

2018-07-06

LipuSmart-P



- DE** Gebrauchsanleitung
Fettabscheider mit integrierter
Hebeanlage
- EN** User instructions
grease separator with integrated
lifting plant
- FR** Manuel d'utilisation
Séparateur de graisse avec
installation de relevage intégrée
- IT** Istruzioni per l'uso del separatore
di grassi con stazione di
sollevamento integrata
- ES** Instrucciones de servicio del
separador de grasas con equipo
de bombeo integrado
- PL** Instrukcja użytkowania
separatora tłuszczu ze
zintegrowan przepompowni
- TR** Entegre yükseltme
istasyonu ya ayırıcı için
kullanım kılavuzu
- NL** Gebruiksaanwijzing
vetafscheider met geïntegreerd
hefsysteem
- CZ** Návod k použití odluovač tuk
s integrovaným odepřacím
systémem

LipuSmart-P-OB



LipuSmart-P-OD



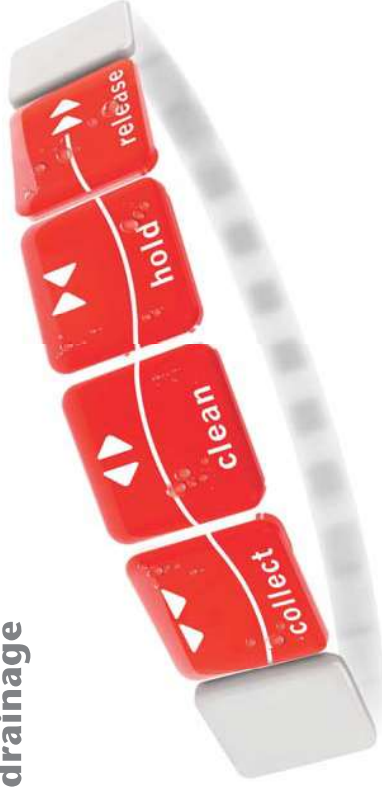
LipuSmart-P-OA



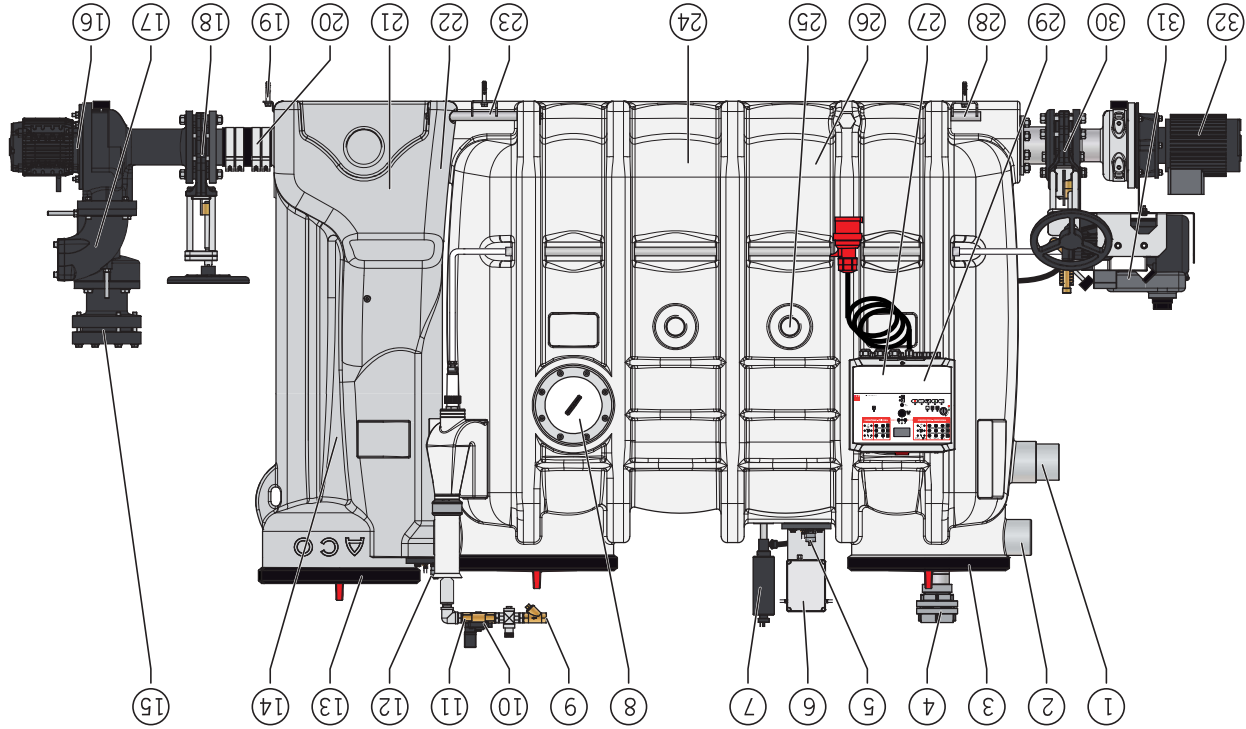
LipuSmart-P-OAP



ACO. creating the future of
drainage

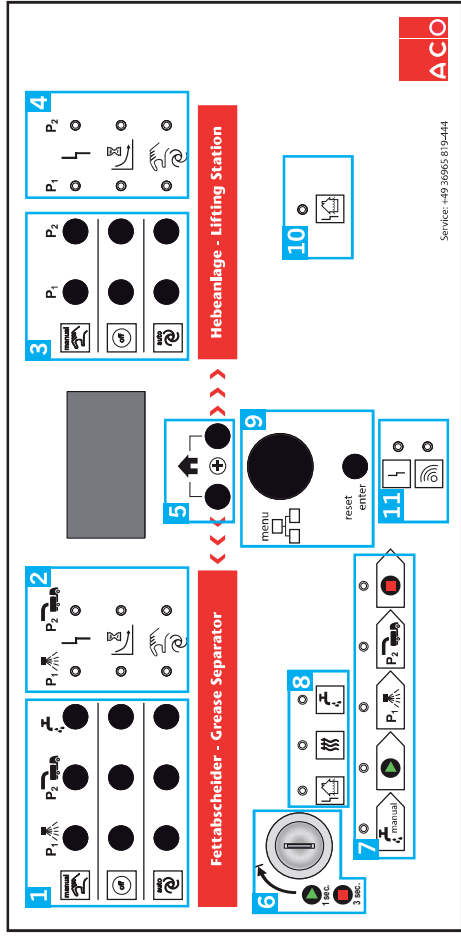


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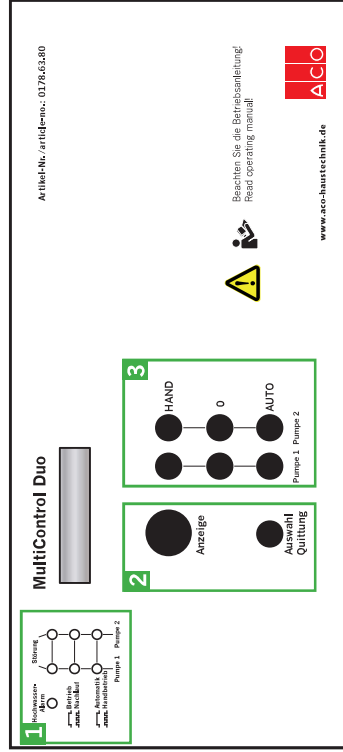
LipSmart-P-0AP

B



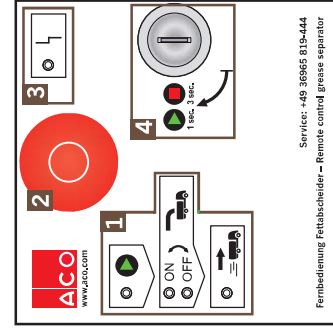
Steuerung LipSmart-P-0A/-0AP

C



Steuerung LipSmart-P-0B/-0D

D



Fernbedienung LipSmart-P-0A/-0AP

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1 For your Safety



Read the instructions (Grease separator with integrated lifting plant) before installing and operating the grease separator in order to avoid injury to persons and damage to property.

1.1 ACO Service

ACO Service will gladly be of help should you require more information on grease separators, on ordering spare parts and on services, for example specific training courses, maintenance contracts and general inspections.

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CH	ACO Passavant AG Industrie Kleinzaun Postfach 197 8754 Netstal (Switzerland)	Tel.: +41 55 6455-300 Fax: +41 55 6455-312 aco@aco.ch www.aco.ch

For other ACO locations see  www.aco.com.

1.2 Intended use

Very greasy wastewater is a risk to pipelines and sanitary drainage objects. Greases and oils deposit on the walls of the pipes together with other wastewater constituents and cause corrosion, obstructions and odour nuisance. Therefore, grease separators are mandatory in the industrial and commercial sectors.


These include, for example:

- Hotels, restaurants, refectories and canteens
- Butchers' shops, slaughterhouses, meat processing factories
- Canneries, ready meals producers, chip and crisp production

The integrated lifting plant with the combined sampling option serves to collect and automatically lift wastewater above the backflow level. The wastewater is drained into the drainage sewer safely for people and without damaging structures.

Harmful substances must not be discharged, e.g.:

- Faecal wastewater
- Rain water
- Wastewater containing mineral oils and greases
- Wastewater from wet waste/shredder units
- Wastewater from slaughterhouses
- Solidifying greases in concentrated mould (e.g. deep-frying fat)
- The use of biologically active agents, e.g. products containing enzymes for converting the greasy substances or for so-called self-cleaning, is not permitted in the grease separator and the inlet lines.

Detergents, washing-up liquids, cleaning products, disinfectants and auxiliaries, which can get into the wastewater must not form stable emulsions or contain or release chlorine. For further information on suitable rinsing agents, refer to the technical information sheets (German/English) issued by the German Commercial Dishwashing Association (“Arbeitsgemeinschaft Geschirrspülen, Hagen”):  www.vgg-online.de.

1.3 Planning drainage systems

Wastewater, in which a significant part of the fats exists in non-separable (emulsified) mould, cannot be treated effectively in grease separators which operate using the gravity principle.

For instance, wastewater from the following application fields:

- Dairies, cheese dairies, slaughterhouses, fish and meat processing companies
- Catering service companies, e.g. catering establishments in which pure dishwashing operation exists
- Waste treatment units

The design must provide for separation of the wastewater substreams, by type, quantity and state of the wastewater contents. In this way the wastewater substreams can be treated optimally and the retained substances disposed of properly. If the formation of stable emulsions in the wastewater cannot be prevented, special wastewater treatment units are required, e.g. ACO Lipufloc or ACO Biojet.

1.4 Operational regulations


erection and operation of grease separators and lifting plants are subject to communal guidelines. For more information, please contact the responsible authorities. The following standards are listed for orientation purposes and must be supplemented and checked to ensure that they are up-to-date(Only applies for Germany. Provisions in other countries can vary).

Grease separator

- DIN 4040-100: Grease separators – Part 100: Specifications for the application of separators according to EN 1825-1 and EN 1825-2
- EN 1825-1: Grease separators – Part 1: Principles of design, performance and testing, marking and quality control
- EN 1825-2 Grease separators – Part 2: Selection of nominal size, installation, operation and maintenance
- EN 1717: Protection against pollution of potable water in water installations and general specifications of devices to prevent pollution by backflow
- DIN 1988: Codes of practice for drinking water installations - Part 100: Protection of drinking water, drinking water quality control; DVGW code of practice
- DIN 1986-100: Drainage systems for buildings and property – Part 100: Specifications in connection to EN 752 and EN 12056
- EN 752: Drainage systems outside buildings
- EN 12056 (series): Gravity drainage systems inside buildings

Examples from the listed standards:

- Sampling: On installing the grease separator a device for sampling and inspection, e.g. in the mould of a sampling pipe, is to be installed directly at the gully of the separator and before the discharge is mixed with other wastewater. Samples must be taken from the flowing discharge water of the grease separator by qualified persons.
- Disposal: The sludge trap and grease separator must be drained and cleaned at least once a month. The grease separator must be subsequently refilled with water (e.g. drinking water, process water, treated wastewater from the grease separator), which conforms to the local discharge provisions.
- General inspection: Before launching the grease separator, and then every 5 years at the latest, it must be completely drained and cleaned and then checked by a properly qualified technician to ensure that it is in proper working order and operates properly.

- Operating log: The operator must keep an operating log for each grease separator and submit it to the local competent inspecting authority on request. Operating logs can be purchased from ACO Service,  Introduction Chap. 1.1. "ACO Service".

Lifting plant

- DIN EN 12050-2 'Wastewater lifting plants for for land and site drainage
– Part 2: Wastewater lifting plants for waste water free of faeces
- DIN EN 12050-4 'Wastewater lifting plants for lanf and site drainage
– Part 4: Backflow valve for wastewater with and without faeces
- EN 12056-1 'Gravity drainage systems inside buildings
– Part 1: General and execution requirements'
- EN 12056-4 'Gravity drainage systems inside buildings
– Part 4: Wastewater lifting plant; planning and dimensioning
- EN 12056-5 'Gravity drainage systems inside buildings
– Part 5: Wastewater lifting plant; Installation and testing, instructions for operation, maintenance and use'
- DIN 1986-100 'Drainage systems for buildings and property
– Part 100: Specifications in connection to EN 752 and EN 12056"

Examples from the listed standards:

- Backflow protection: Wastewater produced below the backflow level must be fed into the drainage system via an automatic wastewater lifting plant.
- Test run: Carry out at least 2 test runs every month
- Maintenance: Wastewater lifting plants must be operated and maintained according to EN 12056-4 to ensure proper functioning and operating safety. Stipulated maintenance intervals for the wastewater lifting plant according to EN 12056-4: Commercial operation = every 3 months.

1.5 Personnel qualifications

Activities	Person	Knowledge
Layout, operational changes	Planners	Knowledge of building systems and services, evaluation of wastewater technology application cases. Layout of grease separators and drainage systems. Normative specifications and directives
Erection, installation, launch	Skilled persons	Sanitary and electro installation
Operation Monitoring	Operator	No specific requirements
Monthly check	Properly qualified personnel	Approved disposal contractor
Maintenance	Properly qualified personnel	„Properly qualified technicians“ according to DIN 4040-100* and/or “Competent persons” according to DIN 4040-100* and DIN 1986-100**
General inspection before launch and every 5 years	Competent persons	“Properly qualified technicians” according to DIN 4040-100**
Disposal of the grease separator contents	Properly qualified personnel	Approved disposal contractor

* Definition of “properly qualified technicians” according to DIN 4040-100:






Properly qualified personnel are personnel of the operator or designated third parties, who by virtue of their training, knowledge and practical experience ensure that they carry out assessments or tests and inspections in the respective field properly.

** Definition “Competent persons” according to DIN 4040-100 and/or DIN 1986-100:

Properly qualified technicians are employees of companies independent of the operator company/ owner, experts or other institutions, who verifiably have the required technical knowledge to operate, maintain and check separators to the scope named here and have the equipment required to test separators. In individual cases, in larger operational units, these tests and inspections can also be carried out by internal personnel of the operator who are competent persons, independent with regard to their area of responsibility and who are not bound by instructions, and who have the same qualification and technical equipment.

1.6 Personal protective equipment

Personal protective equipment must be made available to the personnel.

Mandatory sign	Meaning
	Safety footwear provides good slip resistance, especially in wet conditions, as well as a high degree of penetration resistance (e.g. in case of nails) and protects the feet from falling objects (e.g. during transport).
	Protective gloves protect the hands from infection and from minor bruising and cut injuries.
	Protective clothing protect the skin from infection and from minor bruising and cut injuries.
	A protective helmet protects the head in case of low ceilings and from falling objects (e.g. during transport).
	Safety glasses and goggles protect eyes from infections, especially during launch, maintenance and repair.

1.7 Storage and Transport

IMPORTANT Note during storage and transport:

- Store the system in frostproof rooms.
- Never drive the forks of a fork-lift truck or lift truck directly under the system parts. Where possible, transport the system parts on its base frame or a Euro pallet.
- Use additional transport straps.
- If transporting the unit parts using a crane or crane hook: Attach the lashing straps on the sub-structure or suitable components (e.g. pipe socket).
- Where possible, do not remove the package and transport restraints until the separator is in its place of installation.

1.8 Decommissioning and disposal

IMPORTANT Improper disposal is a hazard for the environment. Comply with the regional disposal regulations and recover or recycle the components.

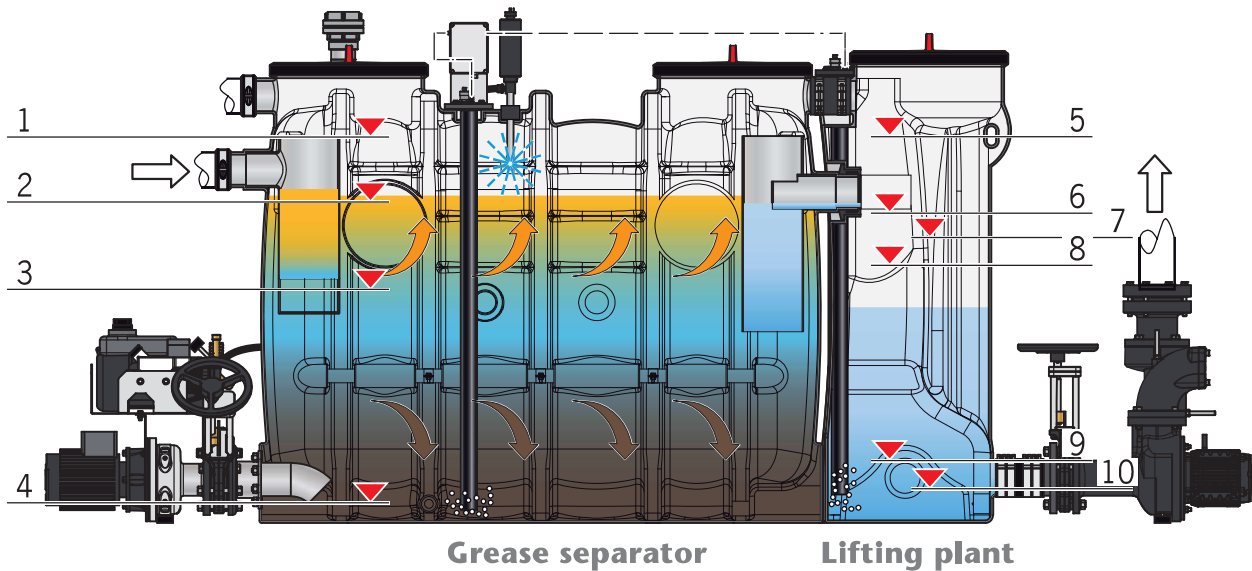
- Completely drain and clean the system parts (grease separator and lifting plant) during decommissioning.
- Separate plastic parts (e.g. seals) and metal parts. Recover metal scrap.
- Electrical equipment and accumulators may never be disposed of in household waste. Comply with the regional disposal regulations for the protection of the environment. Dealers have a duty to take back end-of-life electrical devices and accumulators.



2 Product Description

ACO LipuSmart-P is made of polyethylene. Polyethylene is characterised, for example, by lightweight construction and long life.

2.1 Operating principle (using the example LipuSmart-P-OAP)



Water levels in the grease separator:

- 1 = High alarm
- 2 = Normal level
- 3 = Lowered level
- 4 = Empty level

Water levels in the lifting plant:

- 5 = High water level alarm (AL)
- 6 = Peak load (SL)
- 7 = Peak load OFF (SL OFF)
- 8 = Baseload (GL)
- 9 = Peak load OFF (GL OFF)
- 10 = Stop delay period OFF (NLZ OFF)

Grease separator

Grease separators operate physically according to the gravity principle. The different densities are used to separate grease/oil from wastewater. Animal and vegetable greases/oils have a lower specific density than water and therefore rise to the surface. Wastewater constituents with a higher density than water, e.g. sludge, sink to the bottom in the sludge chamber.

The level is monitored by means of a pressure sensor that is mounted to a pneumatic pipe and records the pressure differences in the pneumatic pipe. If the water rises, the air in the pneumatic pipe is compressed. The overall system control analyses the sensor and shows the water level in the grease separator accurately to within a centimetre. During the disposal process, the hydromechanical high-pressure inner cleaning, the disposal pump and the filling device are controlled automatically. The additionally possible high alarm requires supervision of the grease separator operation. The air bubble injection prevents the grease layer hardening in the pneumatic pipe and could causes obstructions.

Lifting plant

Any wastewater from the grease separator flows through the separator outlet into the lifting plant. A specially shaped recess facilitates sampling.

The level is monitored by means of a pressure sensor that is mounted to a pneumatic pipe and records the pressure differences in the pneumatic pipe. If the water rises, the air in the pneumatic pipe is compressed. The overall system control and/or the lifting plant control analyses the sensor and shows the water level in the lifting plant accurately to within a centimetre. If necessary, the pumps are switched on and off or the high water level alarm is triggered. The air bubble injection prevents the floating layer hardening in the pneumatic pipe and could causes obstructions.

If the water level reaches the baseload level (GL), a pump switches on and pumps the wastewater through the Y-branch pipe into the pressure line to the drainage pump.

Two backflow valves in front of the Y-branch pipe prevent backflows from the pressure line into the lifting plant.

If the water level drops to the baseload OFF (GL) level, the pre-set stop delay period (NLZ) of the pump is activated and the water level drops again to the 'NLZ OFF' level.

The prefabricated pumping station is equipped with two pumps:

- With each new start, alternating operation occurs.
- If one pump fails, the second pump switches on.
- If the wastewater inflow is higher than the delivery performance of one pump and the water level rises to the peak load (SL) level, the second pump also switches on.
- If the water level falls to the peak load OFF (SL OFF) level the second pump switches off again.

2.2 Modular extension system

The equipment level system enables the reduction of odour nuisance during disposal and cleaning. The higher the extension stage the lower the risk of infection, the degree of pollution and the time required for disposal and cleaning of the grease separator.

Product name: The first letter after the ‘ ’ in the type appellation identifies the material, P = Polyethylene.

Design: The first letter after the ‘ ’ behind the material information identifies the design, O = Oval design


Extension stages: The letters after the design information in the type appellation identify the extension stages: B = Basic version, D = Direct suction, A = Automatic high-pressure cleaning, AP = Automatic high-pressure cleaning and disposal pump.

	LipuSmart-P-OB	LipuSmart-P-OD	LipuSmart-P-OA	LipuSmart-P-OAP
Technical features	<ul style="list-style-type: none"> ■ Draining and cleaning via maintenance opening(s) ■ Two flow-optimised pumps ■ Control of the lifting plant ■ Integrated sampling 	<ul style="list-style-type: none"> ■ Connection for direct suction ■ Two flow-optimised pumps ■ Control of the lifting plant ■ Integrated sampling 	<ul style="list-style-type: none"> ■ Connection for direct suction (optionally with disposal pump) ■ Automatic high-pressure inner cleaning and filling device (operation with solenoid valve) ■ Two flow-optimised pumps ■ Control system for overall system ■ Integrated sampling 	<ul style="list-style-type: none"> ■ Connection for direct suction with disposal pump ■ Automatic high-pressure inner cleaning and filling device (operation with solenoid valve) ■ Two flow-optimised pumps ■ Control system for overall system ■ Integrated sampling

	LipuSmart-P-OB	LipuSmart-P-OD	LipuSmart-P-OA	LipuSmart-P-OAP
Betriebsmerkmale	<ul style="list-style-type: none"> ■ Odour nuisance during draining and cleaning ■ Automatic control of the lifting plant (pumping processes) ■ Integrated sampling 	<ul style="list-style-type: none"> ■ No odour nuisance during draining (closed cover) ■ Odour nuisance during cleaning ■ Automatic control of the lifting plant (pumping processes) ■ Integrated sampling 	<ul style="list-style-type: none"> ■ No odour nuisance during disposal and cleaning ■ Automatic control of the filling device and high-pressure inner cleaning ■ Automatic control of the lifting plant (pumping processes) ■ Optional remote control (the building does not need to be accessed) ■ Integrated sampling 	<ul style="list-style-type: none"> ■ No odour nuisance during disposal and cleaning ■ Automatic control of the filling device, the high-pressure inner cleaning and the disposal pump ■ Automatic control of the lifting plant (pumping processes) ■ Optional remote control (the building does not need to be accessed) ■ Integrated sampling

2.3 Product features

Numbers in brackets “()”, see diagram of the system (example LipuSmart-P-OAP),

 page 2 **A**.

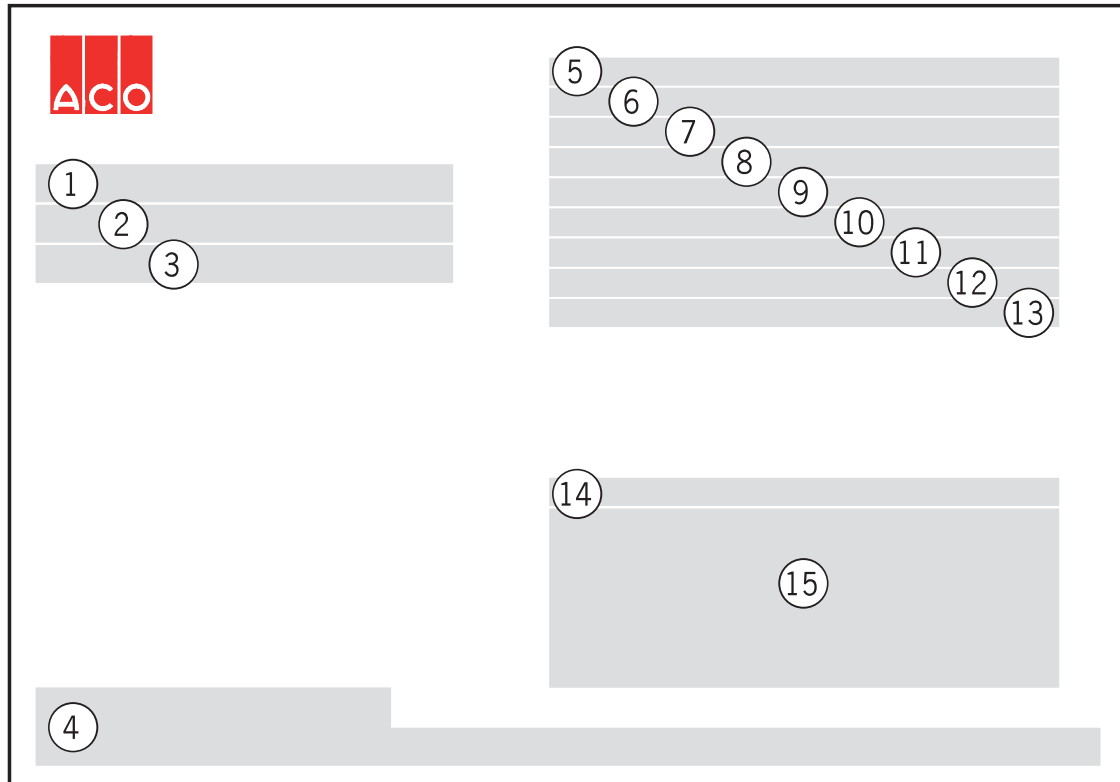
Design	LipuSmart-P-Ausbaustufe			
	-OB	-OD	-OA	-OAP
(1) = Connection port inlet line	●	●	●	●
(2) = Connection port ventilation line (optional)	●	●	●	●
(3) = Maintenance opening(s)	●	●	●	●
(4) = Disposal connection DN 65 with blank cover	–	●	●	●
(5) = Pressure sensor, grease separator	–	–	●	●
(6) = Pneumatic box	–	–	●	●
(7) = HP(high-pressure) cleaning head	–	–	●	●
(8) = Inspection window with wiper	○	○	●	●
(9) = Connection socket drinking water	–	–	●	●

LipuSmart-P

Product Description

Design	LipuSmart-P-Ausbaustufe			
	-OB	-OD	-OA	-OAP
(10)= Filling device with ball valve for manual operation	○	○	–	–
(11)= Filling device with solenoid valve for automatic operation	–	–	●	●
(12)= Pressure sensor lifting plant	●	●	●	●
(13)= Maintenance opening	●	●	●	●
(14)= Integrated sampling (inside)	●	●	●	●
(15)= Special mounting adapter	●	●	●	●
(16)= Pumps	●	●	●	●
(17)= Dual backflow preventer	●	●	●	●
(18)= Shut-off valve	●	●	●	●
(19)= Buoyancy safeguard (lifting plant)	●	●	●	●
(20)= Flange pipe with connector	●	●	●	●
(21)= Lifting plant	●	●	●	●
(22)= Pneumatic pipe lifting plant (inside)	●	●	●	●
(23)= Buoyancy safeguard (grease separator/lifting plant)	●	●	●	●
(24)= Grease separator	●	●	●	●
(25)= Connection dimension heating rod (optional)	●	●	●	●
(26)= Pneumatic pipe grease separator (inside)	–	–	●	●
(27)= Control lifting plant	●	●	–	–
(28)= Buoyancy safeguard (grease separator)	●	●	●	●
(29)= Control for overall system	–	–	●	●
(30)= Shut-off valve	–	–	●	●
(31)= HP(high-pressure) pump inner cleaning	–	–	●	●
(32)= Disposal pump	–	–	○	●
(33)= Remote control (not shown)	–	–	○	○
● available ○ optional – not available				

2.4 Product identification (type plate)



EN

- (1) = System version (extension stage)
- (2) = Year of construction (week/year)
- (3) = Article no.
- (4) = Manufacturer's address
- (5) = Grease separator to EN 1825-1
- (6) = Lifting plant to EN 12050-2
- (7) = DOP No. (Declaration of Performance)
- (8) = Nominal size

- (9) = Sludge trap content
- (10) = Separator content
- (11) = Grease storage capacity
- (12) = Grease layer thickness
- (13) = Catalogue No.
- (14) = Serial number
- (15) = Serial number (S/N) barcode

2.5 Key pump data

2.5.1 Disposal pumps, grease separator

	Motor power P2 [kW]	Nominal current [A]	Granulation size [mm]	Protection type –	Temperature range medium [<°C]
AS0840	2.6	5.6	30	IP 68	40 (briefly 65)
V30	3.0	6.6	63	IP 68	40 (briefly 65)

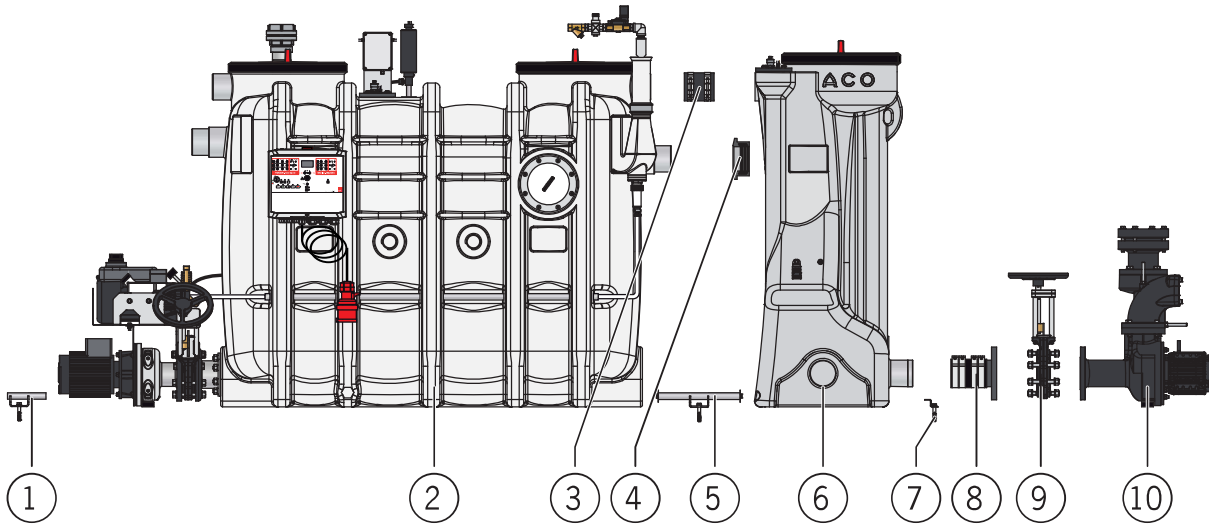
2.5.2 Pumps lifting plant

	Motor power P2 [kW]	Nominal current [A]	Granulation size [mm]	Protection type –	Temperature range medium [<°C]
1.5 kW	1.5	3.5	60	IP 68	40 (briefly 65)
4.0 kW	4.0	7.5	60	IP 68	40 (briefly 65)

3 Installation

3.1 Delivery units (using the example LipuSmart-P-OAP)

EN



- | | |
|--|---|
| 1 = Buoyancy safeguard (grease separator)* | 6 = Lifting plant unit |
| 2 = Grease separator unit | 7 = Buoyancy safeguard (lifting plant)* |
| 3 = Pipe connector | 8 = Flange pipe with connector |
| 4 = Forsheda socket sleeve** | 9 = Shut-off valve |
| 5 = Buoyancy safeguard (grease separator/
lifting plant)* | 10 = Pump unit |

* **WARNING** Parts are also used as transport locks, please do not throw away.

** Seal is already inserted in the socket on the lifting plant on delivery..

3.2 Erection and sanitary installation

Digits in brackets ('()'), see illustration of the delivery units, chap. 3.1 'Delivery units (on the example LipuSmart-P-OAP)'.

Work	LipuSmart-P-Type			
	-OB	-OD	-OA	-OAP
Assemble the grease separator unit (2)	X	X	X	X
Position the pipe connector (3) at the ventilation connection above the gully of the grease separator*	X	X	X	X

LipuSmart-P Installation

Work	LipuSmart-P-Type			
	-OB	-OD	-OA	-OAP
Feed the buoyancy safeguard (5) into the adapter on the grease separator	X	X	X	X
Grease the connection port gully on the grease separator and Forsheda socket seal (4) at the inlet of the lifting plant with acid-free lubricant	X	X	X	X
Position unit lifting plant (6) behind the grease separator: <ul style="list-style-type: none"> ■ Feed the pipe connector (3) across the aeration slots of the lifting plant ■ Feed the connection port gully of the grease separator into the Forsheda socket seal ■ Feed the buoyancy safeguard (5) into the adapter on the lifting plant 	X	X	X	X
Pull the unit lifting plant, e.g. with tension strap and buoyancy safeguard (5), with the grease separator unit together	X	X	X	X
Mount the shut-off valve (9) to the pump unit (10)	X	X	X	X
Mount the flange pipe (8) to the shut-off valve (9)	X	X	X	X
Determine the connection port for the 'pump' construction unit on the lifting plant and open by hand (cut on form notch)	X	X	X	X
Mount the connection socket DN 50 for additional inlet to the lifting plant (NS 3 – 10)	X	X	X	X
Align the system horizontally/vertically and attached to the soil with buoyancy safeguards (1, 5 + 7)	X	X	X	X
Connect the 'pump' construction unit to the connection port of the lifting plant with connectors	X	X	X	X
Connect the on-site inlet line	X	X	X	X
Connect the on-site pressure line	X	X	X	X
Connect the on-site disposal line (optional)	–	X	X	X
Connect the on-site water pipe to the filling device	–**	–**	X	X
Connect the on-site ventilation line	X	X	X	X
Connect the on-site pendulum gas line (optional)	X	X	X	X
<p>* Exception for NS 2: there is no ventilation connection on the grease separator. Ventilation of the lifting plant via the existing connection port DN 70 on the lifting plant</p> <p>** Optional for filling device (accessories)</p>				

3.2.1 Erection specifications

Observe the following when erecting the system:

- To prevent odour nuisance, do not install near occupied rooms and in particular windows near paths or ventilation openings.
- Install as close as possible to the point of waste water incidence, in well-ventilated, frostfree rooms, circulation or storage areas. Easily accessible for erection, operation, disposal, cleaning and maintenance.
- Horizontal floor with appropriate load-bearing capacity (load-bearing calculations by structural engineer).
- The system can be installed on sound absorbing supports (e.g. made of SBR or NBR materials) to insulate noise.
- Connections for drinking water and drainage lines as well as electro installation must be available.
- Drainage points, e.g. floor gullies, are to be equipped with odour seals and if necessary with silt buckets, which can be removed for cleaning.
- Safety against buoyancy of free-standing plants in case of flooding or backflow from the drainage sewer.

3.2.2 Connection specifications

Inlet line specifications:

- Wastewater must be fed to the system with slope of at least 1 – 1.5 %. If this is not possible, use of ACO upstream tank plants with positive-displacement pumps is recommended.
- The transition between downpipes to horizontal pipes is to be made with two 45° pipe bends and one connection pipe length at least 250 mm long (equivalent pipe bends with correspondingly large radius). A stabilisation distance must then be provided in the flow direction, the length of which is at least equal to 10 times the nominal width in mm of the inlet line of the separator.
- Install an inlet line made of materials resistant to fatty acid (e.g. KML, PP, PE).

Pressure line specifications:

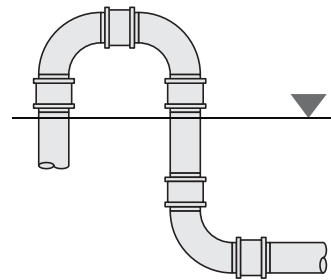
The lifting plant must be drained via a backflow loop. The backflow loop must be established above the backflow level.

Definition of terms as per EN 12056-4:

- “Backflow”: Flow of wastewater from a drain or sewer against the direction of flow back into the connected conduit.
- “Backflow level”: The maximum level to which wastewater can rise within a drainage system.
- “Backflow loop”: Part of the pressure line from a wastewater lifting plant above backflow level.

Specifications:

- Install the backflow loop above the “backflow level” ▼.



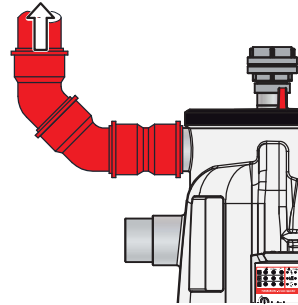
- The pressure line must be designed for at least 1.5 times the pump pressure.
- Install the pressure line so that it rises continuously and is frost resistant.
- The flow velocity in the pressure line must not fall below 0.7 m/s and must not exceed 2.3 m/s.
- Never connect other conduits to the pressure line.
- Ventilation valves are not allowed in the pressure line.
- The pressure line may not stand up in the special mounting adapter.

Ventilation line specifications:

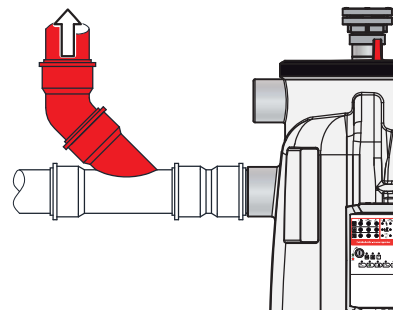
- Install the ventilation line up to above the roof. Ventilate connection lines longer than 5 m separately.
- If the inlet line above the system does not have a separate ventilation connection line longer than 10 m, it must be equipped with an additional vent stack as close as possible to the system.
- Instead of an additional connection in the inlet line near the system, a connection port on the grease separator can be used.
- Ventilation valves are not permitted in areas at risk of backflow or for ventilating the system.
- Install ventilation lines made of materials resistant to fatty acid (e.g. KML, PP, PE).

Connection of the on-site ventilation line DN 100/OD = 110 mm (on the grease separator) and/or DN 70/OD = 75 mm (on the lifting plant):

- Option 1 at NS 4 – 10:
Connection to connection port ventilation line

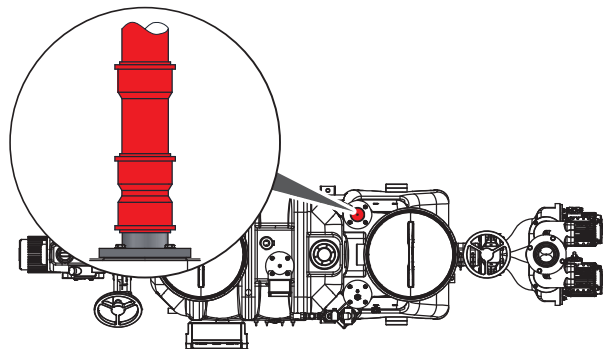


- Option 2 at NS 4 – 10:
Connection to a branch in the on-site inlet line



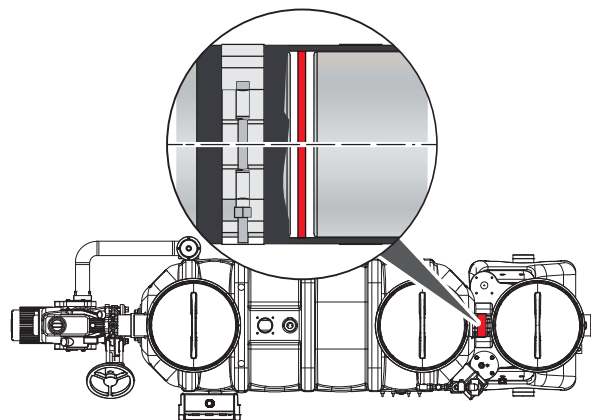
WARNING For NS 2, a ventilation line DN 70 must be connected to the lifting plant according to option 1 or 2 in addition to the ventilation line on the grease separator.

- Connection to the connection port of the lifting plant.



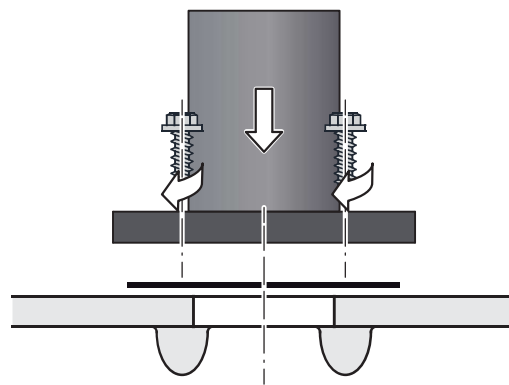
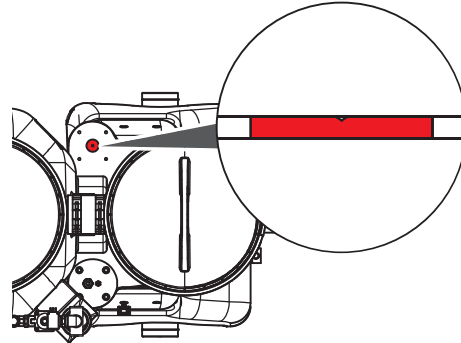
If a separate ventilation for the grease separator and lifting plant (at NS 3 - 10) is preferred and/or specified, the following tasks are necessary:

- Close the connection between the grease separator and lifting plant (e.g. by using an on-site washer \varnothing 110 mm in the pipe connector).



LipuSmart-P Installation

- Mount the connection port DN 70 (can be purchased optionally from ACO) to the lifting plant:
 - Drill open the tank at the marked point (●) using a keyhole saw (Ø 70 mm) and remove the burr.
 - Arrange the flat seal between the tank and flange of the connection port.
 - Attach the flange with E-jot screws to the marked points of the tank (5 N m).
- Connect on-site ventilation line DN 70/OD = 75 mm.



Disposal line specifications:

- Disposal pipes, as pressure and suction pipes, must be at least pressure rating PN 6. Use tension-proof connections for individual pipes and fittings.
- Install disposal lines made of corrosion-resistant materials (e.g. plastic pipes made of PE, PP).
- Install disposal line from the grease separator up to the transfer point (disposal vehicle) with a continuously rising gradient, make changes in direction in the conduit with 90° elbow bends with the largest possible radius. If the horizontal disposal lines are very long, it may make sense to install the line on-site on a slope toward the disposal point (to prevent the wastewater flowing back into the grease separator after disposal).
- Install disposal line with diameter as uniform as possible up to the transfer point (disposal vehicle). Suction pipes with at least DN 65.

Water connection line specifications:

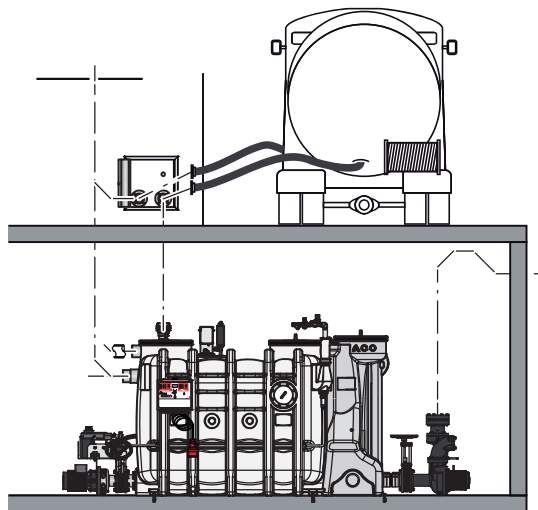
WARNING Observe the regional regulations for connection of the filling device to the drinking water network (only applies in Germany, may vary in other countries).

- A permanent water connection pipe for filling the grease separator must have a free outlet according to the legal requirements. ACO grease separators with filling device fulfil these specifications. A drinking water connection R $\frac{3}{4}$ is required for the filling device. The installed pressure reducer is set to 4 bar.
- A shut-off valve should be installed in the water connection line if possible.

Pendulum gas line specifications:

To avoid annoying noises during disposal, the exhaust air of the disposal vehicle is discharged via a pendulum gas line over the roof.

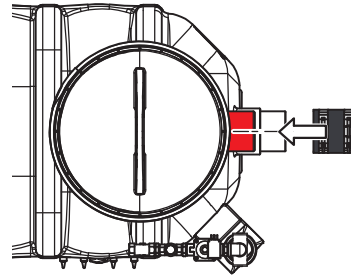
If the pendulum gas line cannot be connected to the vent stack (2), a connection to the inlet line can be attached directly to the grease separator.



3.2.3 More detailed descriptions of a selection of installation work

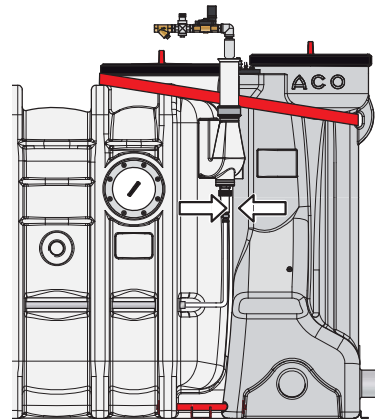
Position the pipe connector at the ventilation line above the gully of the grease separator:

- Release the clip screws and push the hose over the connection port (●).



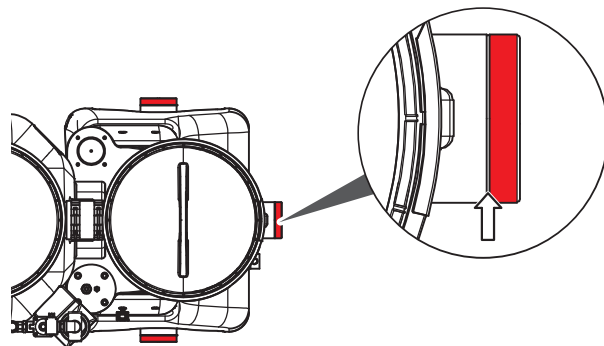
Pull the lifting plant unit and the grease separator unit together:

- Arrange the tension belt at the indicated position (●) and pull the grease separator and lifting plant together.
- Also use a buoyancy safeguard (●).



Determine the connection port for the 'pump' construction unit on the lifting plant and open:

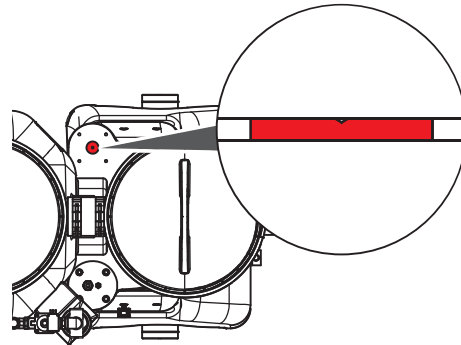
- Select a connection port (●) and open/cut along the cutting notches and remove the burr.



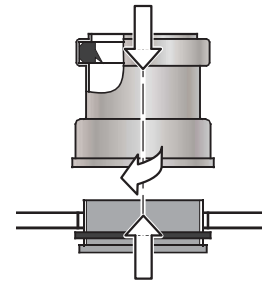
Mount the connection socket for additional inlet to the lifting plant (NS 3 – 10):

Optionally the connection socket DN 50 can be purchased from ACO.

- Drill open the tank at the marked point (●) using a keyhole saw (maximal Ø 42 mm) and remove the burr.



- Push the flat seal over the thread of the threaded rod, and push the threaded piece from inside outwards through the hole in the tank.
- Turn the inlet socket on the thread of the threaded rod and tighten by hand.
- Grease the lip seal of the inlet socket and spigot of the on-site inlet socket with an acid-free lubricant.
- Push the inlet line DN 50 (OD = 50 mm) into the inlet socket.



3.3 Electrical installation

3.3.1 Electrical data

Technical Data	Versions			
	-OB	-OB	-OA	-OAP
Performance	1.5 kW (NS 2 – 4)	1.5 kW (NS 2 – 4)	5.2 kW (NS 2 – 4)	8.2 kW (NS 2 – 4)
	4.0 kW (NS 5.5 – 10)	4.0 kW (NS 5.5 – 10)	7.7 kW (NS 5.5 – 10)	10.7 kW (NS 5.5 – 10)
power supply	–	400 V / 50 Hz		
CEE power socket 32 A	X	X	X	X
Fuse (local)	3 x 32 A (time lag)			
Protection type	Control and remote control: IP 54			

3.3.2 Electrical installation




WARNING

Risk of electric shock due to live parts


Arrange for an electrician to realise the connections in the control unit.

Individual steps can be omitted depending on the system version:

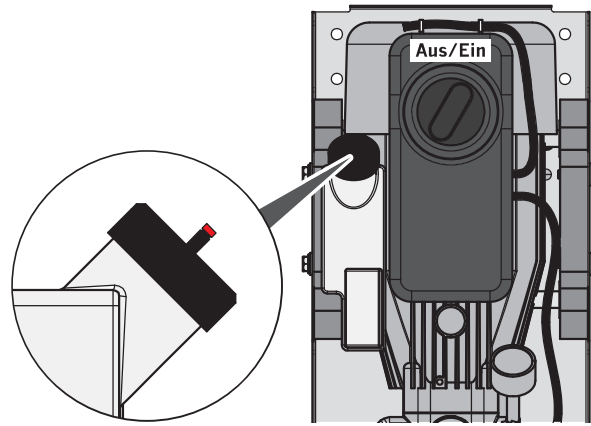
- Install the CEE power socket for the lifting plant control and/or control of the overall system.
- Flood-proof control of the lifting plant near the lifting plant.
- Install the remote control in a flood-proof place near the disposal connection.
- Install the on-site connecting cable from the control to the remote control:
 - Allowable up to 50 m: Cable (wire cross-section 7 x 1.0 mm², without protective conductor).
 - Required from 50 m to 200 m: Cable (wire cross-section 7 x 1.5 mm², without protective conductor).
- Unit 'Lifting plant': Connect the connector pump 1, pump 2 and pressure switch (respective connection cable 5 m long) to the control.
- Set up group alarm. All control systems have a isolated contact for transmission of a group alarm. The contact is realised by means of a changer. The electrical circuits of the devices that need to be connected are separated from each other galvanically. Circuit diagrams,  rear hinged side.






4 Operation

4.1 Launch

A general inspection by a properly qualified technician is mandatory for the launch,  Chap. 1.5 "Personnel qualifications".

- Cut off the (●) rubber overhang of the cap (sealing cover) for the ventilation of the oil basin.
- Check the HP pump inner cleaning, top up with oil (type SAE 90) if necessary.
- Switch on HP pump.










- Clean the grease separator and lifting plant.
- Check the setting values in the menu items of the control systems,  chap. 4.2.3 and/or 4.3.3 'Setting values for commissioning'. **WARNING** During setting, there may be no water in the containers (grease separator and lifting plant).
- Fill the grease separator with freshwater up to the static water level (pipe bottom, outlet socket):
 - All extension stages: Via the inlet line or a maintenance opening.
 - Alternative for extension stages -OB, -OD (optional): via the manual ball valve of the freshwater filling device.
 - Alternative for extension stages -OA, -OAP: Activate fresh water supply ,  chap. 4.3.1 'operating elements and displays' (Field **1**).
The water level rises automatically up to the lowered level of the container.
- Close maintenance openings.
- Open the penstocks in the inlet and pressure line.
- Test the system and all pipe connections for leaks.
- For version with disposal and cleaning equipment: Carry out a test run,  chap. 4.5.6 'LipuSmart-P-OAP' and/or chap. 4.5.7 'LipuSmart-P-OAP with remote control'.
- Test run lifting plant,  chap. 4.6 'Test run lifting plant'.

4.2 Control lifting plant (LipuSmart-P-OB/-OD)

4.2.1 Operating elements and displays

Presentation of the control,  page 2 **C**.

Field	LED displays / symbols and meanings	
1	High water level alarm	LED lights up: The water level in the tank has reached the “High water level alarm” level
	Malfunction	LED lights up: Group alarm, e.g. when the power consumption is too high, wrong rotating field error...
	 Operation After-running	LED lights up: Pump(s) in operation LED flashes: Pump(s) in operation via the stop delay function
	 Automatic Manual drive	LED lights up: Automatic mode is active LED flashes regularly: Manual operation is active LED flashes irregularly: Manual operation was switched off automatically after 2 minutes
2	 Display	Activate the rotary switch ‘display’ to select menu items
	 Selection acknowledge	Confirm the setting (menu): Acknowledge the malfunction by pressing the ‘Select acknowledge’ button briefly: Keep „Select acknowledge“ button pressed for approx. 2 seconds
3	 HAND	Activate manual operation for pump P1 and pump P2 independent of the dynamic pressure measurement: Press the ‘MANUAL’ button briefly Manual operation is switched off automatically after 2 minutes
	 0	Deactivate manual and/or automatic operation for pump P1 and pump P2 independent of the dynamic pressure measurement: Press the ‘0’ button briefly
	 AUTO	Activate automatic mode for pump P1 and P2: Press the ‘AUTO’ button briefly

4.2.2 Settings in the menu

Settings in several menu items can only be made in Service mode and should be agreed with ACO Service.

If no entry is made within 20 seconds the display automatically switches back to the basic setting. Run time and pump cycles can be displayed but not changed.

- Select the menu items (top line): Activate the rotary switch 'display'.
- Change settings (bottom line):
 - Press the "Acknowledge selection" button briefly. The most recently saved setting begins to flash.
 - Turn the 'display' rotary switch (turn fast for a general setting, turn slowly for fine setting).
- Confirm setting: Press the "Acknowledge selection" button briefly.

Explanation of the menu items

Menu items (top line)	Settings (bottom line)	Explanation
Baseload ON	0 – 200 cm	Activation point for first pump 1
Baseload OFF	0 – 200 cm	Switch-off point for first pump 1
Peak load ON	0 – 200 cm	Activation point for additional pump
Peak load OFF	0 – 200 cm	Switch-off point for additional pump
High water level	0 – 200 cm	High water level alarm if exceeded
Run. Time max.	0 – 60 min	Value '0' deactivates the function. If the pump is operated without interruption, the system shuts down automatically after the set stop delay. The pump does not start up again until the defect has been acknowledged.
Run time altern.	deactivated 1 – 60 min	The pump changeover is after the set time in the basic load mode. After three changes without interruption the High water level alarm is also triggered and the 'Running time altern.' message appears in the display.
Delay	0 – 900 s	After a mains failure (staggered start) the pumps do not start until the set time has expired. The remaining time is shown in the display.

LipuSmart-P Operation

Menu items (top line)	Settings (bottom line)	Explanation
Stop delay	0 – 180 s	Stop delay period of the pump after the switch-off point.
Max. current – 1	0,3 – 12,0 A	Pump P1 is deactivated automatically if the power consumption is exceeded. The message 'Excess current' appears in the display field. The pump is not released again until the 'Acknowledge' button is pressed.
Max. current – 2	0,3 – 12,0 A	Pump P1 is deactivated automatically if the power consumption is exceeded. The message 'Excess current' appears in the display field. The pump is not released again until the 'Acknowledge' button is pressed.
Test Pump run 24h	deactivated 1 – 10 s	Duration of the automatic activation of the pumps of the pumps have not been operated for more than 24 hours.
Acoustic alarm	deactivated activated	Activated: In the event of a malfunction an alarm sounds.
Interm. Alarm	deactivated activated	Activated: Malfunction reinstall is clocked.
Pump changeover	deactivated activated	Activated: Pump changeover after each restart.
Thermal overlad P1	deactivated activated	Deactivated: No bimetal contact (alarm contact) is connected to terminal 31,32 (pump 1).
Thermal overlad P2	deactivated activated	Deactivated: No bimetal contact (alarm contact) is connected to terminal 38,39 (pump 2).
Rotating field error	deactivated activated	Activated: In the event of incorrect phase sequence or the lack of L2 or L3, a group alarm is triggered and the pumps cannot be started up.
ATEX mode	deactivated activated	Activated: If the level sensing does not determine any liquid, the pumps cannot be started. This applies to the manual function, and to 24h operation and the telecontrol systems.
Service mode	deactivated activated	Activated: All settings can be changed. Deactivated: Settings are shown, but cannot be changed.

Menu items (top line)	Settings (bottom line)	Explanation
Level control	Internal converter float switch 4 – 20 mA Interface	Internal converter: Level sensing via pneumatic pressure or air bubble injection Float switch: Level sensing via float switch 4 – 20 mA interface: Level sensing via external sensor (4 – 20 mA)
Range Pres Sensor	0 – 1.000 cm	The measurement range of the external level probe can be set.
Language	German, English ...	Selection of the language for the menu.

4.2.3 Set values for launch

All menu items are already pre-set on delivery. The values and/or settings must be checked and adjusted if necessary during launch, and entered by hand in the following table.


















Menu items	Unit	Setting values		
		Ex-works NS 2 – 4	NS 5,5 – 10	on launch NS ...
Baseload ON	cm	84	100	
Baseload OFF	cm	10	10	
Peak load ON	cm	92	114	
Peak load OFF	cm	86	102	
High water level	cm	96	118	
Run. Time max.	min	0		
Run. Time altern.	min	5		
Delay	s	0		
Stop delay	s	2 *		
Max. current – 1	A	3.5 (at 1.5 kW) and/or 7.5 (at 4.0 kW)		
Max. current – 2	A			
Test Pump run 24h	s	Activated		
Acoustic alarm	–	Activated		
Interm. Alarm	–	deaktiviert		
Pump changeover	–	Activated		
Thermal overlad P1	–	deactivated		
Thermal overlad P2	–	deactivated		
Rotating field error	–	Activated		
ATEX mode	–	deactivated		
Service mode	–	deactivated		
Level control	–	4 – 20 mA interface		
Range Pres Sensor	cm	250		
Language	–	German		

* Adapted during commissioning

4.3 Overall system control (LipuSmart-P-OA/-OAP)

4.3.1 Operating elements and displays

Presentation of the control,  page 2 **B**.

Field	LED displays / symbols and meanings			
1	 Activate manually	 P1 (HP pump Inner cleaning)	 P2 (Disposal pump)	 Fresh water supply
	 Switch off automatic mode			
	 Switch on automatic mode			
2	 P1 (HP pump Inner cleaning)	LED  shines: Malfunction	LED  flashes: Stop delay period Shines: in operation	LED  Flashes: in operation shines: Automatic mode is active
	 P2 (Disposal pump)			
3	 Activate manual operation for pump P1 and pump P2 independent of the dynamic pressure measurement: Press the 'manual' button briefly Manual mode is shut off automatically after 2 minutes			
	 Deactivate manual and/or automatic operation for pump P1 and pump P2 independent of the dynamic pressure measurement: Press the 'off' button briefly			
	 Activate automatic mode for pump P1 and P2: Press the 'auto' button briefly			
4	 LED lights up: Malfunction, pump(s) not in operation			
	 LED lights up: Pump(s) in operation LED flashes: Pump(s) in operation via the stop delay function			
	 LED lights up: Automatic mode is active LED flashes regularly: Manual operation is active LED flashes irregularly: Manual operation was switched off automatically after 2 minutes			

EN





Field	LED displays / symbols and meanings				
5		Call up the menu structure grease separator: Press left button			
		Call up the menu structure lifting plant: Press right button			
		Call up the menu structure (main menu) system: Press both buttons at the same time			
6		Programme (disposal/cleaning programme) start: Turn key-operated switch into position and hold for approx. 1 second			
		Programme (disposal/cleaning programme) stop: Turn key-operated switch into position and hold for approx. 3 seconds			
7	LED displays: Process steps (depending on the extension stage)				
	manual				
	Refil time	Prog. start	Cleaning	Disposal	Prog. end
8		LED lights up: High water level alarm in the grease separator			
		LED lights up: Heating rod (optional), filling level achieved			
		LED flashes: Fresh water supply in operation LED lights up: Automatic mode is active			
9		Activate the rotary switch 'menu' to select menu items			
		Confirm the setting (menu): Acknowledge the malfunction by pressing the 'reset/enter' button briefly: Keep "reset/enter" button pressed for approx. 2 seconds			
10		LED lights up: Liquid level in the lifting plant is too high			
11		LED lights up: Group alarm, e.g. when the power consumption is too high, ...			
		LED flashes: Bluetooth, GSM and/or Modbus ready LED lights up: Bluetooth, GSM and/or Modbus connected			

4.3.2 Settings in the menu

Settings in several menu items can only be made in Service mode and should be agreed with ACO Service. The menu items in the main menu, grease separator menu, lifting plant menu are shown in sequence, always starting with number 1 (start menu).

If no entry is made within 20 seconds the display automatically switches back to the basic setting.



Run time and pump cycles can be displayed but not changed.

- Select menu items (1st and 2nd line): Activate the rotary switch .
- Change setting (3rd +4th line):
 - Press  button briefly. The most recently saved setting begins to flash.
 - Turn the rotary switch  (turn fast for a general setting, turn slowly for fine setting).
- Confirm setting: Press  button briefly.

Explanation of the display

Displays					
No.	1. Line	2. Line	3. Line	4. Line	
Main menu	1	Type after selection	Level *	AHA: xx cm	FA: xx cm
	2	Lifting plant	Pump cycles	P1: xx	P2: xx
	3	Lifting plant	Run time	P1: xx h	P2: xx h
	4	Grease separator	Run time	P1: xx h	P2: xx h
	5	Grease separator	Run time	MV: xx s	
	6	Main menu	Last faults	xx (5 malfunctions)	
	7	Main menu	interm. Alarm	deactivated	
	8	Main menu	rot. Field error	Activated	
	9	Main menu	Acoustic alarm	Activated	
	10	Main menu	Display dim.	Activated	
	11	Main menu	Range Pres Sensor	xx cm	
	12	Main menu	Service Mode	Activated	
	13	Main menu	Language	German	
	14	Grease separator	Maintenance is now	due	
	15	Lifting plant	Maintenance is now	due	

* Current water level in the grease separator and lifting plant

		Displays				
		No.	1. Line	2. Line	3. Line	4. Line
Grease separator menu	1	Type after selection	Level *	AHA: xx cm	FA: xx cm	
	2	Grease separator	Pre-cleaning	xx min		
	3	Grease separator	After-cleaning	xx min		
	4	Grease separator	Normal level	xx cm		
	5	Grease separator	Lower level	xx cm		
	6	Grease separator	Empty level	xx cm		
	7	Grease separator	High water level	xx cm		
	8	Grease separator	Stop delay period	xx s		
	9	Grease separator	TrapSV open time	xx s		
	10	Grease separator	Max. current P1	xx A		
	11	Grease separator	Max. current P2	xx A		
	12	Grease separator	Inspection every	xx days		
	13	Back to	Main menu			
Lifting plant menu	1	Type after selection	Level *	AHA: xx cm	FA: xx cm	
	2	Lifting plant	Baseload ON	xx cm		
	3	Lifting plant	Baseload OFF	xx cm		
	4	Lifting plant	Peak load ON	xx cm		
	5	Lifting plant	Peak load OFF	xx cm		
	6	Lifting plant	High water level	xx cm		
	7	Lifting plant	Run time altern.	xx min		
	8	Lifting plant	Run. Time max.	xx min		
	9	Lifting plant	Stop delay period	xx s		
	10	Lifting plant	Max. current P1	xx A		
	11	Lifting plant	Max. current P2	xx A		
	12	Lifting plant	Inspection every	xx days		
	13	Lifting plant	24 h Test pump run	is activated		
	14	Lifting plant	Pump changeover	is activated		
	15	Back to	Main menu			
* Current water level in the grease separator and lifting plant						

Explanation of the menu items

	Menu items (2nd line)	Settings (3rd +4th line)	Explanation
Main menu	Level	0 – 200 cm	Current water level in the grease separator and/or lifting plant (depending on selection)
	Pump cycles	0 – 99999	Lifting plant: Pump cycles Pump P1 (line 3) and/or P2 (line 4)
	Run time	0 – 99999 min	Lifting plant: Run time Pump P1 (line 3) and/or P2 (line 4)
	Run Time	0 – 99999 min	Grease separator: Run time HP pump P1 (line 3) and/or disposal pump P2 (line 4)
	Run time	0 – 99999 min	Grease separator: Run time opening time of the solenoid valve of the filling device (line 3)
	Last faults		Display last 5 faults
	Interm. Alarm	deactivated activated	Overall system Activated: Malfunction reinstall is clocked.
	Rot. Field error	deactivated activated	Overall system Activated: An alarm sounds in case of incorrect phase sequence or lack of a phase (L1, L2 L3).
	Acoustic alarm	deactivated activated	Overall system Activated: in the event of a malfunction an alarm sounds.
	Display dim.	deactivated activated	If no entry is made within 20 seconds the display light goes off automatically
	Range Pres Sensor	0 – 300 cm	Overall system: The measurement range of the external level probe can be set.
	Service Mode	activated deactivated	Overall system Activated: All settings can be changed. Deactivated: Settings are shown, but cannot be changed.

EN

	Menu items (2nd line)	Settings (3rd +4th line)	Explanation
Main menu	Language	German English ...	Selection of the language for the menu.
	Maintenance is now	0, 180 or 365 days	Grease separator: Specified maintenance intervals
	Maintenance is now	0, 90, 180 or 365 days	Lifting plant:: Specified maintenance intervals
Grease separator menu	Level	0 – 200 cm	Current water level in the grease separator
	Pre-cleaning	1 – 60 min	Duration of the pre-cleaning. After the programme has started, the water level is lowered to the 'lower level'. Then the pre-cleaning phase starts, hardened grease layers are crushed
	After-cleaning	1 – 60 min	Duration of the after-cleaning cleaning The after-cleaning cleaning starts after the pre-cleaning. During the after-cleaning cleaning phase, the container is cleaned thoroughly and the water level is lowered to the set zero-point of the 'Empty level'.
	Normal level	0 – 200 cm	Water level, outlet pipe gully.
	Lower level	0 – 200 cm	Water level, at which the "pre-cleaning" starts.
	Empty level	0 – 200 cm	Water level, which is defined as "empty" for the "Empty level".
	High water level	0 – 200 cm	Water level, at which an alarm is triggered.
	Stop delay period	0 – 180 s	Specification of the time during which the disposal pump continues to run, after the water level has reached the "Empty level" level.
TrapSV open time	0 – 60 s	Period during which the solenoid valve opens automatically 2 x per day and the odour seal (fresh water filling device) is equipped with a water trap.	

	Menu items (2nd line)	Settings (3rd +4th line)	Explanation
Grease separator menu	Max. current P1	0 – 12 A	Maximum power consumption for the inner cleaning HP pump. Automatic switching off of the inner cleaning HP pump if the set power consumption is exceeded.
	Max. current P2	0 – 12 A	Maximum power consumption for the disposal pump. Automatic switching off of the disposal pump if the set power consumption is exceeded.
	Inspection every	0, 180 or 365 days	Specified maintenance intervals
Lifting plant menu	Level	0 – 200 cm	Current water level in the lifting plant
	Baseload ON	0 – 200 cm	Activation point for first pump 1
	Baseload OFF	0 – 200 cm	Switch-off point for first pump 1
	Peak load ON	0 – 200 cm	Activation point for additional pump
	Peak load OFF	0 – 200 cm	Switch-off point for additional pump
	High water level	0 – 200 cm	High water level alarm if exceeded
	Run time altern.	deactivated 1 – 60 min	The pump changeover is after the set time in the basic load mode. After three changes without interruption the High water level alarm is also triggered and the 'Stop delay' message appears in the display.
	Run. Time max.	0 – 60 min	Value '0' deactivates the function. If the pump is operated without interruption, the system shuts down automatically after the set Stop delay. The pump does not start up again until the defect has been acknowledged.
Stop delay	0 – 60 s	Stop delay period of the pump after the switch-off point.	

LipuSmart-P Operation

	Menu items (2nd line)	Settings (3rd +4th line)	Explanation
Lifting plant menu	Max. current – 1	0.3 – 12.0 A	Pump P1 is deactivated automatically if the power consumption is exceeded. The message 'Excess current' appears in the display field. The pump is not released again until the 'Acknowledge' button is pressed.
	Max. current – 2	0.3 – 12.0 A	Pump P2 is deactivated automatically if the power consumption is exceeded. The message 'Excess current' appears in the display field. The pump is not released again until the 'Acknowledge' button is pressed.
	Inspection every	0. 90, 180 or 365 days	Specified maintenance intervals
	Test Pump run 24h	deactivated activated	Duration of the automatic activation of the pumps of the pumps have not been operated for more than 24 hours.
	Pump changeover	deactivated activated	Activated: Pump change after each restart.

4.3.3 Set values for launch

All menu items are already pre-set on delivery. The values and/or settings must be checked and adjusted if necessary during launch, and entered by hand in the following table.

	Menu items	Unit	Setting values		on launch NS ...
			ex-works NS 2 – 4	NS 5,5 – 10	
Main menu	Interm. Alarm	–	deactivated		
	Rotating field error	–	activated		
	Acoustic alarm	–	activated		
	Display dim.	–	activated		
	Range Pres Sensor	cm	250		
	Service Mode	–	activated		
	Language	–	German		
	Maintenance is now	d	365 (grease separator)		
	Maintenance is now	d	90 (lifting plant)		
Grease separator menu	Pre-cleaning	min	4	9	
	After-cleaning	min	6	11	
	Normal level	cm	85	105	
	Lower level	cm	60	80	
	Empty level	cm	5		
	High water level	cm	115	135	
	Stop delay	s	10		
	TrapSV open time	s	5		
	Max. current P1	A	7.5		
	Max. current P2	A	7.5		
	Inspection every	d	365		




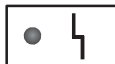


EN

LipuSmart-P Operation

	Menu items	Unit	Setting values		
			ex-works		on launch
			NS 2 – 4	NS 5,5 – 10	NS ...
Lifting plant menu	Baseload ON	cm	84	100	
	Baseload OFF	cm	10	10	
	Peak load ON	cm	92	114	
	Peak load OFF	cm	86	102	
	High water level	cm	96	118	
	Run time altern.	min	5		
	Run. Time max.	min	0		
	Stop delay	s	2 *		
	Max. current – 1	A	3.5 (at 1.5 kW) and/or 7.5 (at 4.0 kW)		
	Max. current – 2	A			
	Inspection every	d	90		
	Test Pump run 24h	–	activated		
	Pump changeover	–	activated		
	* Adapted during commissioning				


4.4 Remote control grease separator

Presentation of the remote control,  page 2 **D**.

Field	Symbols and meanings
1	Process steps:  LED lights up: Disposal / cleaning programme running
	 Suction pump (suction vehicle): LED ON flashes: Signal for switching on the suction pump LED OFF shines: Signal for switching off the suction pump
	 LED lights up: Disposal/cleaning programme is finished, disconnect the suction hose (suction vehicle) from the disposal line
2	Emergency stop button
3	 LED lights up: There is a malfunction
4	 Programme (disposal/cleaning programme) start: Turn key-operated switch into position and hold for approx. 1 second
	 Programme (disposal/cleaning programme) stop: Turn key-operated switch into position and hold for approx. 3 seconds

EN

4.5 draining and cleaning grease separators

Grease separators must be drained and cleaned at least once a month by properly qualified personnel,  Chap. 1.5 „Personnel qualifications”. More frequently depending on the wastewater composition.



Enter the date and address of the disposal contractor in the operating log.

With the optional ACO „Multi Control” grease thickness measuring device the date and data of the grease thickness profile is stored on an integrated SD card.

Numbers in brackets “()”, see diagram of the system (example LipuSmart-P-OAP),

 page 2 **A**.

4.5.1 Checks

- Define further disposal intervals. The storage capacity of the sludge trap (half sludge trap volume) and the grease separator (volume of the grease collection chamber) must not be exceeded.
- In the case of grease separators with sludge and grease extraction equipment or with disposal and rinsing device: Carry out the cleaning and functional check, if applicable, check for the free outlet of the filling equipment to EN 1717.
- Check maintenance opening(s), especially the condition and the leakproofness of the seal(s).
- Clean the sampling equipment (in lifting plant).


4.5.2 LipuSmart-P-OB

- Interrupt the wastewater inlet (1) or set catering establishment.
- By hand, open the maintenance opening (3) and insert the suction hose (suction vehicle).
- Switch on the suction pump until the quantity in the container has dropped by approx. $\frac{1}{4}$.
- Crush the hardened grease layers in the container.
- Switch on suction pump (suction vehicle) and clean the container.
- Switch on suction pump (suction vehicle) and pump out polluted cleaning water.
- Switch off suction pump (suction vehicle) and remove the suction hose from the inspection opening (3).
- Fill at least $\frac{2}{3}$ of the tank capacity with fresh water.
- Close the maintenance opening (3) and connect the wastewater supply (1) or start catering establishment.

4.5.3 LipuSmart-P-OD

- Interrupt the wastewater inlet (1) or set catering establishment.
- Connect the suction hose (suction vehicle) to the disposal line (4).
- Switch on the suction pump until the quantity in the container has dropped by approx. $\frac{1}{4}$.
- By Hand, open the maintenance opening (3) and crush the hardened grease layers in the container.
- Switch on suction pump (suction vehicle) and clean the container.
- Switch on suction pump (suction vehicle) and pump out polluted cleaning water.
- Switch off suction pump (suction vehicle) and remove the suction hose from the disposal line (4).
- Fill at least $\frac{2}{3}$ of the tank capacity with fresh water.
- Close the maintenance opening (3) and connect the wastewater supply (1) or start catering establishment.

4.5.4 LipuSmart-P-OA

- Interrupt the wastewater inlet (1) or set catering establishment.
- Connect the suction hose (suction vehicle) to the disposal line (4). Do not switch on suction pump yet.
- Turn key-operated switch (control unit) into position  and hold for approx. 1 second.


LED  lights up: Disposal / cleaning programme starts.


- Every time, if LED  flashes:
Switch on suction pump (suction vehicle) until LED no longer flashes.

LED  lights up: Disposal / cleaning programme is finished.

- Disconnect the suction hose (suction vehicle) to the disposal line (4).
- Switch on wastewater supply (1) or start catering establishment.


4.5.5 LipuSmart-P-OA with remote control

- Interrupt the wastewater inlet (1) or set catering establishment.
- Connect the suction hose (suction vehicle) to the disposal line (4). Do not switch on suction pump yet.
- Turn key-operated switch (remote control) into position  and hold for approx. 1 second.

LED  lights up: Disposal / cleaning programme starts.

LipuSmart-P

Operation


→ Every time, if LED "ON"  flashes:
Switch on suction pump (suction vehicle).

→ LED "OFF"  shines:
Switch off suction pump (suction vehicle).

LED  lights up: Disposal / cleaning programme is finished.


- Disconnect the suction hose (suction vehicle) to the disposal line (4).
- Connect wastewater supply (1) or start catering establishment, once the filling process has been completed.

4.5.6 LipuSmart-P-OAP

- Interrupt the wastewater inlet (1) or set catering establishment.
- Connect the suction hose (suction vehicle) to the disposal line (4). Do not switch on suction pump yet.
- Turn key-operated switch (control unit) into position  and hold for approx. 1 second.


LED  lights up: Disposal / cleaning programme starts.

→ Every time, if LED  flashes: Switch on suction pump (suction vehicle) until LED no longer flashes.


LED  lights up: Disposal / cleaning programme is finished.

- Disconnect the suction hose (suction vehicle) to the disposal line (4).
- Connect wastewater supply (1) or start catering establishment, once the filling process has been completed.

4.5.7 LipuSmart-P-OAP with remote control

- Interrupt the wastewater inlet (1) or set catering establishment.
- Connect the suction hose (suction vehicle) to the disposal line (4). Do not switch on suction pump yet.
- Turn key-operated switch (remote control) into position  and hold for approx. 1 second.

LED  lights up: Disposal / cleaning programme starts.

→ Every time, if LED “ON”  flashes:
Switch on suction pump (suction vehicle).

→ LED OFF”  shines:
Switch off suction pump (suction vehicle).

LED  lights up: Disposal / cleaning programme is finished.

- Disconnect the suction hose (suction vehicle) to the disposal line (4).
- Connect wastewater supply (1) or start catering establishment, once the filling process has been completed.

4.6 Test run lifting plant

Requirements:

- Shut-off valve in the pressure line (if there is one) is open.
- The control is connected to the power supply.

During the trial run, pay attention to the following:

- Perform the trial run at least twice during launch.
- Test run with drinking water.
- Avoid dry running during the trial run.
- Observe the signals/messages in the display panel of the control.

WARNING If there are knocking noises/vibrations in the pressure line when the pump is switched off, the stop delay period must be increased in 2 second steps until these no longer occur.

The lifting plant can be filled via the inlet line or via the inspection opening.

Start automatic mode:

- Press ^{AUTO} both  buttons to start automatic operation of pump 1 and 2.

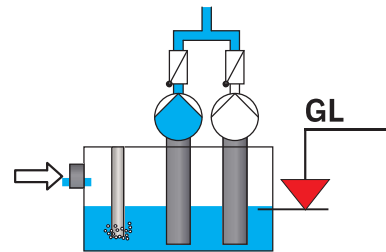
LipuSmart-P

Operation

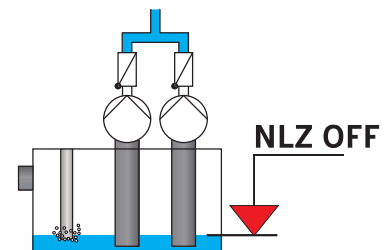
→ Fill tank.

When the water level reaches the “Baseload” (GL) level, pump 1 switches on.

→ Interrupt the inlet.



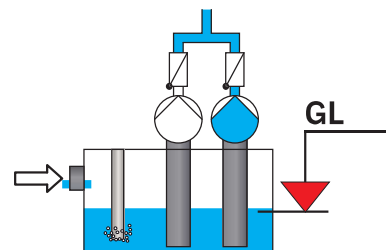
If the water level reaches the ‘Baseload OFF’ level, the water level is lowered to the level ‘Stop delay period OFF’ (NLZ AUS) by the stop delay period. Then pump 1 switches off.



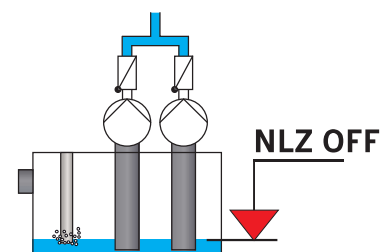
→ Fill tank.

When the water level reaches the “Baseload” (GL) level, pump 2 switches on.

→ Interrupt the inlet.



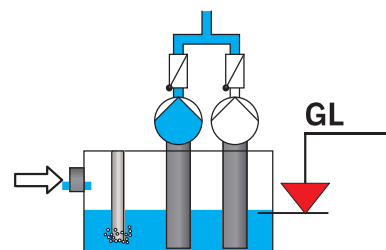
If the water level reaches the ‘Baseload OFF’ level, the water level is lowered to the level ‘Stop delay period OFF’ (NLZ AUS) by the stop delay period. Then pump 2 switches off.



→ Fill tank.

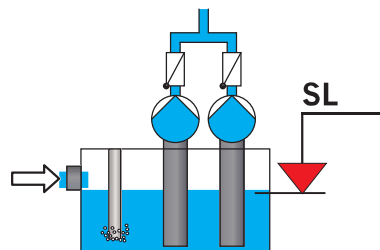
When the water level reaches the “Baseload” (GL) level, pump 1 switches on.

→ Increase the inlet flow so that the water level continues to rise.

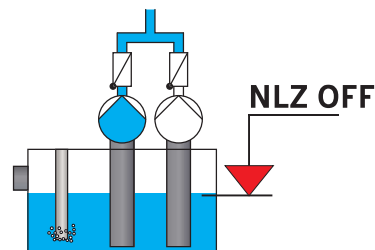


When the water level reaches the “Peak load” (SL) level, pump 2 also switches on.

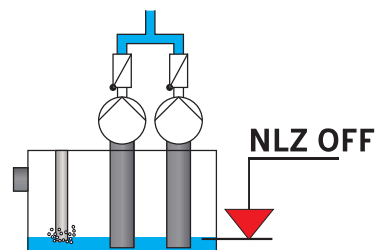
→ Interrupt the inlet.




When the water level reaches the “Peak load OFF” (SL OFF) level, pump 2 switches off.



If the water level reaches the ‘Baseload OFF’ level, the water level is lowered to the level ‘Stop delay period OFF’ (NLZ AUS) by the stop delay period. Then pump 1 switches off.



Ending automatic mode:

→ Press ⁰ both  buttons to end automatic operation of pump 1 and 2.

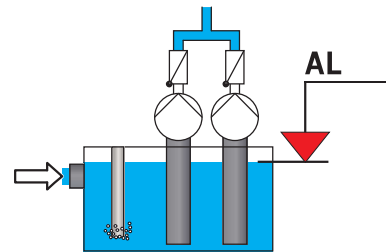
LipuSmart-P

Operation

→ Fill the collection tank.

If the water level reaches the 'high water level alarm' level (AL), an alarm will sound and a fault message will appear in the display field and the LED ● for 'High water level' shines.

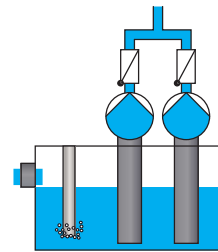
→ Interrupt supply.




Start automatic mode:

→ Press both buttons **AUTO** and/or  to start the automatic mode of pump 1 and 2.

Both pumps switch on. Water level 'AL' is undercut.





Acknowledge malfunction:

→ Press button **Auswahl** **Quittung** and/or  for approx. 2 seconds to acknowledge the fault. The fault is no longer shown and the LED for 'High water level' goes off.

The test run is over.

5 Regular testing and maintenance

ACO recommends that you take out a maintenance contract. This ensures professional and on-schedule completion of the maintenance work by ACO product specialists,  chap. 1.1. “ACO Service”.

Required qualifications for testing, inspection and maintenance,  Chap. 1.5 “Personnel qualifications”.

Enter the tests, inspections, maintenance work and test results in the operating log:

- Inspections by the operator company
- Probenahmen
- Measurement: Water consumption, sludge layer and grease layer thickness, pH value, temperature
- Maintenance and general inspections
- Disposal (draining and cleaning)

IMPORTANT If defects are found during the tests or inspections, the system must not be put back into service until these defects have been corrected.

5.1 Daily checks

Checks by the operator company:

- Check system for external damage.
- Remove any impurities in the coarse trap of the inlet line.

5.2 Weekly checks

Checks by the operator company:

- Check the system, connections, mechanical and electrical components for external damage.
- Testing of the sludge volume in the integrated sludge trap and the grease layer thickness in the grease collection area of the grease separator.
- Remove the coarse floating matter on the surface of the water in the grease separator.
- For systems with filling device: Check the water trap in the odour seal.


5.3 Three-monthly maintenance of the lifting plant

Tests and/or inspections (following prior draining and cleaning) by a competent person (if operated in private areas = every 6 months):

- Check that the shut-off valve moves smoothly and does not leak, if necessary reset and grease.
- Check the function of the dual backflow preventer: open and clean, check the position of the balls and seal.
- Clean the inside of the container.
- Test the function of the pumps.
- Check the wear of the pump parts.
- Connecting hose between the pneumatics box and pneumatic pipe of the dynamic pressure measurement: Check hose for blank value measurement is free, blow through if necessary.
- Check the pneumatic pipe of the pneumatic pressure measurement (= air bubble injection pipe), especially where the pipe joins the tank, for pollution and cross-section reductions, clean if necessary.
- Test the function of the mini compressor: The mini compressor is installed in a box on the pneumatic pipe or the grease separator. There may be pump malfunctions, if the air bubble injection is impaired.
- Check the function of the pressure sensor on the pneumatic pipe: The switching points of the pressure switch are factory-made and can be adjusted.

5.4 Annual maintenance of the system

Tests & inspections (after prior draining and cleaning) by a properly qualified person:

- Test the function of the disposal pump.
- Remove the filter screen in the suction socket of the HP pump and clean.
- Check the function of the HP pump and the high-pressure cleaning head.
- Check oil level of the HP pump,  Chap. 4.1 “Commissioning”.
- Connecting hose between the pneumatics box and pneumatic pipe of the dynamic pressure measurement: Check hose for blank value measurement is free, blow through if necessary.
- Check the pneumatic pipe of the pneumatic pressure measurement (= air bubble injection pipe), especially where the pipe joins the container, for pollution and cross-section reductions, clean if necessary.
- Test the function of the mini compressor: The mini compressor is installed in a box on the pneumatic pipe. Pump malfunctions can occur, if the air bubble injection is impaired.
- Check the function of the pressure sensor on the pneumatic pipe: The switching points of the pressure switch are factory-made and can be adjusted.


- Check the inspection window: In case of leaks, re-tighten the outer threaded screws. If liquid escapes the unit must be replaced.
- Check the inside wall surfaces of the grease separator and the lifting plant.
- Test the function of the electrical component installations, e.g. disposal pump, pumps of the lifting plant.
- Test the function of the suction device and free outlet of the freshwater filling device according to EN 1717. Clean the outlet of the drinking water filling device.
- Check the condition and function of the dual backflow protection device.
- Check maintenance opening(s), especially the condition and the leakproofness of the seal(s).


5.5 5-year general inspection of the grease separator


Tests and/or inspections (following prior draining and cleaning) by a properly qualified technician before launch and then every 5 years at the latest:


- Check the dimensioning of the grease separator.
- Check the structural condition and leak tightness of the grease separator according to DIN 4040-100.
- Check the condition of the internal wall surfaces, built-in parts and electrical equipment.
- Check for proper execution of the vent stack of the grease separator as a vent stack above the roof according to EN 1825-2.
- Check the completeness and plausibility of the entries in the operating log, e.g. verifications of proper disposal, substances removed, sampling.
- Check that all the required permits and documents are complete, e.g. approvals, drainage plans, instructions for operation and maintenance.

6 Troubleshooting

Display malfunctions (control system),  chap. 4.2.1 and 4.3.1 “Operating elements and displays”.



For safe and trouble-free operation, only original spare parts from ACO are allowed,  chap. 1.1. “ACO Service”.

For repairs and spare part orders: State the serial number and article number,  Chap. 2.4 “Product identification (type plate)”.

Numbers in brackets “()”, see diagram of the system (example LipuSmart-P-OAP),  page 2 **A**.


The list does not claim to be complete.

6.1 Malfunctions on the grease separator


Malfunction	Cause(s)	Remedy
Odour nuisance in normal operation	Odour seal without water trap	By hand, open the ball valve in the connection line. For operation with control (29): Set “TrapSV open time in the menu,  chap. 4.3.2
	Seals of the maintenance openings (3) damaged	Replace seals
	Control (29) without power supply	Restore power supply (electrician)
	Emergency Stop button (control or remote control) pressed	Unlock emergency stop button
	No drinking water supply (on site)	Restore drinking water supply (on site)
High water level alarm (water level above the ‘High water level’ level)	Backflow from the lifting plant	Check and/or open by hand the penstock in the pressure line
	High water level level incorrectly set	Set ‘High water level’ in the menu,  chap. 4.3.2
	Pump (16) of the lifting plant damaged	Check the pump (16) in the lifting plant and replace if necessary (ACO Service)

Malfunction	Cause(s)	Remedy
P1 HP pump inner cleaning (31) does not generate pressure	HP pump (31) not switched on	Set the HP pump (31) on the rotary knob of the pump
	Power consumption too high (automatic shut-off)	Keep "reset/enter" button pressed for approx. 2 seconds If malfunction persists: Contact ACO Service
	Emergency Stop button (control or remote control) pressed	Unlock emergency stop button
	Pressure drop (> 15 seconds) in the inlet line of the HP pump (31) (automatic shut-off)	By hand, open the ball valve in the inlet line of the filling device Clean filter in the inlet line Check the solenoid valve (11) Clean filter in the inlet line
	HP monitor is defective	Replace HP monitor
	Control (29) without power supply	Restore power supply (electrician)
	Automatic mode not switched on	Switch on automatic mode
	HP pump (31) runs without a load	Check the connections to power supply Replace the HP pump (31)
P1 HP pump inner cleaning (31) does not generate enough pressure	Filter in the inlet line of the HP pump (31) is obstructed	Clean filter in the inlet line
high-pressure cleaning head (7) does not turn	High-pressure cleaning head (7) polluted	Clean the high-pressure cleaning head
	Power supply interrupted	Restore power supply (electrician)
	High-pressure cleaning head (7) defective	Replace the high-pressure cleaning head (7)
high-pressure cleaning head (7) without water outlet	Outlet nozzles in the high-pressure cleaning head (7) obstructed	Clean outlet nozzles
	High-pressure cleaning head (7) defective	Replace the high-pressure cleaning head (7)

LipuSmart-P Troubleshooting

Malfunction	Cause(s)	Remedy
Control (27 and/or 29)	Control without power supply	Restore power supply (electrician)
	Emergency Stop button (control or remote control) pressed	Unlock emergency stop button
	Programme error	Pull the power plug of the control unit out of the power socket and then plug in again after approx. 15 seconds
P2 Disposal pump (32) no function	Power consumption too high (automatic shut-off)	Keep "reset/enter" button pressed for approx. 2 seconds If malfunction persists: Contact ACO Service
	Emergency Stop button (control or remote control) pressed	Unlock emergency stop button
	Control (29) without power supply	Restore power supply (electrician)
	Automatic mode not switched on	Switch on automatic mode
P2 Disposal pump (32) does not pump	Incorrect rotational direction Phases L1, L2, L3 interchanged	Check rotational direction, if necessary turn 2 phases via phase changer in the plug (electrician)
	Suction opening in the grease separator is obstructed	Clean suction opening
P2 Disposal pump (32) does not switch off	Pressure sensor (5) incorrectly set and/or defective	Set 'Water levels' in the menu,  chap. 4.3.2 and/or replace the pressure sensor (5)
	Pneumatic pipe (26) is obstructed	Clean the pneumatic pipe (26)
	Mini compressor defective	Replace the mini compressor

6.2 Malfunctions on the lifting plant

Malfunction	Cause(s)	Remedy
Pump (16) no function	Power consumption too high (automatic shut-off)	Keep „reset/enter“ button pressed for approx. 2 seconds If malfunction persists: Contact ACO Service
	Control (27 and/or 29) without power supply	Restore power supply (electrician)
	Automatic mode not switched on	Switch on automatic mode
	Pump motor is defective	Pump (16) needs to be replaced (ACO Service)
	Pump (16) blocked by foreign bodies	Pump maintenance required (16) (ACO Service)
Pump (16) does not pump and/or pumps insufficiently, or the tank is full	Shut-off valve in the pressure line or on the suction side (18) is not completely open and/or closed	Shut-off valve in the pressure line or on the suction side (18) is completely open
	Incorrect rotational direction Phases L1, L2, L3 interchanged	Check rotational direction, if necessary turn 2 phases via phase changer in the plug (electrician)
	Pressure line is obstructed	Clean the pressure line
	Impeller (pump) is obstructed	Pump maintenance required (16) (ACO Service)
	Pump parts are worn	Pump (16) needs to be repaired (ACO Service)
Pump (16) only runs in manual mode	Pressure sensor (12) incorrectly set and/or defective	Set 'Water levels' in the menu,  chap. 4.2.2 and/or 4.3.2 and/or replace the pressure sensor (12)
	Pneumatic pipe (22) is obstructed	Clean the pneumatic pipe (22)
	Mini compressor defective	Replace the mini compressor
Knocking noises/ vibrations in the pressure line when switching off the pump(s)	Stop delay period of the pump(s) is too short	Increase the stop delay period of the pump(s)