

LipuLift-P/PF -B und -D



DE Gebrauchsanleitung EN Instruction for Use

3 in 1: Fettscheider, Probenahmestelle und Pumpstation in einem Behälter_ Erdeinbau /
3 in 1: Grease separator, sampling point and pumping station in one container_ underground installation



LipuLift-P-B

P = Werkstoff Polyethylen / Material polyethylene
B = Basisausführung / Basic version



LipuLift-P-D

P = Werkstoff Polyethylen / Material polyethylene
D = Direktabsaugung / Direct extraction



LipuLift-PF-B

P = Werkstoff Polyethylen / Material polyethylene
F = Flexible Einbautiefe / Flexible installation depth
B = Basisausführung / Basic version





LipuLift-PF-D

P = Werkstoff Polyethylen / Material polyethylene
F = Flexible Einbautiefe / Flexible installation depth
D = Direktabsaugung / Direct extraction



Verwendete Zeichen

Bestimmte Informationen sind in dieser Gebrauchsanleitung wie folgt gekennzeichnet:


-  Tipps und zusätzliche Informationen, die das Arbeiten erleichtern
- Aufzählungszeichen
- Auszuführende Handlungsschritte in vorgegebener Reihenfolge
-  Verweise zu weiterführenden Informationen in dieser Gebrauchsanleitung und anderen Dokumenten

Symbols used

Certain information in these instructions for use is marked as follows:

-  Tips and additional information to make the work easier
- Bullet points
- Actions to be carried out in a given order
-  References to further information in this user manual and other documents

Verweis

Informationen zum Einbau der Anlage,  Einbauanleitung „LipuLift-P/PF“

Reference

Information on the installation of the plant,  „LipuLift -P / PF“ installation instructions

DE	Deutsch	<i>Originalanleitung</i>	4
EN	English	<i>Translation of the original instructions</i>	90

DE

EN

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Introduction

ACO Tiefbau Vertrieb GmbH (hereinafter referred to as ACO) thanks you for your trust and hands over to you a product (hereinafter referred to as the plant) which is state-of-the-art and has been tested for proper condition as part of quality controls which were executed before delivery.


 Figures in these instructions are provided for basic understanding and may differ, depending on the product version and the installation situation.

ACO Service


Accessories, refer to "Product Catalogue":  <http://katalog.aco-haustechnik.de>
ACO Service is available for further information regarding the plant, ordering spare parts and services, e.g. expert training, maintenance contracts, general inspections.

ACO Service	Telephone: + 49 36965 819-444
Im Gewerbepark 11c	Fax: + 49 36965 819-367
36466 Dermbach	service@aco.com


Target group

The target group for these operating instructions is technically trained personnel.
The personnel must have the appropriate qualifications,  Chap. 1.4 "Personnel qualifications". Areas of responsibility, competence and monitoring of the personnel must be closely regulated by the operator. Any lack of knowledge in the personnel must be rectified through training and instruction by adequately trained skilled personnel. Training on the system shall be carried out only under the supervision of technical skilled personnel.

Guarantee

For information regarding the guarantee, refer to General Terms and Conditions of Business ("Allgemeine Geschäftsbedingungen"),
 <http://www.aco-haustechnik.de/agb>

Declaration of Performance (DoP)

"Declaration of Performance" (DoP) for the plant,
 <http://www.aco-haustechnik.de/DoP>

1 For your safety



Read the safety instructions before installing and operating the system, in order to prevent personal injuries and damage to property.

1.1 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, blockages and odour nuisance. Therefore, grease separators are mandatory in the industrial and trade sectors.


These include, for example:

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

Only wastewater which contains greases and oils of vegetable and animal origin may be discharged. Other possible uses and changes are not allowed.

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 form (e.g. deep-frying fat)
- The use of biologically active agents, e.g. products containing enzymes for converting the fatty substances or for so-called self-cleaning, is not permitted in the grease separator and the inlet pipes

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 additional information regarding suitable rinsing agents, refer to the technical information sheets (German/English) issued by the German Commercial Dishwasher Association („Arbeitsgemeinschaft Geschirrspülen, Hagen“):  www.vgg-online.de.

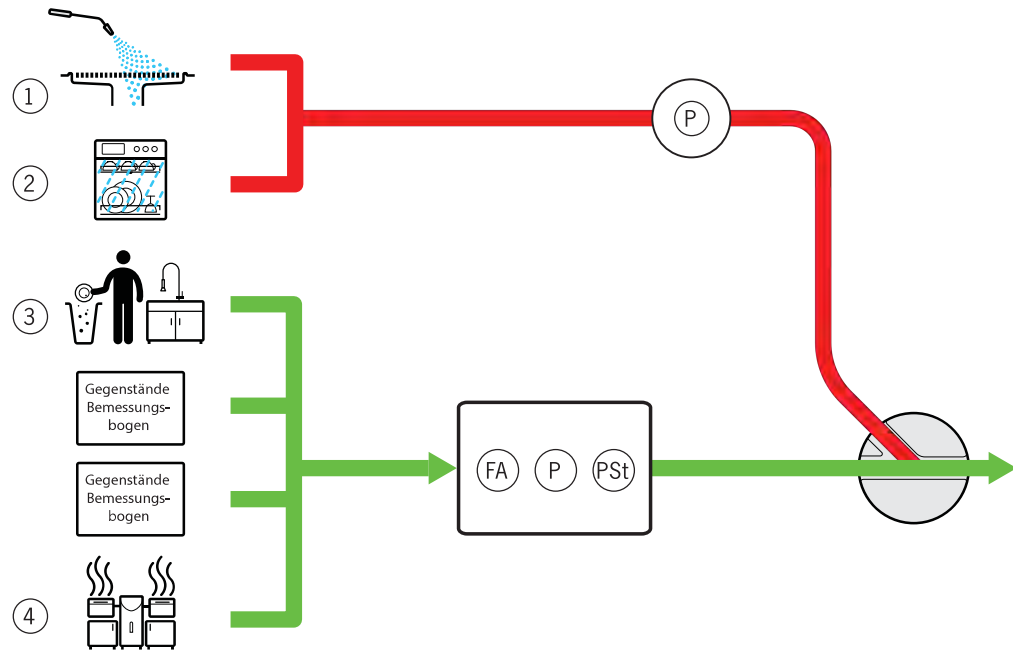
Entry into the plant

- The built-in fittings and components (e.g. submersible inlet pipe) are designed for operation as separators. They are not designed to be a step or foot board for people and storage e.g. heavy cleaning devices. The load capacity is not designed for such purposes.

The use of an access aid for accessing or entering the plant is anchored in the requirements of the employers' liability insurance association.

1.2 Planning drainage systems

Connecting sanitary drainage objects to grease separators



Some sanitary drainage objects generate wastewater with a high emulsified or finely dispersed content (e.g. high-pressure cleaning devices, ①, commercial dishwashers ②). If this is in accordance with the local authority statutes, it is recommended that these drainage objects are not routed through a grease separator (GS), as this would no longer fully guarantee the intended use of the separator.

Rinsing facilities where the return dishes are pre-cleaned must ③, be connected to the grease separator (GS) in addition to the other drainage items in accordance with the dimensioning sheet from DIN EN 1825. The same applies to combi steamers and multifunctional cooking appliances ④.

Sampling facilities (S) have to be installed in both pipelines, depending on local authority requirements.

Advanced wastewater treatment

Before installing more extensive wastewater treatment, the following should be checked:

- is a reduction of the emulsified components in the waste water required by local authorities?
- is the payment of the heavy polluter surcharges more uneconomical compared to system technology?
- does the respective sewage treatment plant have problems due to the limit value being exceeded?
- where exactly is the threshold value set by the public authority (sampling pot / transfer point sewer system etc.)?


1.3 Operational regulations

Installation and operation of grease separators and pump stations are subjected to municipal statutes. 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: Requirements for the utilisation of separator systems according to DIN EN 1825-1 and DIN EN 1825-2
- DIN EN 1825-1: Grease separators – Part 1: Principles for design, function and testing, identification marking and quality controlling and monitoring
- DIN EN 1825-2: Grease separators – Part 2: Selecting the nominal size, operation and maintenance
- DIN EN 1717: Protection of drinking water against contamination in drinking water installations and general requirements for safety devices for the prevention of drinking water contamination caused by backflow
- DIN 1986-100: Drainage systems for buildings and property – Part 100: Provisions in connection with DIN EN 752 and DIN EN 12056
- DIN EN 752: Drainage systems outside buildings
- DIN EN 12056 (Standards Series): Gravity drainage systems inside buildings

Examples from the listed standards:

- Sampling: When installing the grease separator, a device for sampling and inspection e.g. in the form of a shaft or 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, water for industrial use, treated wastewater from the grease separator), which conforms to the local discharge provisions.
- General inspection: Before commissioning the grease separation system, and then every 5 years at the latest, it must be completely drained and cleaned and then inspected by a properly qualified technician to ensure that it is in proper working order and operates properly.
- Operating log: The operator must maintain and keep an operating log for every grease separator and submit it to the local competent inspecting authority on request. Operating logs can be purchased from ACO Service,  Introduction Chap. „ACO Service“.

Pump station

- DIN EN 12050-2 “Wastewater lifting plants for building and land drainage – Part 2: Wastewater lifting plants for faecal-free wastewater”
- DIN EN 12050-4 “Wastewater lifting plants for building and land drainage – Part 4: Back flow preventer for faecal-free and faecal-containing wastewater”
- DIN EN 12056-1 “Gravity drainage systems inside buildings – Part 1: General points and design requirements”
- DIN EN 12056-4 „Gravity drainage systems inside buildings – Part 4: Wastewater lifting plants; design and dimensioning“
- DIN EN 12056-5 Gravity drainage systems inside buildings – Part 5: Wastewater lifting plant; Installation and testing, instructions for operation, maintenance and use’
- EN 752 “Drain and sewer systems outside buildings”
- DIN 1986-100: “Drainage systems for buildings and property – Part 100: Provisions in connection with DIN EN 752 and DIN EN 12056”

Examples from the listed standards:



- Backflow protection: Wastewater which is produced below the backflow level must be routed into the drainage system via an automatic wastewater lifting plant.
- Trial run: Execute at least 2 trial runs every month
- Maintenance: Wastewater lifting plants must be operated and maintained according to EN 12056-4 in such a way as to ensure proper functioning and operating safety. Prescribed maintenance intervals for the wastewater lifting plant according to DIN EN 12056-4: Operation in commercial enterprises = every 3 months




1.4 Personnel qualifications

Activities	Person	Knowledge
Layout, operational changes	Planners	Knowledge of building systems and services, evaluation of wastewater technology application cases. Design of separator systems for grease and drainage systems. Standardised requirements, specifications and directives
Installation	Skilled persons	Safe handling of machines and tools Laying and connecting pipes and connections Sanitary and electrical installation
Operational monitoring, daily, weekly checks	Owner, operating company	No specific requirements
Monthly check	Properly qualified, competent person	Approved disposal contractor
Annual maintenance	Properly qualified, competent person	"Experts" in accordance with DIN 4040-100*
General inspection before commissioning and every 5 years	Qualified people	"Properly qualified technicians" according to DIN 4040-100**
Disposal of the grease separator contents	Properly qualified, competent person	Approved disposal contractor
<p>*Definition of "properly qualified personnel" in accordance with DIN 4040-100: Specialist, and properly qualified, personnel are people from 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.</p> <p>**Definition of "competent personnel" in accordance with DIN 4040-100: "Competent, and properly qualified, personnel are employees of companies independent of the operating company/owner, experts or other institutions, who verifiably have the required technical knowledge to operate, maintain and inspect wastewater lifting plants to the scope named here and have the equipment required to test wastewater lifting plants. In individual cases, these inspections of larger operating units may also be carried out by internal personnel of the operator who are properly qualified technicians, independent with regard to their area of responsibility and who are not bound by instructions, and who have the same qualification and technical equipment.</p>		

1.5 Personal protection equipment




Personal protective equipment must be made available to the personnel and supervisors must check that it is used or worn.

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 (moisture proof protective gloves) and from minor bruising and cut injuries.

Mandatory sign	Meaning
	Protective clothing protects the skin from minor mechanical effects and infections.
	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.


1.6 Warnings

In the instructions for use, warnings are identified by the following warning symbols and signal words.

Warning sign / signal word		Meaning	
	DANGER	Personal injuries	Hazard with a high degree of risk which, if not prevented, results in death or severe injuries.
	WARNING		Hazard with a moderate degree of risk which, if not prevented, can result in death or severe injuries.
	CAUTION		Hazard with a low degree of risk which, if not prevented, can result in minor or moderate injuries.
	ATTENTION	Damage to property	Hazard which, if not prevented, can result in the damage of products and their functions or an item/property in the surrounding area.

1.7 Storage and Transport

ATTENTION Note during storage and transport:

- Store the plant parts in frost-protected premises.
- If intermediate storage is required, then the tank must be protected from water ingress.
- Never drive the forks of a fork-lift truck or lift truck directly under the plant parts.
- Where possible, do not remove the packaging and transport restraints until the components are at their installation site.
- If transporting the unit parts using a crane or crane hook:
 - Comply with the accident prevention regulations
 - Check the working load limit of the crane and the slings
 - Use the transport lugs provided (2 pieces),  chapter 2.3 „Equipment“.
 - Never stand under the suspended load
 - Prevent other persons from entering the entire danger zone
 - Avoid oscillating motion (swinging) during transport

1.8 Decommissioning and disposal

ATTENTION Improper disposal is a hazard for the environment. Comply with the regional disposal regulations.

- Completely drain and clean the plant when decommissioning.
- Separate the unit parts according to their material and hand them over for recovery or recycling.
- Electrical equipment must never be disposed of in household waste

2 Product description

Plants are made of polyethylene. Polyethylene is characterised, for example, by lightweight construction and long life.

EN

2.1 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.

Type designation: The first letter after the „-“ after the product name indicates the material, P = polyethylene. The second letter after the „-“ indicates the installation depth, F = Flexible installation depth, without second letter = Low installation depth

Extension stages: The letters after the „-“ after the type designation indicate the expansion stages: B = basic version, D = direct extraction

2.2 Product features

		-P		-PF	
		-B	-D	-B	-D
Product advantages	■ 3 in 1: grease separator, sampling point and pump station in one container	●	●	●	●
	■ Reduced/simplified installation work	●	●	●	●
	■ Possible trade separation or partial delivery according to construction progress	●	●	●	●
	■ Only one vent stack required for the grease separator and pump station	●	●	●	●
	■ Automatic operation of the pump station	●	●	●	●
General	■ Grease separator in accordance with DIN 1825 and DIN 4040- 100, Nominal sizes (4/7/10)	●	●	●	●
	■ For underground installation	●	●	●	●
	■ With integrated sludge trap	●	●	●	●
	■ With integrated sampling point according to DIN 4040-100 and pump station -duo according to DIN EN 12050	●	●	●	●
	■ 2 x maintenance openings Ø 650 mm for the respective accommodation of a necessary cover system (accessories) with load classes A 15, B 125 or D 400	●	●		
■ 2 x maintenance openings Ø 840 mm for the respective accommodation of a necessary extension system (accessories) with load classes A 15, B 125 or D 400			●	●	

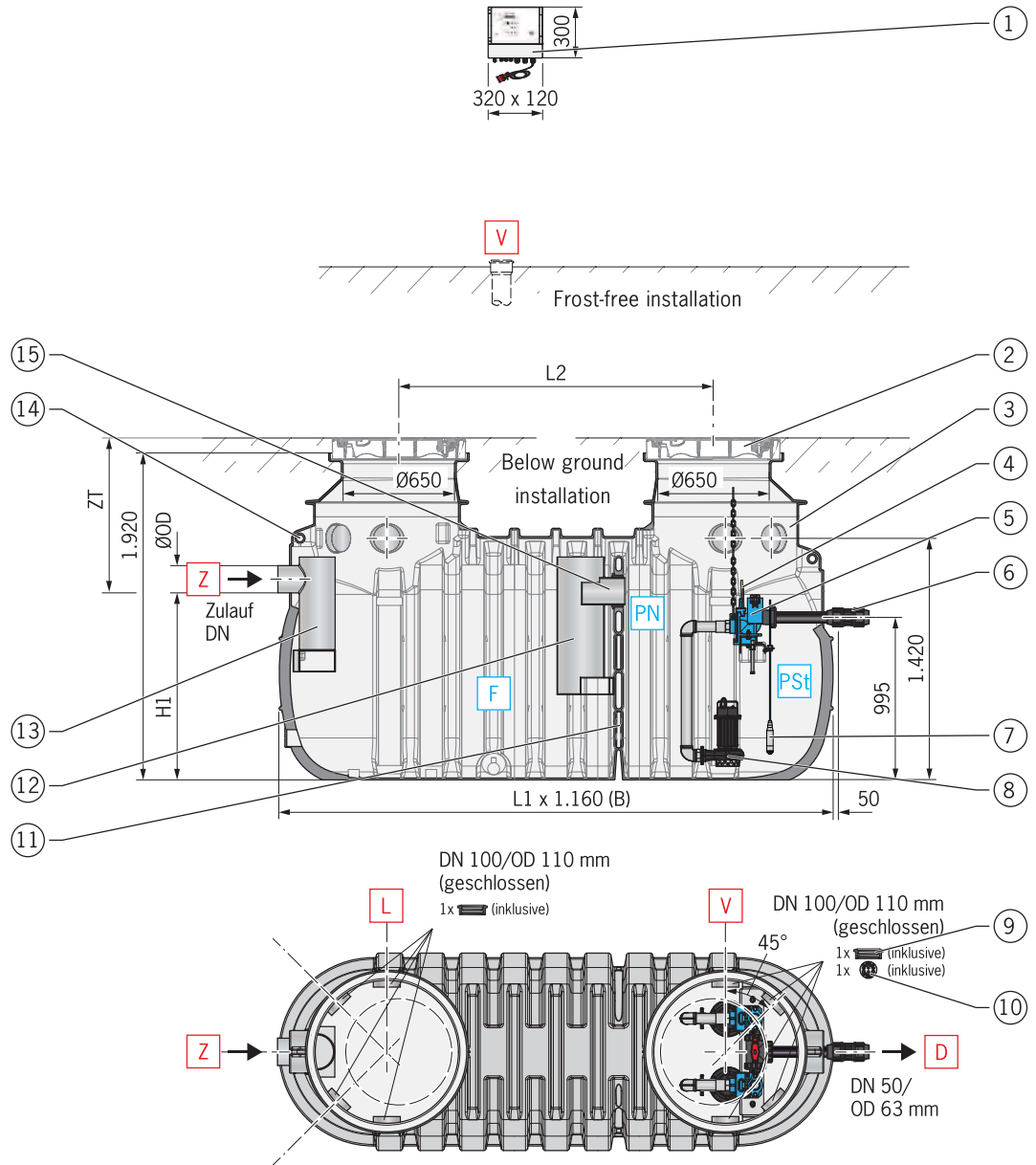
Product description

		-P		-PF	
		-B	-D	-B	-D
General	<ul style="list-style-type: none"> ■ Maximum installation depth up to approx. 2.25 m (distance from top edge of ground to lower edge of tank) 	●	●		
	<ul style="list-style-type: none"> ■ Maximum installation depth 3 m (distance from top edge of ground to lower edge of tank) 			●	●
	<ul style="list-style-type: none"> ■ Buoyancy safety of the tank: Buoyancy-proof up to 1.65 m above the lower edge of the tank with cover system and on-site buoyancy protection (for A 15 and B 125) or load distribution plate (for D 400) 	●	●		
	<ul style="list-style-type: none"> ■ Buoyancy safety of the tank: Buoyancy-proof up to 1.65 m above the lower edge of the tank with extension system and on-site buoyancy protection (for A 15 and B 125) or load distribution plate (for D 400) 			●	●
	<ul style="list-style-type: none"> ■ Control unit for frost-free installation with connecting cable 1.5 m and CEE plug 16 A including phase inverter, protection class IP 54 	●	●	●	●
	<ul style="list-style-type: none"> ■ Declaration of Performance (DoP) No: BD/G1/1012 	●	●	●	●
Grease separator	<ul style="list-style-type: none"> ■ Connection parts for on-site vent stack: <ul style="list-style-type: none"> □ 1x Socket seal DN100 	●	●	●	●
	<ul style="list-style-type: none"> ■ Connection parts for on-site disposal line: <ul style="list-style-type: none"> □ 1x Compression fitting DN 80/ 65 (OD 90/ 75 mm) □ 1x Compression fitting DN65 (OD 75 mm) □ Pipe (OD 75 mm) with fixed coupling Storz-B / 2½" and blind coupling 		●		●
Pump station -duo	<ul style="list-style-type: none"> ■ 2 x above-water coupling with vertically closing ball check valve (with connection for an optional rinsing connection), to accommodate two ACO submersible pumps 	●	●	●	●
	<ul style="list-style-type: none"> ■ 1 x pressure line outlet with internal ball valve and external pipe socket DN 50 / OD 63 mm 	●	●	●	●
	<ul style="list-style-type: none"> ■ Necessary level sensor (accessory) for level measurement 	○	○	○	○
	<ul style="list-style-type: none"> ■ 2 x submersible pump with mounted pressure line: <ul style="list-style-type: none"> □ Version with open multi-channel impeller □ Three-phase motor with 10 m connection cable □ Possible geodetic height according to nominal size grading between 4 and 8 m □ Conveyance data according to performance diagram □ Connection unit (sliding claw) for easy mounting and sealing into the above-water coupling without tools 	●	●	●	●
	<ul style="list-style-type: none"> ■ Connection parts for on-site supply line (cable conduit): <ul style="list-style-type: none"> □ 1x Socket seal DN100 □ 1 x Cable gland 	●	●	●	●
	<ul style="list-style-type: none"> ■ Compression fitting DN 50 (OD 63 mm) for connecting the on-site pressure line (other DN's also available as accessories) 	●	●	●	●

		-P		-PF	
		-B	-D	-B	-D
Connections	<ul style="list-style-type: none"> ■ Pipe connections: <ul style="list-style-type: none"> □ Inlet pipe socket DN 100 / OD 110 mm (NS 4) or DN 150 / OD 160 mm (NS 7 + 10) □ 8 x pipe socket (closed) DN 100 / OD 110 mm □ Disposal connection for pipe socket DN 80 / OD 90 mm (closed) □ Pressure line connection for pipe socket DN 50 / OD 63 mm 	●	●	●	●
	<ul style="list-style-type: none"> ■ Electrical connection: <ul style="list-style-type: none"> □ 400 V / 50 Hz / 2.6 kW (submersible pumps type SAT 100/D) □ 400 V / 50 Hz / 3.2 kW (submersible pumps type SAT 150/D) □ 400 V / 50 Hz / 4.0 kW (submersible pumps type SAT 200/D) □ General fuse protection: 3 x 16 A (time lag) or according to local conditions. 	●	●	●	●
● = applicable ○ = necessary for the functionality of the pump station-duo					

2.3 Design

2.3.1 LipuLift - P - B



Components

- | | |
|---|------------------------------------|
| 1 = Control unit | 9 = Sleeve seal DN 100 / OD 110 mm |
| 2 = Cover system (accessories, necessary) | 10 = Cable gland DN 100 |
| 3 = Tank | 11 = Partition wall |
| 4 = Guide strap (accessories) | 12 = Submersible outlet pipe |
| 5 = Above-water coupling | 13 = Submersible inlet pipe |
| 6 = Compression fitting DN 50 / OD 63 mm | 14 = Transport lugs |
| 7 = Necessary level sensor (accessory): pressure transducer (shown) or open pressure bell with air bubble injection | 15 = Inlet socket |
| 8 = Submersible pump (with sliding claw) | 16 = Type plate (not shown) |

3 in 1


- F** = Grease separator
PN = Integrated sampling point
PSt = Pump station-duo

On-site connection pipes

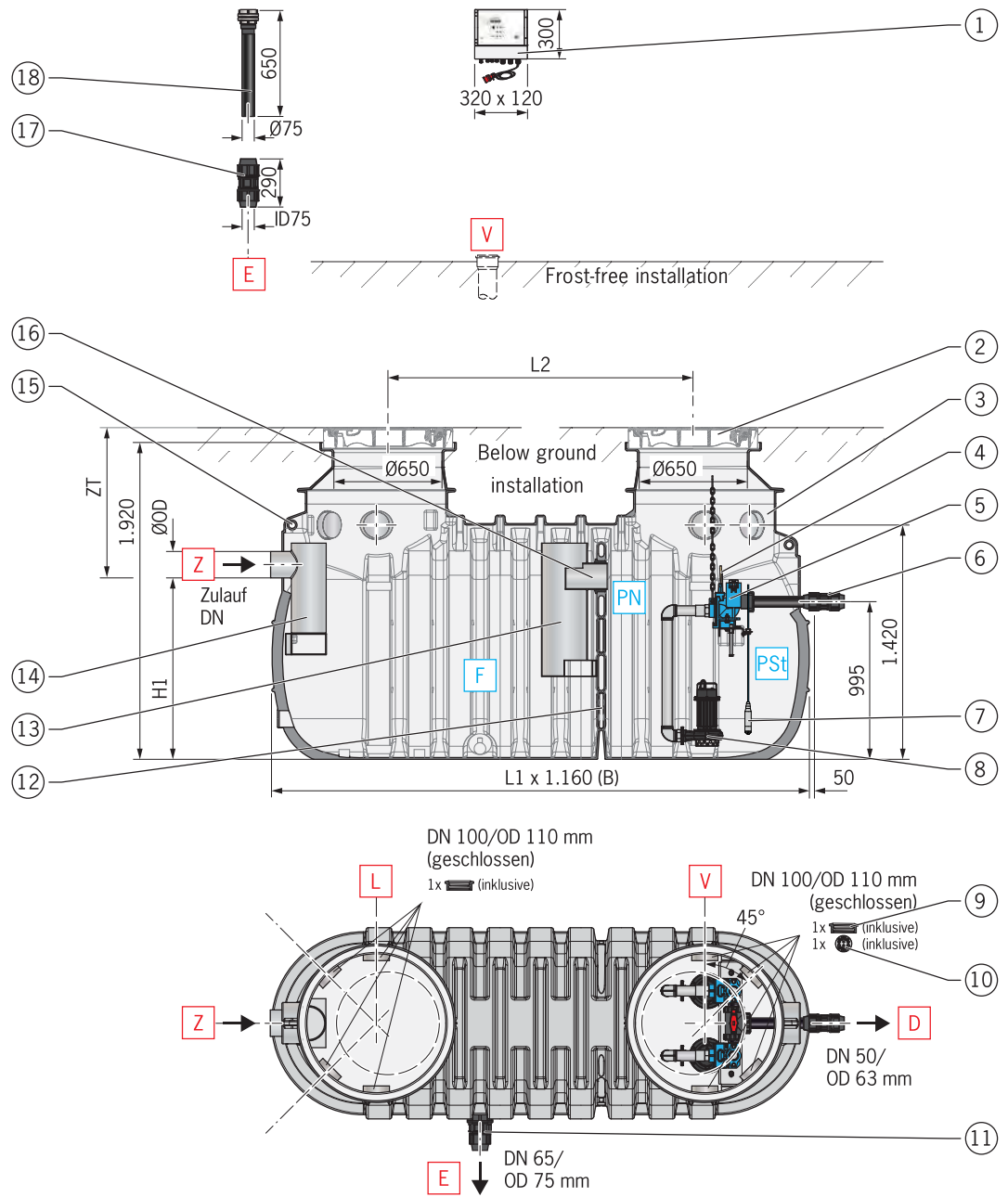
- D** = Pressure line at least DN 50 / OD 63 mm up above the backflow level
L = Vent stack DN 100/OD 110 mm
Z = Inlet pipe DN according to NS Grease separator
V = Supply line DN 100 / OD 110 mm

Dimensions table

Nominal size NS	Nominal diameter DN	Dimensions [mm]				
		OD	H1	L1	L2	ZT
4	100	110	1,125	2,800	1,360	*
7	150	160	1,100	3,250	1,850	*
10	150	160	1,100	3,800	2,340	*

* Dimension,  LipuLift -P / PF" installation instructions

2.3.2 LipuLift - P - D



Components

- | | |
|---|--|
| 1 = Control unit | 11 = Compression fitting DN 80/ 65 (OD 90/ 75 mm) |
| 2 = Cover system (accessories, necessary) | 12 = Partition wall |
| 3 = Tank | 13 = Submersible outlet pipe |
| 4 = Guide strap (accessories) | 14 = Submersible inlet pipe |
| 5 = Above-water coupling | 15 = Transport lugs |
| 6 = Compression fitting DN 50 / OD 63 mm | 16 = Inlet socket |
| 7 = Necessary level sensor (accessory): pressure transducer (shown) or open pressure bell with air bubble injection | 17 = Compression fitting DN 65 / OD 75 mm |
| 8 = Submersible pump (with sliding claw) | 18 = Pipe (OD 75 mm) with fixed coupling Storz B / 2½ " and blind coupling |
| 9 = Sleeve seal DN 100 / OD 110 mm | 19 = Type plate with sticker (not shown) |
| 10 = Cable gland DN100 | |

3 in 1


- F** = Grease separator
PN = Integrated sampling point
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On-site connection pipes

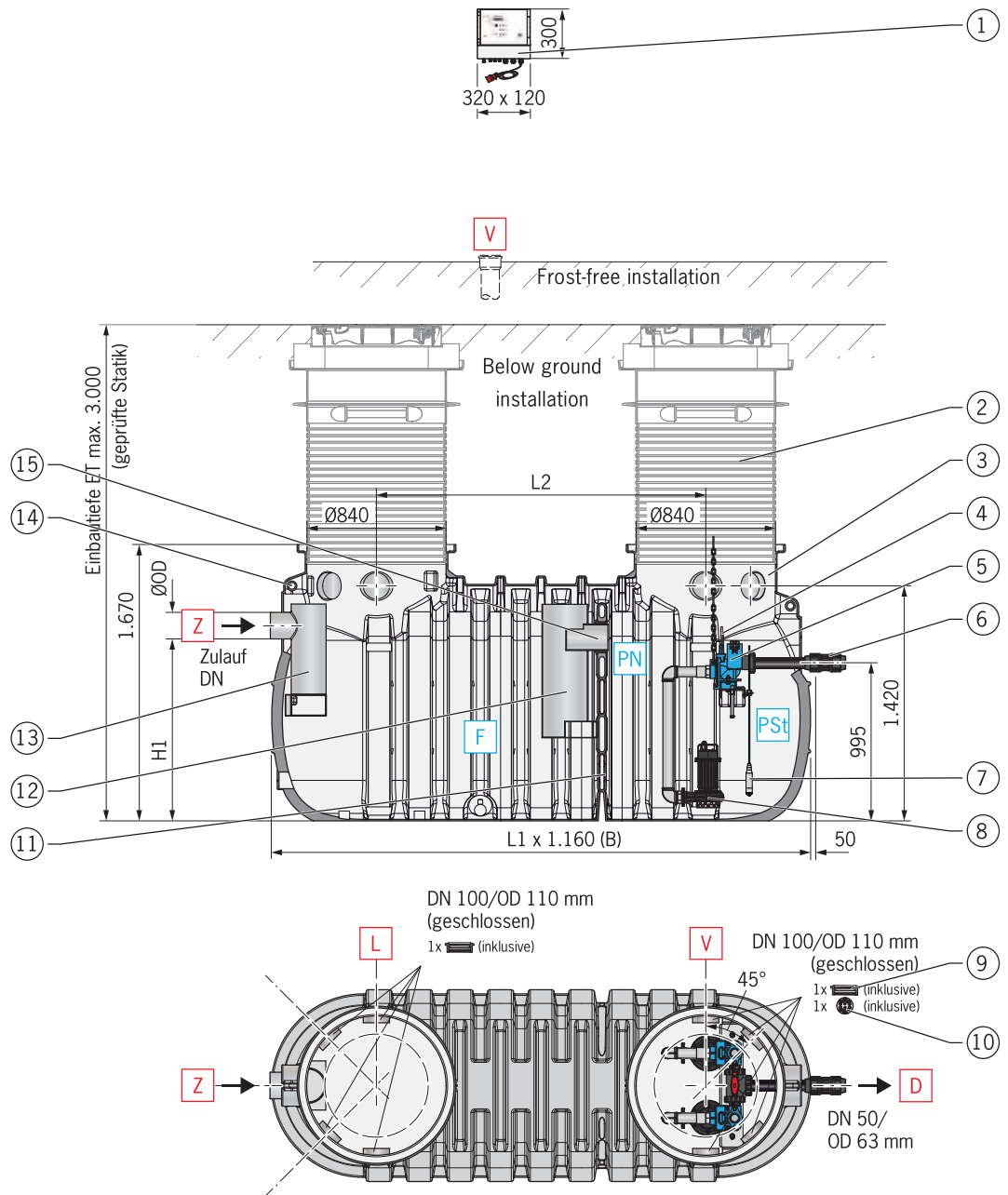
- D** = Pressure line at least DN 50 / OD 63 mm up above the backflow level
E = Disposal line DN65/OD 75 mm
L = Vent stack DN100/OD110 mm
Z = Inlet pipe DN according to NS Grease separator
V = Supply line DN 100 / OD 110 mm

Dimensions table

Nominal size NS	Nominal diameter DN	Dimensions [mm]				
		OD	H1	L1	L2	ZT
4	100	110	1,125	2,800	1,360	*
7	150	160	1,100	3,250	1,850	*
10	150	160	1,100	3,800	2,340	*

* Dimension,  LipuLift -P / PF" installation instructions

2.3.3 LipuLift - PF - B



Components

- | | |
|---|------------------------------------|
| 1 = Control unit | 9 = Sleeve seal DN 100 / OD 110 mm |
| 2 = extension system (accessories, necessary) | 10 = Cable gland DN 100 |
| 3 = Tank | 11 = Partition wall |
| 4 = Guide strap (accessories) | 12 = Submersible outlet pipe |
| 5 = Above-water coupling | 13 = Submersible inlet pipe |
| 6 = Compression fitting DN 50 / OD 63 mm | 14 = Transport lugs |
| 7 = Necessary level sensor (accessory): pressure transducer (shown) or open pressure bell with air bubble injection | 15 = Inlet socket |
| 8 = Submersible pump (with sliding claw) | 16 = Type plate (not shown) |

3 in 1

- F** = Grease separator
PN = Integrated sampling point
PSt = Pump station-duo

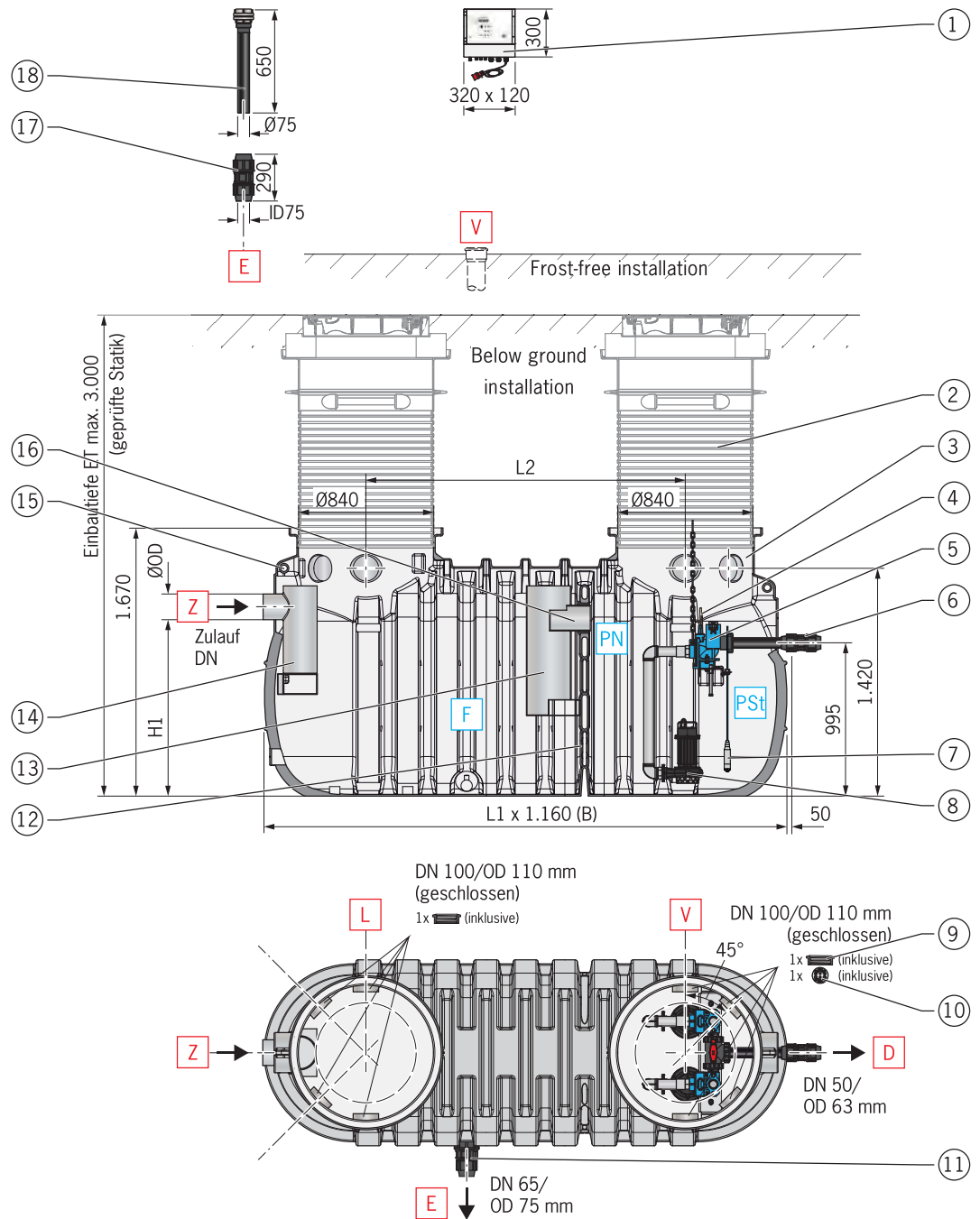
On-site connection pipes

- D** = Pressure line at least DN 50 / OD 63 mm up above the backflow level
L = Vent stack DN 100/OD 110 mm
Z = Inlet pipe DN according to NS Grease separator
V = Supply line DN 100 / OD 110 mm

Dimensions table

Nominal size NS	Nominal diameter DN	Dimensions [mm]			
		OD	H1	L1	L2
4	100	110	1,125	2,800	1,500
7	150	160	1,100	3,250	1,990
10	150	160	1,100	3,800	2,480

2.3.4 LipuLift - PF - D



Components

- | | |
|---|--|
| 1 = Control unit | 11 = Compression fitting DN 80/ 65 (OD 90/ 75 mm) |
| 2 = extension system (accessories, necessary) | 12 = Partition wall |
| 3 = Tank | 13 = Submersible outlet pipe |
| 4 = Guide strap (accessories) | 14 = Submersible inlet pipe |
| 5 = Above-water coupling | 15 = Transport lugs |
| 6 = Compression fitting DN 50 / OD 63 mm | 16 = Inlet socket |
| 7 = Necessary level sensor (accessory): pressure transducer (shown) or open pressure bell with air bubble injection | 17 = Compression fitting DN 65 / OD 75 mm |
| 8 = Submersible pump (with sliding claw) | 18 = Pipe (OD 75 mm) with fixed coupling Storz B / 2½ " and blind coupling |
| 9 = Sleeve seal DN 100 / OD 110 mm | 19 = Type plate with sticker (not shown) |
| 10 = Cable gland DN 100 | |

3 in 1

- F** = Grease separator
PN = Integrated sampling point
PSt = Pump station-duo

On-site connection pipes

- D** = Pressure line at least DN 50 / OD 63 mm up above the backflow level
E = Disposal line DN 65 / OD 75 mm
L = Vent stack DN 100 / OD 110 mm
Z = Inlet pipe DN according to NS Grease separator
V = Supply line DN 100 / OD 110 mm

Dimensions table

Nominal size NS	Nominal diameter DN	Dimensions [mm]			
		OD	H1	L1	L2
4	100	110	1,125	2,800	1,500
7	150	160	1,100	3,250	1,990
10	150	160	1,100	3,800	2,480

2.4 Operating principle

2.4.1 LipuLift - P - B and LipuLift - PF - B

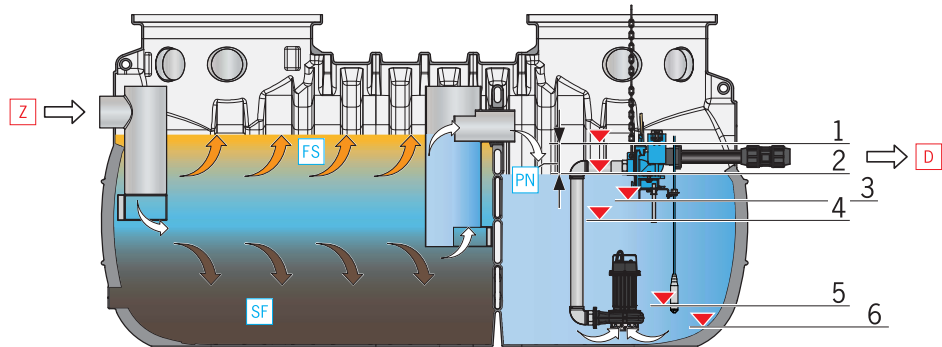


Figure: LipuLift - PF - B

FS = Grease collection chamber

SF = Integrated sludge trap

PN = Integrated sampling point

D = Pressure line up above the backflow level

Z = Inlet pipe

Pump station water level:

1 = High water level alarm (H-AL)

2 = Peak load (PL)

3 = Peak load OFF (PL OFF)

4 = Base load (BL)

5 = Base load OFF (BL OFF)

6 = Stop delay period OFF (SDP OFF)

Numbers in brackets „()“,  equipment, chap. 2.3.1 „LipuLift - P - B“ or 2.3.3 „LipuLift - PF - B“.

Grease separator

Before commissioning, the grease separator must be filled with water until it overflows into the pump station duo. The grease separator operates 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 (grease collection area **FS**). Wastewater constituents with a higher density than water, e.g. sludge, will sink to the bottom in the sludge trap **SF**. The inlet immersion pipe (13) and the outlet immersion pipe (12) at the inlet and outlet and the partition wall (11) keep the substances that can be separated freely and the substances that can be settled in the grease separator. The contents must be completely disposed when the maximum storage capacity of sludge and grease has been reached or once a month at the latest. The grease separator is emptied and cleaned via the open maintenance opening.


The use of the Multi Control grease layer thickness gauge (accessory) can be agreed with the authorities to extend the interval between disposal dates.


Sampling point

The waste water from the grease separator runs over the inlet connection (15) that protrudes over the partition wall (11) into the pump station -duo in a free gradient. There is sufficient space between the bottom of the inlet socket (15) and the water level of the peak load (PL) to take a sample from the outflowing water of the grease separator (e.g. with a 1 litre wide-neck bottle).

Pump station -duo

Any waste water from the grease separator flows with a free gradient down the submersible outlet pipe (12) of the grease separator and the inlet pipe (15) into the pump station -duo. A mounted level sensor * (pressure transducer or open pressure bell, 7) is connected to the control unit (1). The control unit (1) evaluates the level sensor (7) and displays the water level in the pump station to the nearest centimetre. If necessary, the submerged pumps (8) can be switched on and off or the high water level alarm can be triggered. The air bubble injection in the open pressure bell (as level sensor, 7) prevents the formation of a floating layer in the pressure bell that would harden and lead to clogging.

If the water level reaches the base load (BL), then a submerged pump (8) switches on and pumps the wastewater through the pressure pipe above the  "Pipe base, backflow loop" level. From there the wastewater flows by gravity to the drainage sewer.

A ball retaining valve in the above-water coupling (5) prevents backflow from the pressure line  into the pump station -duo.

If the water level falls to the base load (BL OFF) level, then the submerged pump (8) switches off. With a set stop delay period (SDP), the submersible pump (8) remains activated and the water level continues to be lowered to the stop delay period OFF (SDP OFF) level.

The pump station -duo is equipped with two submerged pumps (8):

- With each new start, alternating operation is executed.
- If one submerged pump fails (8), then the second submerged pump (8) switches on.
- If the wastewater inflow is higher than the delivery performance of one submerged pump (8) and the water level rises to the peak load (PL) level, then the second submersible pump (8) also switches on.
- If the water level falls to the peak load OFF (PL OFF) level the second submerged pump (8)

* necessary for the functionality of the pump station -duo

2.4.2 LipuLift - P - D and LipuLift - PF - D

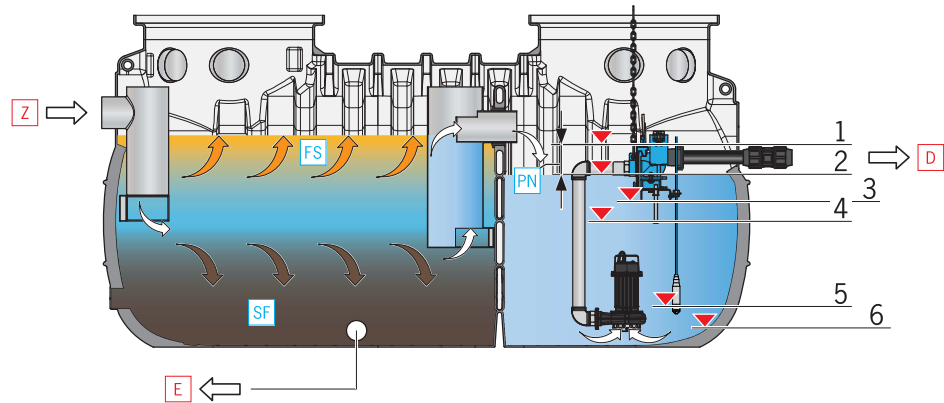



Figure: LipuLift - PF - D

FS = Grease collection chamber
 SF = Integrated sludge trap
 PN = Integrated sampling point

D = Pressure line up above the backflow level
 E = Disposal pipe
 Z = Inlet pipe

Pump station water level:

- | | |
|-----------------------------------|-------------------------------------|
| 1 = High water level alarm (H-AL) | 4 = Base load (BL) |
| 2 = Peak load (PL) | 5 = Base load OFF (BL OFF) |
| 3 = Peak load OFF (PL OFF) | 6 = Stop delay period OFF (SDP OFF) |

Numbers in brackets „()“,  equipment, chap. 2.3.2 „LipuLift - P - B“ or 2.3.4 „LipuLift - PF - D“.

Grease separator

Before commissioning, the grease separator must be filled with water until it overflows into the pump station duo. The grease separator operates 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 (grease collection area FS). Wastewater constituents with a higher density than water, e.g. sludge, will sink to the bottom in the silt trap SF. The inlet immersion pipe (14) and the outlet immersion pipe (13) at the inlet and outlet and the partition wall (12) keep the substances that can be freely separated and the substances that can be settled in the grease separator. The contents must be completely disposed when the maximum storage capacity of sludge and grease has been reached or once a month at the latest. After connecting the vacuum truck (vacuum truck) to the on-site disposal pipe (disposal connection 11 including compression fitting is provided by the manufacturer), the grease separator is emptied and cleaned via the open maintenance opening.


The use of the Multi Control grease layer thickness gauge (accessory) can be agreed with the authorities to extend the interval between disposal dates.


Sampling point

The waste water from the grease separator runs over the inlet connection (16) that protrudes over the partition wall (12) into the pump station -duo in a free gradient. There is sufficient space between the bottom of the inlet socket (16) and the water level of the peak load (PL) to take a sample from the outflowing water of the grease separator (e.g. with a 1 litre wide-neck bottle).

Pump station -duo

Any waste water from the grease separator flows with a free gradient down the submersible outlet pipe (13) of the grease separator and the inlet pipe (16) into the pump station -duo. A mounted level sensor * (pressure transducer or open pressure bell, 7) is connected to the control unit (1). The control unit (1) evaluates the level sensor (7) and displays the water level in the pump station to the nearest centimetre. If necessary, the submerged pumps (8) can be switched on and off or the high water level alarm can be triggered. The air bubble injection in the open pressure bell (as level sensor, 7) prevents the formation of a floating layer in the pressure bell that would harden and lead to clogging.

If the water level reaches the base load (BL), then a submerged pump (8) switches on and pumps the wastewater through the pressure pipe above the  "Pipe base, backflow loop" level. From there the wastewater flows by gravity to the drainage sewer.

A ball retaining valve in the above-water coupling (5) prevents backflow from the pressure line  into the pump station -duo.

If the water level falls to the base load (BL OFF) level, then the submerged pump (8) switches off. With a set stop delay period (SDP), the submersible pump (8) remains activated and the water level continues to be lowered to the stop delay period OFF (SDP OFF) level.


The pump station -duo is equipped with two submerged pumps (8):

- With each new start, alternating operation is executed.
- If one submerged pump fails (8), then the second submerged pump (8) switches on.
- If the wastewater inflow is higher than the delivery performance of one submerged pump (8) and the water level rises to the peak load (PL) level, then the second submersible pump (8) also switches on.
- If the water level falls to the peak load OFF (PL OFF) level the second submerged pump (8)






* necessary for the functionality of the pump station -duo

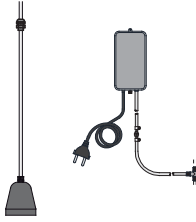
2.5 Scope of supply

2.5.1 Parts for frost-free installation or use

Plant parts	Weight [kg]	Image	-P		-PF	
			-B	-D	-B	-D
■ Control for pump station -duo	5 kg		(1)	(1)	(1)	(1)
■ Instructions for Use	-		(1)	(1)	(1)	(1)
() = Amount						

2.5.2 Parts for installation in the plant

Plant parts	Weight [kg]	Image	-P		-PF	
			-B	-D	-B	-D
■ Cable gland	1 kg		(1)	(1)	(1)	(1)
■ Submerged pump unit □ Submerged pump (connection cable 10 m) with mounted pressure line □ Connection unit (sliding claw)	30–32 kg		(2)	(2)	(2)	(2)
■ Operating key ball valve pump station -duo: □ Length 1,235 mm □ Length 1,735 mm	2 kg 2.5 kg		(1)	(1)	(1)	(1)
■ Necessary guide belt 2,500 mm long (accessory) for inserting the submersible pump unit	2 kg		(2)	(2)	(2)	(2)
■ Necessary level sensor * (accessory) for level measurement □ Pressure transducer with 20 or 40 m connection cable or	2 or 3.4 kg		(1)	(1)	(1)	(1)

Plant parts	Weight [kg]	Image	-P		-PF	
			-B	-D	-B	-D
<input type="checkbox"/> Open pressure bell with 20 m pneumatic control line (hose) and air bubble injection (miniature compressor with connection parts)	2 kg		(1)	(1)	(1)	(1)
<input checked="" type="checkbox"/> Type plate sticker	-			(1)		(1)
()= Amount * necessary for the functionality of the pump station -duo						

2.6 Suggested installations

2.6.1 LipuLift - P - B

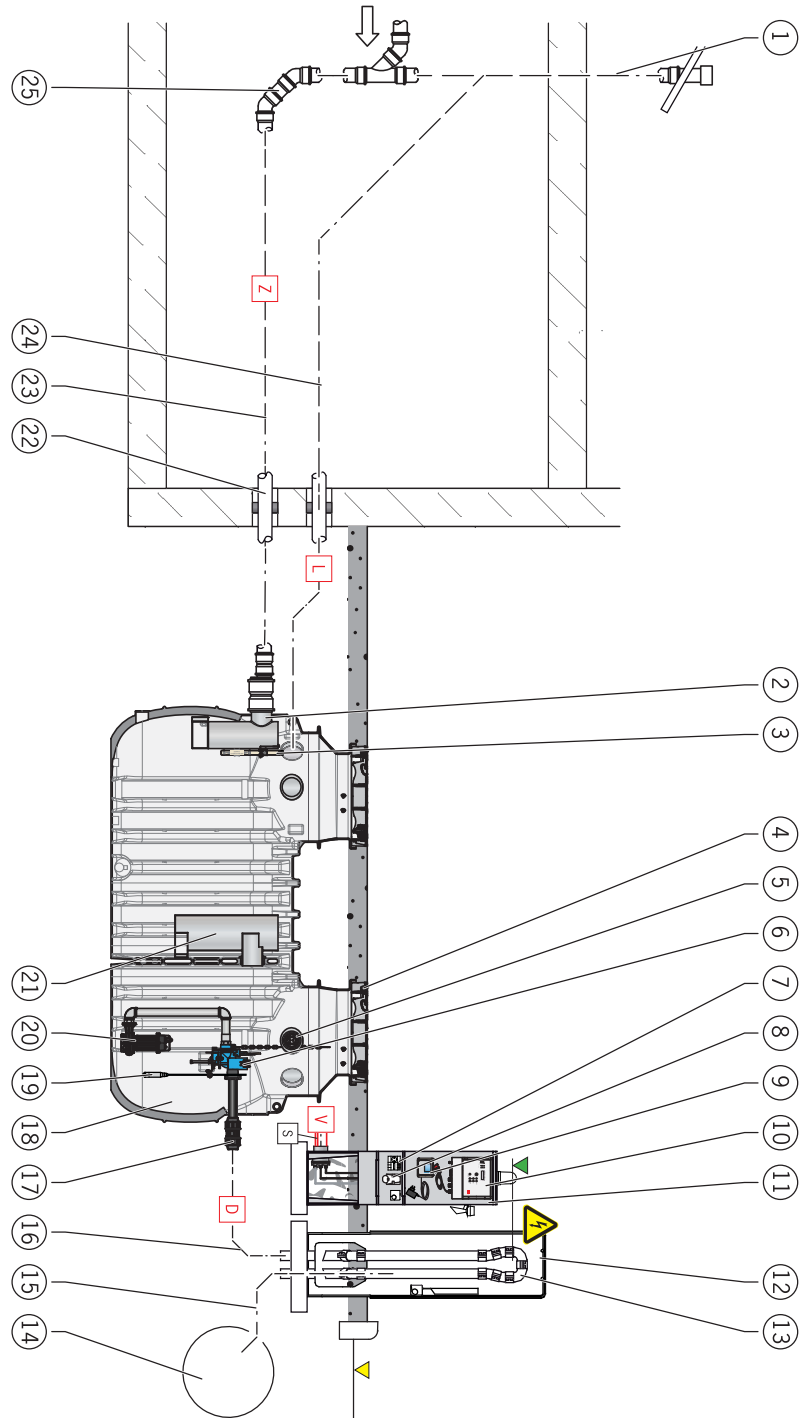


Figure: Plant _ Section / View

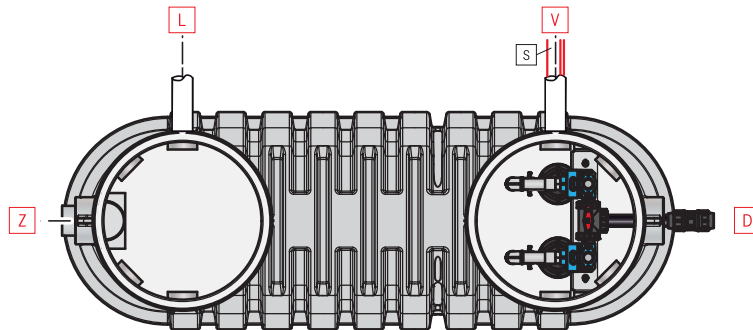





Figure: Plant _ Top view

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
1	Ventilation DN 100 / OD 110 mm of the inlet pipe pulled up to above the roof			X
2	Submerged inlet pipe	X		
3	Grease layer thickness measuring device measuring rod		X	
4	Necessary cover system Load class A 15, B 125 or D 400		X	
5	Cable gland DN100	X		
6	Above-water coupling	X		
7	Earthed plug socket 230 V/50 Hz			X
8	CEE-plug socket 16 A			X
9	Evaluation device for grease layer thickness measuring device with 3m connection cable and power socket		X	
10	Control unit	X		
11	Outdoor cabinet with special equipment (heating, horn, signal tower, ...)		X	
12	Outdoor cabinet with heating		X	
13	Backflow loop			X
14	Channel			X
15	Outlet pipe to sewer			X
16	Pressure line at least DN 50 / OD 63 mm			X
17	Compression fitting DN 50 / OD 63 mm	X		
18	Tank	X		
19	Necessary level sensor		X	
20	Submersible pump (with sliding claw)	X		
21	Submerged outlet pipe	X		
22	Pipe feedthroughs		X	
23	Calming section of the inlet pipe according to DIN EN 1825-2			X
24	Vent stack DN 100 / OD 110 mm (pulled up to above roof)			X
25	Transition from downpipe to horizontal pipe according to DIN EN 1825-2			X

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
	<ul style="list-style-type: none"> ■ Construction phase 1: <ul style="list-style-type: none"> <input type="checkbox"/> 1 x qualitative pull wire (connection of supply line and tank) 			X
S	<ul style="list-style-type: none"> ■ Construction phase 2: <ul style="list-style-type: none"> <input type="checkbox"/> Connection cable or control line for level sensor <input type="checkbox"/> 2 x connection cable 10 m (submerged pump) <input type="checkbox"/> Earthing cable H07V-K 6 mm² for equipotential bonding to earth outside the tank <input type="checkbox"/> Connection cable (accessory) 10, 20 or 30 m long (for connecting measuring rod and evaluation device for the grease layer thickness measuring device) 	X	X	X
D	Pressure line at least DN 50 / OD 63 mm up above the backflow level			X ¹⁾
L	Vent stack DN 100 / OD 110 mm (ventilation connection via roof and tank)			X ³⁾
Z	Inlet pipe DN according to NS (connection of waste water accumulation and tank)			X ⁴⁾
V	Supply line DN 100 / OD 110 mm (connection of supply line and tank)			X ²⁾
	<ul style="list-style-type: none"> ■ Electrical connection CEE socket: <ul style="list-style-type: none"> <input type="checkbox"/> 400 V / 50 Hz / 2.6 kW (article no. 3204.20.01 and 3207.20.01) <input type="checkbox"/> 400 V / 50 Hz / 3.2 kW (article no. 3207.20.02 and 3210.20.02) <input type="checkbox"/> 400 V / 50 Hz / 4.0 kW (article no. 3210.20.03) <input type="checkbox"/> General fuse protection: 3 x 16 A (time lag) or according to local conditions. 			X
	<ul style="list-style-type: none"> ■ Electrical connection for earthed socket for optional grease layer thickness measurement: <ul style="list-style-type: none"> <input type="checkbox"/> 230V/50Hz <input type="checkbox"/> Fuse: 16 A (time lag) and/or according to the conditions on site 			X
	<ul style="list-style-type: none"> ■ Electrical connection for heating outdoor cabinet (accessory): <ul style="list-style-type: none"> <input type="checkbox"/> 230V/50Hz <input type="checkbox"/> Fuse: 16 A (time lag) and/or according to the conditions on site 			X
	Back flow level: The highest level to which water can rise within a drainage system.			X
	Pipe bottom of backflow loop, part of the pressure line above the backflow level			X
<p>¹⁾ Specifications:</p> <ul style="list-style-type: none"> ■ The pressure pipe must be designed for at least 1.5 times the pump pressure. ■ Lay the pressure pipe so that it rises continuously and is frost-resistant ■ The flow velocity in the pressure pipe must not fall below 0.7 m/s and must not exceed 2.3 m/s ■ Never connect other pipes to the pressure pipe ■ Air admittance valves are not allowed in the pressure pipe ■ Connect the pressure pipe without any tension ■ Install pressure line in at least DN 50 				

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
	<p>2) Specifications:</p> <ul style="list-style-type: none"> ■ Install with a slope of at least 1.5 - 2 % from the outdoor cabinet or plant room to the tank. Do not reduce the stack cross-section ■ Do not use pipe bends with angles larger than 30° ■ Use materials* with high resistance Not necessary if the cable gland is installed. <p>3) Specifications:</p> <ul style="list-style-type: none"> ■ Run up to the roof, do not reduce the stack cross-section. ■ Ventilation valves are not permitted ■ Use materials* with high resistance <p>4) Specifications:</p> <ul style="list-style-type: none"> ■ Wastewater is to be routed to the grease separator with a gravity drainage pipe with gradient at least 1.5 – 2 %. If this is not possible, use of ACO upstream tank plants with positive-displacement pumps is recommended. ■ Transition from downpipes to horizontal pipes must be made with two 45° pipe bends and a connecting piece at least 250 mm long (equivalent pipe bends with a correspondingly large radius). ■ A calm region must subsequently 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 pipe of the grease separator. ■ Use materials* with high resistance <p>* Materials that are resistant to animal and vegetable fats, cleaning agents and high temperatures. The permissible materials are cast iron (KML, TML), plastic (PP, PE), glass (borosilicate, float glass) and stainless steel (V4A e.g. 1.4404). In addition, seals that are resistant to the substances contained in the wastewater must be used for all pipe connections.</p>			

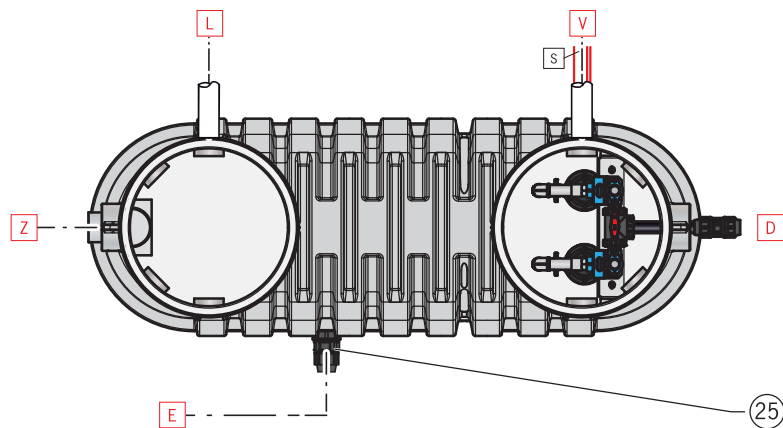



Figure: Plant _ Top view

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
1	Ventilation DN 100 / OD 110 mm of the inlet pipe pulled up to above the roof			X
2	Compression fitting DN 65 / OD 75 mm	X		
3	Pipe with fixed coupling Storz-B / 2½" and blind coupling	X		
4	Connection box		X	
5	Flush-mounted frame for terminal box		X	
6	Fixed coupling Storz-B / 2½" and blind coupling for pendulum gas line (optional)		X	
7	Submerged inlet pipe	X		
8	Grease layer thickness measuring device measuring rod		X	
9	Necessary cover system Load class A 15, B 125 or D 400		X	
10	Cable gland DN100	X		
11	Above-water coupling	X		
12	Earthed plug socket 230 V/50 Hz			X
13	CEE-plug socket 16A			X
14	Evaluation device for grease layer thickness measuring device with 3m connection cable and power socket		X	
15	Control unit	X		
16	Outdoor cabinet with special equipment (heating, horn, signal tower, ...)		X	
17	Outdoor cabinet with heating		X	
18	Backflow loop			X
19	Channel			X
20	Outlet pipe to sewer			X
21	Pressure line at least DN 50 / OD 63 mm			X
22	Compression fitting DN 50 / OD 63 mm	X		
23	Tank	X		
24	Necessary level sensor		X	

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
25	Submersible pump (with sliding claw)	X		
26	Submerged outlet pipe	X		
27	Pipe feedthroughs		X	
28	Calming section of the inlet pipe according to DIN EN 1825-2			X
29	Vent stack DN 100 / OD 110 mm (pulled up to above roof)			X
30	Transition from downpipe to horizontal pipe according to DIN EN 1825-2			X
31	Compression fitting DN 80/65 (OD 90/75 mm)	X		
S	<ul style="list-style-type: none"> ■ Construction phase 1: <ul style="list-style-type: none"> <input type="checkbox"/> 1 x qualitative pull wire (connection of supply line and tank) 			X
	<ul style="list-style-type: none"> ■ Construction phase 2: <ul style="list-style-type: none"> <input type="checkbox"/> Connection cable or control line for level sensor <input type="checkbox"/> 2 x connection cable 10 m (submerged pump) <input type="checkbox"/> Earthing cable H07V-K 6 mm² for equipotential bonding to earth outside the tank <input type="checkbox"/> Connection cable (accessory) 10, 20 or 30 m long (for connecting measuring rod and evaluation device for the grease layer thickness measuring device) 	X	X	X
D	Pressure line at least DN 50 / OD 63 mm up above the backflow level			X ¹⁾
E	Disposal pipe DN 65 / OD 75 mm (connection point for disposal vehicle and disposal connection on the tank)			X ¹⁾
L	Vent stack DN 100 / OD 110 mm (ventilation connection via roof and tank)			X ³⁾
Z	Inlet pipe DN according to NS (connection of waste water accumulation and tank)			X ⁴⁾
V	Supply line DN 100 / OD 110 mm (connection of supply line and tank)			X ²⁾
	<ul style="list-style-type: none"> ■ Electrical connection CEE socket: <ul style="list-style-type: none"> <input type="checkbox"/> 400 V / 50 Hz / 2.6 kW (article no. 3204.20.11 and 3207.20.11) <input type="checkbox"/> 400 V / 50 Hz / 3.2 kW (article no. 3207.20.12 and 3210.20.12) <input type="checkbox"/> 400 V / 50 Hz / 4.0 kW (article no. 3210.20.13) <input type="checkbox"/> General fuse protection: 3 x 16 A (time lag) or according to local conditions. 			X
	<ul style="list-style-type: none"> ■ Electrical connection for earthed socket for optional grease layer thickness measurement: <ul style="list-style-type: none"> <input type="checkbox"/> 230V/50Hz <input type="checkbox"/> Fuse: 16 A (time lag) and/or according to the conditions on site 			X
	<ul style="list-style-type: none"> ■ Electrical connection for heating outdoor cabinet (accessory): <ul style="list-style-type: none"> <input type="checkbox"/> 230V/50Hz <input type="checkbox"/> Fuse: 16 A (time lag) and/or according to the conditions on site 			X

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
▼	Back flow level: The highest level to which water can rise within a drainage system.			X
▼	Pipe bottom of backflow loop, part of the pressure line above the backflow level			X
<p>1) Specifications:</p> <ul style="list-style-type: none"> ■ The pressure pipe must be designed for at least 1.5 times the pump pressure. ■ Lay the pressure pipe so that it rises continuously and is frost-resistant ■ The flow velocity in the pressure pipe must not fall below 0.7 m/s and must not exceed 2.3 m/s ■ Never connect other pipes to the pressure pipe ■ Air admittance valves are not allowed in the pressure pipe ■ Connect the pressure pipe without any tension ■ Install pressure line in at least DN 50 <p>2) Specifications:</p> <ul style="list-style-type: none"> ■ Install with a slope of at least 1.5 - 2 % from the outdoor cabinet or plant room to the tank. Do not reduce the stack cross-section ■ Do not use pipe bends with angles larger than 30° ■ Use materials* with high resistance Not necessary if the cable gland is installed. <p>3) Specifications:</p> <ul style="list-style-type: none"> ■ Run up to the roof, do not reduce the stack cross-section. ■ Ventilation valves are not permitted ■ Use materials* with high resistance <p>4) Specifications:</p> <ul style="list-style-type: none"> ■ Wastewater is to be routed to the grease separator with a gravity drainage pipe with gradient at least 1.5 – 2 %. If this is not possible, use of ACO upstream tank plants with positive-displacement pumps is recommended. ■ Transition from downpipes to horizontal pipes must be made with two 45° pipe bends and a connecting piece at least 250 mm long (equivalent pipe bends with a correspondingly large radius). ■ A calm region must subsequently 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 pipe of the grease separator. ■ Use materials* with high resistance <p>* Materials that are resistant to animal and vegetable fats, cleaning agents and high temperatures. The permissible materials are cast iron (KML, TML), plastic (PP, PE), glass (borosilicate, float glass) and stainless steel (V4A e.g. 1.4404). In addition, seals that are resistant to the substances contained in the wastewater must be used for all pipe connections.</p>				

2.6.3 LipuLift - PF - B

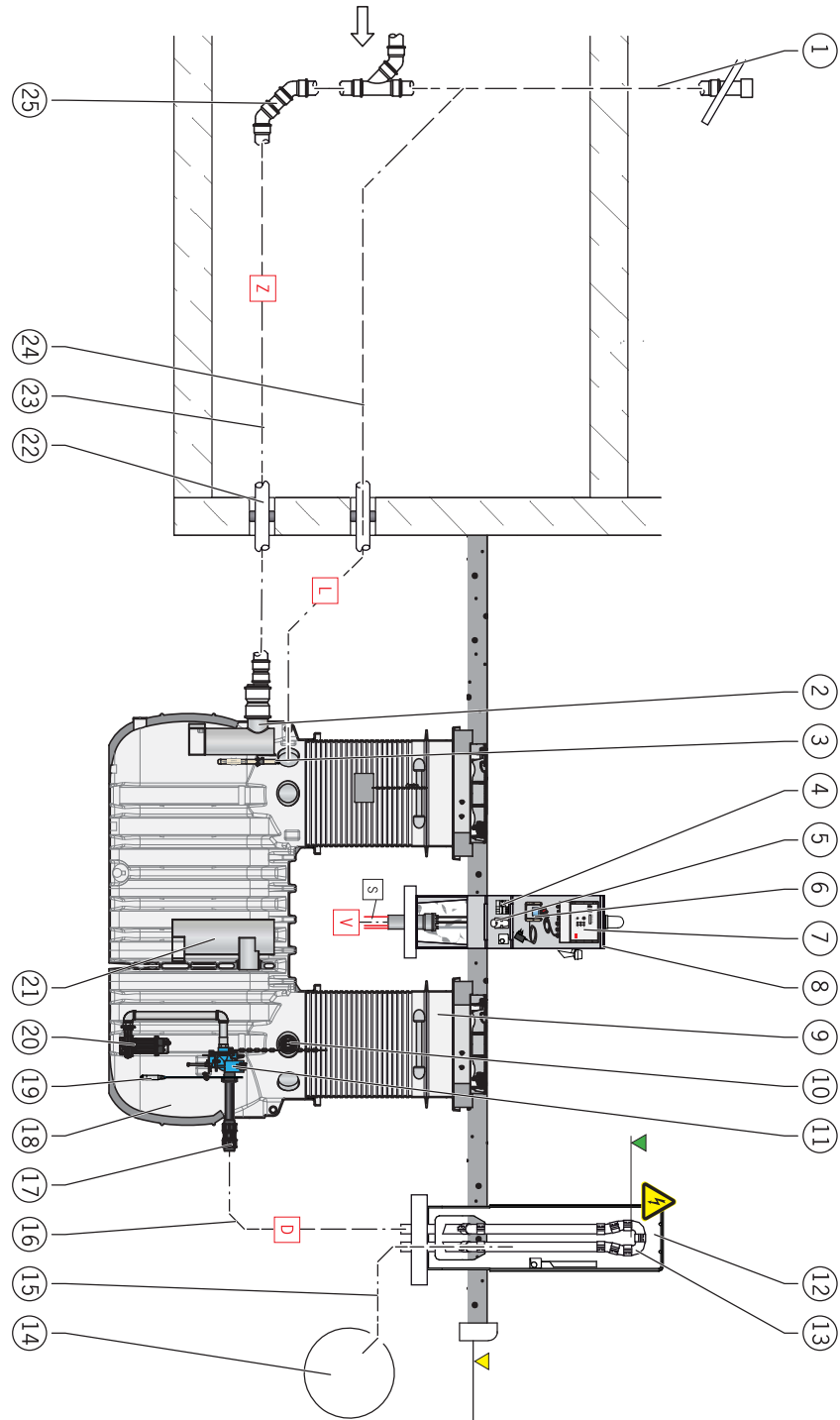


Figure: Plant _ Section / View

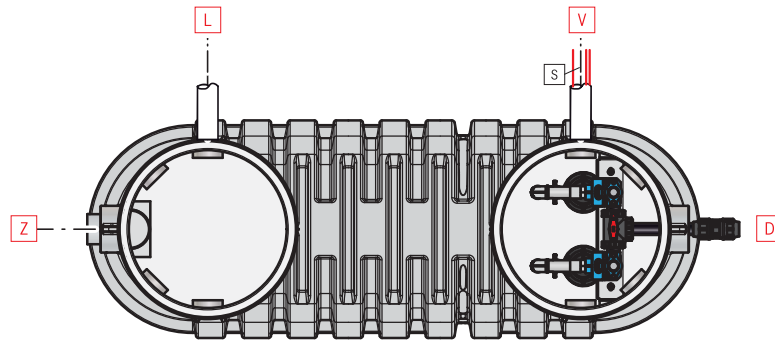





Figure: Plant _ Top view

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
1	Ventilation DN 100 / OD 110 mm of the inlet pipe pulled up to above the roof			X
2	Submerged inlet pipe	X		
3	Grease layer thickness measuring device measuring rod		X	
4	Earthed plug socket 230 V/50 Hz			X
5	CEE-plug socket 16 A			X
6	Evaluation device for grease layer thickness measuring device with 3m connection cable and power socket		X	
7	Control unit	X		
8	Outdoor cabinet with special equipment (heating, horn, signal tower, ...)		X	
9	Necessary extension system Load class A 15, B 125 or D 400		X	
10	Cable gland DN100	X		
11	Above-water coupling	X		
12	Outdoor cabinet with heating		X	
13	Backflow loop			X
14	Channel			X
15	Outlet pipe to sewer			X
16	Pressure line at least DN 50 / OD 63 mm			X
17	Compression fitting DN 50 / OD 63 mm	X		
18	Tank	X		
19	Necessary level sensor		X	
20	Submersible pump (with sliding claw)	X		
21	Submerged outlet pipe	X		
22	Pipe feedthroughs		X	
23	Calming section of the inlet pipe according to DIN EN 1825-2			X
24	Vent stack DN 100 / OD 110 mm (pulled up to above roof)			X
25	Transition from downpipe to horizontal pipe according to DIN EN 1825-2			X

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
	<ul style="list-style-type: none"> ■ Construction phase 1: <ul style="list-style-type: none"> <input type="checkbox"/> 1 x qualitative pull wire (connection of supply line and tank) 			X
S	<ul style="list-style-type: none"> ■ Construction phase 2: <ul style="list-style-type: none"> <input type="checkbox"/> Connection cable or control line for level sensor <input type="checkbox"/> 2 x connection cable 10 m (submerged pump) <input type="checkbox"/> Earthing cable H07V-K 6 mm² for equipotential bonding to earth outside the tank <input type="checkbox"/> Connection cable (accessory) 10, 20 or 30 m long (for connecting measuring rod and evaluation device for the grease layer thickness measuring device) 	X	X	X
D	Pressure line at least DN 50 / OD 63 mm up above the backflow level			X ¹⁾
L	Vent stack DN 100 / OD 110 mm (ventilation connection via roof and tank)			X ³⁾
Z	Inlet pipe DN according to NS (connection of waste water accumulation and tank)			X ⁴⁾
V	Supply line DN 100 / OD 110 mm (connection of supply line and tank)			X ²⁾
	<ul style="list-style-type: none"> ■ Electrical connection CEE socket: <ul style="list-style-type: none"> <input type="checkbox"/> 400 V / 50 Hz / 2.6 kW (article no. 3204.30.01 and 3207.30.01) <input type="checkbox"/> 400 V / 50 Hz / 3.2 kW (article no. 3207.30.02 and 3210.30.02) <input type="checkbox"/> 400 V / 50 Hz / 4.0 kW (article no. 3210.30.03) <input type="checkbox"/> General fuse protection: 3 x 16 A (time lag) or according to local conditions. 			X
	<ul style="list-style-type: none"> ■ Electrical connection for earthed socket for optional grease layer thickness measurement: <ul style="list-style-type: none"> <input type="checkbox"/> 230V/50Hz <input type="checkbox"/> Fuse: 16 A (time lag) and/or according to the conditions on site 			X
	<ul style="list-style-type: none"> ■ Electrical connection for heating outdoor cabinet (accessory): <ul style="list-style-type: none"> <input type="checkbox"/> 230V/50Hz <input type="checkbox"/> Fuse: 16 A (time lag) and/or according to the conditions on site 			X
	Back flow level: The highest level to which water can rise within a drainage system.			X
	Pipe bottom of backflow loop, part of the pressure line above the backflow level			X
<p>¹⁾ Specifications:</p> <ul style="list-style-type: none"> ■ The pressure pipe must be designed for at least 1.5 times the pump pressure. ■ Lay the pressure pipe so that it rises continuously and is frost-resistant ■ The flow velocity in the pressure pipe must not fall below 0.7 m/s and must not exceed 2.3 m/s ■ Never connect other pipes to the pressure pipe ■ Air admittance valves are not allowed in the pressure pipe ■ Connect the pressure pipe without any tension ■ Install pressure line in at least DN 50 				

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
	<p>2) Specifications:</p> <ul style="list-style-type: none"> ■ Install with a slope of at least 1.5 - 2 % from the outdoor cabinet or plant room to the tank. Do not reduce the stack cross-section ■ Do not use pipe bends with angles larger than 30° ■ Use materials* with high resistance Not necessary if the cable gland is installed. <p>3) Specifications:</p> <ul style="list-style-type: none"> ■ Run up to the roof, do not reduce the stack cross-section. ■ Ventilation valves are not permitted ■ Use materials* with high resistance <p>4) Specifications:</p> <ul style="list-style-type: none"> ■ Wastewater is to be routed to the grease separator with a gravity drainage pipe with gradient at least 1.5 – 2 %. If this is not possible, use of ACO upstream tank plants with positive-displacement pumps is recommended. ■ Transition from downpipes to horizontal pipes must be made with two 45° pipe bends and a connecting piece at least 250 mm long (equivalent pipe bends with a correspondingly large radius). ■ A calm region must subsequently 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 pipe of the grease separator. ■ Use materials* with high resistance <p>* Materials that are resistant to animal and vegetable fats, cleaning agents and high temperatures. The permissible materials are cast iron (KML, TML), plastic (PP, PE), glass (borosilicate, float glass) and stainless steel (V4A e.g. 1.4404). In addition, seals that are resistant to the substances contained in the wastewater must be used for all pipe connections.</p>			

2.6.4 LipuLift - PF - D

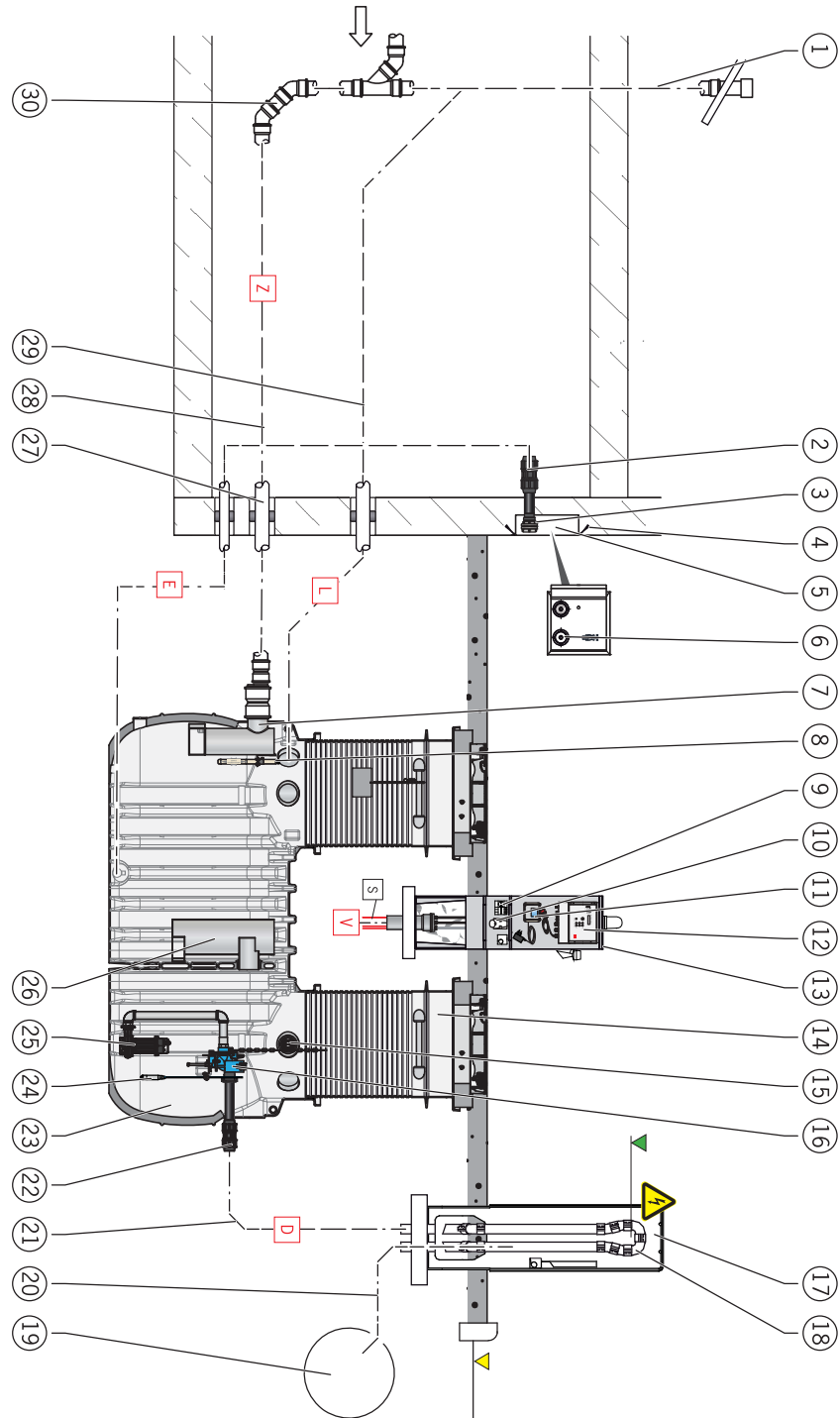


Figure: Plant _ Section / View

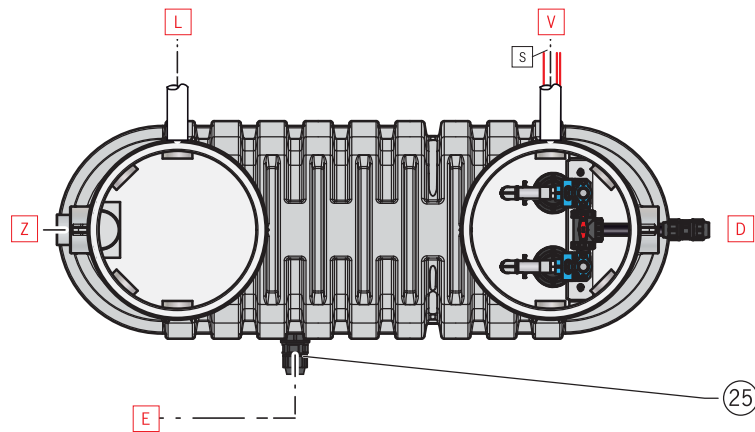



Figure: Plant _ Top view

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
1	Ventilation DN 100 / OD 110 mm of the inlet pipe pulled up to above the roof			X
2	Compression fitting DN 65 / OD 75 mm	X		
3	Pipe with fixed coupling Storz-B / 2½" and blind coupling	X		
4	Connection box		X	
5	Flush-mounted frame for terminal box		X	
6	Fixed coupling Storz-B / 2½" and blind coupling for pendulum gas line (optional)		X	
7	Submerged inlet pipe	X		
8	Grease layer thickness measuring device measuring rod		X	
9	Earthed plug socket 230 V/50 Hz			X
10	CEE-plug socket 16 A			X
11	Evaluation device for grease layer thickness measuring device with 3m connection cable and power socket		X	
12	Control unit	X		
13	Outdoor cabinet with special equipment (heating, horn, signal tower, ...)		X	
14	Necessary extension system Load class A 15, B 125 or D 400		X	
15	Cable gland DN100	X		
16	Above-water coupling	X		
17	Outdoor cabinet with heating		X	
18	Backflow loop			X
19	Channel			X
20	Outlet pipe to sewer			X
21	Pressure line at least DN 50 / OD 63 mm			X
22	Compression fitting DN 50 / OD 63 mm	X		
23	Tank	X		
24	Necessary level sensor		X	

Product description

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
25	Submersible pump (with sliding claw)	X		
26	Submerged outlet pipe	X		
27	Pipe feedthroughs		X	
28	Calming section of the inlet pipe according to DIN EN 1825-2			X
29	Vent stack DN 100 / OD 110 mm (pulled up to above roof)			X
30	Transition from downpipe to horizontal pipe according to DIN EN 1825-2			X
31	Compression fitting DN80/65 (OD 90/75 mm)	X		
S	<ul style="list-style-type: none"> ■ Construction phase 1: <ul style="list-style-type: none"> <input type="checkbox"/> 1 x qualitative pull wire (connection of supply line and tank) 			X
	<ul style="list-style-type: none"> ■ Construction phase 2: <ul style="list-style-type: none"> <input type="checkbox"/> Connection cable or control line for level sensor <input type="checkbox"/> 2 x connection cable 10 m (submerged pump) <input type="checkbox"/> Earthing cable H07V-K 6 mm² for equipotential bonding to earth outside the tank <input type="checkbox"/> Connection cable (accessory) 10, 20 or 30 m long (for connecting measuring rod and evaluation device for the grease layer thickness measuring device) 	X	X	X
D	Pressure line at least DN 50 / OD 63 mm up above the backflow level			X ¹⁾
E	Disposal pipe DN 65 / OD 75 mm (connection point for disposal vehicle and disposal connection on the tank)			X ¹⁾
L	Vent stack DN 100 / OD 110 mm (ventilation connection via roof and tank)			X ³⁾
Z	Inlet pipe DN according to NS (connection of waste water accumulation and tank)			X ⁴⁾
V	Supply line DN 100 / OD 110 mm (connection of supply line and tank)			X ²⁾
	<ul style="list-style-type: none"> ■ Electrical connection CEE socket: <ul style="list-style-type: none"> <input type="checkbox"/> 400 V / 50 Hz / 2.6 kW (article no. 3204.30.11 and 3207.30.11) <input type="checkbox"/> 400 V / 50 Hz / 3.2 kW (article no. 3207.30.12 and 3210.30.12) <input type="checkbox"/> 400 V / 50 Hz / 4.0 kW (article no. 3210.30.13) <input type="checkbox"/> General fuse protection: 3 x 16 A (time lag) or according to local conditions. 			X
	<ul style="list-style-type: none"> ■ Electrical connection for earthed socket for optional grease layer thickness measurement: <ul style="list-style-type: none"> <input type="checkbox"/> 230V/50 Hz <input type="checkbox"/> Fuse: 16 A (time lag) and/or according to the conditions on site 			X
	<ul style="list-style-type: none"> ■ Electrical connection for heating outdoor cabinet (accessory): <ul style="list-style-type: none"> <input type="checkbox"/> 230V/50 Hz <input type="checkbox"/> Fuse: 16 A (time lag) and/or according to the conditions on site 			X

Item	Component/performance	ACO scope of supply	Accessories from ACO	On-site performance
▼	Back flow level: The highest level to which water can rise within a drainage system.			X
▼	Pipe bottom of backflow loop, part of the pressure line above the backflow level			X
<p>1) Specifications:</p> <ul style="list-style-type: none"> ■ The pressure pipe must be designed for at least 1.5 times the pump pressure. ■ Lay the pressure pipe so that it rises continuously and is frost-resistant ■ The flow velocity in the pressure pipe must not fall below 0.7 m/s and must not exceed 2.3 m/s ■ Never connect other pipes to the pressure pipe ■ Air admittance valves are not allowed in the pressure pipe ■ Connect the pressure pipe without any tension ■ Install pressure line in at least DN 50 <p>2) Specifications:</p> <ul style="list-style-type: none"> ■ Install with a slope of at least 1.5 - 2 % from the outdoor cabinet or plant room to the tank. Do not reduce the stack cross-section ■ Do not use pipe bends with angles larger than 30° ■ Use materials* with high resistance Not necessary if the cable gland is installed. <p>3) Specifications:</p> <ul style="list-style-type: none"> ■ Run up to the roof, do not reduce the stack cross-section. ■ Ventilation valves are not permitted ■ Use materials* with high resistance <p>4) Specifications:</p> <ul style="list-style-type: none"> ■ Wastewater is to be routed to the grease separator with a gravity drainage pipe with gradient at least 1.5 – 2 %. If this is not possible, use of ACO upstream tank plants with positive-displacement pumps is recommended. ■ Transition from downpipes to horizontal pipes must be made with two 45° pipe bends and a connecting piece at least 250 mm long (equivalent pipe bends with a correspondingly large radius). ■ A calm region must subsequently 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 pipe of the grease separator. ■ Use materials* with high resistance <p>* Materials that are resistant to animal and vegetable fats, cleaning agents and high temperatures. The permissible materials are cast iron (KML, TML), plastic (PP, PE), glass (borosilicate, float glass) and stainless steel (V4A e.g. 1.4404). In addition, seals that are resistant to the substances contained in the wastewater must be used for all pipe connections.</p>				

2.7 Product identification (type plate)

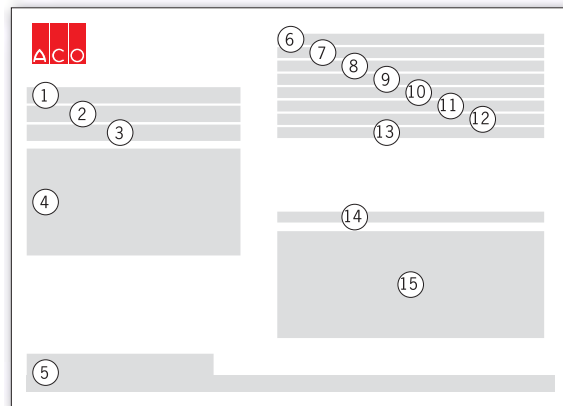




Illustration: Type plate

- | | |
|---|-------------------------------|
| 1 = Grease separator designation | 9 = Nominal size |
| 2 = Year built (week/year) | 10 = Sludge trap capacity |
| 3 = Article no. | 11 = Grease separator content |
| 4 = Order details | 12 = Grease storage capacity |
| 5 = Manufacturer's address | 13 = Grease layer thickness |
| 6 = Grease separator w. pumping system according to EN 1825-1 | 14 = Serial number |
| 7 = Pump station according to EN 12050-2 | 15 = QR-Code |
| 8 = Type | |

3 Installation

ATTENTION

- Required personnel qualifications,  Chapter 1.4 „Personnel qualifications“.
- Any remaining water left in the grease separator and the pump station -duo (plant leak test,  installation instructions „LipuLift -P / PF“ must be suctioned off before the installation work.

EN

3.1 Overview of the work

3.1.1 LipuLift - P - B and LipuLift - PF - B

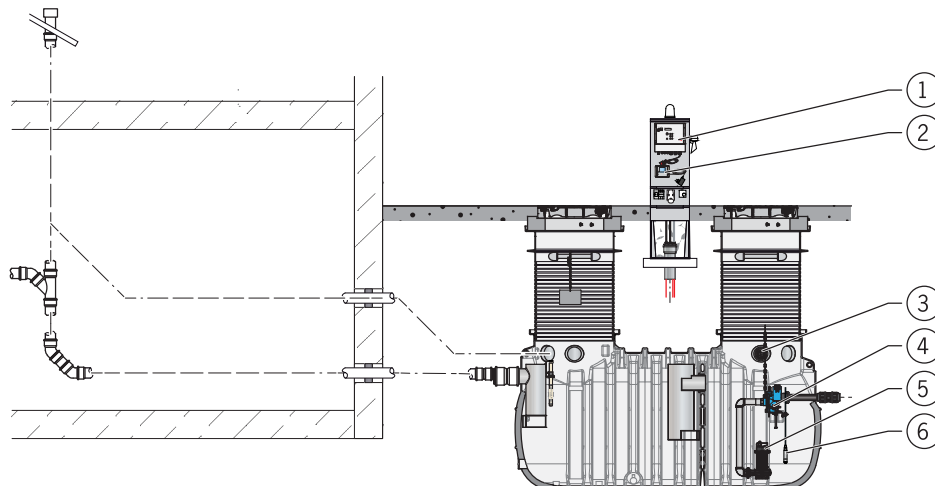



Figure: LipuLift - PF - B

Item	Work	 Chapter
1	Installing the control unit	3.4.1
2	Mount the grease layer thickness measuring device	3.4.8
3	Installing the cable gland	3.2.4
4	Establish potential connection	3.2.1
5	Insert submerged pump unit	3.2.2
6	Mount necessary level sensor	3.2.3
-	Connecting the control unit to the power supply	3.4.3

Item	Work	Chapter
-	Connecting the fault signalling equipment	3.4.4
-	Connect the connection cable of the submerged pumps	3.4.5
-	Connecting the control line of the pressure bell	3.4.6
-	Connecting the air bubble injection	3.4.7

3.1.2 LipuLift - P - D and LipuLift - PF - D

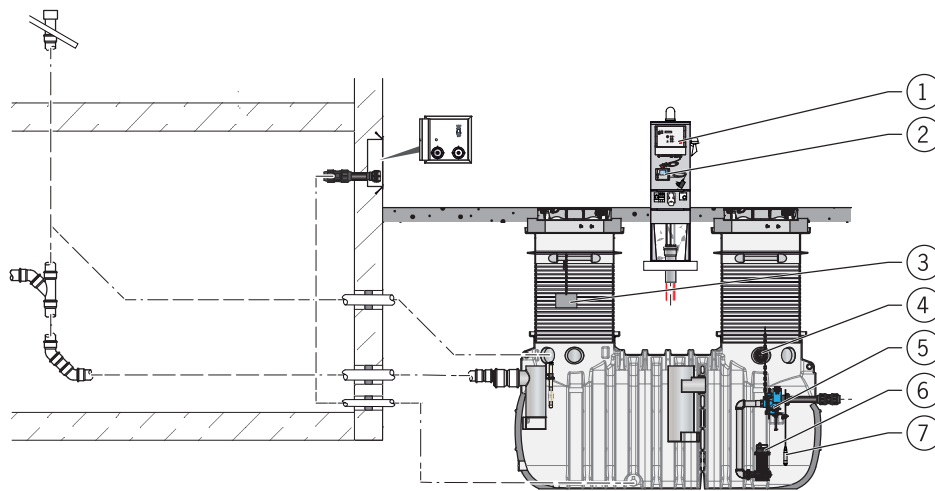


Figure: LipuLift - PF - D

Item	Work	Chapter
1	Installing the control unit	3.4.1
2	Mount the grease layer thickness measuring device	3.4.8
3	Add type plate	3.3
4	Installing the cable gland	3.2.4
5	Establish potential connection	3.2.1
6	Insert submerged pump unit	3.2.2
7	Mount necessary level sensor	3.2.3
-	Connecting the control unit to the power supply	3.4.3
-	Connecting the fault signalling equipment	3.4.4
-	Connect the connection cable of the submerged pumps	3.4.5
-	Connecting the control line of the pressure bell	3.4.6
-	Connecting the air bubble injection	3.4.7

3.2 Installing in pump station -duo



WARNING

Danger of falling into the pump station -duo

- Special care must be taken when carrying out the work so as not to fall into the pump station.
- Work should be carried out by 2 people.

Electric shock risk in case of improper electrical installation

- Work on electrical connections to power supply must be carried out by qualified electricians only.

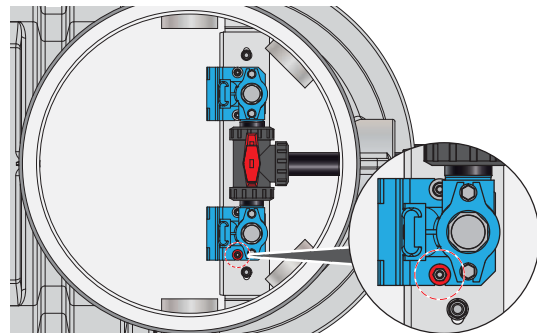
3.2.1 Establish potential connection

Equipotential bonding according to VDE 0100, part 540.

Requirement:

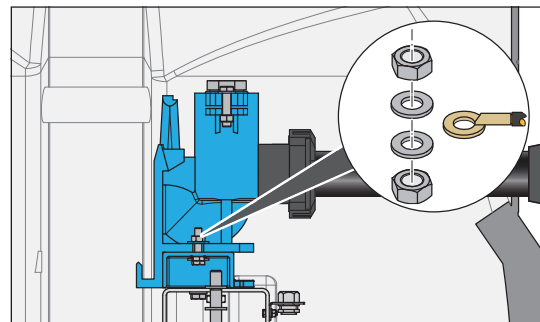
- Use on-site earth cable H07V-K 6 mm².
- Establish potential equalisation to earth outside the tank.

Connection point ● (screw connection) of the earth cable:




The earth cable must be connected to the attachment of the above-water coupling.

- Connect the earth cable to the screw connection.
- Pull the earthing cable with the pull wire through the supply line (reserve conduit) to the rod electrode or equipotential bonding rail. **ATTENTION** 📖 Chapter 3.2.4 "Installing the cable gland".
- Connect the earth cable to a suitable rod electrode or equipotential bonding rail.



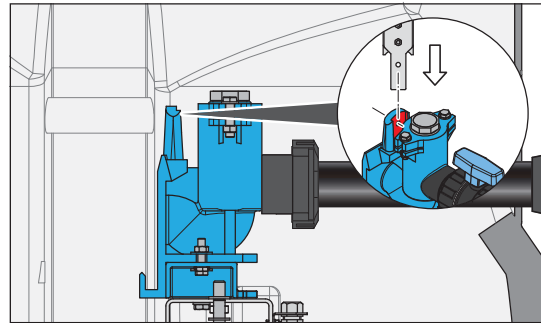
3.2.2 Insert submerged pump unit

Fitting the guide straps

 Guide straps (accessories) can be obtained from ACO.

The use of the guide straps simplifies the installation of the submerged pumps. Guide strap are each mounted on the above-water coupling in the pump station -duo.

- Push the guide strap into the recess of the above-water coupling and fix it with a screw.
- Place the guide straps in loops and hang them on the fastening hook below the shaft cover.



Installing submerged pumps into the pump station

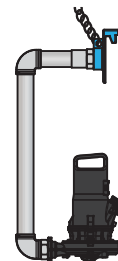
As delivered, 2 units of submerged pumps are supplied separately. A 4 m chain is attached to both units for suspension. Both units must be installed into the pump station -duo.

ATTENTION


- Before installing, be sure to clean the pumping station -duo of any contamination.
- Before installing, be sure to check that any protective caps on the above-water couplings have been removed and that the seals on the sliding claws are clean.
- Carry out work with 2 persons. One person threads and holds the guide strap, while another person positions the unit into the tank.
- Use suitable lifting gear.

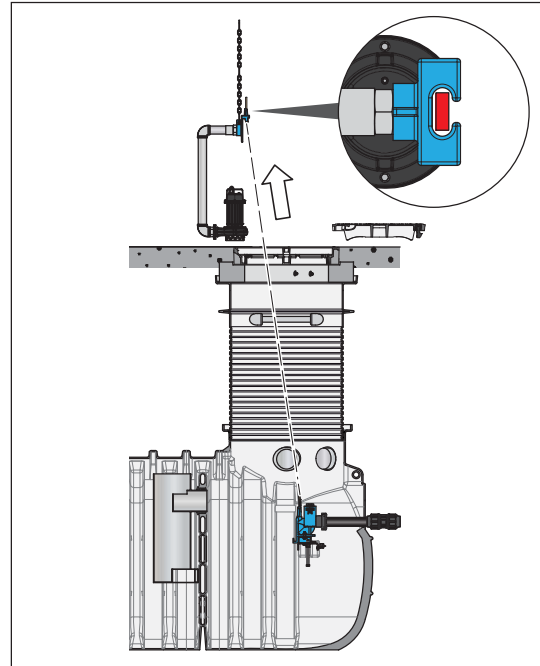
Weight of the units:

SAT 100/D	30 kg
SAT 150/D	32 kg
SAT 200/D	32 kg

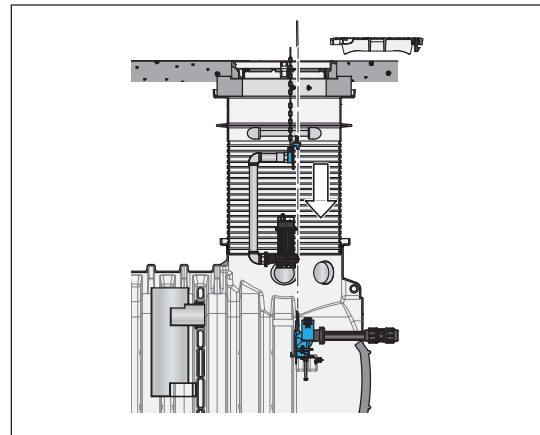


Description applies to both units:

- Place the unit next to the pumping station -duo.
- Thread the guide strap (accessory) into the opening  of the sliding claw,

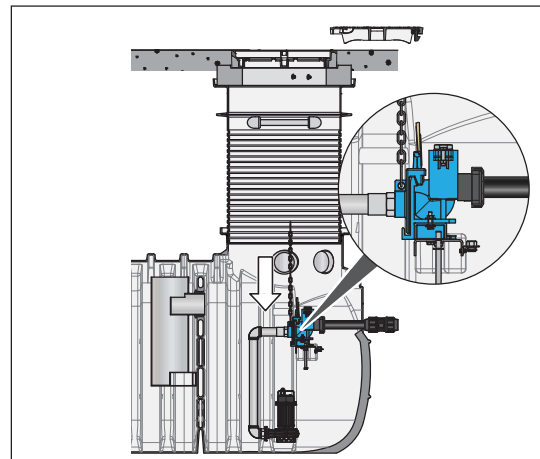


- Lift the unit, pull the guide strap (accessory) tight and lower the unit into the pump station.



- Lower the unit further until the sliding claw is positioned in the above-water coupling.
- Hook the guide strap and chain onto the attachment point underneath the manhole cover.
- Protect the ends of the connection cables (each 10 m long) against moisture and dirt penetration and pull them with the pull wire through the supply line (reserve conduit) to the installation site of the control unit.

ATTENTION  Chapter 3.2.4 "Installing the cable gland".



3.2.3 Mount necessary level sensor

- The necessary level sensor (accessory) for level measurement can be obtained from ACO.
- The level sensor (pressure transducer or open pressure bell) and cable glands are delivered as separate parts.

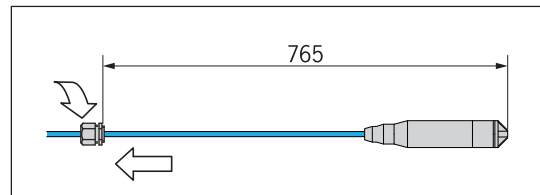
ATTENTION

- Protect the ends of the connecting cable or control line against penetrating moisture and dirt.
- Ensure free movement (level sensor hangs freely downwards without obstruction) after installation.

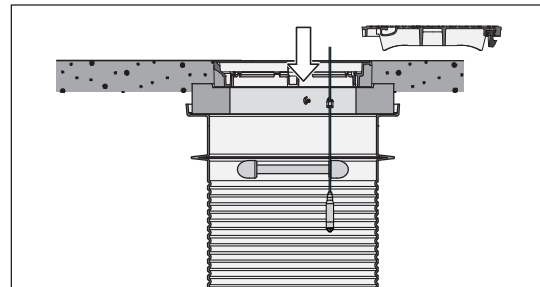
Pressure pick-up

The pressure sensor has a 20 m or 40 m long connection cable (already clamped and sealed to the pressure sensor) and is suspended from the crossbar.

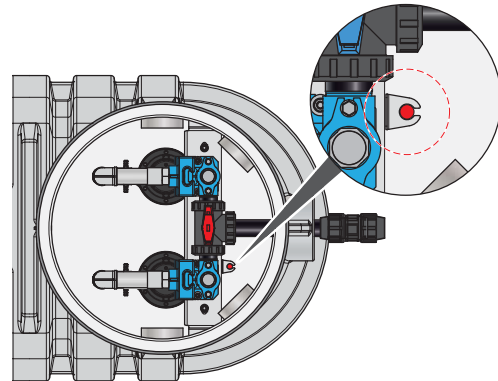
- Push the connection cable through the cable gland, set it to the **longitudinal measurement 765 mm** and tighten the union nut of the cable gland as hand-tight.



- Drain the pressure transducer on the connection cable into the pump station -duo.

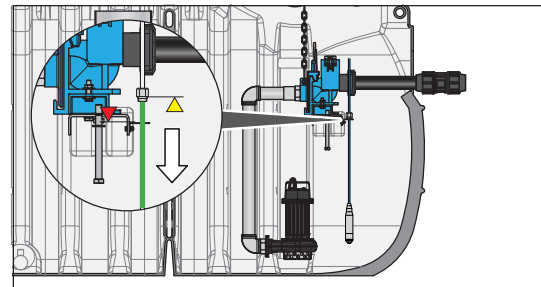


Position of the recess ● on the mounting bracket of the crossbar for holding the pressure transducer:



EN

- Guide the connection cable ■ below the cable gland into the recess ● of the retaining bracket.
- Continue to lower the pressure transducer until ▲ the cable gland is seated on the upper edge ▼ of the retaining bracket.
- Protect the end of the connection cable against dirt and moisture penetration and pull it with the pull wire through the supply line (reserve conduit) to the installation location of the high-pressure unit.

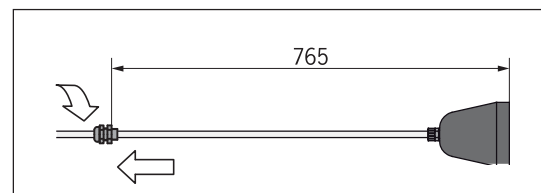


ATTENTION 📖 Chapter 3.2.4
"Installing the cable gland".

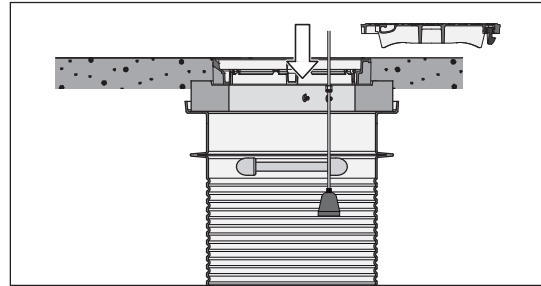
Open pressure bell

Open pressure bell has a 20 m long pneumatic control line (hose connected to the bell) and is suspended from the cross beam.

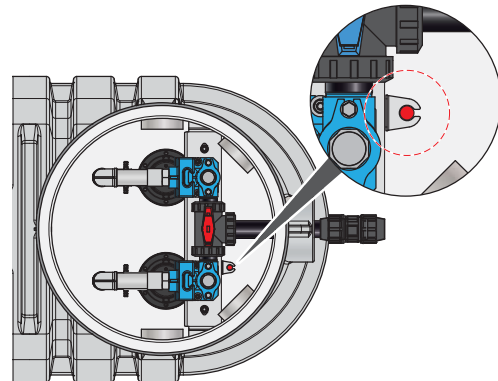
- Push the control line through the cable gland, set it to the **longitudinal measurement 765** and tighten the union nut of the cable gland as hand-tight.



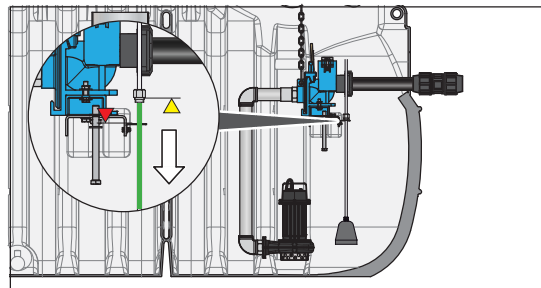
- Lower the open pressure bell on the control line into the pump station -duo tank.



- Position of the recess ● on the support bracket of the crossbar to receive the open pressure bell:



- Guide the control line ■ below the cable gland into the recess ● of the retaining bracket.
- Continue to lower the pressure bell until ▲ the cable gland is seated on the upper edge ▼ of the retaining bracket.
- Protect the end of the control line against dirt and moisture penetration and pull it with the pull wire through the supply line (reserve conduit) to the installation location of the control unit.



ATTENTION 📖 Chapter 3.2.4
"Installing the cable gland".

3.2.4 Installing the cable gland

A cable gland (approx. 1 kg) for sealing the connection cable and control line in the empty conduit (reserve conduit) provided by the customer is supplied separately.

Specifications:

- Install the control line to the control system upwards, kink-free and frost-resistant manner.
- Ensure that the connecting cable or the control line protrudes sufficiently from the control unit (approx. 1 m) in order to guarantee adequate cabling in the terminal compartment or the connection to the control unit.

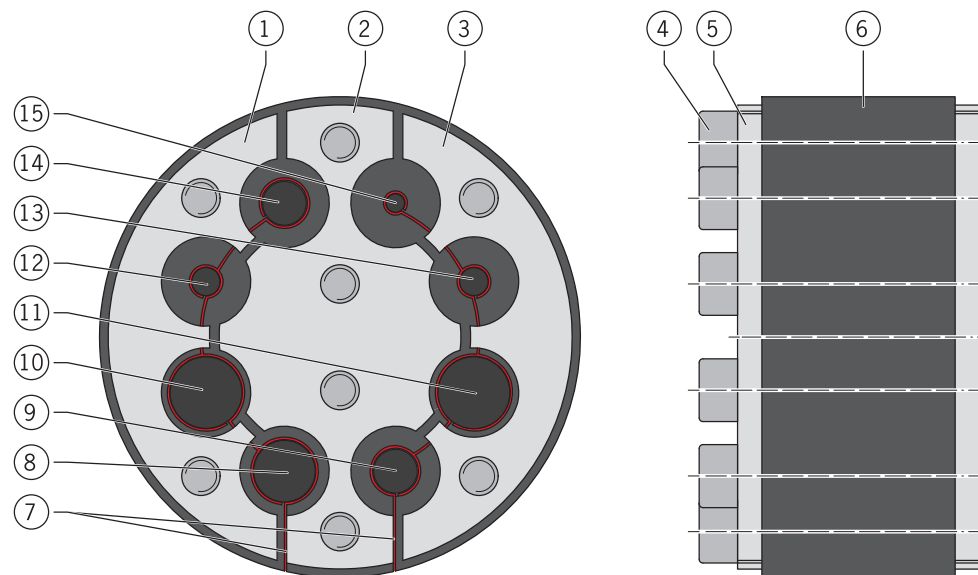



Figure: Cable gland

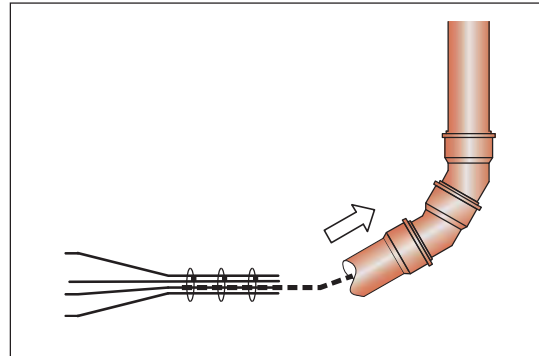
- | | |
|--|---|
| 1 = flange part (with threaded holes) | 9 = Bore or placeholder no. 4/Ø10.5 mm |
| 2 = flange part (with threaded holes) | 10 = Bore or placeholder no. 6/Ø16 mm |
| 3 = flange part (with threaded holes) | 11 = Bore or placeholder no. 3/Ø16 mm |
| 4 = Hex cap screws | 12 = Bore or placeholder no. 7/Ø7 mm |
| 5 = Flange parts with through bore-holes | 13 = Bore or placeholder no. 2/Ø7 mm |
| 6 = Split sealing sleeve | 14 = Bore or placeholder no. 8/Ø10.5 mm |
| 7 = Division  of the sealing sleeve | 15 = Bore or placeholder no. 1/Ø5 mm |
| 8 = Bore or placeholder no. 5/Ø14 mm | |

Arrangement of the drillholes and connecting cables or control lines (suggestion)

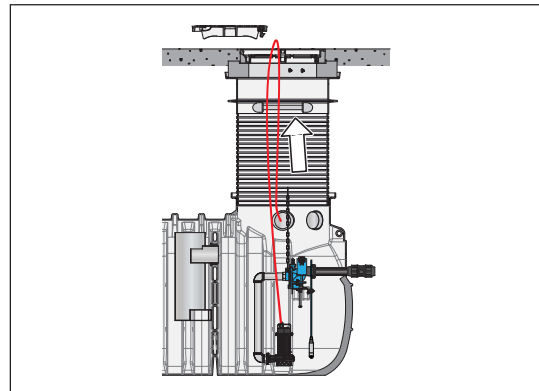
Drillhole number	Penetration of
9 (Ø 10.5 mm)	Submerged pump 1 connection cable
14 (Ø 10.5 mm)	Submerged pump 2 connection cable
1 (Ø 5 mm)	Earth cable
12 (Ø 7 mm) or 5 (Ø 14 mm)	Pressure transducer connection cable Pressure bell control line

Pulling in the connection cable or control cable

- Fasten the connection cable, earth cable and control line to the pull wire provided by the customer with cable ties ■■■ and pull it through the supply line (reserve conduit) to the control unit or into the plant room.



- **ATTENTION** Pull the connecting cable back until a loop can be ■ made at the top edge of the ground. This is the only way to remove the submerged pumps and the pressure transducer from the plant during operation.



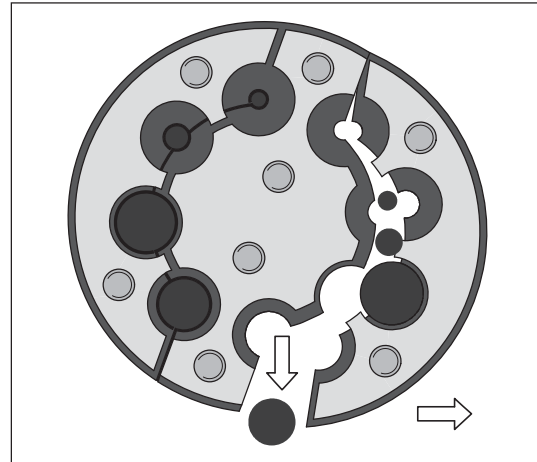
- Hook the connection cable loops into the extension system at a fixing point provided by the customer.


ATTENTION Exception for control line:

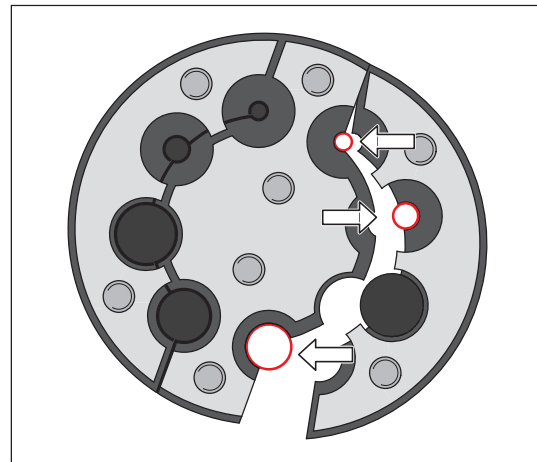
- Arrange these in an almost horizontal path from the cable gland to the beginning of the supply line.

Installation of the cable gland


- Position the cable gland close to the supply line sleeve.
- Loosen the hex cap screws a little.
- Unfold part(s) of the sealing sleeve as required.
- Remove unnecessary placeholders.

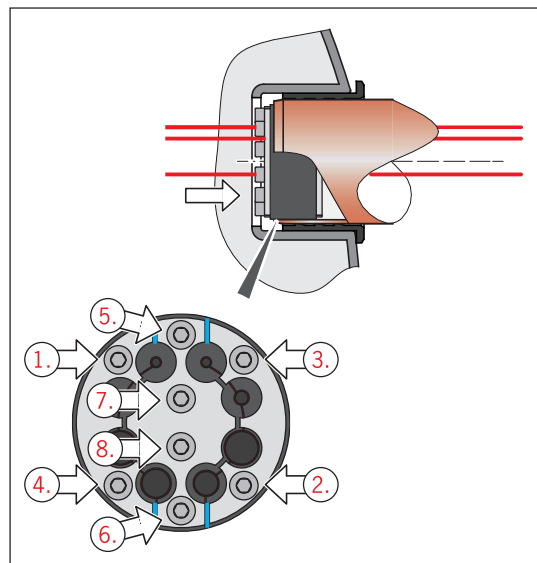


- Insert the connection cable or control line  and close the sealing sleeve again.



- Push the entire unit into the start of the supply line (until the sealing sleeve is seated in the reserve conduit) and tighten the screw connections by hand.

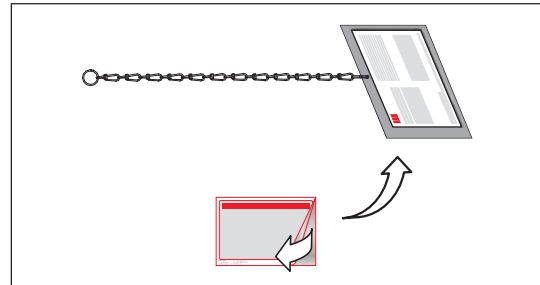
ATTENTION Observe tightening sequence 1 – 8 to avoid misalignment  of the flange parts.



3.3 Add type plate

For product identification, the existing type plate (hanging in the top system of the grease separator) of the installed models LipuLift - PF - D and LipuLift - P - D must be supplemented with the sticker supplied separately upon delivery.

- Remove the cover from the frame of the manhole cover above the grease separator and store it to the side.
- Remove the type plate from the extension system.
- Peel the sticker off the backing material and stick it on the back of the type plate.
- Reinsert the type plate into the extension system.
- Insert the cover back into the frame of the manhole cover.




3.4 Electrical installation




WARNING

Electric shock risk in case of improper electrical installation

- The control unit must not be connected to the power supply until after the sanitary and electrical installation have been completed.
- Work on electrical connections to power supply must be carried out by qualified electricians only.
- Electrical connections must be executed in accordance with the circuit diagram,  Chapter 7.6 "Circuit diagram of the control unit".



Accessories can be obtained from ACO:

- Grease layer thickness measuring device
- Outdoor cabinets to accommodate the control unit or other accessories (e.g. heating, thermostat, sockets, flashing light, horn),  "LipuLift - P / PF" installation instructions

3.4.1 Installing the control unit

Mounting on a wall

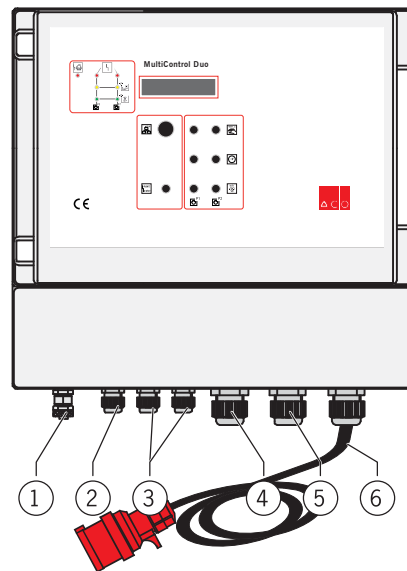
Specifications:

- Flood-proof and free wall area (width x height) of at least 400 mm x 400 mm
- Select the maximum distance according to the lengths of the connection cables of the submerged pumps and pressure transducer or the control line of the open pressure bell. If necessary, versions with longer connection cable or a control line can be purchased from ACO as optional components.

Installation in the outdoor cabinet

Installation of outdoor cabinet,  „LipuLift - P / PF“ installation instructions


3.4.2 Connections for the control unit



- | | |
|--|---|
| 1 = Connection for the control line of pneumatic level measurement (accessory) * | 4 = Submerged pump 1 power supply connection |
| 2 = Connection, mini compressor power supply (accessory) * | 5 = Submerged pump 2 power supply connection |
| 3 = Connection, connecting cable for pressure transducer (accessory) * | 6 = 1.5 m connecting cable with CEE plug 16 A |

* Connection 1 + 2 or 3

3.4.3 Connecting the control unit to the power supply

ATTENTION Connection data,  chapter 7.2 „Control unit“

- Install a CEE socket 16 A near the control unit according to the manufacturer's specifications (control unit connection cable 1.5 m long).
- Insert the CEE plug (16 A) into the CEE socket.

3.4.4 Connecting the fault signalling equipment

A cable (2-wire/0.75 mm²) must be connected in the control unit to forward the potential-free contact to the building management system (BMS) as a group alarm.

3.4.5 Connect the connection cable of the submerged pumps

ATTENTION There is an arrow on the submerged pumps (partly on the volute casing, partly as a sticker).

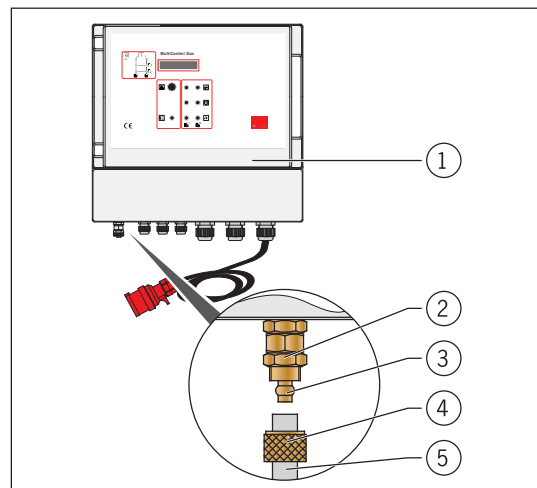
- Check the direction of turn
 - Clean the impeller unit and then switch the submerged pump on and off briefly.
 - Compare the direction of rotation with the arrow and, if necessary, turn the phase inverter into the CEE plug.

3.4.6 Connecting the control line of the pressure bell

ATTENTION To prevent malfunctions:

- Install the control line to the control system upwards, kink-free and frost-resistant manner.
- Use a cutter to adjust the control cable length at right angles.
- Only connect the control cable to the MultiControl Duo Control when the open pressure bell is not hanging in the water.

- At the control (1), unscrew the union nut (4) from the compression fitting (2) and push over the control line (5).
- Push the control line (5) onto the bush (3).
- Twist the union nut (4) onto the compression fitting (2) and tighten hand-tight.



3.4.7 Connecting the air bubble injection

The air bubble injection makes the level measurement even more reliable. This prevents a floating layer in the pressure bell from hardening and causing blockage.

Assembling the mini compressor onto a wall

The mini compressor has a 1.5 m long connection cable with earthed socket.

Requirement:

Flood-proof and clear wall surface 100 mm x 200 mm (width x height) near the control unit

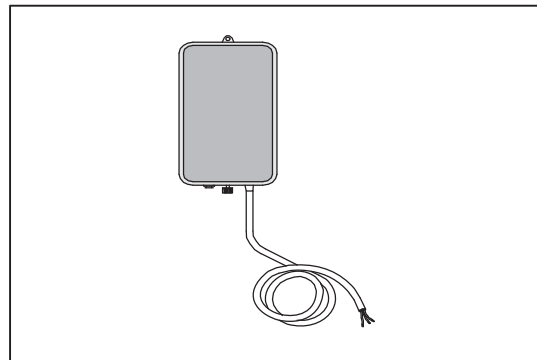
Installation of the mini compressor in the outdoor cabinet

Installation of outdoor cabinet,  „LipuLift - P / PF“ installation instructions

Connecting the mini compressor to the power supply

ATTENTION Connection data,  chapter 7.5 „Air bubble injection“

- Install the earthed socket near the control unit in accordance with the manufacturer's instructions.
- or
- Connect the mini compressor to the control unit:
- Strip the ends of the cables and fit on wire-end ferrules.
- Unscrew the cover of the control unit and connect the cable ends.

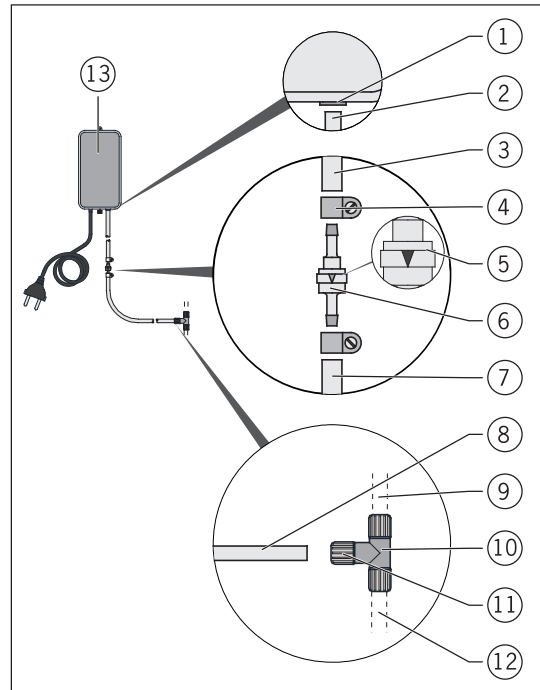


Connecting the control line

In the as-delivered condition, the connection parts are enclosed with the mini compressor as loose items.

ATTENTION To prevent malfunctions:
Use a cutter to adjust the control cable length at right angles.

- Cut the control line (12).
- Push the hose ends (8, 9 + 12) into the retainers of the screw-in T-fitting (10) and clamp (tighten hand-tight) using the respective union nuts (11).
- Push hose clamp (4) over the end (7) of the 0.5 m long hose.
- Push the hose end (7) onto the hose bush of the spring check valve (6), in accordance with the installation direction (5), and fix using a hose clamp (4).
- Push hose clamp (4) over the end (3) of the 0.5 m long hose.
- Push the hose end (3) onto the other hose bush of the spring check valve (6) and fix using a hose clamp (4).
- Push the other end of the hose (2) over the retainer (1) of the mini compressor (13).



3.4.8 Mount the grease layer thickness measuring device

 Instructions for use „Multi Control Grease layer thickness measuring device“.

4 Operation



CAUTION

Risk of infection in the event of contact with wastewater

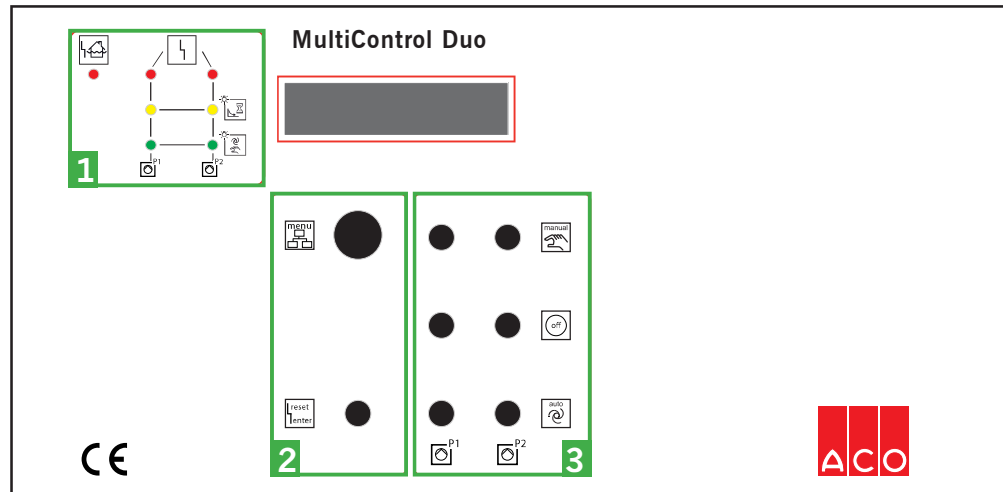
- Wear protective equipment, Chap. 1.5 "Personal protective equipment".

4.1 Commissioning










A general inspection of the grease separator by a competent person is mandatory during commissioning, Chapter 1.4 „Personnel qualifications“. Scope of the general inspection, Chapter 5.5 „5 year general inspection“.

- Empty and clean the grease separator and pump station.
- Connect the control unit to the electric power supply.
- Inspect and test the setting values in the menu items of the control unit, Chap. 4.2.3 'Setting values for commissioning'. **ATTENTION** There must not be any water in the pump station -duo during the setting operation.
- Fill the grease separator with freshwater up to the static water level (pipe bottom, outlet socket):
 - via the maintenance opening
 - Via the inlet line
- Set the automatic mode on the control unit.
- Close maintenance openings.
- Open the penstock in the supply (if present) and pressure line.
- Carry out a trial run of the pump station -duo, chap. 4.4.3 „Carrying out a trial run“.

4.2 Control unit



4.2.1 Operating elements and displays

Field	LED displays / symbols and meanings
1	 LED lights up: High water level alarm in pump station -duo
	 LED lights up: Group alarm, e.g. when the power consumption is too high, ...
	 LED lights up: Pump(s) in operation LED flashes: Pump(s) in operation via the after-running function
	 LED lights up: Automatic mode is active LED flashes regularly: Manual operation is active LED flashes irregularly: Manual operation was deactivated after 2 minutes
2	 Activate the rotary switch 'menu' to select menu items
	 Confirm setting (menu): Briefly press the "reset/enter" button Acknowledge the malfunction: Press and hold the "reset/enter" button for approx. 2 seconds.
3	 Switch on manual operation for pump P1 and P2 regardless of the level measurement: Press button briefly Manual operation is switched off automatically after 2 minutes
	 Switch off manual or automatic operation for pump P1 and P2 regardless of the level measurement: Press the button briefly
	 Switch on automatic mode for pump P1 and P2: Press key 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.

Operating hours and pump cycles can be displayed but not changed.

- Select menu items (upper line): Press the rotary switch „Display“.
- Amend 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: Briefly press the „Acknowledge selection“ button.

Explanation of the menu items

Menu items (top line)	Settings (bottom line)	Explanation
Base load ON	0 – 200 cm	Activation point for first pump 1
Base load 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	Deactivation point for additional pump
High water level	0 – 200 cm	High water level alarm in the event of exceedance
Max Run Time	0 – 60 minutes	Value '0' deactivates the function. if the pump is operated without interruption, it is automatically shut down after the set running period. The pump does not start up again until the defect has been acknowledged.
Run time altern.	deactivated 1 – 60 minutes	After the set time in base load operation a pump changeover takes place. After three changes without interruption the "High water level alarm" is also triggered and the "Running time change" 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.
Stop delay	0 – 180 s	Stop delay period of the pump after the switch-off point has been reached.
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.

Menu items (top line)	Settings (bottom line)	Explanation
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.
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: An alarm sounds in the event of a malfunction.
Interm. alarm	deactivated activated	Activated: Malfunction message relay will be cycled.
Pump changeover	deactivated activated	Activated: Pump changeover with every restart.
Thermal overload P1 malfunction 1	deactivated, activated	Deactivated: No bimetallic contact (warning contact) is connected to terminals 31,32 (pump 1).
Thermal overload P2 malfunction 1	deactivated, activated	Deactivated: No bimetallic contact (warning contact) is connected to terminals 38,39 (pump 2).
Rot. field error	deactivated activated	Activated: If the phase sequence is incorrect or L2 or L3 are missing, the group alarm message is triggered and the pumps cannot be put into operation.
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 the Test Pump run 24h and the telecontrol systems.
Service mode	activated deactivated	Activated: all settings can be amended. Deactivated: Settings are shown, but cannot be amended.
Level control	Internal converter Float switch 4 – 20 mA interface	Internal transducer: level detection via pneumatic pressure and air bubble injection Float switch: Level detection via float switch 4 - 20 mA interface: Level detection via external sensor (4 - 20 mA)
20mA => level	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 commissioning

The values must be set when commissioning. Adjustments are to be entered by hand in the table below.

Menu items	Unit	Setting values					Adjustments
		Commissioning					
		NS 4 100/D	NS 7 100/D	NS 10 150/D	NS 10 150/D	NS 10 200/D	
Base load ON	cm	62					
Base load OFF	cm	5					
Peak load ON	cm	70					
Peak load OFF	cm	64					
High water level	cm	80					
Run time altern.	Minimum	5					
Max Run Time	Minimum	0					
Delay	s	0					
Stop delay	s	10					
Max. current – 1	A	2.3	2.3	2.7	2.7	3.6	
Max. current – 2	A	2.3	2.3	2.7	2.7	3.6	
Test Pump run 24h	–	activated					
Acoustic alarm	–	activated					
Interm. alarm	–	deactivated					
Pump changeover	–	activated					
Thermal overload P1 malfunction 1	–	deactivated					
Thermal overload P2 malfunction 1	–	deactivated					
Rot. field error	–	activated					
ATEX mode	–	deactivated					
Service mode	–	deactivated					
Level control	–	4 – 20 mA Interface *					
20mA => level	cm	250					
Language	–	English					

* Setting = "Internal transducer" when using the open pressure bell with air bubble injection (accessory)

4.3 Draining and cleaning grease separators

Grease separators must be emptied and cleaned at least once a month by properly qualified personnel,  Chapter 1.4 „Personnel qualifications“. (Applies to Germany. Provisions in other countries can vary). More frequently depending on the quantity of grease and/or sludge produced.



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

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

4.3.1 Inspections

- Define additional 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.
- Inspect maintenance openings especially the condition and the leak-proof capability of the seals.
- Clean the sampling equipment (in pump station- duo).

4.3.2 LipuLift - P - B and LipuLift - PF - B

- Interrupt the wastewater infeed or stop kitchen operation.
- Open the maintenance opening above the grease separator and insert the suction hose (vacuum truck).
- Switch on the suction pump for so long until the grease separator contentt has dropped by approx. 1/4.
- Break up hardened layers of grease in the grease separator.
- Switch on the suction pump (vacuum truck) and suck out the contents.
- clean the grease separator, Switch on suction pump (vacuum truck) and pump out polluted cleaning water.
- Switch off suction pump (vacuum truck) and remove the suction hose from the maintenance opening.
- Fill at least 2/3 of the grease separator with fresh water.
- Close the maintenance opening and connect the wastewater supply and/or acquire catering establishment.

4.3.3 LipuLift - P - D and LipuLift - PF - D


- Interrupt the wastewater infeed or stop kitchen operation.
- Connect the suction hose (vacuum truck) to the disposal line.
- Open the maintenance opening above the grease separator and switch on the suction pump until the grease separator content is lowered by approx. 1/4.
- Break up hardened layers of grease in the grease separator.

- Switch on the suction pump (vacuum truck) and suck out the contents.
- clean the grease separator, Switch on suction pump (vacuum truck) and pump out polluted cleaning water.
- Switch off suction pump (vacuum truck) and remove the suction hose from the disposal line.
- Fill at least 2/3 of the grease separator with fresh water.
- Close the maintenance opening and connect the wastewater supply and/or acquire catering establishment.

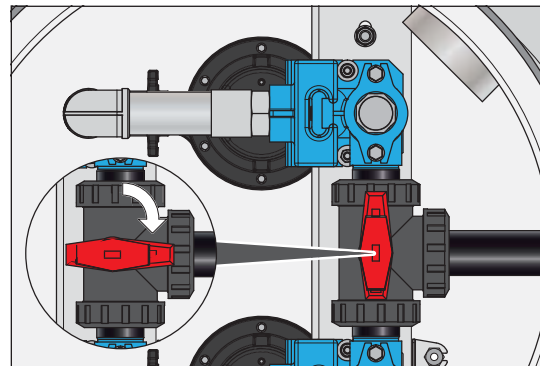
4.4 Trial run pump station -duo

4.4.1 Opening the ball valve

ATTENTION Before commissioning for the first time, open the ball valve in the pressure line.

 An operating key for opening can be obtained from ACO as an accessory.


- Lift the cover out of the frame of the manhole cover above the pumping station -duo and store it to the side.
- Opening the ball valve




4.4.2 Starting up the submersible pumps

The description applies to both submersible pumps.

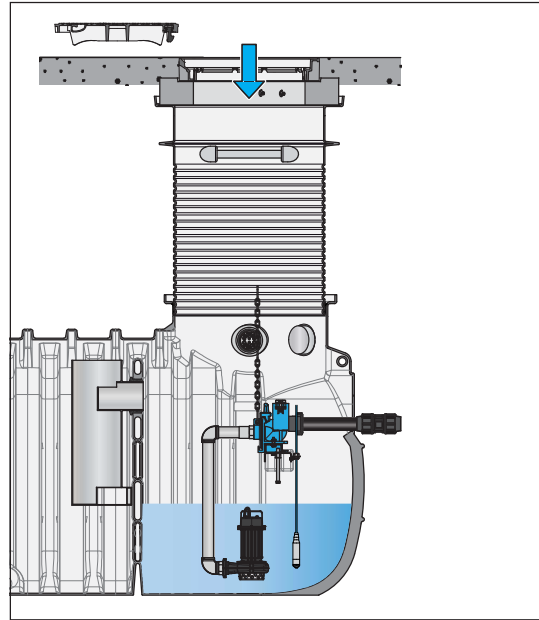
ATTENTION To ensure dry-running protection, the pump chamber must be vented during the initial start-up.

 It can be filled with drinking water, rainwater or process water (when this complies with the local discharge conditions for effluent).

Requirements:

- All installation work is now completed.
- The ball valve in the discharge line is open,  Chapter 4.4.1 „Opening the ball valve“.
- The control unit is connected to the power supply.

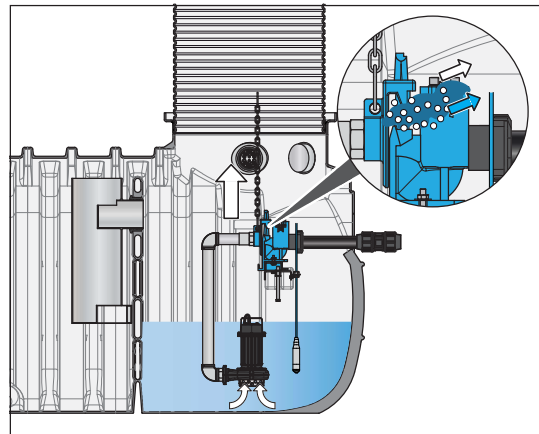
- Fill the pump station -duo with water via the inlet pipe or the maintenance opening up to approx. the halfway point (in relation to the inlet connection).



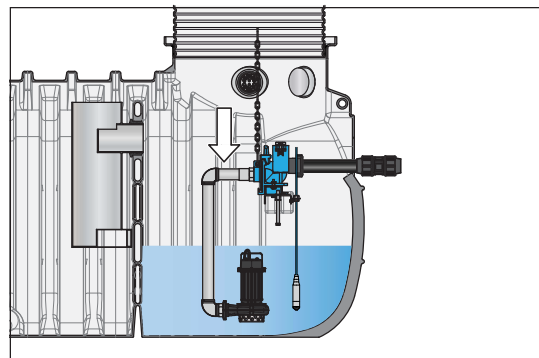
- Switch on the submerged pump at the control unit and lift the "submerged pump" unit a small distance.

ATTENTION Sliding claw must still remain in the guide of the above-water coupling.

Water flows into the pump from below, air is displaced upwards into the pressure line and escapes via the opening of the sliding claw.





- Lower the "submerged pump" unit again until the sliding seal is completely seated in the guide of the above-water coupling.
- Switch off the submerged pump.
- Execute a test run, see Chapter 4.4.3 "Carrying out a trial run".



4.4.3 Execute test run

Requirements:


- The ball valve in the discharge line is open,  Chapter 4.4.1 „Opening the ball valve“.
- Submerged pumps have been put into operation,  Chapter 4.4. 2 „Putting submerged pumps into operation“.
- The control unit is connected to the power supply.

During the trial run, pay attention to the following:


- Perform the trial run at least twice during commissioning.
- Observe the signals/messages in the display panel of the control unit.

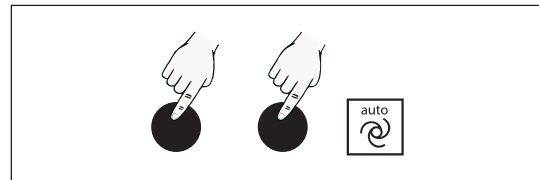
ATTENTION If knocking noises/vibrations occur in the pressure pipe when the submerged pump is switched off, then set an stop delay period and/or increase the set stop delay period.

The pump station -duo can be filled with water via the inlet pipe or via the maintenance opening.

 It can be filled with drinking water, rainwater or process water (when this complies with the local discharge conditions for effluent).

Starting automatic mode:

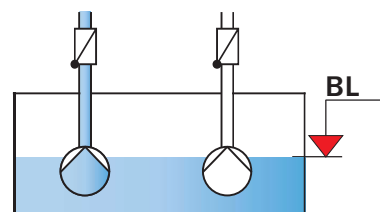
- Press  both buttons to start automatic operation Submerged pumps 1 and 2.



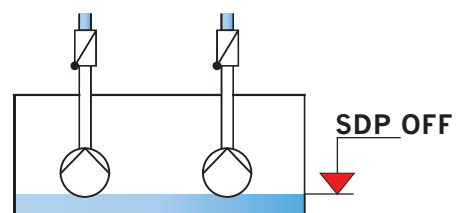
- Filling pump station -duo.

When the water level reaches the “Base load” (BL) level, submerged pump 1 switches on.

- Interrupt the inlet.



When the water reaches the “Base load OFF” level, the water level is reduced by the stop delay period to the level “Stop delay period OFF” (SDP OFF) pump. Then the submerged pump 1 switches off.

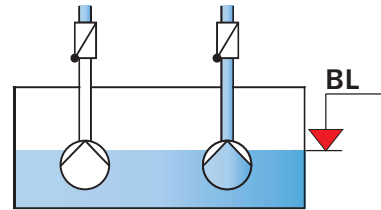


Operation

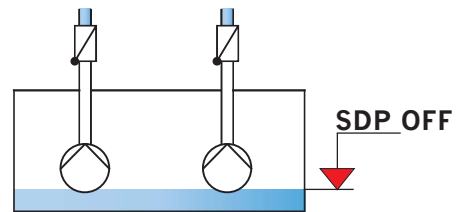
→ Filling pump station -duo.

When the water level reaches the “Base load” (BL) level, submerged pump 2 switches on.

→ Interrupt the inlet.



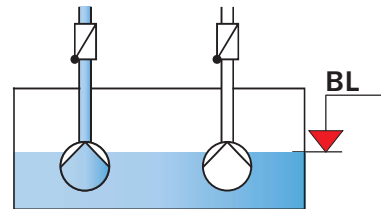
When the water reaches the “Base load OFF” level, the water level is reduced by the stop delay period to the level “Stop delay period OFF” (SDP OFF) pump. Then the submerged pump 2 switches off.



→ Filling pump station -duo.

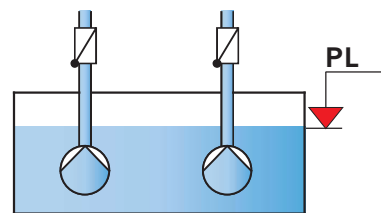
When the water level reaches the “Base load” (BL) level, submerged pump 1 switches on.

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

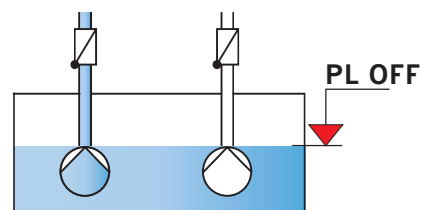


When the water reaches the “Peak load” (PL) level submerged pump 2 also switches on.

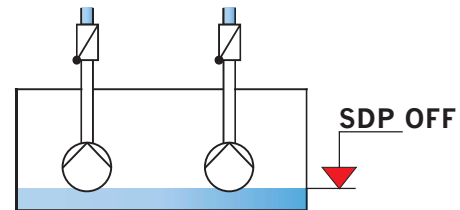
→ Interrupt the inlet.



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

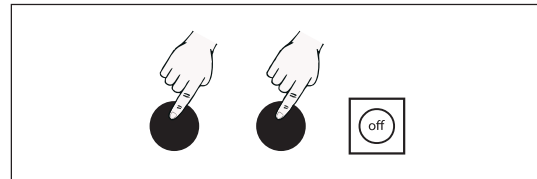


When the water reaches the “Base load OFF” level, the water level is reduced by the stop delay period to the level “Stop delay period OFF” (SDP OFF) pump. Then the submerged pump 1 switches off.



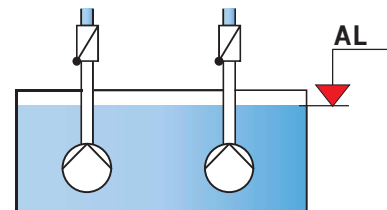
Ending automatic mode:

→ Press  both buttons to end automatic operation Submerged pumps 1 and 2.




→ Filling pump station -duo.

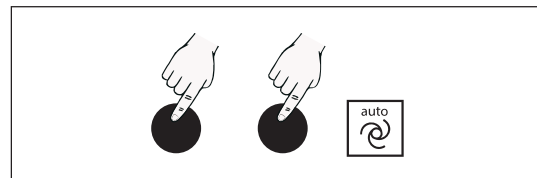
If the water level reaches the “High water level alarm” (H-AL) level, an alarm sounds, a fault signal appears in the display panel and the LED for “Flood alarm” lights up:



→ Interrupt the inlet.

Starting automatic mode:

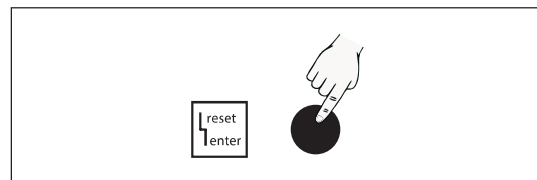
→ Press  both buttons to start automatic operation Submerged pumps 1 and 2.



Acknowledging a malfunction:



→ Press the button  for 2 seconds to acknowledge the malfunction.

A malfunction signal is no longer displayed and the LED for the “High water level alarm” goes out:





The trial run is finished

Final work:

- Replace the cover in the frame of the manhole cover.
- Document the settings,  Chapter 4.2.3 “Setting values during commissioning”
- Document the commissioning,  Appendix: “Commissioning report”

5 Regular testing, inspection and maintenance

ACO recommends that you take out a maintenance contract. This ensures proper and on-schedule completion of the maintenance work by ACO product specialists,  Introduction „ACO Service“.

Required qualifications for testing, inspection and maintenance,  Chapter 1.4 „Personnel qualifications“.

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

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

ATTENTION

- If defects are found during the tests or inspections, then the plant must not be put back into service until these defects have been remedied.
- Inspections carried out, any defects and their rectification must be documented in the operating logbook

5.1 Daily inspections, testing

Inspections by the operating company:

- Remove impurities in the coarse trap (if present) of the inlet pipe.

5.2 Weekly Inspections

Inspections by the operating 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.

5.3 Quarterly maintenance of the pumping station -duo

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

- Check that the ball valve functions properly with the operating key (accessory).
- Check condition and function of the above-water coupling with vertically closing ball check valve, clean if necessary.
- Check the condition (wear of pump parts) and function of the submerged pumps.
- Check the condition of the connection unit (sliding claw) and sealing in the above-water coupling
- Check the function of the level measurement (level sensor).
- Check the condition of the necessary level sensor, clean if necessary.
- Check the function of the air bubble injection when using the open pressure bell (accessory) as a level sensor.

5.4 Annual maintenance of the system

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

Grease separator

- Inspect the internal wall surfaces and components.
- Inspect the covers of the extension system, in particular the condition and sealability of the seal.
- Clean the sampling equipment as and when necessary.

Pump station

- Test the function of the ball valve.
- Check condition and function of the above-water coupling with vertically closing ball check valve and clean if necessary.
- Check the condition (wear of pump parts) and function of the submerged pumps.
- Check the condition of the connection unit (sliding claw) and sealing in the above-water coupling
- Check the function of the level measurement (level sensor).
- Check the condition of the necessary level sensor and clean if necessary.
- Check the function of the air bubble injection when using the open pressure bell (accessory) as a level sensor.

Control unit

- Check the condition and function of the control unit and clean it if necessary.

5.5 5-year general inspection of the grease separator

Inspections (after prior emptying and cleaning) by a competent person prior to commissioning and thereafter at least every 5 years in accordance with the specifications of DIN 4040-100. The issues to be examined include the following:

- Check the dimensioning of the grease separator.
- Inspect the structural condition and leak tightness of the grease separator system or the plant according to DIN 4040-100.
- Inspect the internal wall surfaces and components.
- Check that the ventilation duct of the grease separator is properly installed as a vent stack in accordance with DIN EN 1825-2.
- Inspect the completeness and plausibility of the entries in the operating log, e.g. verifications of proper disposal, constituents removed, sampling.
- Inspect for completeness of the required permits and documents, e.g. approvals, drainage plans, instructions for use.

6 Troubleshooting



WARNING

Electric shock

- Work on electrical connections must only be executed by qualified electricians.
- Disconnect the control unit from the power supply before troubleshooting.

CAUTION

Flooding and risk of infection in case of improper sanitary installation

- Work on the sanitary equipment must only be executed by qualified personnel, Chapter 1.4 "Personnel qualifications".
- Prevent contact with wastewater and wear protective equipment, Chapter 1.5 "Personal protective equipment".
- Never execute work on the connections and pipes unless they are depressurised.

Burns due to hot surfaces

- Always allow the motor of the submerged pump to cool down

ATTENTION

Acoustic alarm with power failure and high water level alarm

- Always interrupt the wastewater feed and remedy the causes.

Display of malfunctions (control unit), Chap. 4.2 „Control unit“.

For safe and fault-free operation, only original spare parts from ACO are permitted, Introduction „Service“.



For repairs and spare part orders: Specify serial and article number, Chapter 2.7 „Product identification (type plate)“.

The list does not claim to be complete.

6.5.1 Grease separator malfunctions




Malfunction	Cause(s)	Remedy
Odour nuisance in normal operation	Manhole cover seal damaged	Replace the seal

6.5.2 Pump station malfunctions

Malfunction	Cause(s)	Remedy
Submerged pump not functioning	Power consumption too high (automatic shut-off)	Keep "Acknowledge selection" button on the control unit pressed for approx. 2 seconds If the malfunction remains: Contact ACO Service
	Control unit without power supply	Restore power supply (electrician)
	Automatic mode not switched on	Switch on automatic mode
	Pump motor is defective	Submerged pump replacement required (ACO Service)
	Submerged pump blocked by foreign bodies	Submerged pump maintenance required (ACO Service)
Submerged pump does not pump or pumps too little or pump station is full.	Ball valve in the pressure pipe is not fully open or is closed	Fully open the ball valve in the pressure pipe
	Incorrect rotational direction Phases L1, L2, L3 interchanged	Check rotational direction, if necessary turn 2 phases via phase changer in the plug (electrician)
	Pressure pipe obstructed	Clean the pressure pipe
	Impeller (submerged pump) obstructed	Submerged pump maintenance required (ACO Service)
	Pump parts are worn	Submerged pump repair required (ACO Service)
Submerged pump only runs in manual operation	Level sensor set incorrectly or is defective	Set 'Water levels' in the menu,  chap. 4.2.2 or 4.2.3 or replace the level sensor replace
	Mini compressor of the air bubbling injection defective when using an open pressure bell	Replace the mini compressor
High water alarm (water level above the 'High water' level)	Ball valve in the pressure line not open or only partially open	Check or open ball valve
	High water level incorrectly set	Set "High water level" in the menu,  chap. 4.2.2 or 4.2.3
	Submerged pump(s) damaged	Check submerged pump(s) and replace if necessary (ACO Service).
Knocking noises/vibrations in the pressure pipe on switching off the submerged pump(s)	Stop delay period of the submerged pump(s) is too low	Increase or adjust the stop delay period of the submerged pump(s).

6.5.3 Fault messages on the control unit

Display panel	LED display	Cause(s)	Remedy
P1: without load P2: without load	●	Pump does not draw current: <ul style="list-style-type: none"> ■ Terminal not tightened properly ■ Pump defective ■ Current consumption is incorrect 	<ul style="list-style-type: none"> ■ Correctly attach the terminal ■ Replace pump ■ Correct setting
Excess current	●	Motor current of the corresponding submerged pump is higher than the set value of the current limitation	Acknowledge malfunction * Check mains supply, pump cable and pump
Dry run protection activated	●	Contact for dry-running protection has opened	Acknowledge malfunction * Check submerged pump or level sensor for function, check level
Runtime - Alarm	●	Tripping after three changes	Acknowledge malfunction * Check the function of the pumps and the run time altern. settings.
Runtime of small pump changeover	●	Maximum running period is smaller than the set value of the running period change	Acknowledge malfunction * Check run time altern., run. time max. - settings
Switch-on below switch-off point	●	Settings for switch-on and switch-off point overlap	Acknowledge malfunction * Check level settings
High water level below switch-on point	●	Settings for high water level alarm and switch-on point overlap	Acknowledge malfunction * Check level settings
Switch-on point above peak load	●	Switch-on point for the baseload pump is above the switch-on point of the peak load pump	Acknowledge malfunction * Check level settings
Rotating field - error	●	One or two phases are missing or the rotating field is not correct.	Check whether all 3 phases are present and whether the rotating field (right) is correct.

Display panel	LED display	Cause(s)	Remedy
High water level		Level has exceeded the high water setting	Acknowledge malfunction * Check the function of the submerged pumps and the high water level setting
		Ball valve in the pressure line not open or only partially open	Check or open ball valve Acknowledge malfunction *
		High water level incorrectly set	Set "High water level" in the menu,  chap. 4.2.2 or 4.2.3 Acknowledge malfunction *
		Automatic mode is switched off	Switch on automatic mode Acknowledge malfunction *
		Pump motor is defective	Pump replacement required (ACO Service)
		Impeller obstructed	Pump maintenance required (ACO Service)
		Pressure bell blocked	Clean the pressure bell
		Pressure pick-up is defective	Replacing the pressure sensor
		Pressure pipe obstructed	Clean the pressure pipe
		Submerged pump(s) damaged	Check submerged pump(s) and replace if necessary (ACO Service).
ATEX: Level below switch-off point		Atex Mode is activated and the level is below the switch-off point of the selected pump.	In the explosion-risk area, the level must first rise above the switch-off point of the pumps before they can be switched on. If the pumps are not in the explosion-risk area, the Atex mode can be deactivated in the menu.
*Keep "Acknowledge selection" button on the control unit pressed for approx. 2 seconds If the malfunction persists: carry out the work described, if necessary consult ACO Service.			

7 Technical data

7.1 Plant

No- minal size	Grease separator			Pump station -duo			Weight			
	Content			Submerged pump		Usable volu- me	Empty		Filled	
	Sludge trap	Grease store	Total	Type	max geode- tic height *		-B	-D	-B	-D
NS	[l]	[l]	[l]		[m]	[l]	[kg]	[kg]	[kg]	[kg]
4	600	380	1,270	SAT 100/D	8	660	340	345	2.270	2.275
7	790	560	1,765	SAT 100/D	6	660	380	385	2.805	2.810
7				SAT 150/D	8	660	380	385	2.805	2.810
10	1,015	720	2,270	SAT 150/D	4	660	400	405	3.330	3.335
10				SAT 200/D	8	660	400	405	3.330	3.335

* Height difference between the bottom of the tank and the bottom of the on-site backflow loop. Value = recommendation (value calculation according to sum: 1x knife gate valve, 1x non-return damper, 10x 45° bends, pipe length 30 m, max. volume flow of the pump)

** Weights apply to type LipuLift - P. For type LipuLift - PF approx. 15 kg less in each case

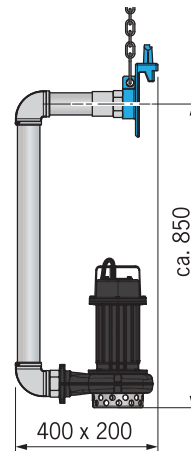
7.2 Control unit

Technical data	Versions
Performance:	2.6 kW (NS 4+7 with SAT 100/D)
	3.2 kW (NS 7+10 with SAT 150/D)
	4.0 kW (NS 10 with SAT 200/D)
Power supply:	400 V / 50 Hz
CEE plug socket:	16A
Fuse (local):	3 x 16 A (time lag) or according to the conditions on site
Protection type:	IP 54
Weight:	5.6 kg
Dimensions (W x H x D):	320 x 300 x 120 mm

7.3 Submerged pumps

Data applies to one pump unit.

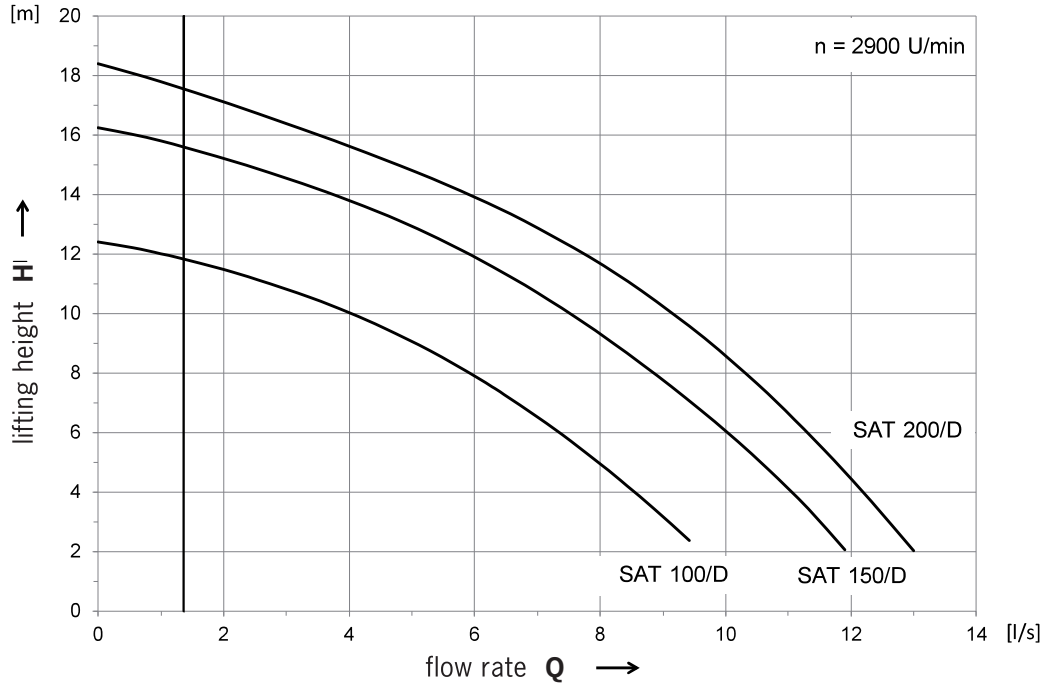
Dimensions



Technical data and application limits

Technical data	Values		
	SAT 100/D	SAT 150/D	SAT 200/D
Type of cable for connection cable:	4G1	4G1	4G1
Pump motor operating voltage [V]:	400	400	400
Frequency [Hz]:	50	50	50
Pump motor speed [1/min.]:	2,900	2,900	2,900
Pump motor power input P1 [kW]:	1.3	1.6	2.0
Pump motor output P2 [kW]:	0.9	1.1	1.5
Pump motor nominal current [A]:	2.3	2.7	3.6
Maximum ball through-flow [mm]:	15	15	15
Fluid pH-value:	6 – 14	6 – 14	6 – 14
Weight [kg]:	30	32	32

Performance diagram



EN

7.4 Required level sensor (accessories)

7.4.1 Pressure pick-up

Technical data	Values	
Length of the connection cable:	20 m	40 m (60 or 80 m on request)
Output signal:	4 – 20 mA	
Use for ambient temperature:	minus 10 – plus 70 °C	
Measurement range:	0 – 200 mbar	
Bending radius of connection cable:	maximum 120 mm	
Weight:	2 kg	3.4 kg
Dimensions of the pressure transducer:	Ø 30 x 160 mm	

7.4.2 Open pressure bell

Technical data	Values
Length of the connection hose:	20 m
Measurement principle:	Pneumatic dynamic pressure measurement
Area of use:	In highly contaminated and viscous liquids and Zone 1 + 2 potentially explosive atmospheres.
Restriction:	Not suitable for aggressive liquids and temperatures higher than 40
Material:	Grey cast iron
Weight:	0.8 kg
Dimensions:	Ø 110 x 100 mm

7.5 Air bubble injection (accessory)

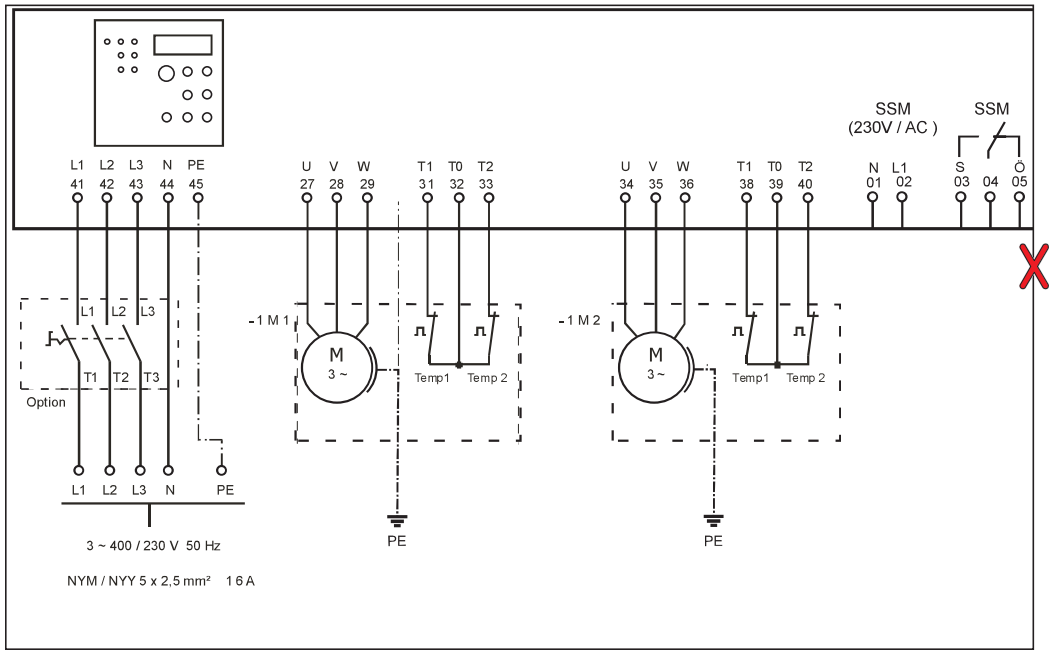
For use with the open pressure bell.

Technical data	Values
Mini compressor connection:	230 V
Ready to plug in, length of connection cable:	1.5 m
Area of use:	Pneumatic dynamic pressure measurement
Length of the hose lines:	0.1 and 0.5 m
Maximum pressure:	300 mbar
Volume flow:	250 l/h
Operating noise:	< 38 dBA
Power consumption:	5 W
Version:	T-screw fitting and non-return valve
Weight:	0.6 kg
Dimensions (W x H x D):	135 x 75 x 60 mm

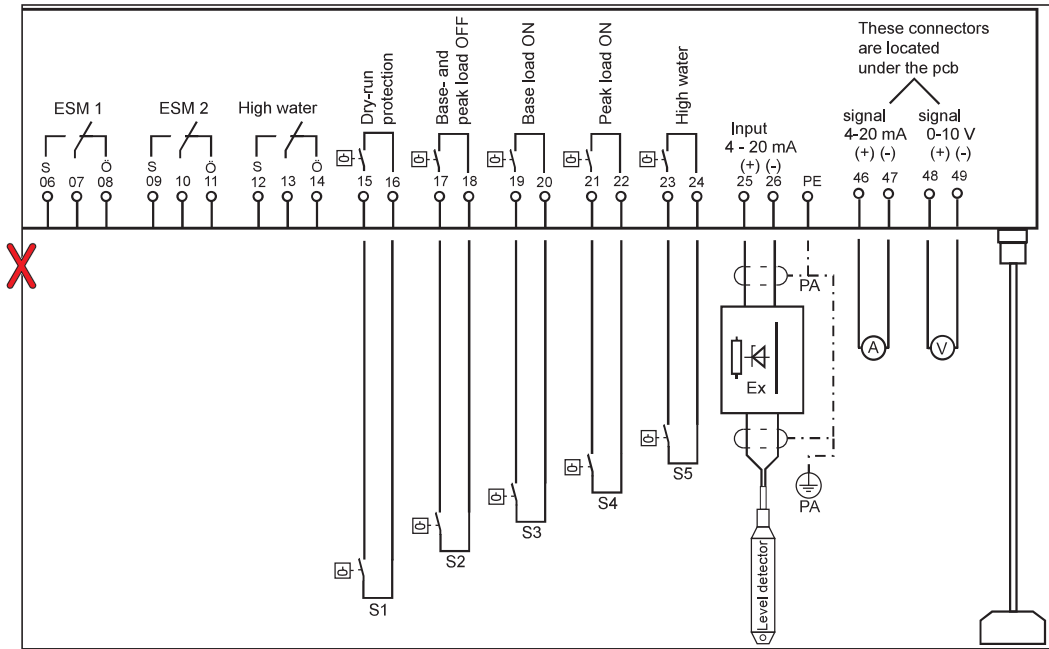
7.6 Circuit diagram of the control unit

Interface **X** between part 1 and part 2.

Part 1:



Part 2:



EN

Appendix: Commissioning report

Commissioning and instruction of a qualified person takes place in the presence of the authorised acceptance inspection representative and the plant operating company.

Commissioning date: _____

Handover date: _____

Plant

Type	Nominal size	Art. No.	Serial no.	Year of construction

Use location

Building/room: _____

Use: Commercial company

Street: _____

Town/city: _____

Responsible persons

	Qualified person	Authorised in- spector	System operator
Name:			
Phone no.:			
Fax no.:			
Email:			
Address:			

Check list for commissioning (Qualified person)

Tests & Inspections (no claim is made that the list is complete)	OK	Not OK
General inspection	<input type="radio"/>	<input type="radio"/>
Installation	<input type="radio"/>	<input type="radio"/>
Electrical fusing of the plant in accordance with the IEC regulations or national and local regulations	<input type="radio"/>	<input type="radio"/>
Control unit: Operating voltage and frequency	<input type="radio"/>	<input type="radio"/>
Control unit: Function test	<input type="radio"/>	<input type="radio"/>
Trial run pump station -duo	<input type="radio"/>	<input type="radio"/>
Malfunction and fault signalling equipment: LED malfunction indicators, telecommunications device (group alarm)	<input type="radio"/>	<input type="radio"/>
Water seal in the grease separator	<input type="radio"/>	<input type="radio"/>

Instruction (by the installer company)

Instruction	Remarks	Yes	No
Instruction:	Functions, control, operating information, troubleshooting, maintenance obligations	<input type="radio"/>	<input type="radio"/>
Handover:	Instructions for Use	<input type="radio"/>	<input type="radio"/>

Remarks:

Signature of qualified person: _____

Signature of authorised acceptance _____

inspection representative: _____

ACO Passavant GmbH

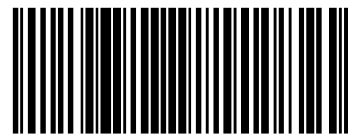
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