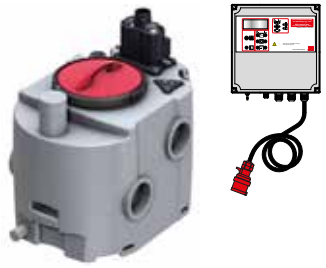
Instructions for Use

Issued: 2024-04-05

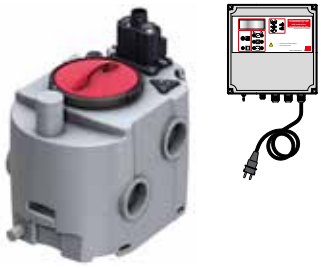
Wastewater lifting plant Muli-Mini duo and mono

for non-faecal wastewater, for free-standing installation in frostproof premises



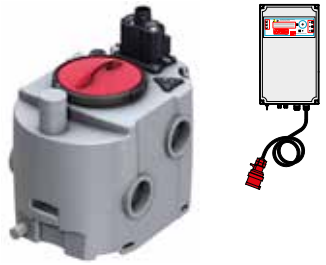
Muli-Mini duo

Type DDP: Duo_three-phase current_ pneumatics



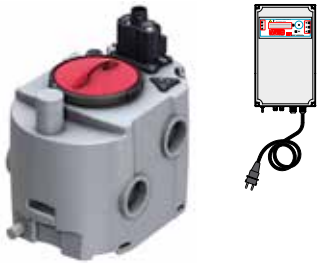
Muli-Mini duo

Type DWP: Duo_AC-current_pneumatics



Muli-Mini mono

Type MDP: Mono_three-phase current_pneumatics



Muli-Mini mono

Type MWP: Mono_AC-current_pneumatics

For safe and proper use, read carefully through the instructions for use and all other documents enclosed with the product, pass them on to the end user and keep them until the end of the product's life.

Introduction

ACO Passavant GmbH (referred to as ACO in the following) thanks you for your trust and hands over to you a product which is state-of-the-art and has been tested for proper condition as part of quality controls carried out before delivery.

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

ACO Service

Spare parts and accessories, see 'Product catalogue': 🕮 http://katalog.aco-haustechnik.de
For further information, please contact the ACO Service.

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Im Gewerbepark 11c
36466 Dermbach, Germany
Tel.: + 49 (0) 36965 819-444
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Guarantee

For information on the guarantee, see General Terms and Conditions of Business ("Allgemeine Geschäftsbedingungen"),
🕮 http://www.aco-haustechnik.de/

Declaration of Performance (DoP)

"Declaration of Performance" (DoP) for the wastewater lifting plant 🕮 http://www.aco-haustechnik.de/

Symbols used

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

- Tips and additional information, which make the work easier
- ■ Bullet points
- ➔ Actions to be carried out in the specified order
- 🕮 References to other information in these instructions for use and other documents

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1 For your safety



Read the safety instructions before installing and launch of the wastewater lifting plant, in order to prevent personal injuries and damage to property.

1.1 Intended use

The wastewater lifting plant is used for collecting and automatic lifting of non-faecal wastewater above the backflow level. The wastewater is drained into the drainage sewer safely for people and without damaging structures.

The Muli-mini duo wastewater lifting plants are designed for free-standing installation in frostproof premises e.g. behind grease separators up to NS 4, laundry rooms, multiple wash installations and cellar rooms below the backflow level.

The Muli-mini mono wastewater lifting plants are designed for free-standing installation in frostproof premises e.g. laundry rooms, cellar rooms are storage rooms below the backflow level.

The following wastewater may not be discharged:

- Waste water free of faeces
- Wastewater from grease separator (Muli-mini duo)

Harmful substances must not be discharged:

- Heavy metals, e.g. zinc, lead, cadmium, nickel, chromium
- Aggressive substances, e.g. acids (pipe cleaning agent with pH value below 4)
- Alkaline solutions, salts and condensates
- Cleaning products and disinfectants, washing-up agents and detergents in overdosed quantities or quantities that result in disproportionate foaming
- Flammable or explosive substances, e.g. petrol, benzene, oil, phenols, solvent-based paints, white spirits
- Solids, e.g. kitchen waste, glass, sand, ashes, fibrous material, synthetic resins, tar, cardboard, textiles, greases (oils), leftover paint
- Liquid substances, which can harden, e.g. gypsum, cement, lime
- Biocides, e.g. plant treatment and pest control products
- Wastewater from manure pits and keeping of livestock, e.g. liquid manure, slurry, dung

Other possible uses and changes are not allowed. Installation of unapproved parts impairs safety and excludes any guarantee from ACO. In case of replacement, only use original ACO parts or spare parts approved by ACO.

1.2 Normative specifications

The listed norms must be supplemented and checked for currency.

- DIN EN 12050-1 'Wastewater lifting plants for building and land drainage – Part 1: Faecal lifting plants'
- DIN EN 12050-2 'Wastewater lifting plants for building and land drainage – Part 2: Wastewater lifting plants for waste water free of faeces
- DIN EN 12050-4 'Wastewater lifting plants for building and land drainage – Part 4: Backflow valve for non-faecal and faecal wastewater'
- DIN EN 12056-1 'Gravity drainage systems inside buildings – Part 1: General an execution requirements'
- DIN EN 12056-4 'Gravity drainage systems inside buildings - Part 4: Wastewater lifting plants; planning and dimensioning'
- DIN 1986-100 'Drainage systems on private property – Part 100: Specifications in relation to EN 752 and EN 12056'

1.3 Personnel qualifications

Activities	Person	Knowledge
Layout, operational changes	Design engineers, consultants	Knowledge of building systems and services and applicable standards and directives Evaluation of wastewater technology application cases Proper layout of drainage systems
Sanitary installation	Skilled persons	Installation, fixing and connection of pipes
Electrical installation	Electrician	According to EN 12056-4, electrical connection to power supply may only be carried out by qualified electricians
Operation Monitoring	Owner, user	No specific requirements
Launch, maintenance	Qualified persons	"Qualified persons" in according to DIN 1986-100*
Disposal	Skilled persons	Appropriate and environmentally friendly disposal of materials and substances, knowledge of recycling

*Definition of "competent persons" in accordance with DIN 1986-100:

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

1.4 Personal protective 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 hands from infections (moisture-tight protective gloves) and minor bruises and cuts, especially during transport, installation, maintenance and dismantling.
	Protective clothing protects the skin from minor mechanical effects and infections.
	A safety helmet protects against head injuries, e.g. in case of falling objects or knocks in the event of low room heights.
	Safety glasses and goggles protect eyes from infections, especially during launch, maintenance and repair.

1.5 Warnings

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

Warning symbols and signal words		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.
	IMPORTANT	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.

1.6 Responsibility of the Owner

Due diligence in the owner's, or the operator's, area of responsibility:

ACO recommends that an operating log be kept and that inspections, servicing, maintenance work, repairs, etc. be documented, so that proof exists in case of an insurance claim:

Planning and installation

Specifications in accordance with DIN EN 12056-4 and regional directives must be met, these include, among other things:

- Layout and dimensioning
- Protection against backflow
- Installation of pipes

Operation Monitoring

- Monitoring normal operation, 🕮 Chap. 1.1 "Intended use".
- Monthly execution of at least 2 test runs, 🕮 Chap. 4.4 "Carry out test run Muli-Mini duo" and/or chap. 4.5 "Carry out a test run Muli-Mini mono"
- Checking of the wastewater lifting plant, e.g. for leakages, unusual running noises.
- Checking of the operational readiness of the wastewater lifting plant on the pump control.

Maintenance

Wastewater lifting plants must be operated and maintained in according to EN 12056-4 to ensure proper functioning and operating safety. We recommend that plant owners/operating companies conclude a maintenance contract for the regular servicing and maintenance work to be undertaken.

ACO Service would be pleased to undertake the servicing and maintenance work professionally. Maintenance contract request 🕮 service@aco.com.

Stipulated servicing intervals for the wastewater lifting plant in according to EN 12056-4:

- Commercial operation = every 3* months
- Operation in multiple dwelling buildings = every 6* months

* Only applies to Germany. Provisions in other countries can vary.

Additional (extraordinary) maintenance of the wastewater lifting plant:

- After flooding the wastewater lifting plant
- Before restarting the wastewater lifting plant

1.7 Transport and storage

On delivery the wastewater lifting plant is fixed onto a wooden pallet and are protected from moisture and dirt by plastic foil.

IMPORTANT Note during storage and transport:

- Store the wastewater lifting plant in frostproof premises.
- Never drive the forks of a fork-lift truck or lift truck directly under the wastewater lifting plant.
- Where possible, transport the wastewater lifting plant on its baseframe or the wooden pallet.
- Where possible, do not remove the package and transport restraints until the separator is in its place of installation.
- Use additional transport straps.
- If transporting the wastewater lifting plant using a crane or crane hook: Fasten the sling straps to the wooden pallet or the transport eyebolts (suspension points).

1.8 Disposal

Completely drain and clean the wastewater lifting plant on decommissioning.

Improper disposal is an environmental hazard. Comply with the regional disposal regulations and recover or recycle the components.

- Separate plastic parts (e.g. seals) and metal parts.
- Recover metal scrap.

IMPORTANT Electrical equipment and batteries must never be disposed of in household waste. Comply with the regional disposal regulations for the protection of the environment. Your dealer has a duty to take back spent electrical appliances and batteries.



2 Product Description

2.1 Type plate

The type plate is attached to the tank.

- Product type appellation
- Year of construction
- Article no.
- CE symbol, design tested
- Manufacturer's address
- Manufacturer norm
- DoP (Declaration of Performance)
- Test symbol/approval no.
- Serial number

2.2 Product features

Tank

- Material polyethylene
- Inspection opening Ø 350 mm with odourproof cover and tension ring
- Fixing set for buoyancy-proof anchorage
- Drain plug R 1"
- Connection port DN 50 for on-site manual membrane pump
- Inlet line:
  - Depending on the version: Inlet height of 250 to 700 mm
  - Connection socket DN 100 each 2x horizontal on the side surfaces or 1x vertical from above for on-site inlet line (OD = 110 mm)
- Usable container volume up to 140 litres
- Ventilation line: Connection port DN 70 for on-site ventilation line (OD = 75 mm)
- Pressure line:
  - Flexible hose with quick-action connector
  - Y-branch pipe with integrated double backflow valve (balls with venting option)
  - Mounting adapter with Rp 2" connection for on-site pressure line DN 50
- Pneumatic pipe (measuring pipe) with connecting flange for pneumatic control line and air bubble injection for version with air bubble injection (optional)

Pumps (1x for mono version, 2x for duo version):

- Housing and impeller made of grey cast iron, residual parts made of rustproof steel
- 3-phase-motor 400 V, 50 Hz (for type DDP and/or MDP); protection type IP 68
- A.C. motor 230 V, 50 Hz (for type DWP and/or MWP); protection type IP 68

- Obstruction-free free flow impeller
- Circular rotating mechanical seal made of silicon carbide (SiC)
- 10 m connecting cable

Level switching

- Pneumatic pipe (in the tank)
- 10 m pneumatic control line (hose)
- Membrane pushbutton (in control)

Pump control mono

- Ready to plug in:
  - 1.5 m cable and CEE plug (16 A) with an integrated phase changer (type three-phase current)
  - 1.5 m cable and safety plug (type alternating current)
- Pneumatic level switching with pneumatic pipe and pneumatic control line
- Isolated group alarm and operating signal
- Mains-independent alarm (85 dBA) in accumulator mode for 5 to 6 hours
- Numeric display with state display and digital potentiometer for setting:
  - Pump ON and OFF
  - Flood alarm
  - Motor current limitation
- Filling level measuring
- Rotary field control
- H-0-A button
- Display service intervals
- Operating hours counting device and display of the activation impulses
- Amperemeter
- Error memory (last defect)
- Control pre-set and multilingual
- 230 V connection for the optional mini compressor

Pump control duo

- Ready to plug in:
  - 1.5 m cable and CEE plug (16 A) with an integrated phase changer (type three-phase current)
  - 1.5 m cable and safety plug (type alternating current)
- Pneumatic level switching with pneumatic pipe and pneumatic control line
- Isolated group alarm and operating signal
- Mains-independent alarm (85 dBA) in accumulator mode for 5 to 6 hours

- Numeric display with state display and digital potentiometer for setting:
  - Pump 1 and 2 ON and OFF
  - Flood alarm
  - Motor current limitation
- Filling level measuring
- Rotary field control
- H-0-A button
- Display service intervals
- Operating hours counting device and display of the activation impulses
- Amperemeter
- Error memory (last defect)
- Automatic pump change
- Control pre-set and multilingual
- 230 V connection for the optional mini compressor

Recommended accessories

- Air bubble injection to protect against media generating floating surfaces at the opening of the pneumatic pipe when installed behind the grease separator
- Special mounting adapter for elastic connection of the pressure line
- ...

Accessories, see "Product catalogue": 🕮 http://katalog.aco-haustechnik.de

2.3 Operating features

- Pneumatic level switching
- Automatic control of the pumping process
- Workplace-related emission value ≤ 70 dB (A). The drive and the pipeline are not included.

2.4 Construction of the wastewater lifting plant

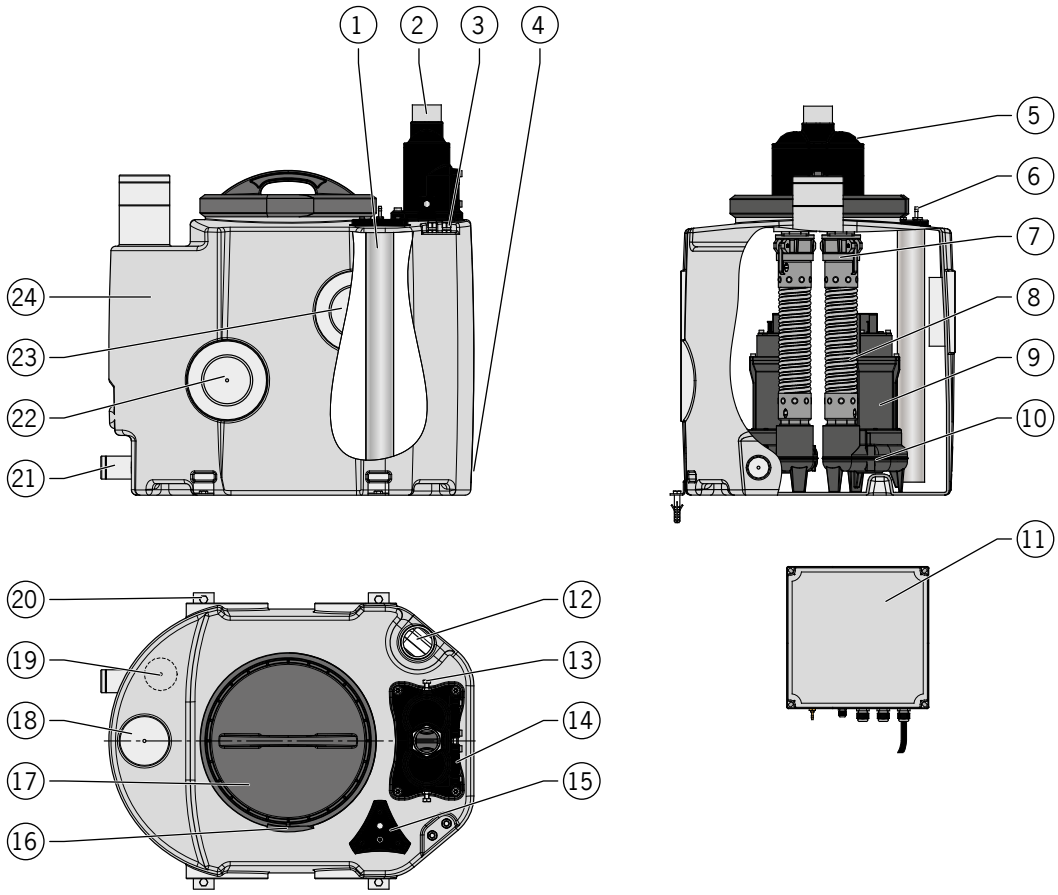


Figure: Muli-Mini duo

1 = Pneumatic pipe
2 = Connection socket Rp 2" for on-site pressure line
3 = Cable gland
4 = Drain plug R 1"
5 = Y-branch pipe with integrated double backflow valve
6 = Hose bush (control line connection)
7 = Quick-action connector
8 = Pressure hose
9 = Submerged pump motor
10 = Volute casing
11 = Pump control
12 = Connection port DN 70 for on-site ventilation line
13 = Venting screw
14 = Inspection cover backflow valve
15 = Air bubble injection connection (optional)
16 = Tension ring
17 = Inspection cover
18 = Connection port DN 100 for on-site inlet line
19 = Connection DN 50(optional)
20 = Mounting set for buoyancy safeguard
21 = Connection port DN 50 for on-site manual membrane pump
22 = Connection port DN 100 for on-site inlet line
23 = Connection port DN 100 for on-site inlet line
24 = Tank

2.5 Operating principle

Pneumatic level switching and automatic control of the pumping process (on the example of the duo type)

Wastewater from the connected sanitary drainage objects flows via the inlet line and into the tank due to the free slope.

A pneumatic pipe installed in the tank is connected to the membrane pushbuttons in the pump control duo by means of a control line. If the water rises, the air in the pneumatic pipe is compressed. At a defined pressure, the pumps are switched on and off and/or a flood alarm is triggered.

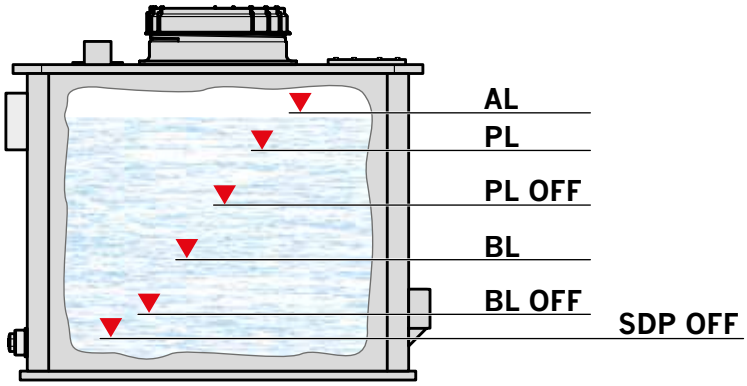


Figure: Water level (type duo)

AL	=	Flood alarm	BL	=	Baseload
PL	=	Peak load	BL OFF	=	Baseload OFF
PL OFF	=	Peak load OFF	SDP OFF	=	Stop delay period OFF

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

Two backflow valves in front of the Y-branch pipe prevent backflow from the pressure line and into the tank.

If the water level drops to the baseload OFF level (BL OFF), the pre-set after-running period (SDP) of the pump is activated and the water level continues to drop to the 'SDP OFF' level.

The wastewater lifting plant is equipped with two pumps:

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

3 Installation

The specifications of EN 12056-4 and the regional directives must be complied with for the installation. Following installation, the launch must be carried out by a qualified person, according to the requirements in these instructions for use, Chap. 4 “Launch”.

3.1 Installation examples (schematic diagrams)

Examples may vary from the respective installation situation and the components used.

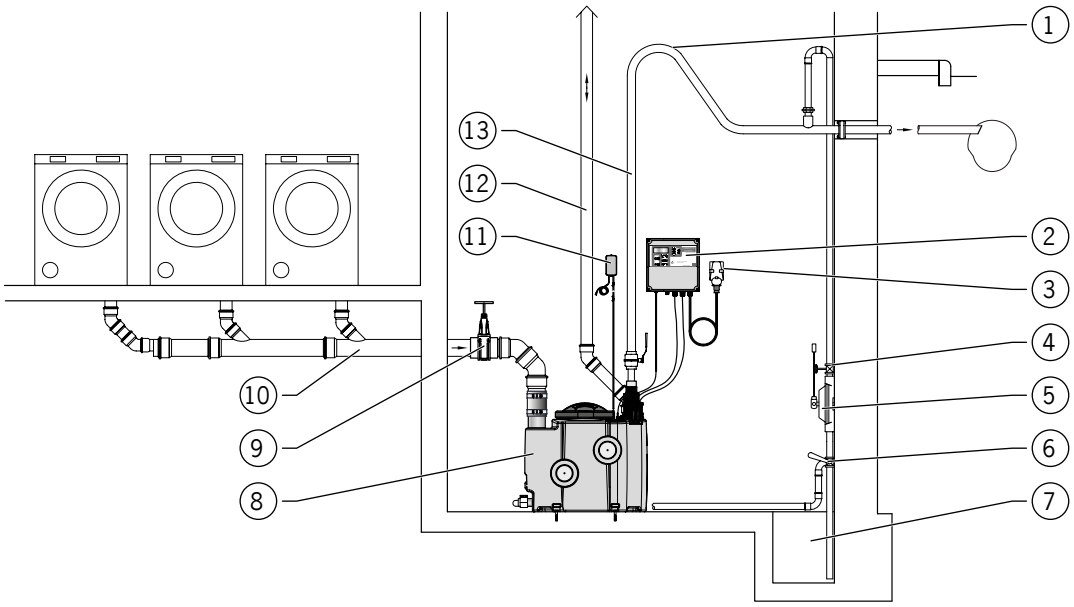


Figure: Installation behind a laundry room

1 = Backflow loop*
2 = Pump control
3 = CEE power socket and/or safety power socket*
4 = Shut-off valve (optional)
5 = Manual membrane pump (optional)
6 = Three-way valve (optional)
7 = Pump sump*
8 = Tank
9 = Inlet shut-off valve (optional)
10 = Inlet line*
11 = Air bubble injection (optional)
12 = Ventilation line*
13 = Pressure line*

* On-site requirements

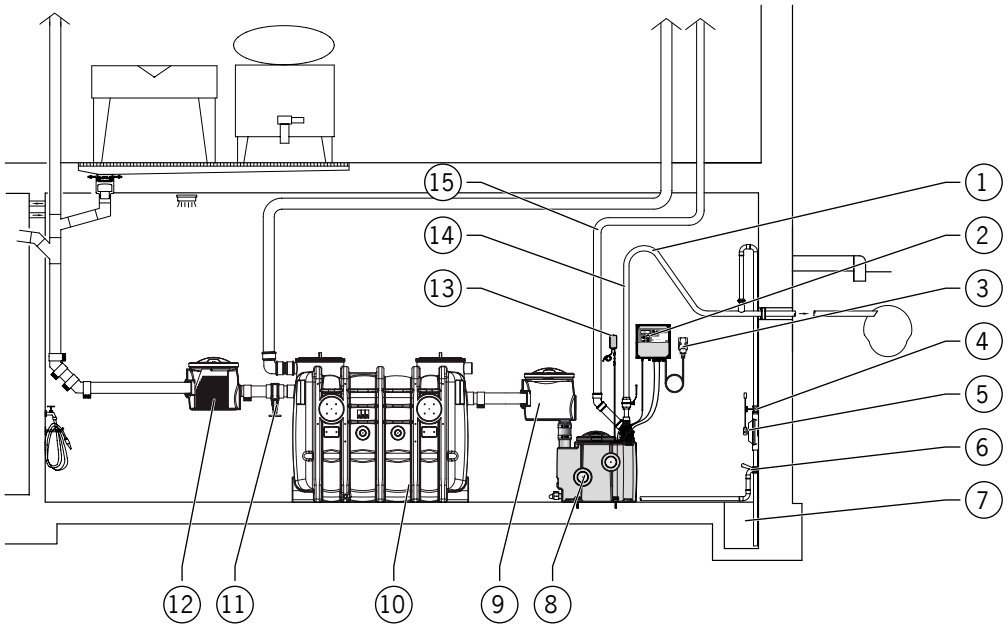


Figure: Installation behind a grease separator

1 = Backflow loop*
2 = Pump control
3 = CEE power socket and/or safety power socket*
4 = Shut-off valve (optional)
5 = Manual membrane pump (optional)
6 = Three-way valve (optional)
7 = Pump sump*
8 = Tank
9 = Sampling pot (optional)
10 = Grease separator (optional)
11 = Shut-off valve (optional)
12 = Coarse trap (optional)
13 = Air bubble injection (optional)
14 = Pressure line*
15 = Ventilation line*

* On-site requirements

3.2 Sanitary installation

CAUTION

Flooding and risk of infection in case of improper sanitary installation

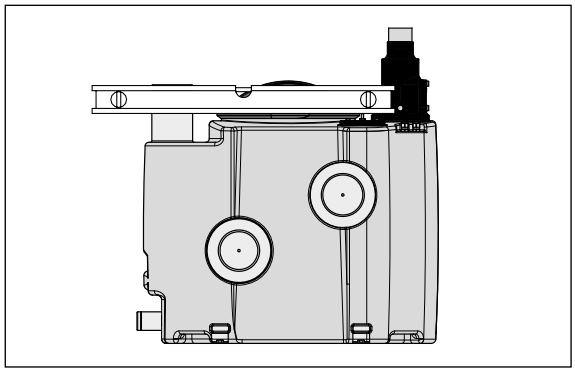
- Work on the sanitary equipment must be carried out by qualified personnel only, Chap. 1.3 "Personnel qualifications".
- All pipes must be installed so that they can drain automatically.
- Conduits may not be constricted in the flow direction.

3.2.1 Assemble the tank

Specifications:

- Frostproof installation premises
- Level installation surface with corresponding bearing load. It is not permitted to install the wastewater lifting plant in a lower position.
- Easily accessible for operation, cleaning and maintenance. Surrounding working environment of at least 600 mm.

➔ Align the tank at the installation site using a spirit level.

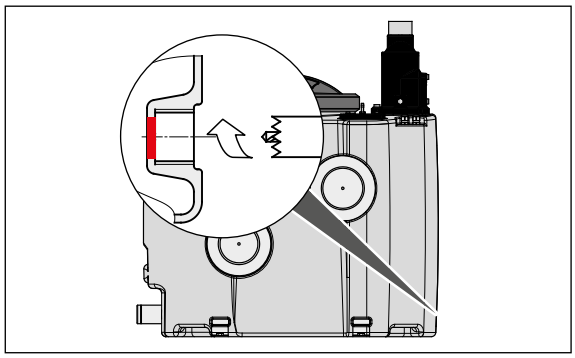


3.2.2 Connect the drainage line on the drain plug (optional)

A threaded socket Rp 1” on the tank can be used to connect a drainage line. The socket base is closed off and must be opened.

➔ Drill the closed socket base open using a lock saw (maximum Ø 29 mm).

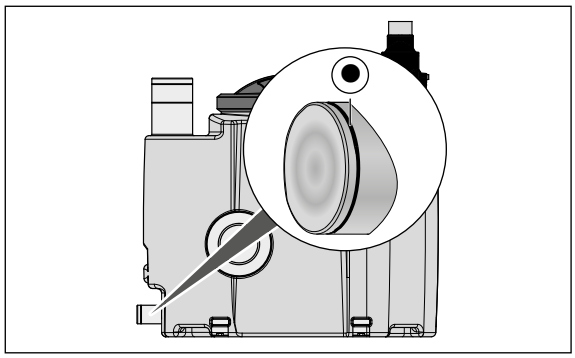
➔ Insert the on-site drain line into the threaded socket and seal.



3.2.3 Connect the manual membrane pump (optional) on the connection port

A connection port DN 50 on the tank can be used to connect a manual membrane pump. The connection port is closed off and must be opened.

➔ Cut open a closed connection socket (●) along the notch provided and deburr the cut edge.

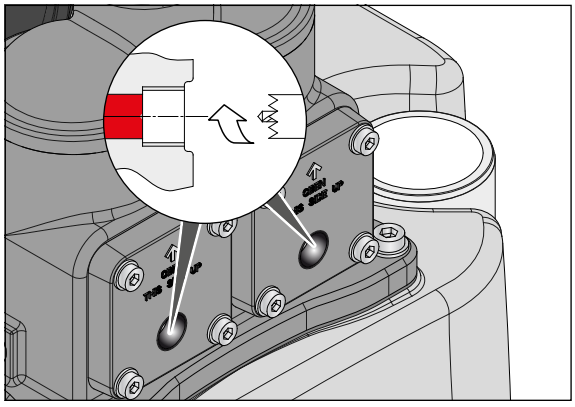


3.2.4 Prepare connection of drain cock (optional)

There is a threaded socket Rp 1/2" is shaped on both ends of the inspection covers of the double backflow valve. An on-site drain cock for partial draining of the pressure line can be attached here.

➔ Drill the closed socket base open using a lock saw (maximum Ø 16 mm).

➔ Insert the on-site drain cock into the threaded socket and seal.



3.2.5 Connect the inlet line

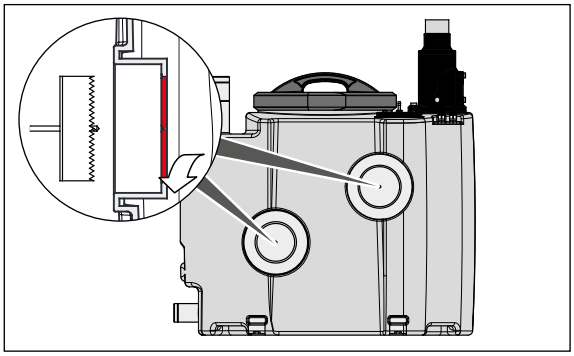
- There are several connections for the inlet line on the tank, 📖 Chap. 2.4 "Construction of the wastewater lifting plant". They are all closed and must be opened for possible connection.
- A socket seal DN 100 and a hose connector DN 100 are enclosed loosely with the delivery.
- An inlet socket DN 50 can be purchased from ACO optionally.

Specifications:

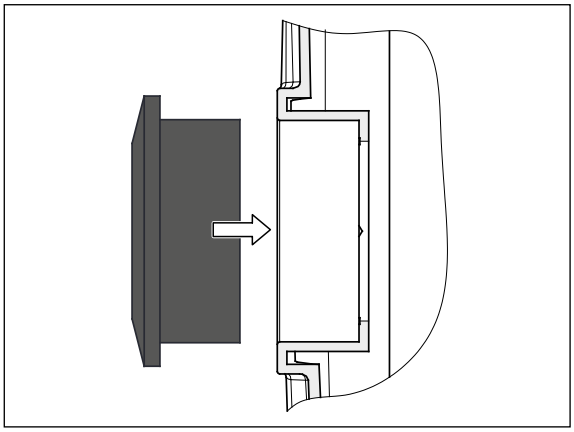
- The pipe cross-section must not reduce in the direction of flow.
- Make flexible pipe joints.
- Install up to the tank with a free slope of at least 1.5 – 2 %.
- When using the hose connector, the inlet line and the connection port in the hose connector must have a distance of at least 10 mm.

Connect the lateral inlet line

➔ Drill open the closed socket base of socket DN 100 with a lock saw (maximum Ø 110 mm) and deburr borehole.

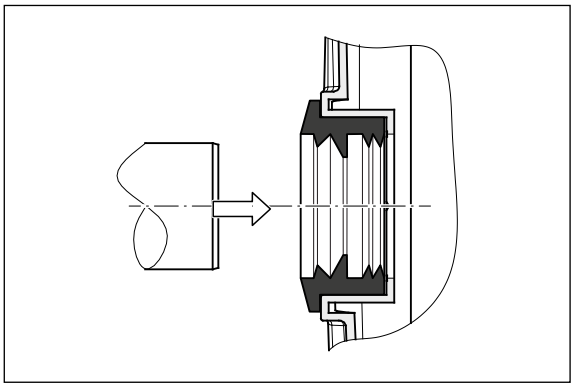


➔ Push the socket seal into the socket up to the socket base and/or the seal collar.



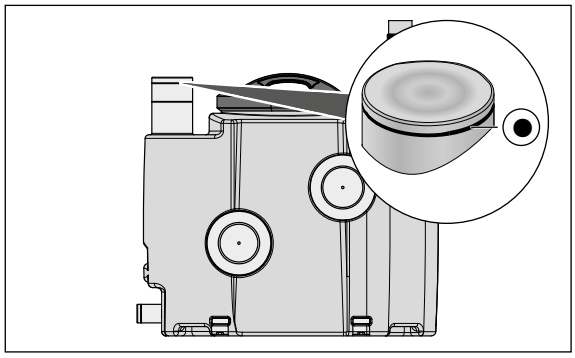
➔ Use acid-free lubricant to grease the spigot of the inlet line DN 100 (OD = 110 mm) and the sealing lips of the socket seal.

➔ Push the spigot into the socket.

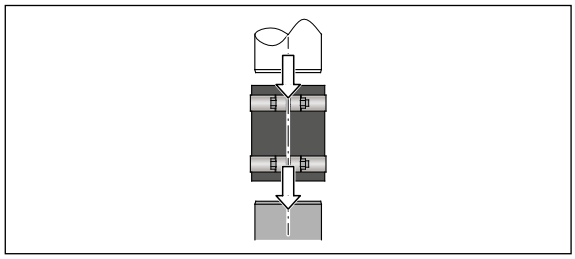


Connect the vertical inlet line

- Cut open a closed connection socket (●) along the notch provided and deburr the cut edge.

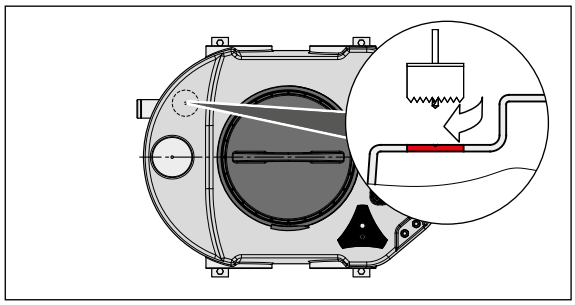


- Connect the inlet line DN 100 (OD = 110 mm) with the hose connector to the connection of the tank.

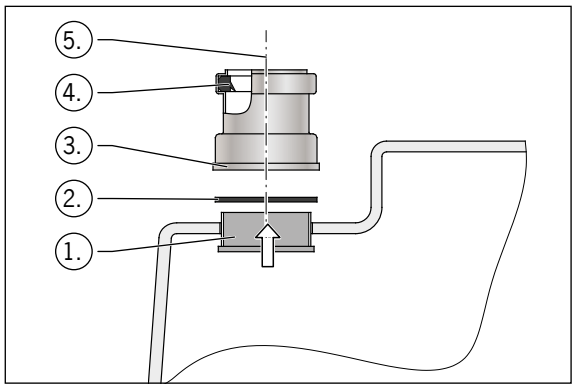


Mount the vertical inlet socket (optional) and connect the inlet line

- Drill the closed tank open at the marked point using a lock saw (maximum Ø 42 mm).



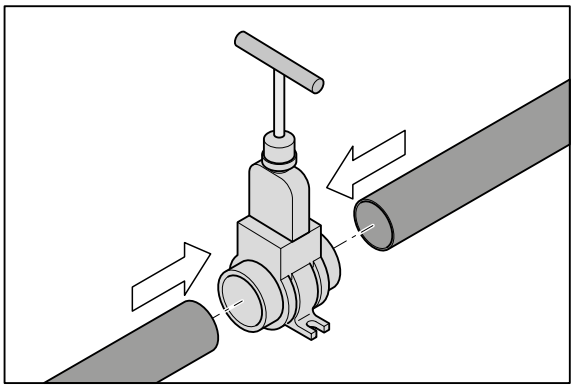
- Insert the threaded piece from inside to outside through the hole in the tank (1).
- Push the flat seal over the threaded part of the threaded piece (2).
- Turn the inlet socket onto the threaded part of the threaded piece and tighten by hand (3).
- Grease the lip seal of the socket (4) and the spigot of the inlet line with an acid-free lubricant.
- Push the inlet line DN 50 (OD = 50 mm) into the inlet socket (5).



3.2.6 Install the inlet valve (optional)

The inlet valve can be purchased from ACO optionally.

- ➔ Use acid-free lubricant to grease the spigots of the inlet line and the sealing lips of the inlet valve.
- ➔ Push the insert socket of the inlet valve onto the inlet line.
- ➔ Push the other end of the inlet line into the inlet socket of the inlet valve.

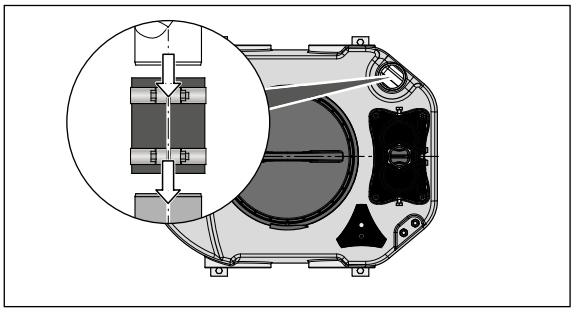


3.2.7 Connect the ventilation line

Specifications:

- Feed the ventilation line with a constant cross-section continuously upwards over the roof of the building. The ventilation pipe may be fed into both the main vent stack and in the secondary vent stack.
- The ventilation line may not be connected to the vent stack on the inlet side of a grease separator.

- ➔ Connect the ventilation line DN 70 (OD = 75 mm) to the connection of the tank, e.g. with the hose connector.



3.2.8 Connect the pressure line

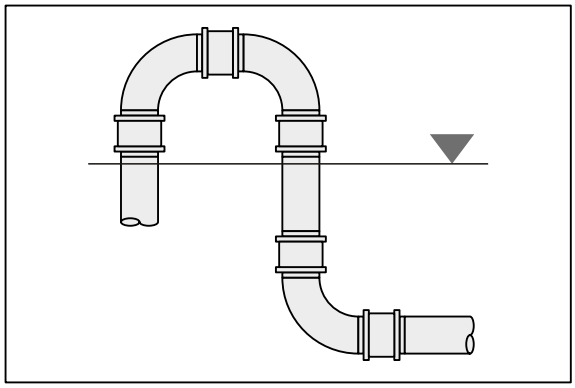
Making the backflow loop in the pressure line

The wastewater lifting plant must have a backflow drain. The backflow loop must be established above the backflow level.

Definition of terms in accordance with EN 12056-4:

- "Backflow": Flow of wastewater from a drain or sewer against the direction of flow back into the connected pipework.
- "Backflow level": The maximum level to which water can rise within a drainage system.
- "Backflow loop": part of the pressurized pipeline from a wastewater lifting plant above backflow level.

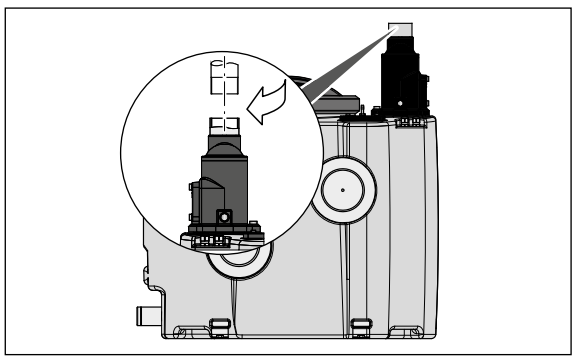
➔ Lay the backflow loop above the "backflow level" ▼.



Specifications:

- The pressure line must be designed for at least 1.5 times the pump pressure.
- Lay the pressure line so that it rises continuously and is frost-resistant.
- The flow velocity in the pressure line must not fall below 0.7 m/s and must not exceed 2.3 m/s.
- Never connect other pipes to the pressure line.
- Air admittance valves are not allowed in the pressure line.

➔ Insert the pressure line DN 50 with R 2" thread into the threaded socket Rp 2" of the connecting piece to seal.



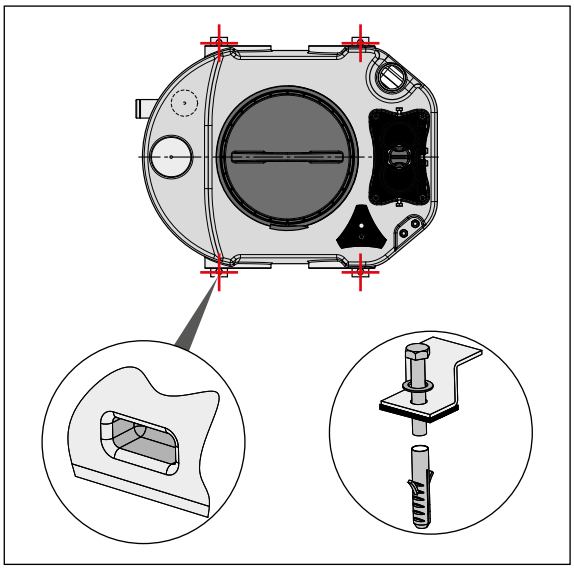
3.2.9 Secure the tank against buoyancy

Specifications:

- Wastewater lifting plants must be installed in a way that ensures no twisting or tension.
- Wastewater lifting plants must be attached to prevent buoyancy.

Anchor the aligned tank at 4 points in the soil + using the supplied attachment set:

- ➔ Place the bracket in the designated groove and mark the borehole in the soil.
- ➔ Remove the angle from the groove.
- ➔ Drill a hole Ø 12 mm, 60 mm deep.
- ➔ Suction out the borehole.
- ➔ Insert wall plug 12 W into the borehole.
- ➔ Place a rubber mat between the angle and the soil for noise insulation.
- ➔ Place the angle in the groove.
- ➔ Push the washers over the wooden screws and through the hole in the angle and then twist in the wall plug.
- ➔ Tighten screws by hand.



3.3 Electrical installation

WARNING

Electric shock risk in case of improper electrical installation

- The controls must not be connected to the power supply until after the sanitary installation and electrical installation have been completed.
- Work on electrical connections to power supply must be carried out by qualified electricians only.
- The power supply must comply with the directives of the local power supplier. In particular, attention should be paid to the specific protection measures and the cable cross-sections and potential compensation.
- Electrical connections to power supply must be carried out in accordance with the circuit diagram, Chap. 6.2.3 to chap. 6.2.6 “Circuit diagrams”.

3.3.1 Connections of the pump control

On delivery, the electrical cables are already connected to the connection terminals of the pumps and the control

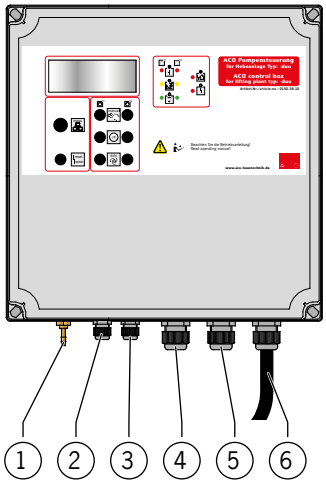


Figure: Pump control duo

1 = Connection control line level switching
2 = Connection power supply mini compressor
3 = Pump 1 power supply connection
5 = Pump 2 power supply connection
6 = 1.5 m connecting cable with CEE plug and/or safety plug

3.3.2 Connect fault message device (optional)

A cable (2-wire/0.75 mm²) must be connected in the pump control to forward the isolated contact as a group alarm. A cost-effective continuous light can be used instead of a flashing light.

3.3.3 Install the pump control

Specifications:

- Flood-proof assembly site
- Space requirement: at least W x H = 400 x 500 mm
- Distance to tank less than 10 m (connecting cable of the pumps, respectively 10 m long, control line 10 m long)

➔ Install the control using on-site fixing material.

3.3.4 Install on-site power sockets and connect to the power supply

CAUTION Malfunction if power socket is unsuitable

Specifications:

- Flood-proof assembly site close to pump control (connecting cable of the pump control is 1.5 m long)
- Space requirements: according to manufacturer's information
- Type DDP and MDP (three-phase current):
  - CEE power socket 16 A
  - Connecting value of 400 V/50 Hz
  - Right rotating field
- Type DWP and MWP (alternating current):
  - Safety socket
  - Connecting value 230 V/50 Hz

➔ Install the power socket in accordance with the manufacturer's instructions.

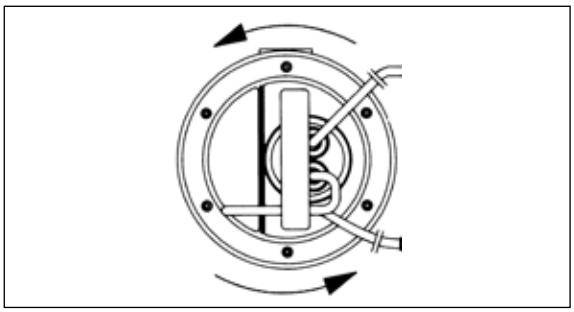
3.3.5 Install and attach connecting cable pump(s)

The connecting cable of the pump(s) are each 10 m long and are clamped to the connection terminals in the connection chamber of the pump(s) and in the pump control on delivery. The connecting cables are rolled up and placed in the plant and are secured with cable ties.

IMPORTANT

- The ends of the wire are labelled. There is a risk of short circuits if the wires are confused.
- If the connecting cable is shortened, transfer the identification of the wires.
- Check that the pump motor turns in the right direction.

- ➔ Adjust the length of the connecting cable or hang in loops and attach.
- ➔ Check the rotational direction of the pumps:
  - ☐ Switch on pump and switch off again immediately.
  - ☐ Observe the starting recoil carefully from the motor side.
  - ☐ The rotational direction is correct, i.e. clockwise, if the protective cover moves as shown.

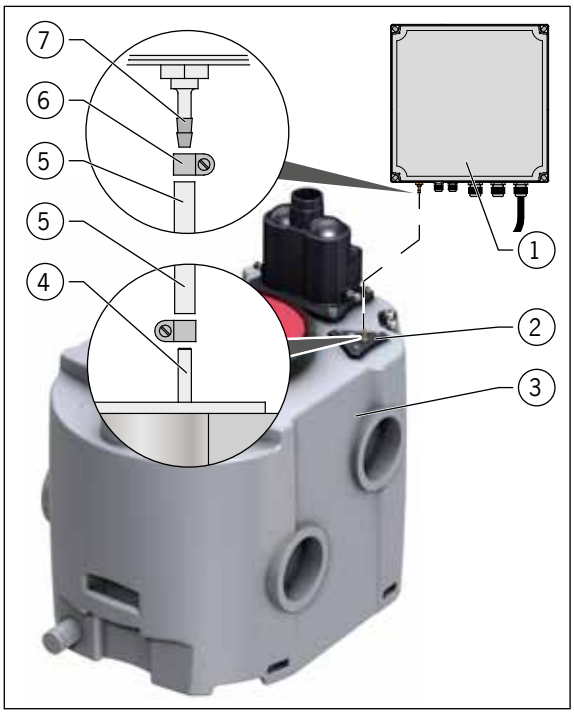


3.3.6 Connect the control line to the level switching

IMPORTANT To prevent malfunctions: Install the control line to the pump control upwards and on a frost-resistant manner.

The control line (5) for the level switching is already connected to the hose bush (4) of the connecting flange (2) on the tank (3) on delivery.

- ➔ Push the hose clamp (6) over the end of the hose (5) of the control line.
- ➔ Push the hose end (5) onto the hose bush (7) of the pump control duo (1) and fix using a hose clamp (6).



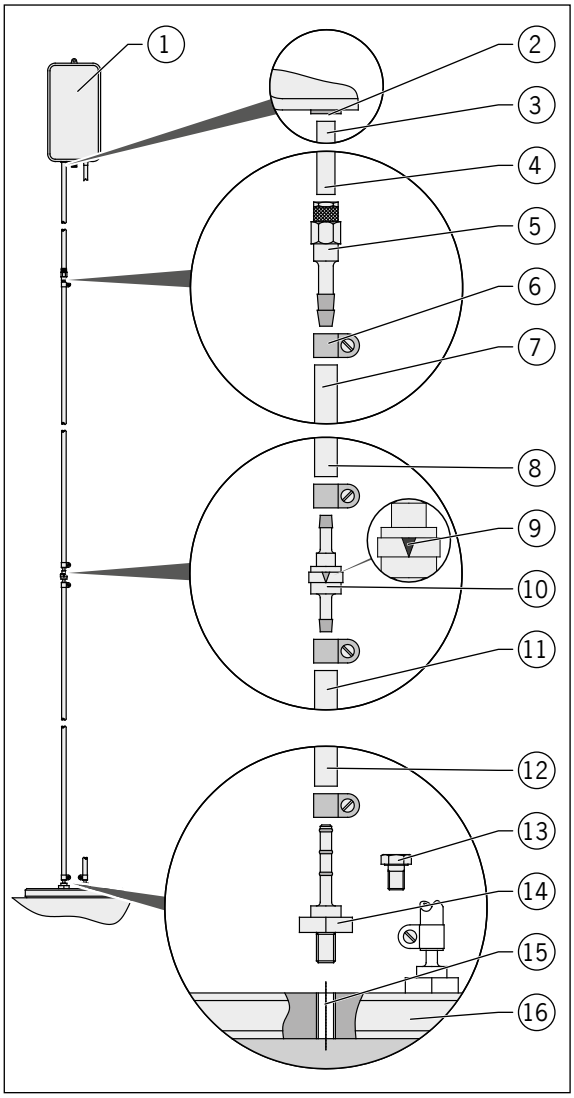
3.3.7 Install the mini compressor (optional)

Normally, the conduit (hose) to the air bubble injection is already connected to the connecting flange of the pneumatic pipe and the mini compressor on delivery.

Specifications

- The assembly site of the mini compressor must be easily accessible for the operator

- Space requirement: at least W x H = 200 x 200 mm
- Distance to tank less than 10 m
- Distance to pump control duo less than 5 m

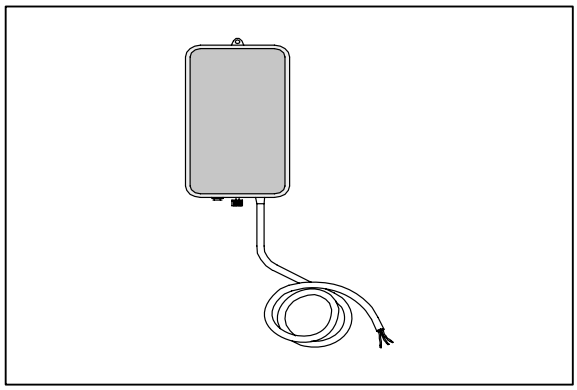


➔ Mount the mini compressor (1) to a wall close to the pump control duo in a flood-proof manner.
➔ Unscrew the screw M8 (13) with the USIT-ring from the threaded borehole (15) of the connection flange (16).
➔ Screw the hose bush (14) with the USIT-ring into the threaded borehole (15).
➔ Push hose clamp (6) over the end (12) of the 9.5 m long hose.
➔ Push the hose end (12) onto the other hose bush (14) and fix using a hose clamp (6).
➔ Push the hose clamp (6) over the other end of the hose (11).
➔ Push the hose end (11) onto the hose bush of the spring check valve (10), in the installation direction (9), and fix using a hose clamp (6).
➔ Push hose clamp (6) over the end (8) of the 500 mm long hose.
➔ Push the hose end (8) onto the hose bush of the spring check valve (10) and fix using a hose clamp (6).
➔ Push the hose clamp (6) over the other end of the hose (7).
➔ Push the hose end (7) onto the hose bush (5) and fix using a hose clamp (6).
➔ Insert the hose end (4, 100 mm long) into the retainer of the screw connection (5) and clamp.
➔ Push the end of the hose (3) over the retainer (2) of the mini compressor (1).

3.3.8 Clamp the connecting cable mini compressor (optional)

The connecting cable is 5 m long and is already connected to the mini compressor on delivery. The connecting cable must still be connected to the pump control duo.

- ➔ Strip the ends of the cables and fit on wire-end ferrules.
- ➔ Unscrew the cover of the pump control duo.
- ➔ Clamp the cable ends.

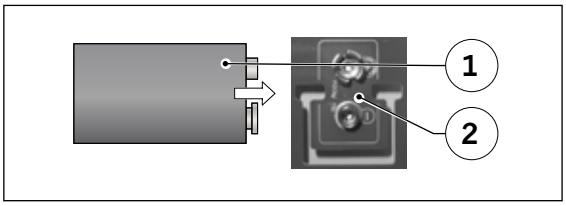


3.3.9 Insert the accumulator into the pump control

If the power supply is interrupted, the accumulator guarantees a mains-independent alarm. Once the accumulator is inserted, the alarm is automatically activated.

CAUTION Damage to the control: Only use original ACO batteries, 📖 Chap. 6.2 "Pump control".

- ➔ Unscrew the cover of the pump control.
- ➔ Insert the accumulator (1) at point (2) on the circuit board.

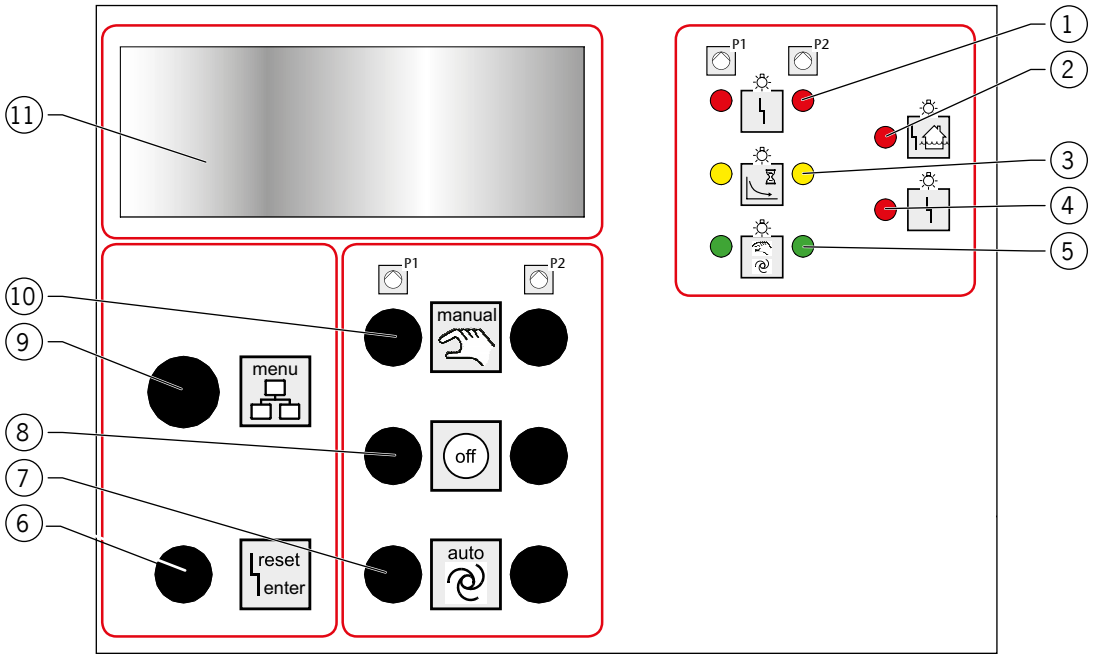


4 Launch

A qualified person must carry out the launch according to DIN EN 12056-4.
The launch must be documented, 🕮 Appendix: "launch report".

4.1 Pump control duo

4.1.1 Controls and display elements

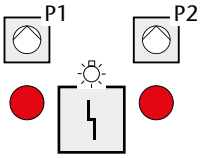
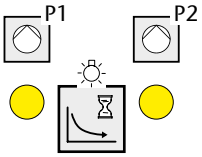
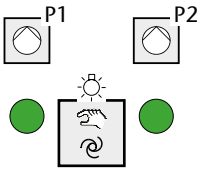
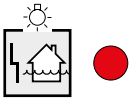
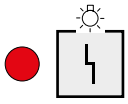


1 = LED lights up: Malfunction P1 or P2
2 = LED lights up: Flood alarm (tank full)
3 = LED lights up: Operation of P1 or P2
LED flashes: After-running period of P1 or P2
4 = LED lights up: Group alarm, e.g. incorrect rotating field
5 = LED lights up: Automatic operation of P1 or P2
LED flashes: Manual operation of P1 or P2
LED flashes irregularly: Manual operation was ended automatically after approx. 2 minutes.
6 = Button: Acknowledgement of the malfunction/value settings
7 = Button: Automatic operation ON P1 or P2
8 = Button: Operation OFF P1 or P2
9 = Rotary knob: Menu item selection
10 = Button: Manual operation ON P1 or P2
11 = Display panel

Function of the controls

Button symbol	Button function	Explanation
	Selection of the menu items	The rotary knob can be used to select the menu items in the display panel. The display automatically changes back to the basic setting after 20 seconds.
	Acknowledge malfunction	The button is used to acknowledge fault signals and messages after removing the cause of the fault. If the malfunction is not corrected, only the group fault alarm relay and the alarm sound signal (e.g. flood alarm) are switched off.
	Confirm setting	The button is used to save the settings made in the menu items.
	Switch on manual operation	The buttons for pump P1 and P2 are used to switch on the pumps independently of the “level switching”. Manual operation is switched off automatically after 2 minutes.
	Switch off operation	The buttons for pump P1 and P2 are used to switch off automatic mode or manual operation of the pumps.
	Switch on automatic mode	The buttons for pump P1 and P2 are used to switch on automatic operation of the pumps and to control them automatically via the “level switching”.

Explanation of the display elements

LED display	Meaning	Explanation
	Pump P1 or P2 malfunction	Malfunction Pump(s) not in operation
	Operating display for pump P1 or P2	LED lights up: Pump(s) in operation LED flashes: Pump(s) in operation via the after-running function
	Pump P1 or P2 operation mode	LED lights up: Automatic mode LED flashes regularly: Manual operation LED flashes irregularly: Manual operation was switched off automatically after approx. 2 minutes
	Flood alarm	The water level in the tank has reached the “Flood alarm” level
	Group alarm	Error messages, e.g. in case of excessive power consumption, wrong rotating field

4.1.2 Menu items and settings

Display panel

Messages in the display panel:

- Top line:
  - The water level in the tank (if no pump is in operation)
  - Setting option (in service mode)
- Bottom line:
  - Operating hours of the pumps (if pumps are not in operation)
  - Malfunctions that have occurred
  - Changeable settings (in service mode)
  - Motor current (if pump is in operation or changing display if both pumps are in operation)

Overview of the menu items and settings

Top row (menu item)	Bottom row (settings)	Explanation
Last fault	Delete value	Fault signal remains saved 'zero voltage-proof'.
Next inspection	90 days 180 days 360 days	Specification of the maintenance intervals
Base Load On	0 – 100 cm	Activation point for first pump 1
Base Load Off	0 – 100 cm	Switch-off point for first pump 1
Peak load ON	0 – 100 cm	Activation point for additional pump
Peak load OFF	0 – 100 cm	Deactivation point for additional pump
High water level	Ignore 0 – 100 cm	Flood alarm is deactivated Flood alarm for overstepping
Run. time Max	0 – 60 min.	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.	Is switched off 1 – 60 min.	After the set time in baseload operation a pump change takes place. After three changes without interruption the "Flood alarm" is also triggered and the "Run. time altern." message appears in the display.
Stop delay	0 – 180 sec.	Stop delay of the pump after the switch-off point has been reached.
Max. current – 1	0.3 – 12.0 A	Pump P1 is shut down automatically when the power consumption is exceeded. The message 'overcurrent' appears in the display field.
Max. current – 2	0.3 – 12.0 A	Pump P2 is shut down automatically when the power consumption is exceeded. The message 'overcurrent' appears in the display field.

Top row (menu item)	Bottom row (settings)	Explanation
Force activation	Is switched off 1 – 10 sec.	Duration of the automatic activation of the pumps, if the pumps have not been operated for longer than 24 hours.
Acoustic alarm	Is switched off Is activated	Activated: In the event of a malfunction an alarm sounds.
Interm. Alarm	Is switched off Is activated	Activated: Malfunction relay is clocked.
Pump alternation	Is switched off Is activated	Activated: Pump change for every restart.
Rot. field fault	Is switched off Is activated	If the phase sequence is incorrect, or there is no L2 and/or I3, the group alarm is triggered.
Service mode	Is switched off Is activated	Shut-down: Settings are shown, but cannot be changed. Activated: Settings can be changed.
Language	German English ...	Selection of the language for the menu.

4.1.3 Changing the settings

Notes:

- Settings can only be changed in service mode. If Service mode is not activated the settings are displayed, but cannot be changed or saved.
- If no entry is made within 20 seconds the display automatically switches back to the basic setting.
- Operating hours and pump starts can be displayed but not changed.

Procedure:

➔ Turn rotary knob 

until the required menu item is displayed.

➔ Press 

button. The most recently saved setting begins to flash.

➔ Turn rotary knob 

, to change the setting (fast turning for a rough setting, slow turning for a fine setting).

➔ Press 

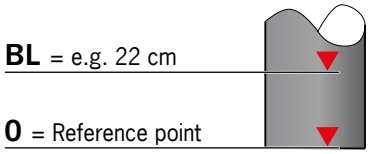
button to save the setting.

4.1.4 Launch settings

➔ Check and set the works setting in the pump control duo menu, 🕮 Chap. 4.1.3 "Change settings".

The settings made during the launch must be entered in the following table by hand.

Reference point for the switch pressure is the lower edge of the pneumatic pipe.

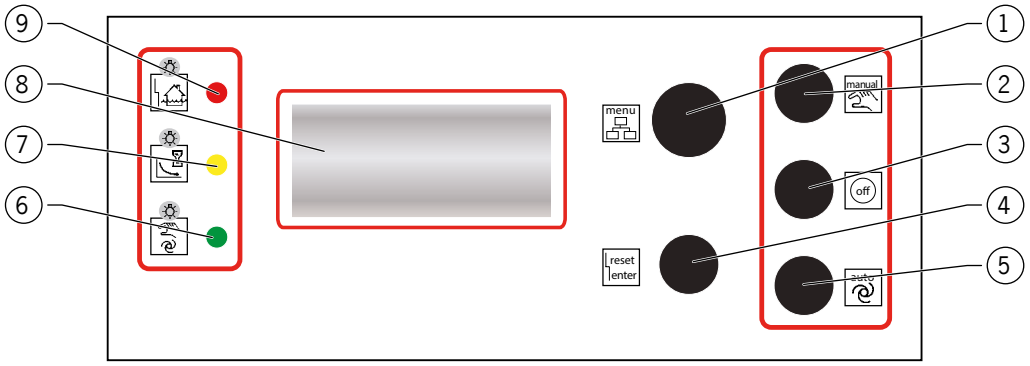


Menu item	Setting values	Factory settings Inlet used			Launch settings
		Z1	Z2	from above	
Next inspection	90 days 180 days 360 days	–			
Base Load On	0 – 100 cm	10	22	28	
Base Load Off	0 – 100 cm	3	3	3	
Peak load ON	0 – 100 cm	14*	26*	32*	
Peak load OFF	0 – 100 cm	12*	24*	30*	
High Water Level	Ignore 0 – 100 cm	18	30	36	
Stop delay	0 – 180 sec.	10 (Type 1.1), 5 (Type 1.2)			
Max. current – 1	0.3 – 12.0 A	1.3 (Type DDP 1.1), 2.6 (Type DDP 1.2)			
Max. current – 2	0.3 – 12.0 A	3.6 (Type DWP 1.1), 8.2 (Type DWP 1.2)			
Language	German English ...	German			

* **CAUTION For type** DWP 1.2: Peak load is deactivated due to excessive power consumption, value = 0.

4.2 Pump control mono

4.2.1 Controls and display elements



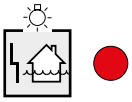
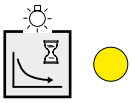
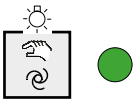
1 = Rotary knob: Menu item selection
2 = Button: Manual operation ON
3 = Button: Operation OFF
4 = Button: Acknowledgement of the malfunction/value settings
5 = Button: Automatic mode ON
6 = LED lights up: Automatic mode
LED flashes: Manual operation
LED flashes irregularly: Manual operation was ended automatically after approx. 2 minutes
7 = LED lights up: Operation
LED flashes: After-running period
8 = Display panel
9 = LED lights up: Group alarm,
e.g. Incorrect rotating field, flood alarm

Function of the controls

Button symbol	Button function	Explanation
menu	Selection of the menu items	The rotary knob can be used to select the menu items in the display panel. The display automatically changes back to the basic setting after 20 seconds.
reset enter	Acknowledge malfunction	The button is used to acknowledge malfunction signals and messages after removing the cause of the fault. If the malfunction is not corrected, only the group fault alarm relay and the alarm sound signal (e.g. flood alarm) are switched off.
	Confirm setting	The button is used to save the settings made in the menu items.
manual	Switch on manual operation	The pump is switched on independent of the 'level switching' with the button. Manual operation is switched off automatically after 2 minutes.

Button symbol	Button function	Explanation
	Switch off operation	The automatic and/or manual pump mode is switched off with the button.
	Switch on automatic mode	The button is used to switch on the automatic mode of the pump and controls it automatically via the "level switching".

Explanation of the display elements

LED display	Meaning	Explanation
	Group alarm	Error messages, e.g. in case of excessive power consumption, wrong rotating field, flood alarm
	Operating display for the pump	LED lights up: Pump in operation LED flashes: Pump in operation via the after-running function
	Pump operating mode	LED lights up: Automatic mode LED flashes regularly: Manual operation LED flashes irregularly: Manual operation was switched off automatically after approx. 2 minutes

4.2.2 Menu items and settings

Display panel

Messages in the display panel:

- Top line:
  - The water level in the tank (if no pump is in operation)
  - Setting option (in service mode)
- Bottom line:
  - Operating hours of the pump (if pumps are not in operation)
  - Malfunctions that have occurred
  - Changeable settings (in service mode)
  - Motor current (if the pump is in operation)

Overview of the menu items and settings

Top row (menu item)	Bottom row (settings)	Explanation
Last fault	Delete value	Fault signal remains saved 'zero voltage-proof'.
Next inspection	90 days 180 days 360 days	Specification of the maintenance intervals
Level ON	0 – 100 cm	Activation point of the pump
Level OFF	0 – 100 cm	Switch-off point of the pump
High Water Level	Ignore 0 – 100 cm	Flood alarm is deactivated Flood alarm for overstepping
running time max	0 – 60 min.	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.
Stop delay	0 – 180 sec.	Stop delay of the pump after the switch-off point has been reached.
Max. current	0.3 – 12.0 A	Pump is shut down automatically when the power consumption is exceeded. The message 'overcurrent' appears in the display field.
Force activation	Is switched off 1 – 10 sec.	Duration of the automatic activation of the pump, if the pump has not been operated for longer than 24 hours.
Acoustic alarm	Is switched off Is activated	Activated: In the event of a malfunction an alarm sounds.
Interm. alarm	Is switched off Is activated	Activated: Malfunction relay is clocked.
Rot. field fault	Is switched off Is activated	If the phase sequence is incorrect, or there is no L2 and/or I3, the group alarm is triggered.
Service mode	Is switched off Is activated	Shut-down: Settings are shown, but cannot be changed. Activated: Settings can be changed.
Language	German English ...	Selection of the language for the menu.

4.2.3 Changing the settings

Notes:

- Settings can only be changed in service mode. If Service mode is not activated the settings are displayed, but cannot be changed or saved.
- If no entry is made within 20 seconds the display automatically switches back to the basic setting.
- Operating hours and pump starts can be displayed but not changed.

Procedure:

➔ Turn rotary knob menu until the required menu item is displayed.

➔ Press reset enter button. The most recently saved setting begins to flash.

➔ Turn rotary knob menu, to change the setting (fast turning for a rough setting, slow turning for a fine setting).

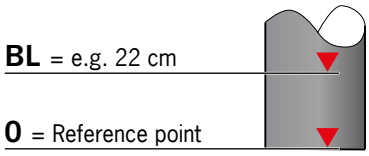
➔ Press reset enter button to save the setting.

4.2.4 Launch settings

➔ Check and set the works setting in the pump control mono menu, Chap. 4.2.3 "Change settings".

The settings made during the launch must be entered in the following table by hand.

Reference point for the switch pressure is the lower edge of the pneumatic pipe.

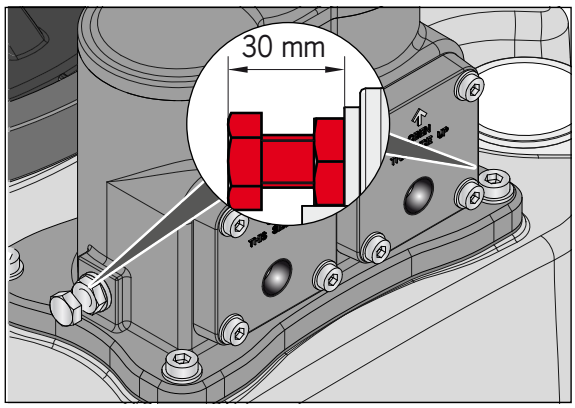


Menu item	Setting values	Factory settings Inlet used			Launch settings
		Z1	Z2	from above	
Next inspection	90 days 180 days 360 days	–			
Base load ON	0 – 100 cm	10	22	28	
Base load OFF	0 – 100 cm	3	3	3	
High Water Level	Do not observe 0 – 100 cm	18	30	36	
Stop delay	0 – 180 sec.	10 (Type 1.1), 5 (Type 1.2)			
Max. current	0.3 – 12.0 A	1.3 (Type DDP 1.1), 2.6 (Type DDP 1.2) 3.6 (Type DWP 1.1), 8.2 (Type DWP 1.2)			
Language	German English ...	German			

4.3 Set the venting screw

Before startup and/or the test run, the setting of the ventilation screw needs to be checked.

➔ Set the ventilation screws on both sides of the backflow valve to 30 mm.



4.4 Carry out a test run Muli-Mini duo

Requirements:

- Shut-off valves in the inlet or pressure line (if there is one) are open.
- The pump control is connected to the power supply.

During the trial run, pay attention to the following:

- Perform the trial run at least twice during launch.
- Carry out a test run with drinking water.
- Avoid dry running during the trial run.
- Observe the messages in the display panel.

CAUTION If knocking noises/vibrations occur in the pressure line when the pump is switched off, the after-running period must be increased

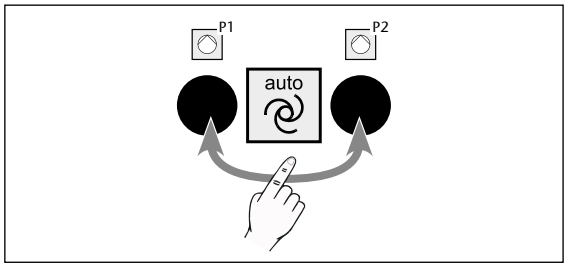
Water level for level “Stop delay OFF” (check through inspection opening):

- For version without an air bubble injection: The lower edged pneumatic pipe is located 30 mm above the water line
- For version with air bubble injection (optional): The lower level pneumatic pipe is located 30 mm below the water line

The **tank** can be filled via the inlet line or via the inspection opening.

Starting automatic mode:

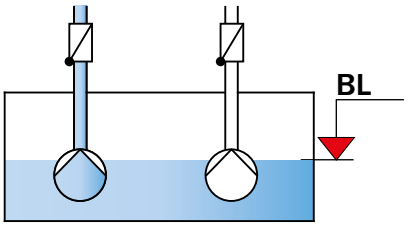
➔ Press both buttons to start automatic operation of pump 1 and 2.



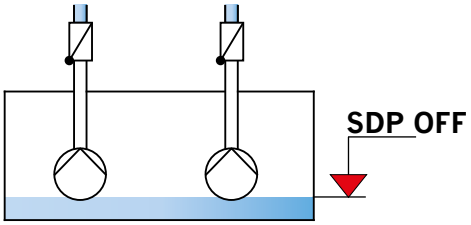
➔ Fill the tank.

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

➔ Interrupt the inlet.



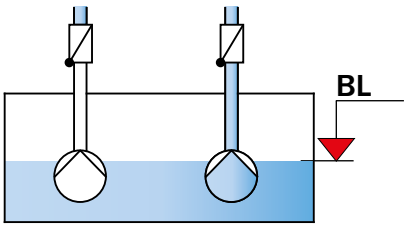
When the water reaches the “Base Load OFF” level, the water level is reduced by the after-running time to the level “Stop delay OFF” (SDP OFF) pump. Then the pump 1 switches off.



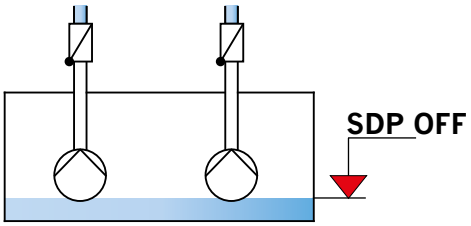
➔ Fill the tank.

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

➔ Interrupt the inlet.



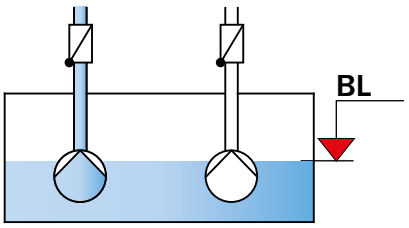
When the water reaches the “Base Load OFF” level, the water level is reduced by the after-running time to the level “Stop delay OFF” (SDP OFF) pump. Then the pump 2 switches off.



➔ Fill the tank.

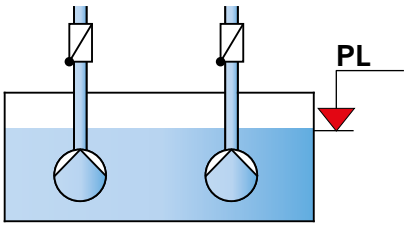
When the water level reaches the “Base Load” (BL) level, pump 1 switches on.

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

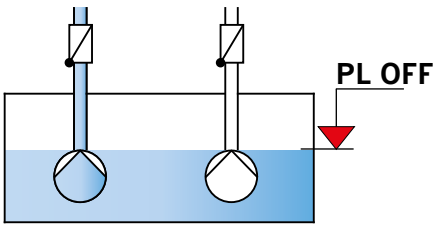


When the water level reaches the “Peak load” (PL) level, both pumps switch on.

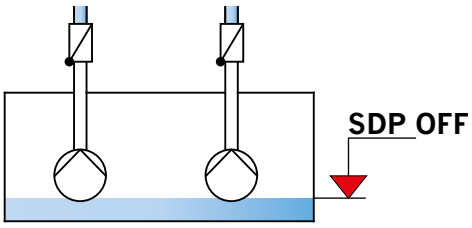
➔ Interrupt the inlet.



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

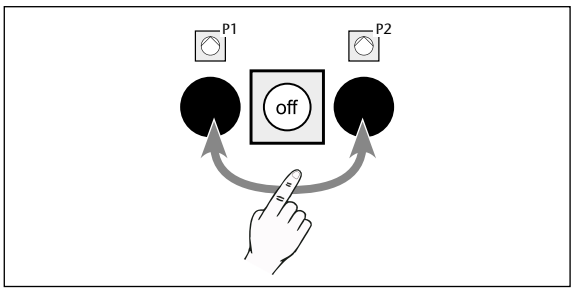


When the water reaches the “Base Load OFF” level, the water level is reduced by the after-running time to the level “Stop delay OFF” (SDP OFF) pump. Then the pump 1 switches off.



Ending automatic mode:

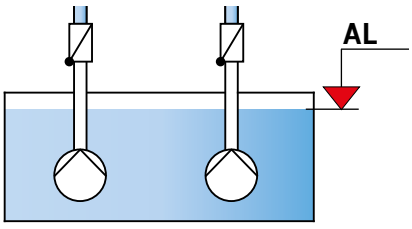
➔ Press both buttons to end automatic operation of pump 1 and 2.



➔ Fill the tank.

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

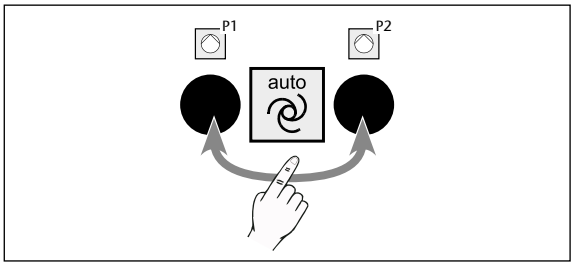




➔ Interrupt the inlet.

Starting automatic mode:

➔ Press both buttons to start automatic operation of pump 1 and 2.

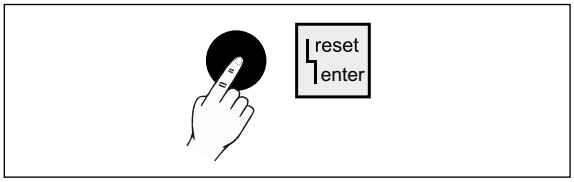


Acknowledging a malfunction:

➔ Press the button to acknowledge the malfunction.

A fault signal is no longer displayed and the LED for the “Flood alarm” goes out:





The trial run is finished

Final work:

- For version with mini compressor (optional): Set air bubble injection 🕮 Chap. 4.6 "Setting air bubble injection (optional)"
- Document the settings, 🕮 Chap. 4.1.4 "Launch settings"
- Document the launch, 🕮 Appendix: "Launch report"

4.5 Carry out a test run Muli-Mini mono

Requirements:

- Shut-off valves in the inlet or pressure line (if there is one) are open.
- The pump control is connected to the power supply.

During the trial run, pay attention to the following:

- Perform the trial run at least twice during Launch.
- Carry out a test run with drinking water.
- Avoid dry running during the trial run.
- Observe the messages in the display panel.

CAUTION If knocking noises/vibrations occur in the pressure line when the pump is switched off, the after-running period must be increased.

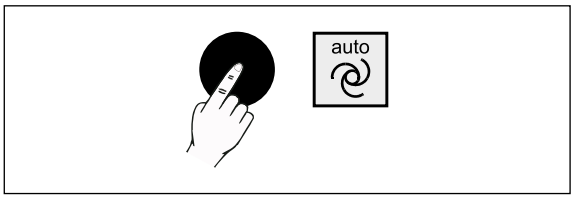
Water level for level “Stop delay OFF” (check through inspection opening):

- For version without an air bubble injection: The lower edged pneumatic pipe is located 30 mm above the water line
- For version with air bubble injection (optional): The lower level pneumatic pipe is located 30 mm below the water line

The **tank** can be filled via the inlet line or via the inspection opening.

Starting automatic mode:

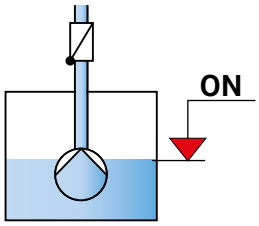
➔ Press the button to start automatic mode.



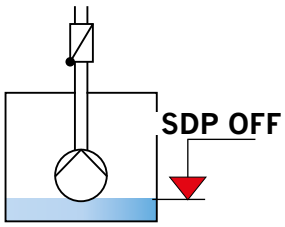
➔ Fill the tank.

When the water level reaches the “ON” level, the pump switches on.

➔ Interrupt the inlet.

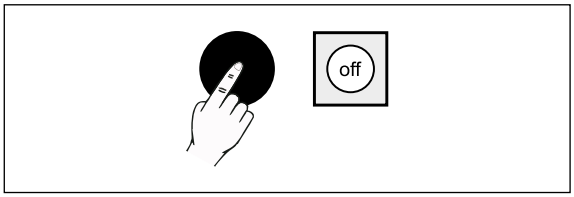


When the water reaches the “OFF” level, the water level is reduced by the after-running time to the level “Stop delay OFF” (SDP OFF) pump. Then the pump switches off.



Ending automatic mode:

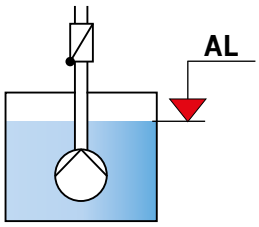
➔ Press both buttons to end automatic operation of the pump.



➔ Fill the tank.

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

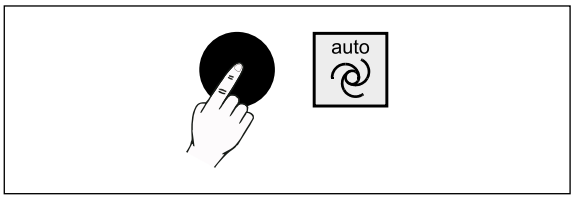




➔ Interrupt the inlet.

Starting automatic mode:

➔ Press the button to start automatic mode.

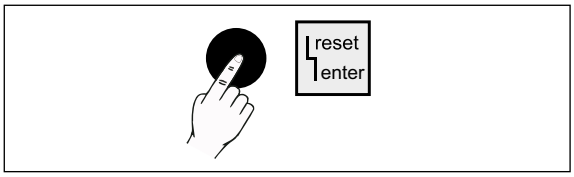


Acknowledging a malfunction:

➔ Press the button to acknowledge the malfunction.

A fault signal is no longer displayed and the LED for the “Group alarm” goes out:





The trial run is finished

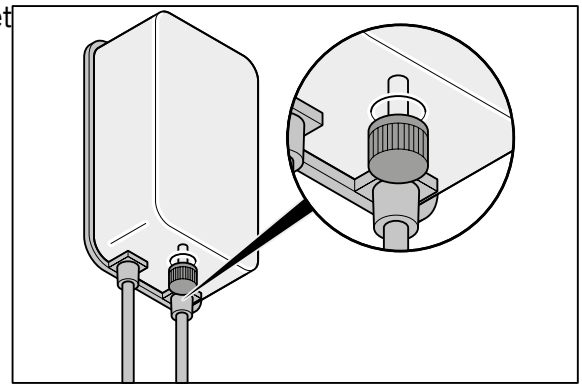
Final work:

- For version with mini compressor (optional): Set air bubble injection 🕮 Chap. 4.6 "Setting air bubble injection (optional)"
- Document the settings, 🕮 Chap. 4.2.4 "Launch settings"
- Document the launch, 🕮 Appendix: "Launch report"

4.6 Setting the air bubble injection (optional)

The air outlet of the mini compressor must be adjusted to reduce the volume and power consumption.

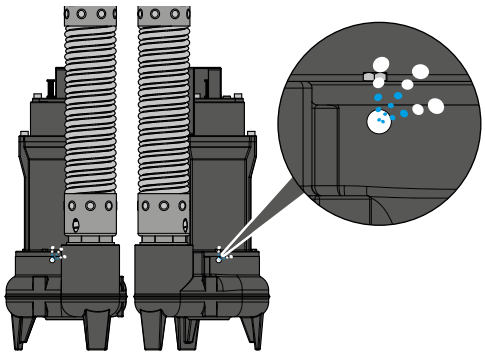
➔ Use the screw on the mini compressor to set the air bubble injection so that only a few air bubbles escape at the end of the pneumatic pipe (check via inspection opening).



4.7 Automatic ventilation volute casing

During operation, the volute casing cents independently and protects the pump(s) against damage.

The water splashes into the tank from boreholes above the pressure connection of the pump(s).



5 Troubleshooting



WARNING

Electric shock

- According to EN 12056, work on electrical connections to power supply may only be carried out by qualified electricians.
- Disconnect the evaluation device from the power supply before troubleshooting.

CAUTION

Flooding and risk of infection in case of improper sanitary installation

- Work on the sanitary equipment must be carried out by qualified personnel only, 🕮 Chap. 1.3 "Personnel qualifications".
- Use original spare parts only.
- Have wastewater lifting plant repairs carried out by ACO or an ACO Service partner, 🕮 page 3 “ACO Service”.
- Avoid contact with wastewater and wear protective equipment, 🕮 Chap. 1.4 "Personal protective equipment".
- Do not carry out work on the connections and pipes unless they are depressurised.

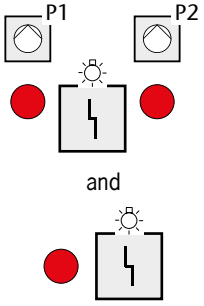
Burns due to hot surfaces

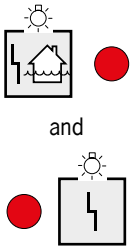
- Allow pump motor(s) to cool.

Malfunctions on the wastewater lifting plant

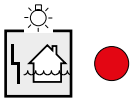
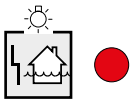
Malfunction	Cause(s)	Actions
Pump does not deliver or pumps too little or the tank is full	Shut-off valve in the pressure line is not fully open or closed on the intake side	Shut-off valve in the pressure line and/or the intake side is completely open
	Pressure line obstructed	Clean the pressure line
	Impeller (pump) obstructed	Pump maintenance required (ACO Service)
	Pump parts are worn	Pump repair required (ACO Service)
Pump does not run	Pump motor is defective	Pump replacement required (ACO Service)
	Pump blocked by foreign bodies	Pump maintenance required (ACO Service)
	Power supply interrupted	Check the electrical connections to power supply Reinstate the power supply
	Automatic mode is switched off	Switch on automatic mode
	Pump overload protection has tripped. Malfunction cannot be acknowledged	Pump maintenance or repair required (ACO Service)
Pump only runs in manual operation	Control line of the level switching is leaking, incorrectly laid, kinked or obstructed	Check the control line
	Pneumatic pipe obstructed	Clean the pneumatic pipe
Knocking noises/ vibrations in the pressure line on switching off the pump(s)	After-running period of the pump(s) is too low	Increase the after-running period of the pump(s)

Malfunctions on the pump control duo

Display panel	LED display(s)	Cause(s)	Actions
max. current		Exceeding of the max. power consumption Pump possibly blocked by foreign bodies	Pump maintenance required (ACO Service)
		Pump overload protection has tripped. Malfunction cannot be acknowledged	Pump maintenance or repair required (ACO Service)

Display panel	LED display(s)	Cause(s)	Actions
Flood alarm		Shut-off valve in the pressure line is not fully open or is closed on the intake side	Shut-off valve in the pressure line and/or the intake side is completely open
		Automatic mode is switched off	Switch on automatic mode
		Pump motor is defective	Pump replacement required (ACO Service)
		Impeller (pump) obstructed	Pump maintenance required (ACO Service)
		Pressure line obstructed	Clean the pressure line
		Pump parts are worn	Pump repair required (ACO Service)

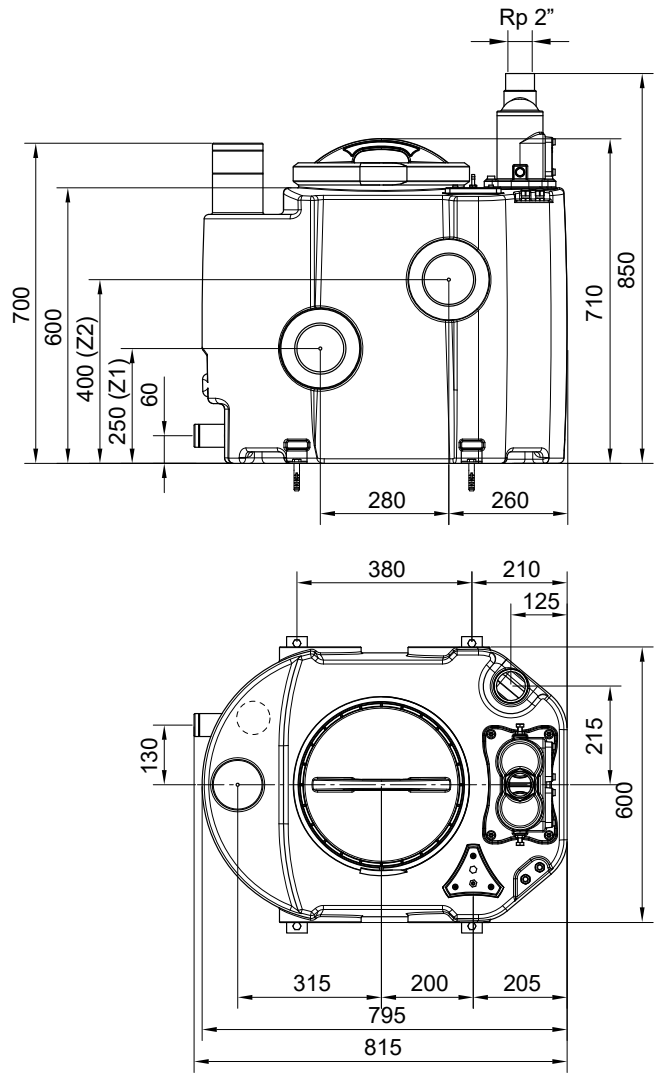
Malfunctions on the pump control mono

Display panel	LED display(s)	Cause(s)	Actions
max. current		Exceeding of the max. power consumption Pump possibly blocked by foreign bodies	Pump maintenance required (ACO Service)
		Pump overload protection has tripped. Malfunction cannot be acknowledged	Pump maintenance or repair required (ACO Service)
Flood alarm		Shut-off valve in the pressure line is not fully open or is closed on the intake side	Shut-off valve in the pressure line and/or the intake side is completely open
		Automatic mode is switched off	Switch on automatic mode
		Pump motor is defective	Pump replacement required (ACO Service)
		Impeller (pump) obstructed	Pump maintenance required (ACO Service)
		Pressure line obstructed	Clean the pressure line
		Pump parts are worn	Pump repair required (ACO Service)

6 Technical Data

6.1 Wastewater lifting plant

6.1.1 Scale drawing



6.1.2 Key data

Pump(s)

		Motor performance P1 [kW]	Motor performance P2 [kW]	Nominal current [A]	Voltage [V]	Revolutions [rpm]	Granulation size [mm]	Protection type –	Temperature range medium [° C]
Muli-Mini duo	DDP 1.1	0.70	0.55	1.3	400	2,900	40	IP 68	40 (briefly 65)
	DDP 1.2	1.50	1.10	2.6	400		50		
	DWP 1.1	0.80	0.55	3.6	230		40		
	DWP 1.2	1.80	1.10	8.2	230		50		
Muli-Mini mono	MDP 1.1	0.70	0.55	1.3	400	2,900	40	IP 68	40 (briefly 65)
	MDP 1.2	1.50	1.10	2.6	400		50		
	MWP 1.1	0.80	0.55	3.6	230		40		
	MWP 1.2	1.80	1.10	8.2	230		50		

Tank

		Volume information: Usable volume *** for inlet Z1 * [l]	Z1 ** [l]	Z2 * [l]	Z2 ** [l]	from above * [l]	from above ** [l]	Total [l]	Empty weight [kg]
Muli-Mini duo	DDP 1.1	55	35	100	80	130	110	195	66
	DDP 1.2								74
	DWP 1.1								66
	DWP 1.2								74
Muli-Mini mono	MDP 1.1	60	40	108	88	140	120	205	50
	MDP 1.2								54
	MWP 1.1								50
	MWP 1.2								54

* without air bubble injection

** with air bubble injection

*** according to factory-made settings, Chap. 4.1.4 (duo)and/or chap. 4.2.4 (mono) "Commissioning settings"

6.1.3 Performance data

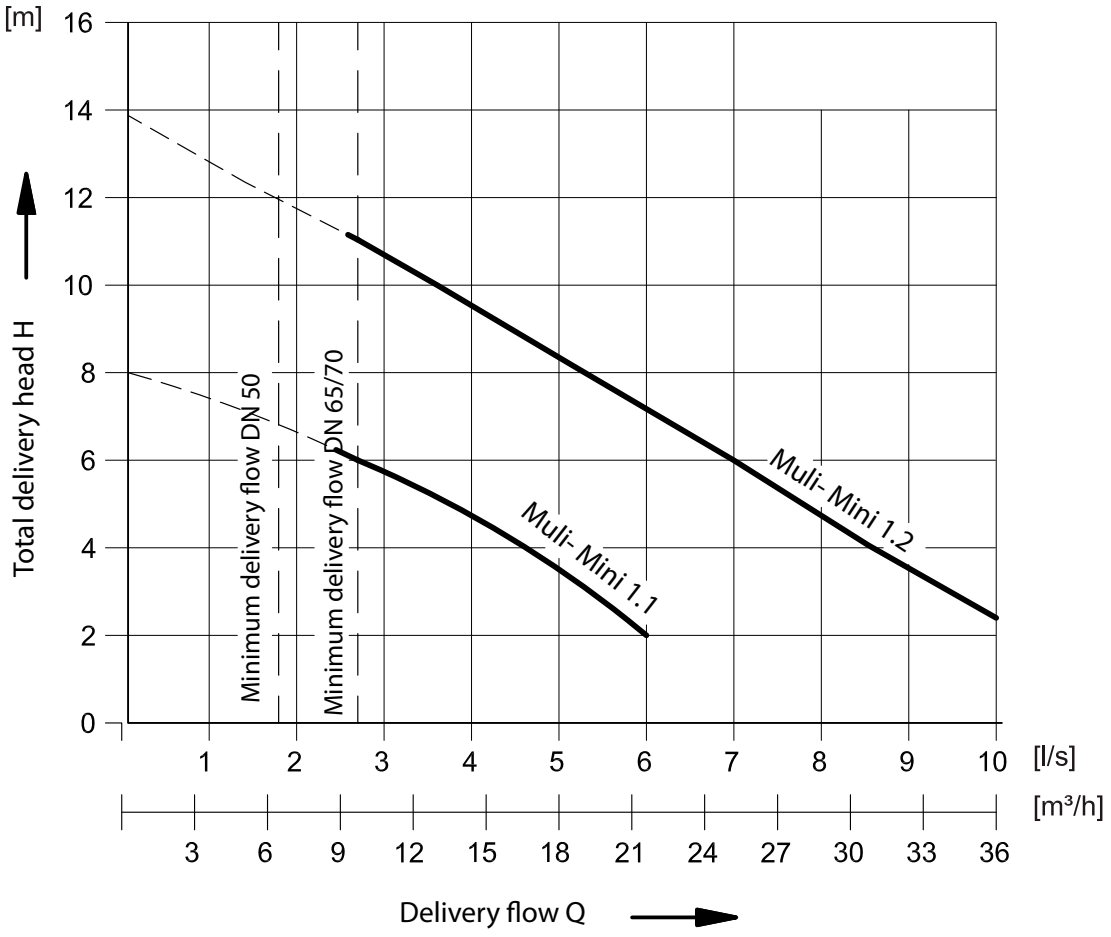
Muli-Mini 1.1

Delivery head [m]	Delivery performance [l/s]	Delivery performance [m³/h]
2	6	21.6
4	4.5	16.2
6	2.75	9.9

Muli-Mini 1.2

Delivery head [m]	Delivery performance [l/s]	Delivery performance [m³/h]
2	10.3	37.1
4	8.7	31.3
6	7.0	25.2
8	5.4	19.4
10	3.6	13.0
12	1.8	6.5

6.1.4 Characteristic curve



6.2 Pump control

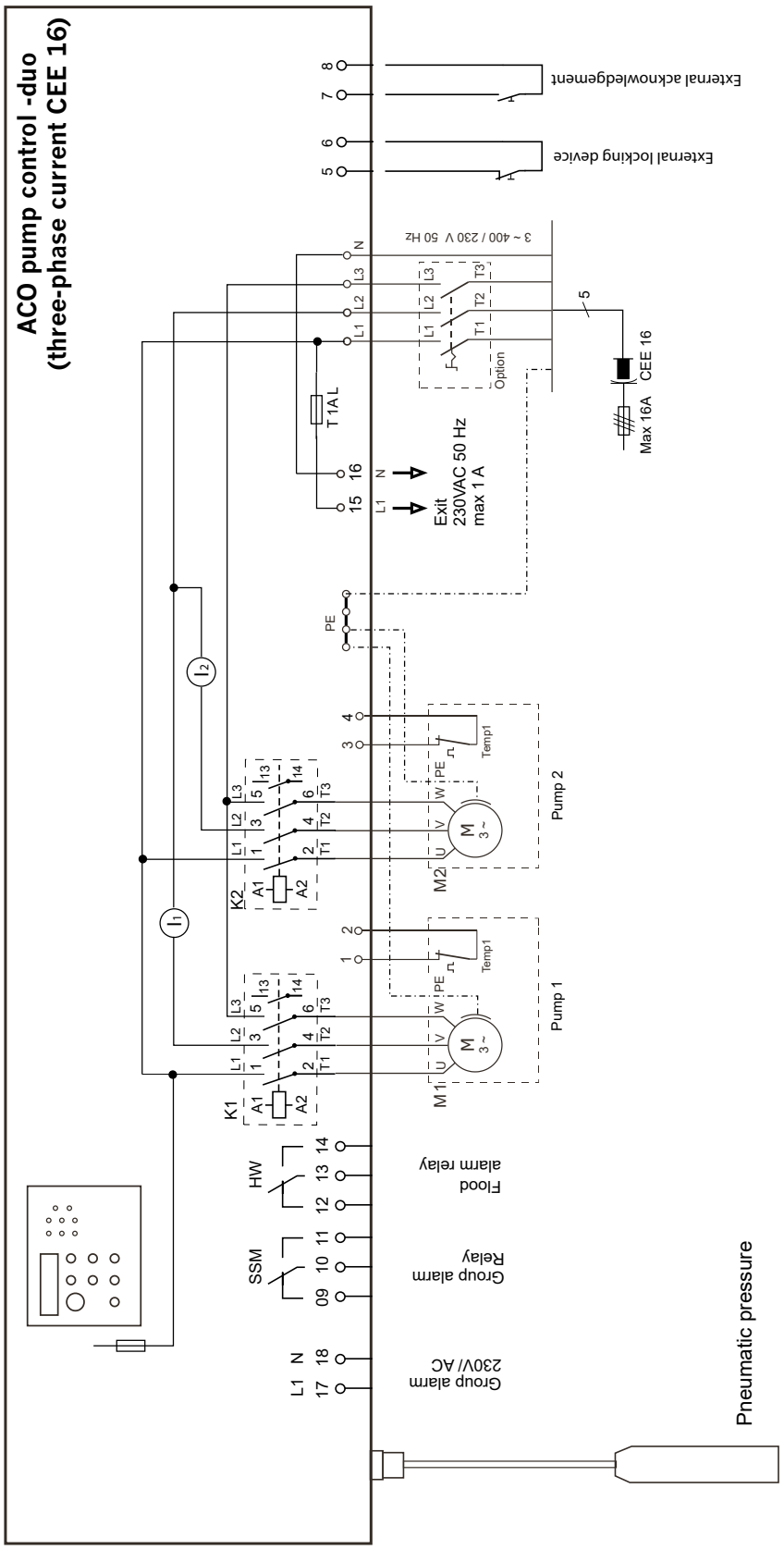
6.2.1 Key data pump control duo

Key data	Values	
	Three-phase current	Alternating current
Operating voltage:	~ 400 V (L1, L2, L3, N, PE), 50 Hz	~ 230 V (L1, N, PE), 50 Hz
Control voltage:	230 VAC, 50 Hz	230 VAC, 50 Hz
Motor current limitation	0.3 A to 12 A (adjustable for each pump)	0.3 A to 12 A (adjustable for each pump)
Power intake (contactors operated):	< 20 VA	< 20 VA
Connected load, max.:	P2 < 5.5 kW	P2 < 5.5 kW
Protection type pump control:	IP 54	IP 54
Isolated alarm contact:	3 A	3 A
Fuse (alarm output):	5 x 20 AT	5 x 20 AT
Rechargeable accumulator (mains-independent alarm):	9 V, 200 mAh (approx. 5 to 6 h)	9 V, 200 mAh (approx. 5 to 6 h)
Alarm volume:	85 dB	85 dB
Dimensions pump control:	320 mm x 340 mm x 120 mm (W x H x D)	320 mm x 340 mm x 120 mm (W x H x D)

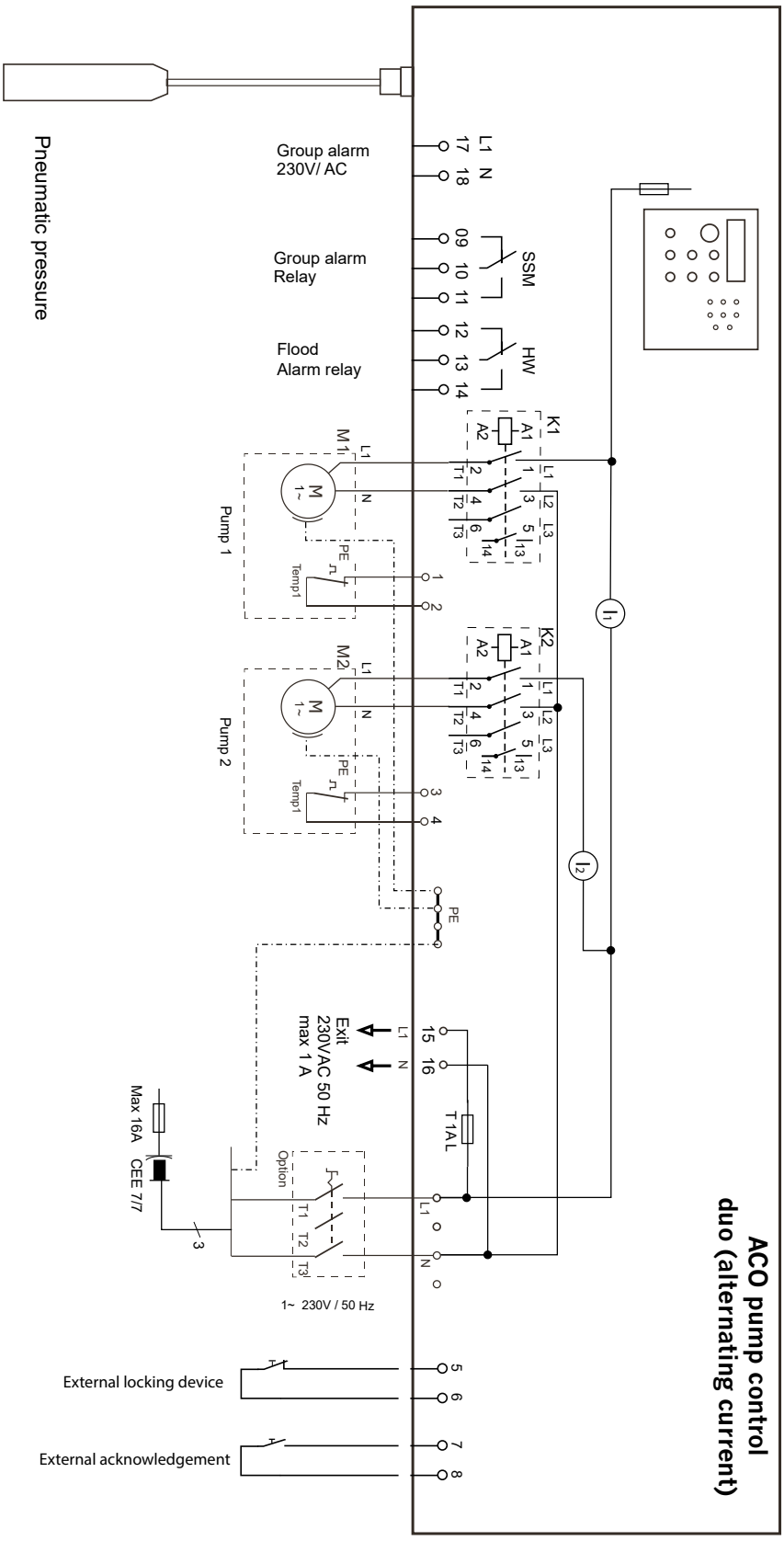
6.2.2 Key data pump control mono

Key data	Values	
	Three-phase current	Alternating current
Operating voltage:	~ 400 V (L1, L2, L3, N, PE), 50 Hz	~ 230 V (L1, N, PE), 50 Hz
Control voltage:	230 VAC, 50 Hz	230 VAC, 50 Hz
Motor current limitation	0.3 A to 12 A	0.3 A to 12 A
Power intake (contactors operated):	< 20 VA	< 20 VA
Connected load, max.:	P2 < 5.5 kW	P2 < 5.5 kW
Protection type pump control:	IP 54	IP 54
Isolated alarm contact:	3 A	3 A
Fuse (alarm output):	5 x 20 AT	5 x 20 AT
Rechargeable accumulator (mains-independent alarm):	9 V, 200 mAh (approx. 5 to 6 h)	9 V, 200 mAh (approx. 5 to 6 h)
Alarm volume:	85 dB	85 dB
Dimensions pump control:	180 mm x 290 mm x 110 mm (W x H x D)	180 mm x 290 mm x 110 mm (W x H x D)

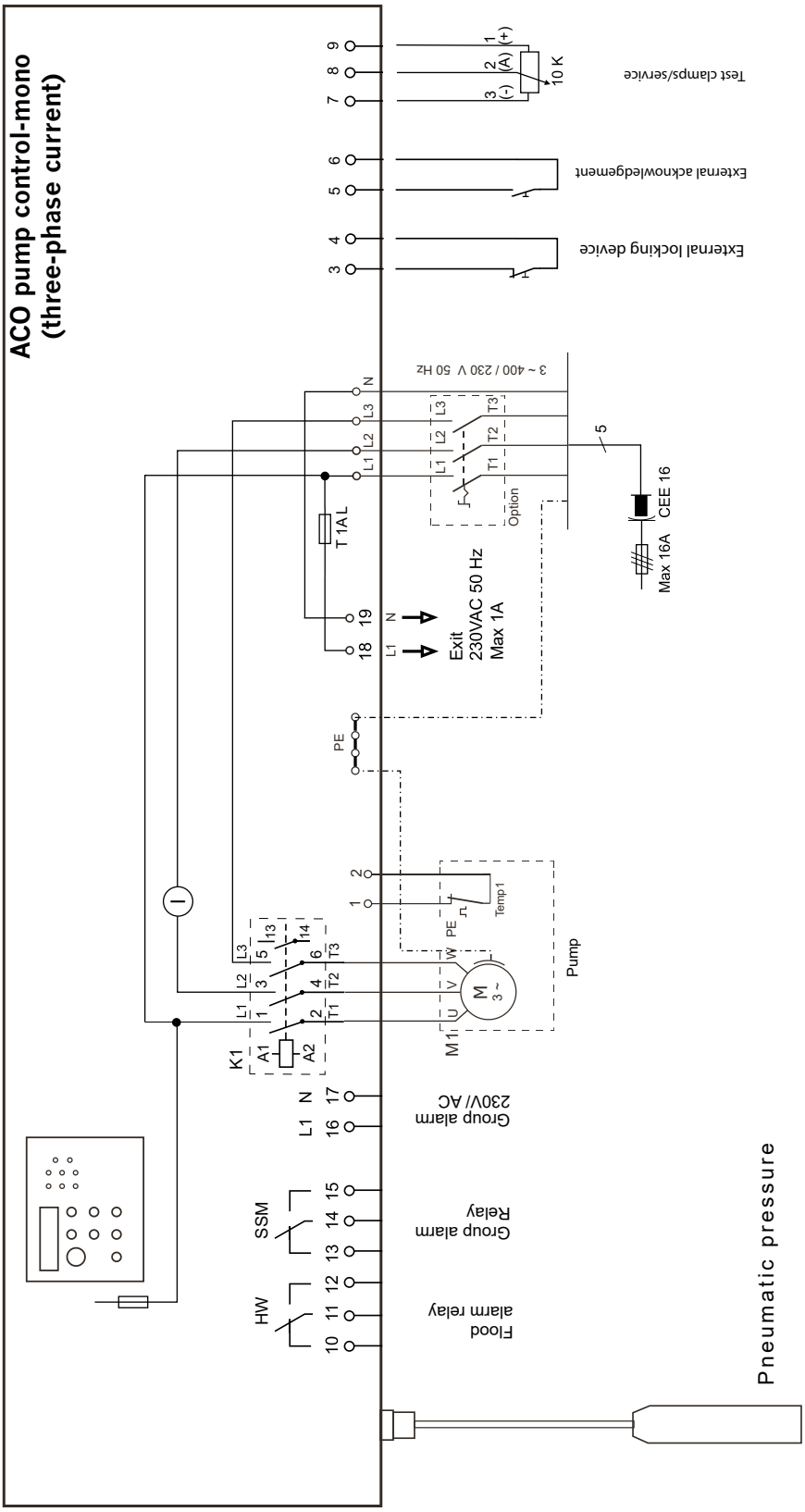
6.2.3 Circuit diagram pump control-duo three-phase current



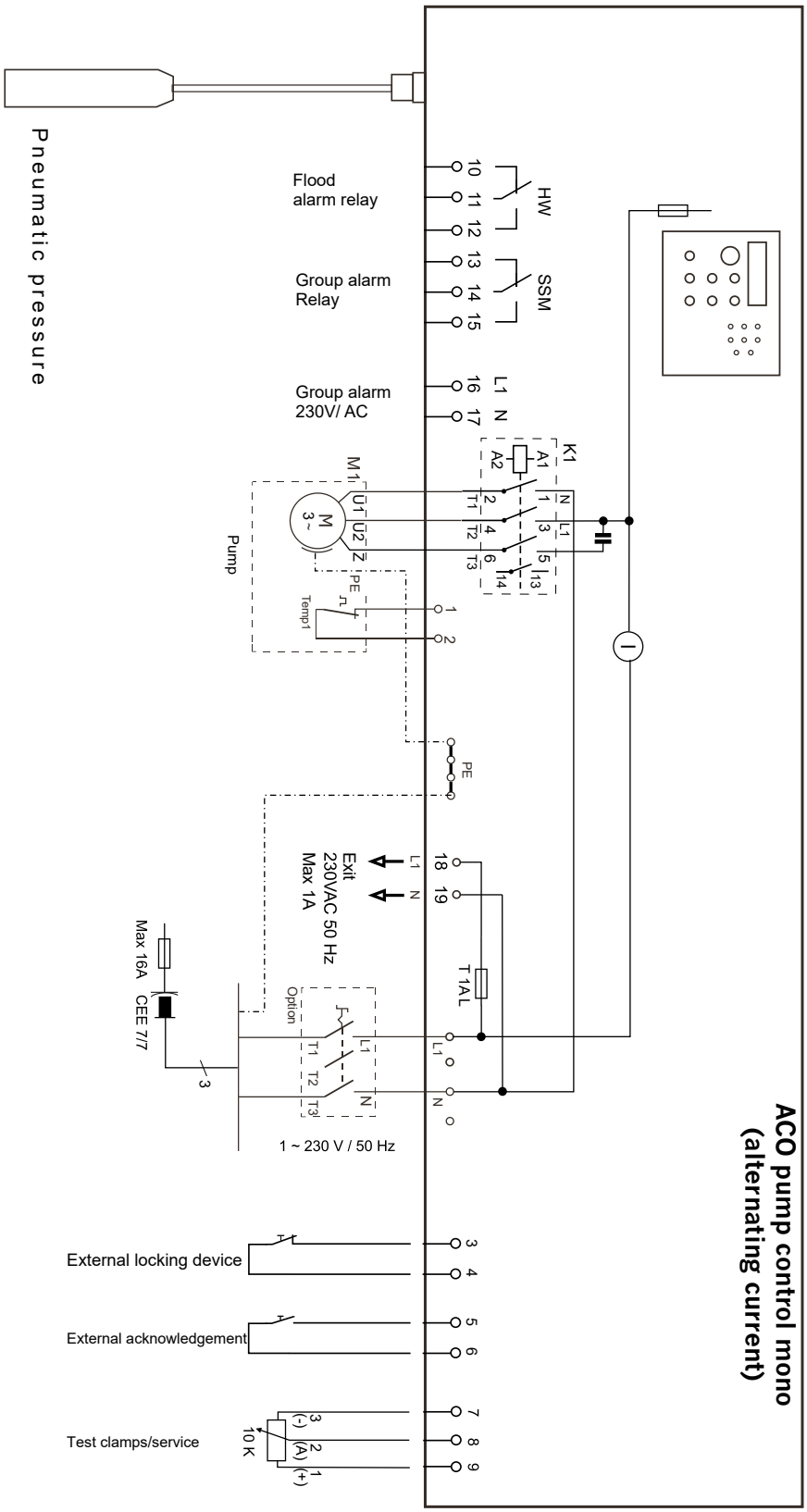
6.2.4 Circuit diagram pump control-duo alternating current



6.2.5 Circuit diagram pump control-mono three-phase current



6.2.6 Circuit diagram pump control-mono alternating current



Appendix: Launch report

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

Launch date: _____

Handover date: _____

Wastewater lifting plant

Type	Article. No.	Serial No.	Year of construction

Use location

Building/room: _____

Use: Multi-dwelling building ○ Commercial use ○

Street: _____

Town/city: _____

Responsible persons

	Qualified person	Authorised acceptance representative	Plant operator company
Name:			
Phone No.:			
Fax No.:			
Email:			
Address:			

Checklist for launch (Qualified person)

Two trial runs are required before, during and after Launch, 🕮 Chap. 4.4 and or chap. 4.5 "Carry out a test run".

Tests & Inspections (no claim is made that the list is complete)	**OK**	**not OK**
Electrical fusing of the wastewater lifting plant in accordance with the IEC directives or national and local regulations	○	○
Rotational direction of pump motors	○	○
Operating voltage and frequency	○	○
Motor protection switch: Test by briefly unscrewing individual fuses (two-phase run)	○	○
Feed gate valve (if there is one) in the inlet line: Functioning test, actuation, open position, leak tightness	○	○
Shut-off valve (if there is one) in the pressure line: Functioning test, actuation, open position, leak tightness	○	○
Attachment of the inlet and pressure line	○	○
Switching and setting of the switching on levels in the pump control menu	○	○
Tightness: Wastewater lifting plant, fittings, pipes, connections	○	○
Fault signalling equipment: Fault signals in the display panel, fault displays, audible alarm, telecommunication equipment (group fault)	○	○
Functioning test of the backflow valve	○	○

Instruction (by installer company)

Instruction	**Remarks**	**yes**	**no**
Instruction:	Functions, pump control duo, control mixer unit, operating information, malfunction remedy ,maintenance duties	○	○
Handover:	Instructions for Use	○	○

Remarks:

Signature of Qualified person: _____

Signature of authorised acceptance inspection representative: _____

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