A reinforced concrete slab is recommended to be used as an anchor (figure 3).

   An anchoring slab should be cast, if
   - the ground water level in the area is higher than the bottom of the separator;
   - the water transmission in the ground is weak and the rain water may gather into the mounting pit of the separator; or
   - the bearing capacity of the ground is weak.

   Determine the positions of the RST lugs on basis of tank length and the amount and placement of the anchoring belts before casting the concrete slab. Note! The positions of the anchoring belts on the tank have not been determined by the manufacturer. The belts are positioned on the straight part of the tank at even

intervals (ca. 0.8...1 m, at maintenance shafts ca. 1.5 m). Make sure that the belts at both ends cannot slip off the tank.

**Note!** The anchoring belts should not be placed over the inlet and outlet sewers!




| | |
|---|---|
| **1.** RST lug T10 | **2.** Anchoring belt |
| **3.** Anchoring slab<br>Concrete K30-2<br>Reinforcement: A500HW T10 #200 | Slab length = tank length<br>Slab width = tank diameter + 200 mm<br>Slab thickness = 150 mm |

*Figure 2. Anchoring of the separator in an area influenced by ground water or in an area where the bearing capacity of the ground is weak.*

### 3.2 Installing the separator

1. Compact a min. 20 cm stone free sand layer on the anchoring slab.
2. Set the separator on the layer of sand and pour about 20 cm of water into the separator to stabilize it.
3. Fix the separator onto the slab by means of non-stretching anchoring belts. You will need at least as many anchoring belts as the separator is long in metres.

   If the amount of anchoring belts is insufficient or the belts are not tight enough, the buoyant force of the water in the soil can cause the separator to surface later on, when the separator is being emptied.

Fix the anchoring belts round the separator and to the RST lugs on both sides of the anchoring slab. The belts should preferably be tensioned with appropriate ratchets. If you order the anchoring belts with the tank, you will receive the necessary ratchets with the belts. Other appliances are not allowed to be used to tension the belts, because the belts might get overtensioned, causing damage to the tank.

The recommended way to tension the belts is two-phase: each belt is first tensioned to a level, where the force of the ratchet starts to increase substantially. In the second phase, each belt should be tensioned again, starting from the first belt. Make sure that the ratchets do not press onto the tank surface.

4. Compact the sand layer around the separator with extreme care. Keep compacting the sand bed around the separator in 20 cm layers. While this work is being done, keep adding water to the separator to keep it steady.

5. If the system is to be equipped with a EuroNOK sampling shaft including a shut-off valve, see separate installation instructions for the sampling and shut-off valve shaft EuroNOK as well as the instructions laminated onto the side of the shaft.

6. Install the inlets and outlets of the separator.

7. Install rubber gaskets onto the bottom edge of the maintenance shaft(s). Install the EuroHUK maintenance shafts in a vertical position into the installation frame of the separator. Lock the retaining latches (see figure 3).
   **NOTE! Attention must be paid on the fact that a EuroHUK 800 maintenance shaft should always be installed at the same level with the coalescing units. This allows the coalescing units to be lifted out of the separator for maintenance.**

8. Install the ventilation tubes onto the ventilation outlets on the maintenance shafts.

9. Install the alarm probe into the separator. The probe will hang naturally at the right height, when the connection box is hung on the metal hook at the installation frame of the maintenance shaft.

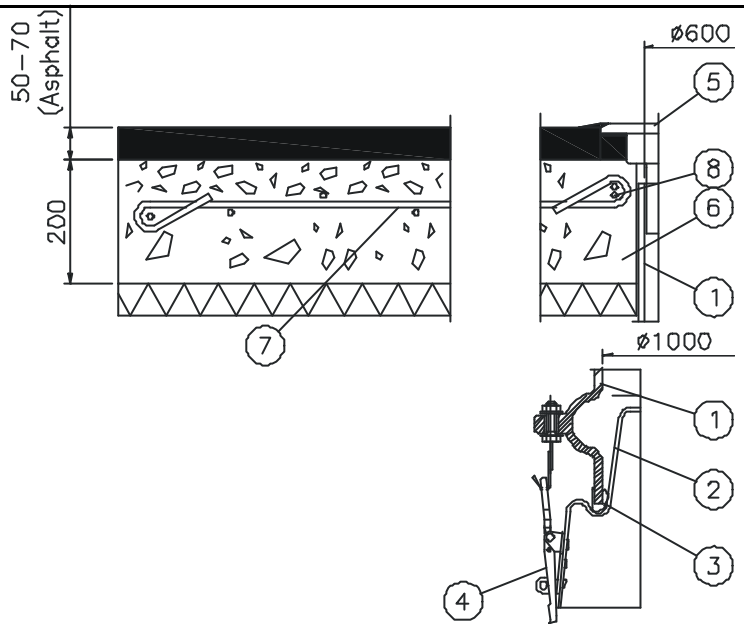
10. Install the cable protection tube into the cable penetration at the top of the maintenance shaft. The probe cable should be pulled into the building through the cable protection tube. Leave enough cable inside the maintenance shaft to lift the probe on the ground surface for maintenance operations.

11. Continue compacting the sand in 40 cm layers until the ground level is reached. Avoid the use of heavy vibration when compacting sand layers on top of the tanks or their inlets and outlets.

12. After filling the pit, cut the maintenance shaft in a proper height. Note that the cover and frame will give about 100 mm extra height for the maintenance shaft.

13. After cutting the maintenance shafts in a proper height, the frame of the cover and frame assembly is installed on the maintenance shaft. The frame must not lean against the maintenance shaft, but against the surrounding compacted layers of sand or a load compensation plate and the asphalt layer laid on the ground surface.

14. In an area of heavy and medium weight traffic, a load compensation plate and a layer of asphalt must be laid to equalize the wheel loads. See also the instructions on the body of the separator concerning mounting in the ground.




| | |
|---|---|
| 1. | EuroHUK 600 maintenance shaft |
| 2. | Collar for the maintenance shaft |
| 3. | Gasket |
| 4. | Lock (4 pcs) |
| 5. | Cast iron cover and frame |
| 6. | Load compensation plate. Frostproof concrete: K30-2<br>Reinforcement: A500 HW T10 # 150 |
| 7. | Reinforcement: A500 HW T10 # 150 |
| 8. | Reinforcement ring A500 HW T10 (2 pcs) |

*Figure 3. Construction of the traffic load compensation plate and the locking of the maintenance shaft EuroHUK onto the separator.*

15. Finally, fill the separator completely with water to ensure its effective operation. Filling with water will also diminish the effect of the groundwater buoyancy.

## 4 MAINTENANCE

Special attention should be given to the maintenance of the oil separator to ensure effective operation throughout the life span of the system. The need for maintenance depends on the location and purpose of the system. If the separator system is used to process waste waters produced at vehicle washing sites or for other purposes where the

separator system is exposed to a degree of solid matter load, its operation should be monitored and maintenance procedures performed more often than e.g. in systems which process rain waters gathered from asphalted areas.

### 4.1 Emptying the oil storage space

1. The oil alarm unit PEK 3001 will switch on a signal light when the oil storage space is full.

2. Drain off the oil layer as the full storage volume is reached, or at least after every six months. The oil is drained manually through the oil skimming pipe of the separator. If there are two maintenance shafts in the separator system, the skimming pipe is in the second shaft. When skimming the oil layer or draining the tank, be careful not to damage the coalescing units.

3. Set the suction hose of the container truck to the skimming pipe and begin to suck off the oil layer that has gathered on the surface of the separator. Stop sucking when the surface of the separator sinks to the lower level of the suction grooves or the pump starts taking in air. **Note!** The layer gathered on the surface of the separator is hazardous waste.

4. The alarm probes must always be cleaned, when oil waste is drained. If necessary, wash the probes with mild detergent (e.g. dish washing liquid) and set them back in their places. Also check the operation of the alarm unit and probes, as described in the installation and operating instruction of the alarm unit.

### 4.2 Maintenance of the coalescing units

Clean the coalescing units periodically to prevent the blockage of the units and reduced separating result. The units should be cleaned always when needed, but at least once in two years.

1. Start the cleaning by draining the separator. Lift the first coalescing unit straight up through the maintenance shaft with a hoist or crane. Take out the coalescing units, one at a time.

2. Clean the units with tap water using a high pressure washer so that the washing water flows into the separator. Alternatively, clean the units in a place where the washing water can be directed to a place where it is processed. Also clean the GRP walls between the coalescing units and the seals on the edges. The most important operation is to remove the solid matter from the plates and effective surface of the coalescing units. Oily surface promotes effective functioning of the unit, so there is no need to remove the oil film from the surface of the plates. Also clean the dirt from the separator walls. Drain the washing water completely from the separator by using the suction hose of the container truck before mounting the coalescing units back.

3. Set the coalescing units carefully to their places, making sure that the seals between the coalescing units and the cassette wall are well in their places. They are used to prevent by-pass flow on the sides of the coalescing units.

4. **NOTE!** Fill the separator immediately with water to ensure its effective operation from the very beginning. Also, if the ground water level is high around the separator, filling will reduce the influence of the buoyant force caused by the ground

water. Always clean the probe of the oil alarm unit PEK 3001 when draining the separator or skimming the waste oil. If necessary, wash the probe with mild detergent (e.g. dish washing liquid).

### 4.3 Maintenance of the separator tank

1. The separator tank should be emptied and its condition checked thoroughly at least every five years (EN 858 - Separator systems for light liquids). In this case, the following should be checked: tightness of the system, condition of the body, inner surfaces of the tank, condition of inner structures, probes and probe cables, installations and the operation of the alarm system.

2. Drain the separator tank for inspection and remove the coalescing units from the separator.

3. Clean the inside of the tank with tap water by using a high pressure washer. Drain the cleaning water completely from the separator with the suction hose of the container truck before checking the tank.

4. Check the tightness of the separator, condition of the separator body, inner surface of the tank and the condition of inner structures. Also check the condition of the coalescing unit and its seals as well as the alarm probes.

5. Fill the separator immediately with water to ensure its effective operation from the very beginning. Also, if the ground water level is high around the separator, filling will reduce the influence of the buoyant force caused by the ground water. The filling of the separator with clean water after cleaning will restore the operation of the probes and prevent false alarms.