Instructions for Use

Issued: 2024-07-23

Muli-Nova Wastewater lifting station

For sewage which is free of faeces or contains faeces, for free-standing installation in frost-protected rooms

Muli-Nova DDP 1.x

Container size 1 / duo station with 2 pumps



Muli-Nova DDP 2.x

Container size 2 / duo station with 2 pumps



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.

3017366 V1.0 Translation of the original instructions

Introduction

ACO Passavant GmbH (hereinafter referred to as ACO) thanks you for your trust and provides you with a product that represents state-of-the-art technology and which has been checked for proper condition during quality controls prior to delivery.

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

Service

Spare parts and accessories, refer to “Product catalogue“: 🕮 http://www.aco-haustechnik.de

For further information, please contact ACO Service.

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Im Gewerbepark 11c	Fax: + 49 (0) 3 69 65 / 81 9 -3 61
36466 Dermbach	service@aco.com

Guarantee

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

Declaration of Performance (DoP)

"Declaration of Performance" (DoP) for the wastewater lifting station 🕮 http://dop.aco.com

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 station, in order to prevent personal injuries and damage to property.

1.1 Intended use

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

The wastewater lifting station is intended for commercial or industrial buildings with a high occurring volume of wastewater and multi-dwelling buildings for free-standing installation in frost-protected rooms below the backflow level.

The following wastewater may not be discharged:

- Non-faecal wastewater from laundry rooms, multiple wash installations and cellar rooms
- Faecal wastewater
- Wastewater from grease separators
- Wastewater containing long and short fibrous substances or particles

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
- Ecocides, 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 the event 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 stations for building and land drainage – Part 1: Faeces lifting plants"
- 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: General points and design requirements"
- DIN 1986-100: Drainage systems for buildings and property – Part 100: Provisions in connection with DIN EN 752 and DIN EN 12056"

1.3 Personnel qualifications

Activities	Personnel	Knowledge
Layout, operational changes	Planners	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 people	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 people	Appropriate and environmentally friendly disposal of materials and substances, knowledge of recycling

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

"Competent persons" are employees of companies independent of operators, experts or other institutions who can prove that they have the necessary specialist knowledge for the operation, maintenance and inspection of separator systems to the extent specified here and have the technical equipment required for the inspection of separator systems. 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 people, 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 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 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 DIN EN 12056-4 as well as regional provisions and directives must be complied with, these include, among other things:

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

Operation monitoring

- Checking the intended operation 🕮 Chap. 1.1 "Intended use"
- Monthly performance of at least 2 trial runs.
- Checking of the wastewater lifting plant, e.g. for leakages, unusual running noises.
- Checking of the operational readiness of the wastewater lifting station on the pump control.

Maintenance

Wastewater lifting stations 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 station in according to EN 12056-4:

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

Additional (extraordinary) maintenance of the wastewater lifting station:

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

1.7 Transport and storage

On delivery the wastewater lifting station 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 station in frost proof premises.
- Never drive the forks of a fork-lift truck or lift truck directly under the wastewater lifting station.
- Where possible, transport the wastewater lifting station on its base frame 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.
- When transporting the wastewater lifting station with a crane and/or crane hook: Attach lashing straps on the wooden pallet or on the transport lifting eyelets.

1.8 Disposal

Completely drain and clean the wastewater lifting station 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.



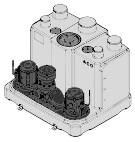
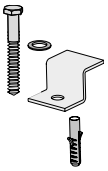
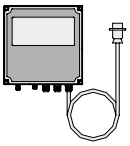
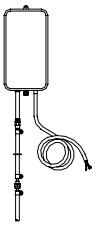
2 Product Description

2.1 Scope of supply

Check perfect condition and completeness of the delivery on the basis of the table below.

IMPORTANT Never install damaged plants.

Report any possible damage to the station to the supplier so that the complaint procedure can be processed quickly.

Unit	Individual component	Figure	Packaging
Wastewater lifting station	■ 1x Collection tank ■ 1x Control cable 10 m long ■ 2x 10 m long connection cable, on the motor terminal box		Wooden pallet
Fixing set	■ 4x Angle ■ 4x Wood screw ■ 4x Washer ■ 4x Dowel		PVC bag
Control (not included in the scope of delivery)	■ Is necessary and must be ordered separately.		—
Accessories (optional)	■ Air bubble injection – 0150.25.45 ■ Pressure transducer – 0178.63.88 ■ Safety barrier – 0178.63.89		Cardboard box
Documentation	■ Operating instructions ■ Delivery papers	–	PVC bag

Additional accessories such as a sampling device, inlet shut-off disc, shut-off valve, signalling unit etc. Product Catalogue, www.aco-haustechnik.de.

2.2 Product features

- Reduced weight (105 kg), ready for connection, rapid assembly.
- Low maintenance work.
- High chemical resistance of all parts.
- Selectable usable volume by means of different inlet heights.
- Suitable for greasy wastewater.
- Flood proof according to IP 68: Flooding height (from set-up flange) maximum 3 m, flooding time maximum 36 hours.

Collection tank

- Material polyethylene.
- Inspection opening Ø 250 mm with odour-tight screw cap.
- Fixing set for buoyancy-proof anchorage.
- Selectable container capacity 430 litres or 550 litres.
- Up to 3 horizontal inlet sockets DN 150/DN 100.
- 2x vertical connection pieces DN 100, for inlet and venting.
- DDP 1.x: 3x vertical inlet connection DN 150.
- DDP 2.x: 2x vertical inlet socket DN 150 and 1x vertical inlet socket DN 200.
- DN 100 ventilation line connection.
- Bottom outlet G 1 ½“
- Inlet line:
- Depending on version: inlet height from 180 up to 700 mm
  - Horizontal inlet can be chosen on rear or side surfaces, hole saw and seal available from ACO as accessories.
  - Vertical inlet from above (DN 100, DN 150 or DN 200 as required (DDP x.2 only)).
  - Connection for plastic pipe or SM-L pipe
- Discharge line:
  - Connecting flange for stop valve DN 80 PN 16
  - Patented flap-type backflow preventer with lifting screw and drain tap for quick draining of the discharge line.
  - Integrated special DN 100 fastening piece for elastic connection of the pressure pipe from Ø108 to 114.3 mm external pipe diameter (optional Ø88 to 90 mm).

Pumps:

- Three-phase motor 400 V, 50 Hz; protection class IP 68.
- Blockage-free free-flow impeller, free ball passage at least 40 mm.
- S2-operation
- 10 m Connection cable.

2.3 Type plate

The type plate is attached to the tank and the motor.

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

2.4 Structure of the wastewater lifting station

Connections and components of a wastewater lifting station (exemplary product)

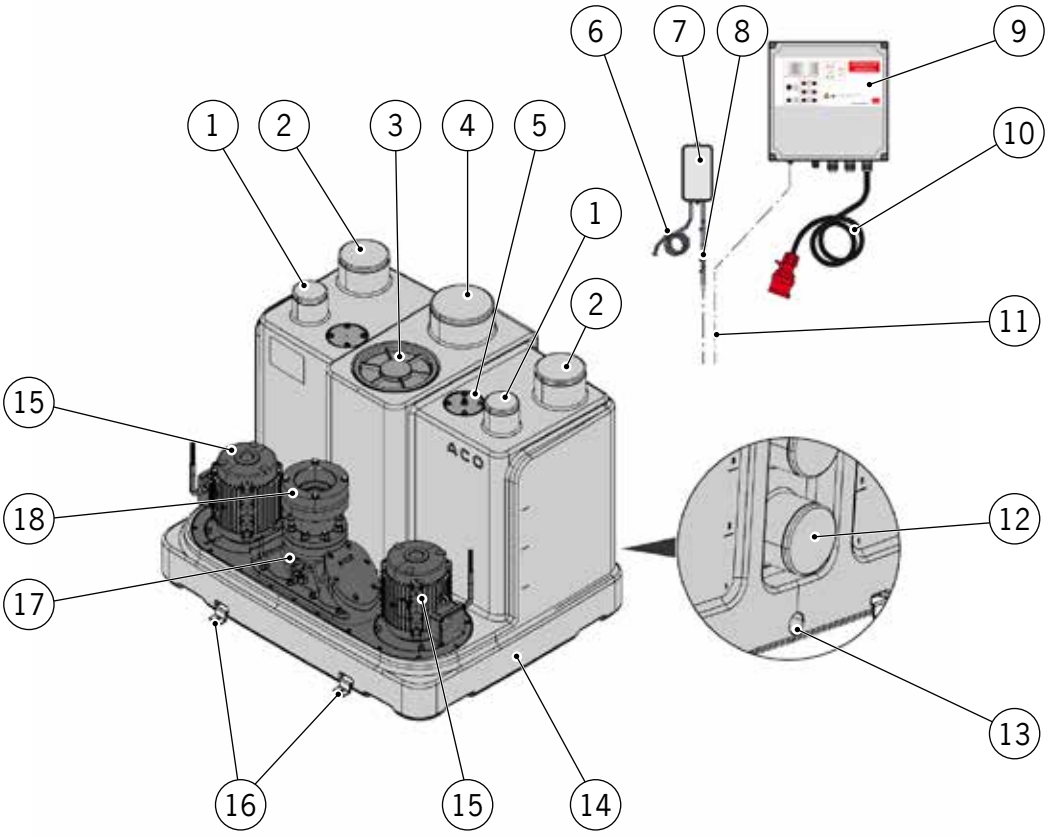


Figure: Muli-Nova 2.x

1 = Connection port DN 100, OD 110 mm
2 = Connection port DN 150, OD 160 mm
3 = Inspection opening
4 = Connection port DN 200, OD 200 mm
5 = Pneumatic level measurement connection, optional air bubble injection
6 = Connection cable for mini compressor
7 = Micro compressor (available separately)
8 = Hose pipe
9 = Pump control -duo (available separately)
10 = Connection cable with CEE plug-in connector
11 = Pneumatic control line
12 = Inlet line connection DN 150, OD 160 mm
13 = Bottom outlet G 1 ½“
14 = Collection tank
15 = Free flow centrifugal pump
16 = Attachment for buoyancy protection
17 = Y-branch pipe with integrated double backflow valve
18 = Special mounting adapter for the flexible connection of the DN 100 discharge line (Ø108 to 114.3 mm), optionally DN 80

2.5 Operating principle

Wastewater (containing or free of faeces) resulting from the connected drainage objects flows through the inlet pipe into the collection tank.

A pneumatic pipe assembled in the collection tank is connected to the membrane pushbuttons in the pump control via a control line. If the water rises, then the air in the pneumatic pipe is compressed. At a defined pressure, the pumps are switched on and off and/or a high water alarm is triggered.

The water level in the collection tank is indicated in the display panel of the pump control unit.

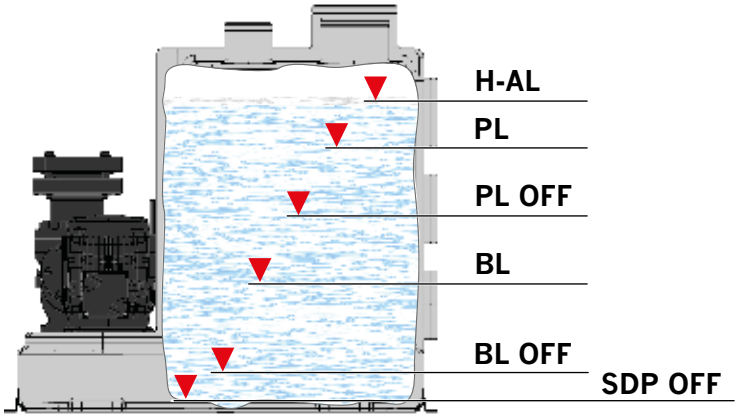


Figure: Water status level

H-AL	=	High water alarm	BL	=	Base load
PL	=	Peak load	BL OFF	=	Base load OFF
PL OFF	=	Peak load OFF	SDP OFF	=	Stop delay period OFF

If the water level reaches the base load level (GL), a pump switches on and pumps the wastewater through the Y-branch pipe into the discharge 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 base load OFF level (GL 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 station is equipped with two pumps:

- With each new start, alternating operation is executed.
- 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 “Commissioning”.

3.1 Installation example (schematic diagram)

The example shows the installation of a wastewater lifting station and may vary depending on the particular installation conditions and the components used.

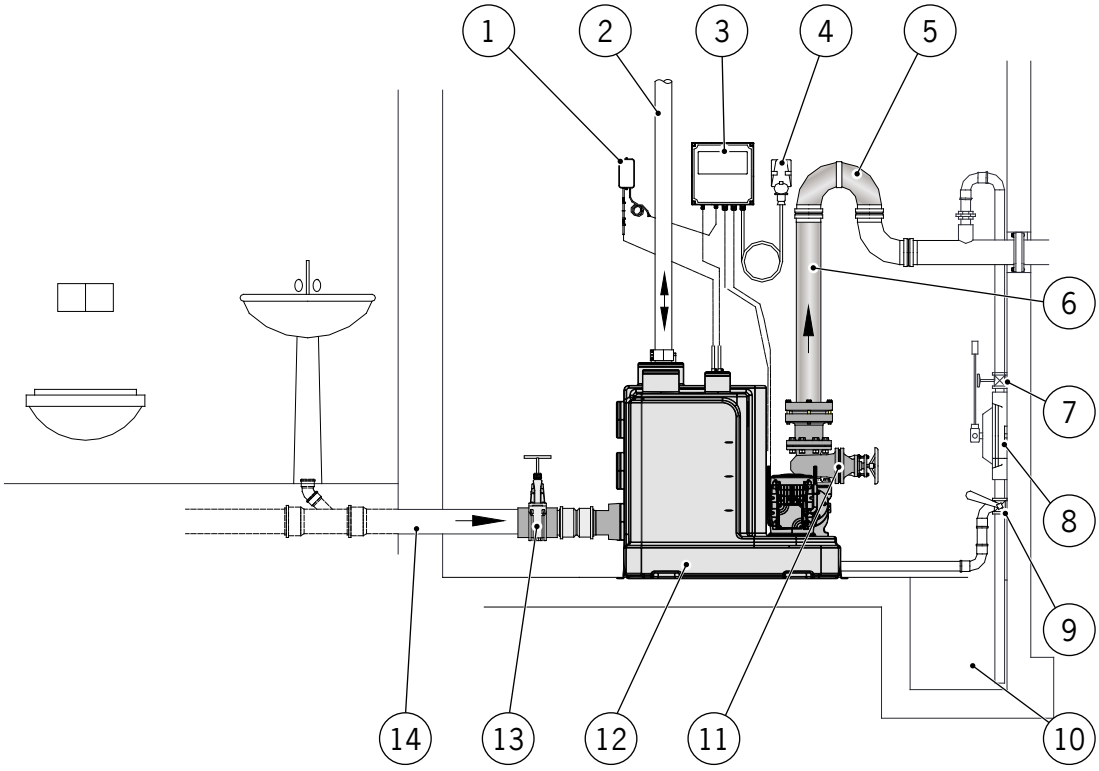


Figure: Wastewater lifting station

1 = Air bubble injection/mini compressor (optional)
2 = Ventilation pipe (on-site)
3 = Pump control unit
4 = CEE plug (on-site)
5 = Backflow loop (on-site)
6 = Discharge line (on-site)
7 = Shut-off valve (optional)
8 = Manual diaphragm pump (optional)
9 = Three-way valve (optional)
10 = Pump sump (on-site)
11 = Stop valve for discharge line (optional)
12 = Collection tank
13 = Stop valve for inlet (optional)
14 = Inlet pipe (on-site)

3.2 Sanitary installation

CAUTION

Flooding and risk of infection in case of improper sanitary installation

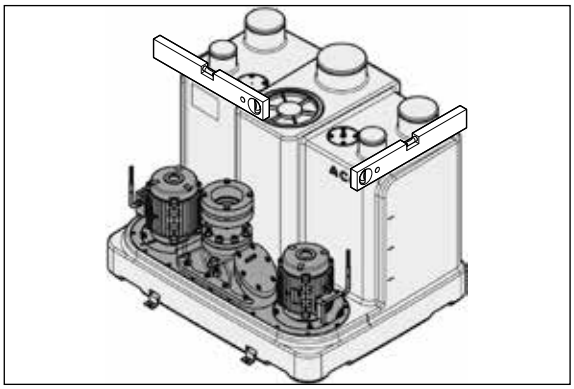
- Work on the sanitary equipment must be carried out by qualified personnel only, Chap. 1.3 “Personnel qualifications”.
- All pipes must be installed so that they can drain automatically.
- Conduits may not be constricted in the flow direction.

3.21 Setting up the wastewater lifting station

Specifications:

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

➔ Align the wastewater lifting station at the installation site using a spirit level.



3.22 Connecting the inlet pipe

Sockets with nominal widths DN 100, 150 and 200, 🕮 Chap. 2.4/part no. 1, 2, 4 + 12, are moulded on the tank. All sockets are closed and must be opened according to the selection for the required connection (there can also be several).

The external diameters are 110 mm, 160 mm and 200 mm.

Requirements.

- Saw
- Keyhole saw
- Drill
- File

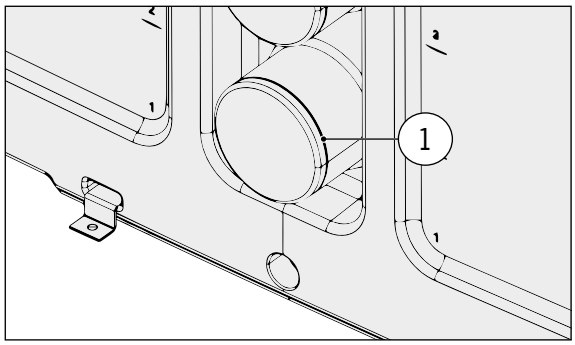
IMPORTANT

- Pipes may not be constricted in the flow direction.
- On the inflow side, a shut-off slide valve is to be arranged, 🕮 Chap. 3.23 “Installing the inlet shut-off valve (optional)”

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.

There are several connections for the inlet line on the tank, 🕮 Chap. 2.4 “Structure of the wastewater lifting station”. Suitable openings can also be drilled into the container wall using a hole saw.

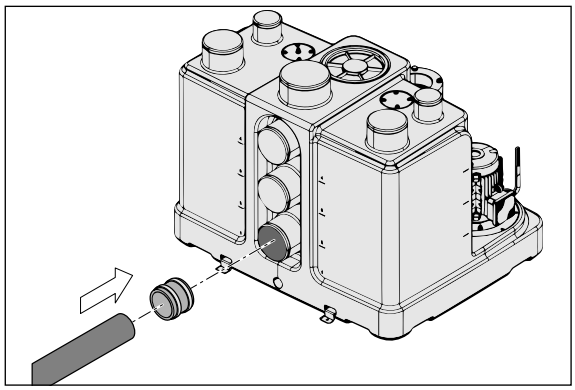
➔ Cut open the closed socket along the notch (1).



Example with hose connector:

➔ Secure the inlet pipe with a hose connector on the connection on the collection tank.

NOTE Alternatively, high temperature push-on sleeves or similar can be used.



Set up inlet at the side of the container wall

Suitable inlet seals can be optionally purchased from ACO.

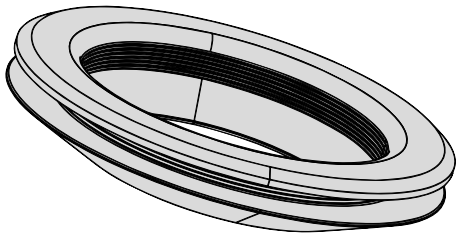
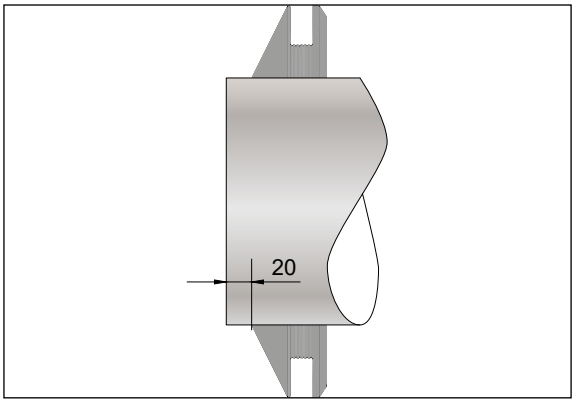


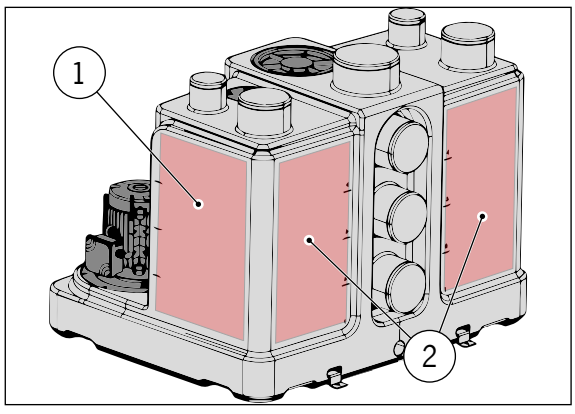
Figure: Inlet seal

Inlet	Pipe OD:	Hole saw Ø +/- 1 mm	Inlet seal Article No.
DN50	50 mm	59 mm	3013641
DN75	75 mm	86 mm	3014479
DN100	110 mm	125 mm	3014478
DN150	160 mm	175 mm	3014477
DN200	200 mm	215 mm	3014476

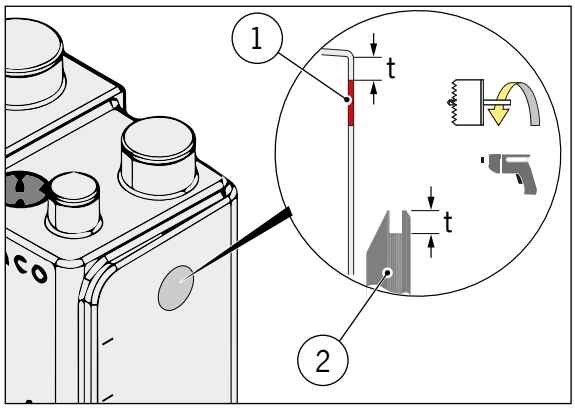
IMPORTANT The spigot end of the connecting pipe should protrude at least 20 mm above the inlet seal after connection.



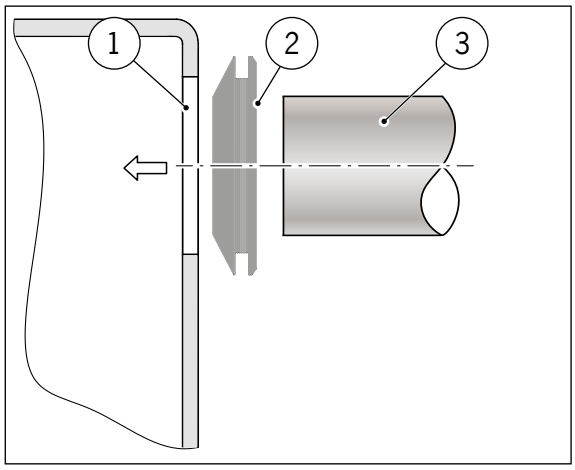
➔ Find a suitable place on the tank. Straight surfaces on the side (1) or rear wall (2) are suitable.



- Drill out the closed tank at the desired point (1) using a hole saw.
- Observe the minimum distance (t) from the edge of the container. Here, t corresponds to the groove depth of the inlet seal (2).
- Deburr the drilled opening.



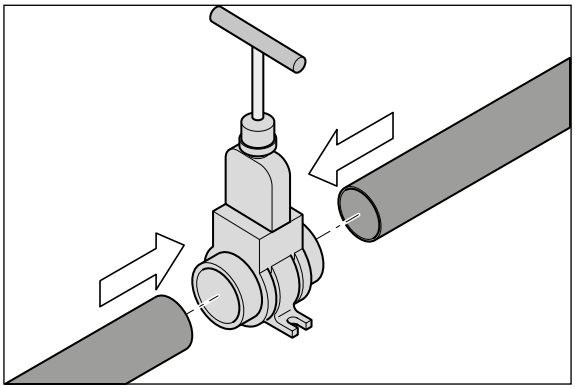
- Insert the inlet seal (2) into the housing opening (1).
- Grease the inside of the inlet line(2) and the spigot of the inlet line (3) with an acid-free lubricant.
- Push the inlet line (3) into the inlet seal (2), ensuring that there is sufficient protrusion.
- Support and secure the pipeline accordingly to prevent unintentional movement.



3.23 Installing the inlet shut-off valve (optional)

IMPORTANT In accordance with the requirements of DIN EN 12056-4, an inlet gate valve must be installed in the inlet line. Such a stop valve in the nominal sizes DN 100, 150 or 200 can be optionally ordered from ACO, “Service” on page 3.

- Grease the spigots of the inlet pipe with an acid-free lubricant.
- 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.



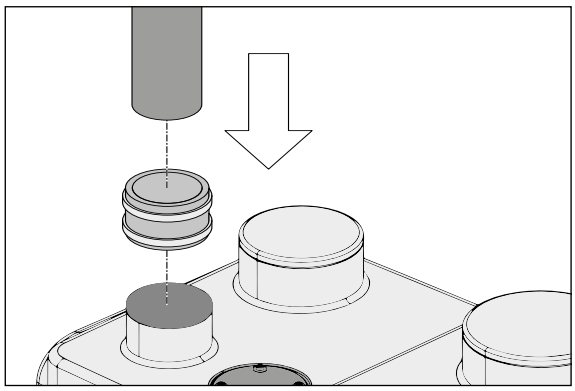
3.24 Connecting the ventilation pipe

Specifications:

- Route the ventilation pipe with a constant cross-section continuously upwards to above the roof of the building. The vent stack may be inserted into both the main and secondary ventilation.
- The ventilation pipe must not be connected to the vent stack on the inlet side of a grease separator.

➔ Secure the ventilation pipe e.g. with a hose connector on the connection on the collection tank.

NOTE Alternatively, high temperature push-on sleeves or similar can be used.



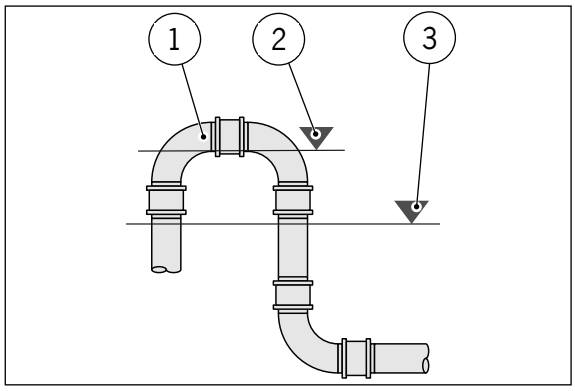
3.25 Creating the backflow loop in the discharge line

The wastewater lifting station must have a backflow drain. The backflow loop must be established above the backflow level. The installation example shows the basic version, Chap. 3.1 “Installation example (schematic diagram)”.

Definition of terms in accordance with EN 12056-4:

- “Back flow”: Wastewater return pressure from the sewer into the connected pipes.
- “Back flow level“: The highest level to which water can rise within a drainage system.
- “Back flow loop“: Part of the discharge line of a wastewater lifting station above backflow level.

➔ Install the backflow loop (1) with the pipe bottom (2) above the “backflow level” (3).



3.26 Connecting the discharge line

The special fixing piece, 🕮 Chap. 2.4/Component No. 18; Assembly 🕮 Chap. 3.27 “Installing the stop valve and special fixing piece”, enables the elastic connection of the on-site discharge line DN 100 (pipe tip Ø108 – 114 mm).

Requirements:

- Open-end spanner SW 19
- Torque wrench SW 19

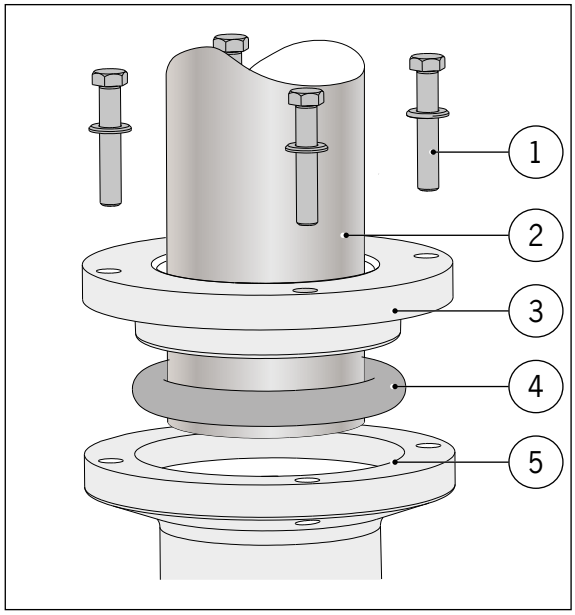
IMPORTANT Always comply with and/or observe the following to prevent damage to property and functional failures:

- Discharge lines must always be connected to a ventilated pipe system or collection pipes. The connections must be executed like connections for pressure-free pipes.
- The discharge line must withstand at least 1.5 times the max. pump pressure.
- The discharge line must be installed so that it is rising continually.
- The flow velocity in the discharge line must not fall below 0.7 m/s and must not exceed 2.3 m/s.
- Never connect other pipes to the discharge line.
- Never connect discharge lines from lifting stations to wastewater downpipes.
- Never connect ventilation valves in the discharge line.

In the as-delivered condition, the sealing ring (4) plus flange ring (3) is placed on the special fastening piece (5) and the screws (1) are screwed into the threaded hole of the flange ring (3).

➔ Insert the pipe (2) through the flange ring (3) and the sealing ring (4) and push it approx. 50 mm into the special fixing piece (5).

➔ Tighten the M12 screws (1) evenly crosswise (max. 15 Nm).



Utilising another sealing ring (4), 🕮 Chap. 2.4, enables the connection for a DN 80 discharge line (pipe tip Ø88 – 90 mm).

3.27 Installing the stop valve and special fixing piece

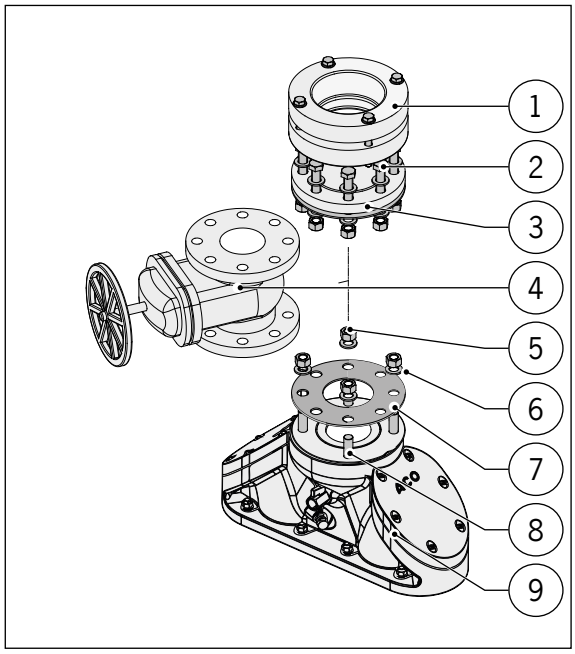
Requirements:

- Open-end spanner SW 19 and 24, torque spanner SW 19 and 24, insert chuck, pipe wrench
- Gate valve (optional)

IMPORTANT

- Only use the seals supplied.
- In accordance with the requirements of DIN EN 12056-4, a shut-off valve must be installed in the discharge line downstream of the non-return valve.

A stop valve in nominal width DN 80 can be obtained from ACO as an accessory,
📖 Product catalogue, www.aco-haustechnik.de. The special fixing piece is delivered as loose.



- Screw in M16 stud bolts (8) with lathe chuck into the threaded holes of the connection flange/double backflow preventer (9) (max. 10 Nm).
- Position the flat seals (7) on the connection flanges of the double backflow preventer.
- Guide the stop valve (4) with the flange holes over the stud bolts.
- Guide the washers (6) over the stud bolts.
- Screw the nuts M16 (5) onto the stud bolts and tighten equally crosswise (max. 10 Nm).
- Position the flat seals (3) on the connection flanges of the stop valve.
- Arrange the special fixing piece (1) with the flange drill holes congruently over the drill holes of the stop valve.
- Create flange connections with the fixing material (2 bolts M16/washers/nuts) and then tighten equally crosswise (maximum 10 Nm).

3.28 Securing the wastewater lifting station

Anchor the aligned tank 🕮 Chap. 3.21 “Setting up the wastewater lifting station” at 4 points in the soil using the supplied attachment set.

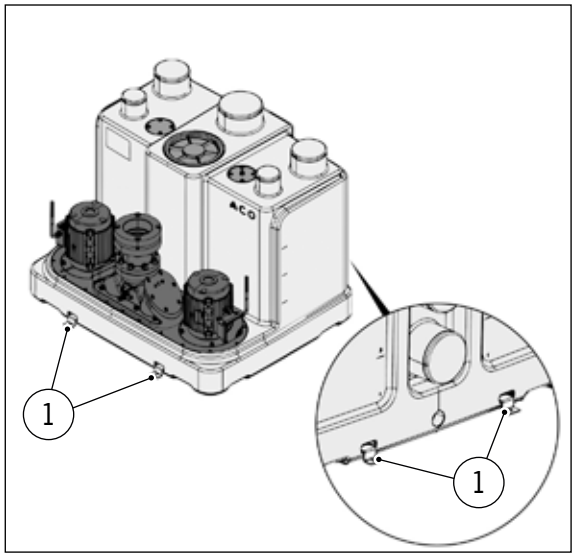
IMPORTANT Always comply with and/or observe the following to prevent damage to property and functional failures:

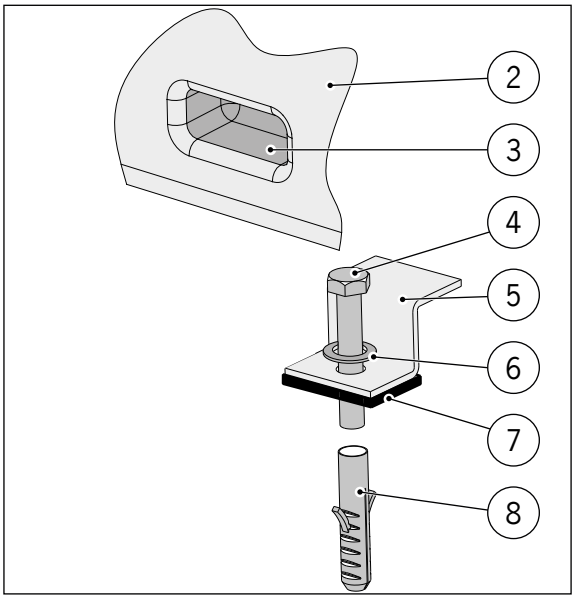
- Wastewater stations must be installed in a way that ensures no twisting.
- Stations at risk of buoyancy must be fixed to prevent buoyancy.

Requirements:

- Marking aid (e.g. pencil)
- Percussion drill and masonry drill bit Ø12 mm.
- Vacuum cleaner.

→ Locate 4 fastening points (1).
→ Place the angle bracket (5) in the designated recess (3) of the collection tank (2) and mark the drill hole on the floor.
→ Remove the angle (5) from the trough (3).
→ Drill a hole Ø12 mm, 60 mm deep.
→ Suction out the borehole.
→ Insert 12 W dowel (8) into the drill hole.
→ Place a rubber mat (7) between the angle (5) and ground for noise insulation.
→ Insert the angle (5) into the trough (3).
→ Push the washers (6) over the wooden screws
10 x 60 (4) and through the hole in the angle and then twist into the dowel (8).
→ Tighten the screws 10 x 60 (4) (10 Nm).





3.29 Connecting the drainage line on the drain plug (optional)

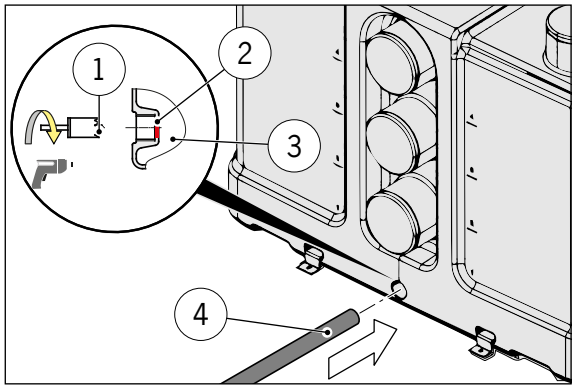
A threaded collar G 1 ½“ (2) on the collection tank, 🕮 Chap. 2.4/ Component No. 13, can be used to connect a drainage pipe.

Requirement:

- Drilling machine with tool hole saw Ø29 mm

➔ Drill open the closed collar base (3) with hole saw (1, max. Ø 29 mm).

➔ Screw the drain line (4) into connection G 1 ½“ (2).



3.210 Connecting the control pipe to the level switching

The pitot tube for pneumatic level measurement is already installed in the tank on delivery. It can be mounted on the right or left-hand side if required by the customer.

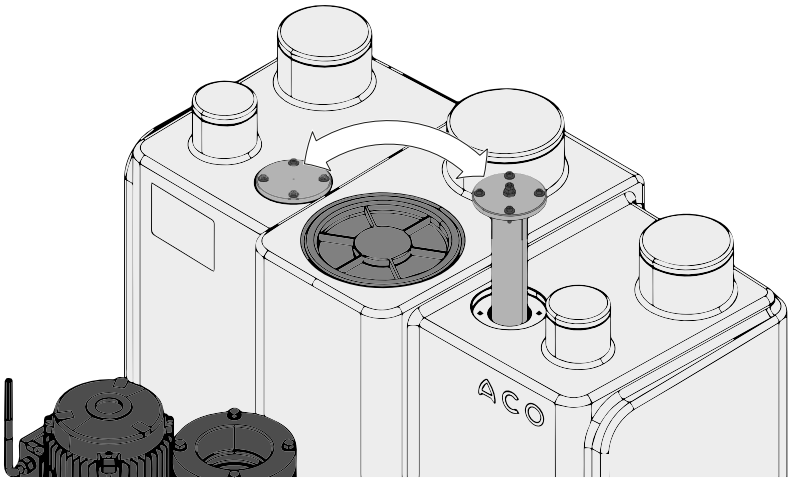
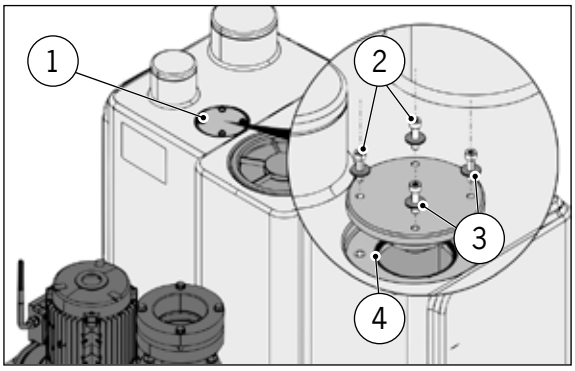
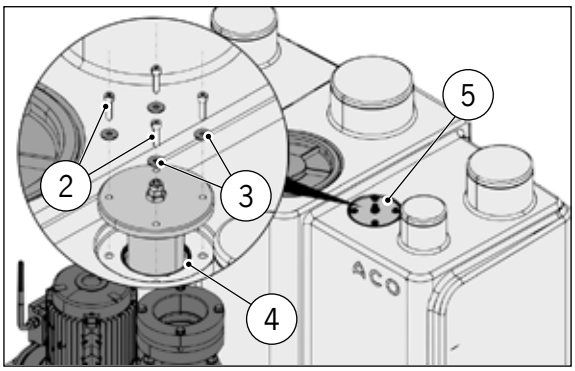


Figure: Components for pitot tube

Moving the pitot tube

- Unscrew the blank flange (1): Unscrew the 4 screws (2) using an Allen key. Remove the washers (3) and blank flange (1) and store them to the side. Make sure that the O-ring (4) is not lost.
- Unscrew the pitot tube (5): Unscrew the 4 screws (2) using an Allen key. Remove the washers (3) and pull the pitot tube (5) out of the opening. Make sure that the O-ring (4) does not slip or get lost.
- Insert the pitot tube (5) into the previously opened connection, ensure that the O-ring (4) is seated correctly and tighten with 4 screws (2) and washers (3).
- Insert the blank flange (1) into the second opening, ensure that the O-ring (4) is seated correctly and tighten with 4 screws (2) and washers (3).





Shortening the control cable

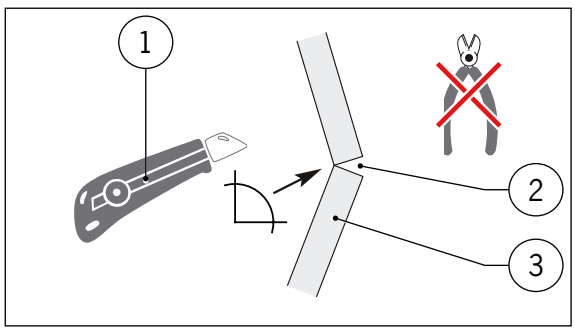
If required, the length of the control line can be adjusted.

Requirements:

- Cutter blade

IMPORTANT Malfunction possible when the length adjustment of the control pipe is not executed professionally.

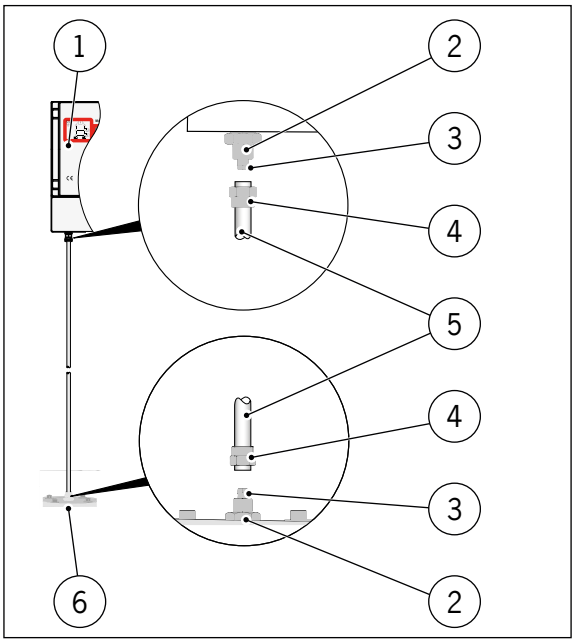
- Cut the control pipe (3) open using a cutter blade (1) at right angles (2)



Connecting the control line

IMPORTANT To prevent function malfunctions: Always lay the control cable to the pump control as rising upwards and frost-resistant.

- 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 by hand.
- Connect the control line (5) to the connection flange (6) of the level switching in the same way.



3.211 Connecting the air bubble injection (optional)

Mounting the mini compressor onto a wall

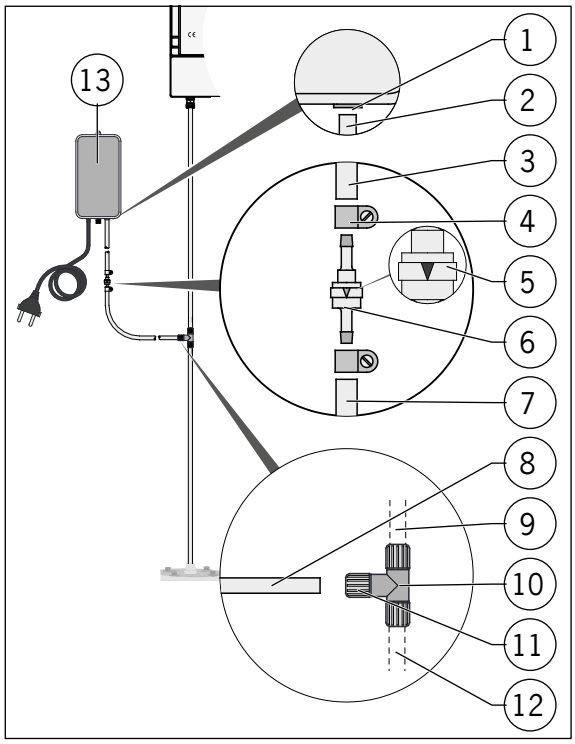
The mini compressor has a 1.5 m long connection cable with Schuko earthed safety plug.

Requirement:
Flood-proof and free wall surface 100 mm x 200 mm (width x height) near the control unit.

Connecting the control line

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

- Cut the control pipe (12).
- Push the hose ends (8, 9 + 12) into the retainers of the screw-in T-fitting (10) and clamp (tighten by hand) 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).



3.3 Electrical installation

WARNING

Electric shock risk due to improper electrical installation

- The pump control unit must not be connected to the power supply until after the sanitary installation and electrical installation have been completed.
- According to DIN EN 12056, electrical connections may only be executed by qualified electricians.
- Carry out electrical connections in accordance with the circuit diagram, Chap. 6.2 “Pump control duo”.

3.31 Connecting the pump control duo

NOTE The pump control unit is not included in the scope of delivery of the wastewater lifting station and must be ordered separately from ACO.

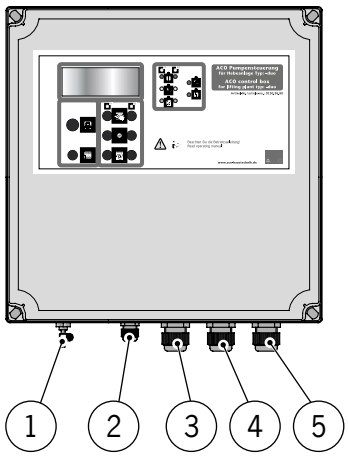


Figure: Connections for pump control duo

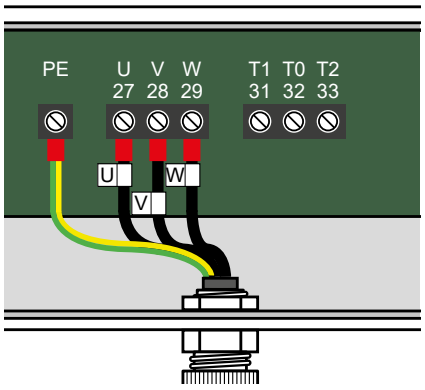
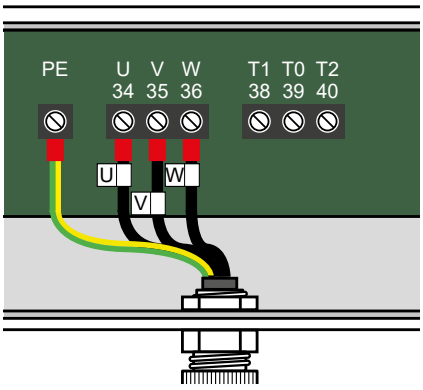
1 = Connection control line level switching
2 = Connection power supply mini compressor
3 = Pump 1 power supply connection
4 = Pump 2 power supply connection
5 = Connection power supply pump control

3.32 Connecting the pump connection cable

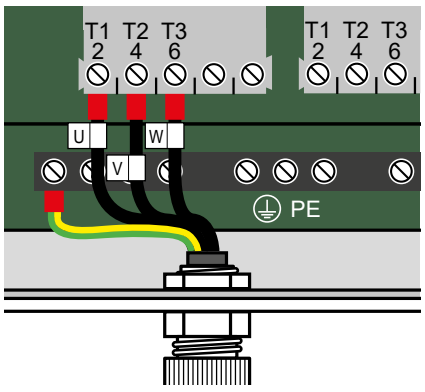
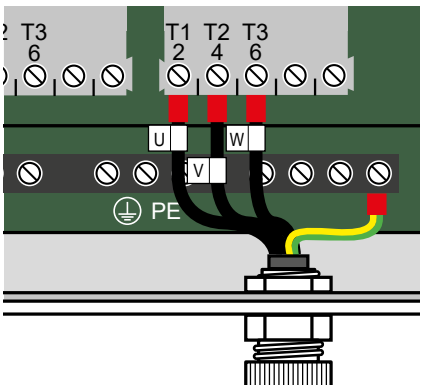
IMPORTANT

- Utilise a suitable material for the connection of cable extensions (e.g. cast resin or gel collars).
- Cable extension for pumps (standard length 10 m):
  - Always calculate the required cable cross-section based on the current consumption, Chap. 6.11 “Key data”.
- The connection of the connecting cables on the circuit board must be made as follows:

MultiControl duo

Pump 1	Pump 2
	

MultiControl Professional duo

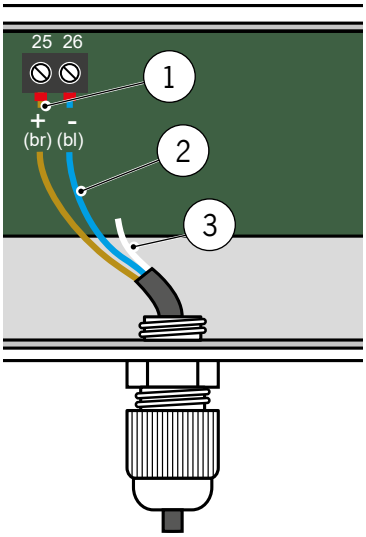
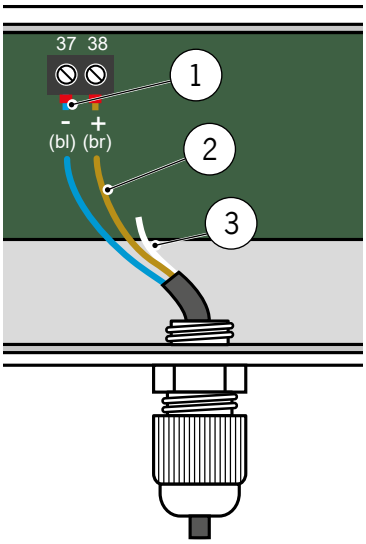
Pump 1	Pump 2
	

The L1 L2 L3 connections of the pumps are connected directly to the motor contactors. The protective conductor of the pumps is connected to the PE terminal strip.

3.33 Connect the connection cable of the pressure transducer (optional)

Only applies to version with pressure transducer. In this case, the pressure transducer replaces the pitot tube measurement.

IMPORTANT The connection cable must be connected to the circuit board as follows (+ and – must not be reversed):

MultiControl duo	MultiControl Professional duo
	
The wire with brown insulation (1) must be connected to terminal 25 and the wire with blue insulation (2) to terminal 26.	Wire with blue insulation (1) is to be connected to terminal 37 and wire with brown insulation (2) to terminal 38.

➔ Connect the pressure transducer connection cable to the control unit.

➔ Adjust the length of the connecting cable or hang in loops and attach.
IMPORTANT White capillary tube (3) is routed with the wires in the connection cable and must not be crushed when shortening (clear cross-section must remain free). Capillary tube (3) is not connected, but remains hanging freely.

- Shortening the connection cable of the pressure transducer: Always ensure to seal the air hose with the Teflon filter part again, otherwise condensation water can flow into the electronics.
- Cable extension of the pressure sensor:
  - Always calculate the required cable cross-section.
  - Connection cable for the supplied pressure transducer: 3 x 0.2 mm² (3 x 26 AWG) plus pressure compensation hose with Teflon filter. The pressure compensation hose must not be sealed in a gel collar or cast resin collar. A suitable cable junction box with membrane must be used.

3.34 Connecting the fault signalling equipment

If fault signalling equipment is prescribed, then it must be installed in accordance with DIN EN 12056-4 in such a way that a malfunction of the wastewater lifting station for every connected multi-dwelling unit will be signalled accordingly.

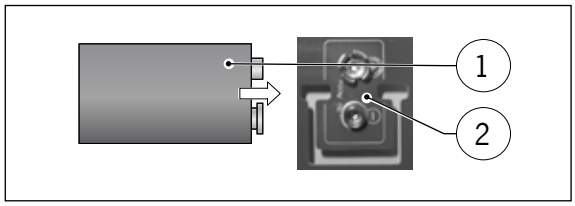
A cable (2-wire/0.75 mm²) must be connected in the pump control to forward the isolated contact as a group alarm Chap. 6.2 “Pump control duo”. A cost-effective continuous light can be used instead of a flashing light.

3.35 Insert the battery into the pump control unit (if available)

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

IMPORTANT Damage to the control unit: Only use original ACO rechargeable batteries for the relevant type of control unit, Chap. 6.2 “Pump control duo”.

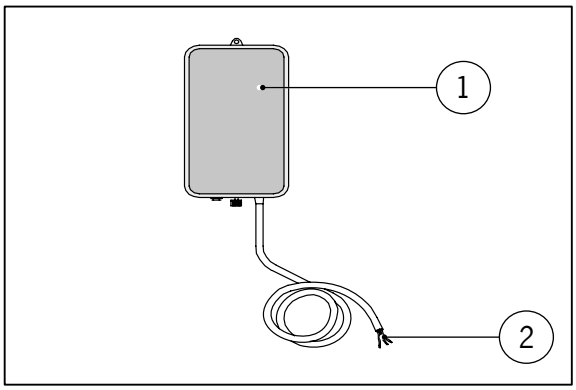
- Unscrew the cover of the pump control.
- Insert the accumulator (1) at point (2) on the circuit board.

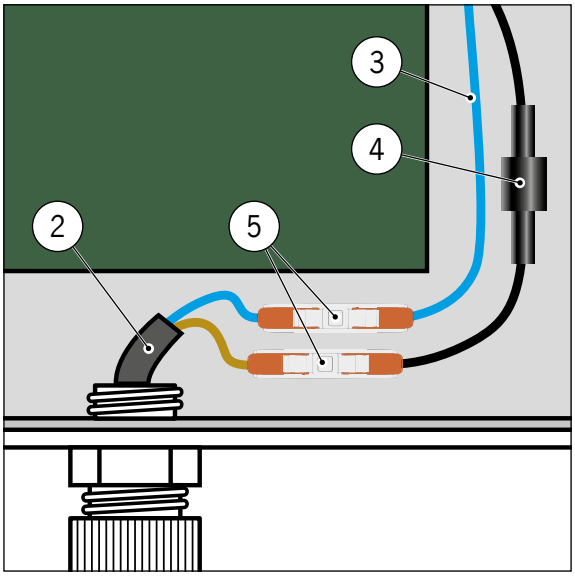


3.36 Connecting the mini compressor (optional) onto the pump control

The electrical cable with safety plug is already connected to the mini compressor (1) on delivery. The electric cable must still be connected to the pump control unit.

- Disconnect the safety plug of the mini compressor (1), strip the cable ends (2) and fit wire end ferrules.
- Unscrew the cover of the pump control.
- Terminals (5) for air bubble injection are loosely installed in the pump controls.
- Connect the cable ends (2) to N (3) and L (4). L is protected with a 1 A screw fuse.
- Screw on the pump control cover.





3.37 Connecting the pump control to the power supply

Note when executing the electrical installation:

- Observe connected loads, 📖 Chap. 6.11 “Key data”.
- Install the CEE plug socket.
- Adjust the length of the electric cables or hang in sufficiently large loops and attach.

4 Commissioning

A qualified person must execute the commissioning according to DIN EN 12056-4.
Commissioning must be documented, 🕮 “Appendix: Commissioning report”.

IMPORTANT Before commissioning for the first time, the pump control unit must be programmed, 🕮 Chap. 4.3 “Commissioning settings”.

4.1 MultiControl Duo control

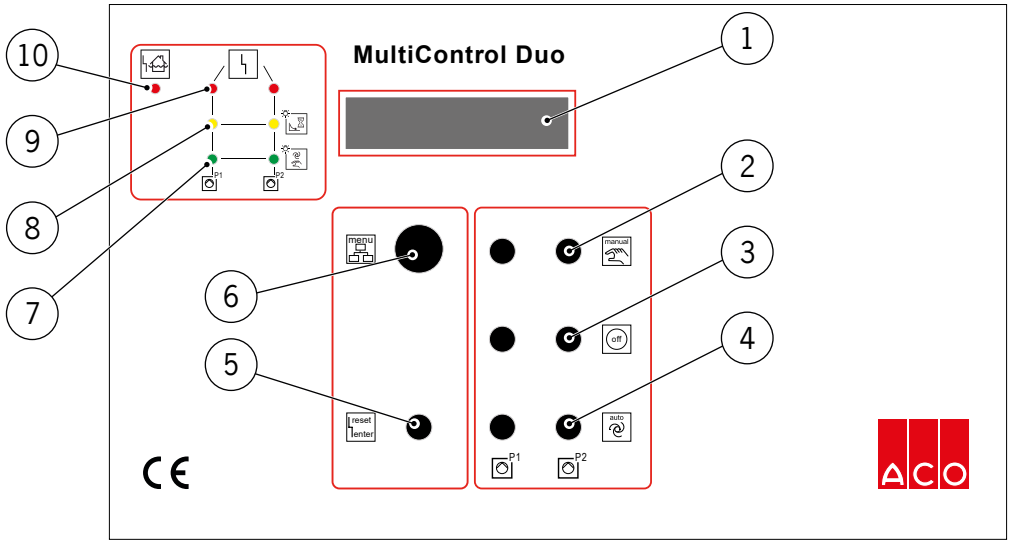


Figure: MultiControl duo control panel

1 = Display panel
2 = Button: Manual mode ON P1 and/or P2
3 = Button: Operation OFF P1 and/or P2
4 = Button: Automatic mode ON P1 and/or P2
5 = Button: Acknowledgement of the malfunction/value settings
6 = Rotary knob: Select menu items
7 = LED: Automatic/manual operation P1 or P2
8 = LED: Operation P1 or P2
9 = LED: malfunction
10 = LED: High water alarm

4.11 Operating elements and displays

LED displays / symbols and meanings		
	Red LED lights up:	High water alarm in the collection tank
	Red LED lights up:	Group alarm, e.g. when the power consumption is too high, ...
	Yellow LED lights up: Yellow LED flashes:	Pump(s) in operation Pump(s) in operation via the stop delay function
	Green LED lights up: Green LED flashes regularly: Green LED flashes irregularly:	Automatic mode is active Manual operation is active Manual operation was deactivated after 2 minutes
	Activate the rotary switch “Menu” to select menu items	
	Confirm setting (Menu): Briefly press the "reset/enter" key Acknowledge malfunction: Press and hold the "reset/enter" key for approx. 2 seconds.	
	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	

4.12 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.

Changing the settings

➔ Select menu items (upper line): Press the rotary switch "Display".

➔ Amend settings (bottom line):

- Press the reset/enter "reset/enter" button briefly. The most recently saved setting begins to flash.
- Turn the menu "Menu" rotary switch (turn fast for a general setting, turn slowly for fine setting).

➔ Confirm setting: Briefly press the reset/enter "reset/enter" 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	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 change takes place. After three changes without interruption the "High water 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.

Menu items (top line)	Settings (bottom line)	Explanation
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 only enabled again after pressing the "reset/ enter" button.
Max. current – 2	0.3 – 12.0 A	Pump P1 is deactivated automatically if the power consumption is exceeded. The message 'excess current' appears in the display field. The pump is only enabled again after pressing the "reset/ enter" button.
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 change 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: In the event of incorrect phase sequence or the lack of L2 or L3, a group alarm is triggered and the pumps cannot be started up.
ATEX mode	deactivated activated	Activated: If the level sensing does not determine any liquid, the pumps cannot be started. This applies to the manual function, and to 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 dynamic pressure (pitot tube) 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.

4.13 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 cycles 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.

4.2 MultiControl Professional duo control

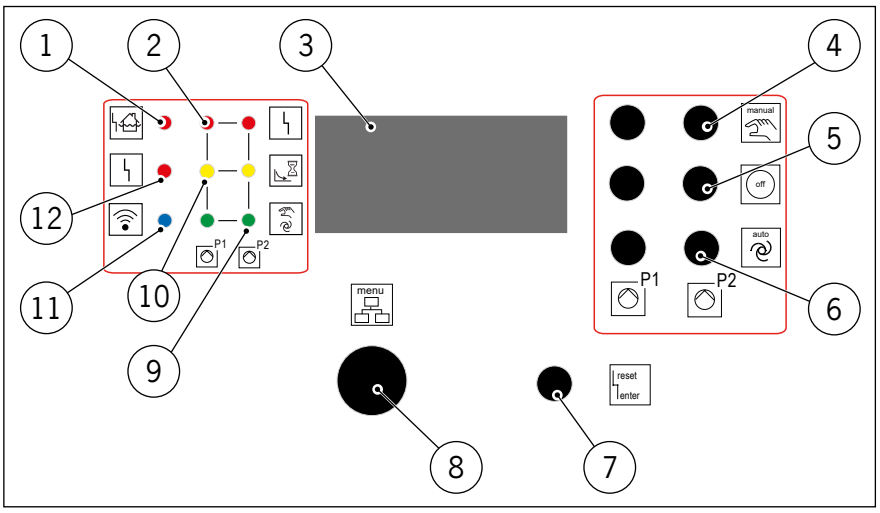


Figure: MultiControl Professional duo

1 = Red LED: “High water alarm”
2 = Red LED: malfunction P1 or P2
3 = Display panel
4 = Button: Manual mode ON P1 and/or P2
5 = Button: Operation OFF P1 and/or P2
6 = Button: Automatic mode ON P1 and/or P2
7 = Button: Acknowledgement of the malfunction/value settings
8 = Rotary knob: Select menu items
9 = Green LED: Automatic/manual operation P1 or P2
10 = Yellow LED: Operation P1 or P2
11 = Blue LED: GSM status
12 = Red LED: General malfunction

4.21 Operating elements and displays

LED displays / symbols and meanings		
	LED lights up:	High water alarm in the collection tank
	LED lights up:	Group alarm, e.g. when the power consumption is too high, ...
	LED lights up: LED flashes:	Pump(s) in operation Pump(s) in operation via the stop delay function
	LED lights up: LED flashes regularly: LED flashes irregularly:	Automatic mode is active Manual operation is active Manual operation was deactivated after 2 minutes
	LED lights up:	Only functions in conjunction with GSM modem
menu	Activate the rotary switch “Menu” to select menu items	
reset enter	Confirm setting (Menu): Briefly press the "reset/enter" key Acknowledge malfunction: Press and hold the "reset/enter" key for approx. 2 seconds.	

LED displays / symbols and meanings	
	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

4.22 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.

Changing the settings

- ➔ Select menu items (upper line): Press the rotary switch "Display".
- ➔ Amend settings (bottom line):
  - Press the  "reset/enter" button briefly. The most recently saved setting begins to flash.
  - Turn the  "Menu" rotary switch (turn fast for a general setting, turn slowly for fine setting).
- ➔ Confirm setting: Briefly press the  "reset/enter" 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	0 – 200 cm	High water 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.

Menu items (top line)	Settings (bottom line)	Explanation
Run time altern.	deactivated 1 – 60 minutes	After the set time in base load operation a pump change takes place. After three changes without interruption the “High water 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 only enabled again after pressing the "reset/ enter" button.
Max. current – 2	0.3 – 12.0 A	Pump P1 is deactivated automatically if the power consumption is exceeded. The message ‘excess current’ appears in the display field. The pump is only enabled again after pressing the "reset/ enter" button.
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 change 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: In the event of incorrect phase sequence or the lack of L2 or L3, a group alarm is triggered and the pumps cannot be started up.
ATEX mode	deactivated activated	Activated: If the level sensing does not determine any liquid, the pumps cannot be started. This applies to the manual function, and to 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 dynamic pressure (pitot tube) and air bubble injection Float switch: Level detection via float switch 4 - 20 mA interface: Level detection via external sensor (4 - 20 mA)

Menu items (top line)	Settings (bottom line)	Explanation
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.

4.23 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 cycles 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.

4.3 Commissioning settings

The pump control is not initialised when delivered. To ensure smooth operation, the pump control unit must be set up with the settings in the following tables during initial commissioning.

- The values for base load, peak load and flood alarm (part 1) depend on the height of the inflow.
- If the inlet is set up via a fixed inlet connection, the values Chap. 4.31 “Setting values for fixed inlets (part 1)” must be selected accordingly.
- If the inlet is routed via a hole in the tank wall (Chap. 3.22 “Connecting the inlet pipe”), the values must be selected according to Chap. 4.32 “Setting values for flexible inlets (part 1)”.
- The settings are completed with the remaining values in Chap. 4.33 “Further basic settings (part 2)”.
- The setting values must be checked with several test runs Chap. 4.4 “Execute trial run” and adjusted if necessary.

4.31 Setting values for fixed inlets (part 1)

- The values for Z2 (Muli-Nova 1.x) or Z3 (Muli-Nova 2.x) apply for vertical inlets.
- If several inlets are installed, the lowest inlet counts.

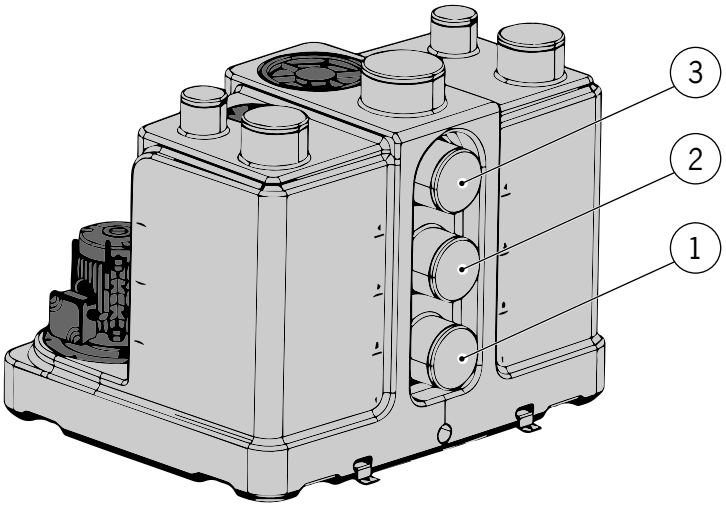


Figure: Inlet level with Muli-Nova DDP 2.x

1 = Inlet Z1
2 = Inlet Z2
3 = Inlet Z3

Menu items	Unit	Setting values Commissioning					Adjustments Inlet
		Muli-Nova 1.x		Muli-Nova 2.x			
		Z1 (1)	Z2 (2)	Z1 (1)	Z2 (2)	Z3 (3)	
Base load ON	cm	5	32	10	30	50	
Base load OFF	cm	2	2	2	2	2	
Peak load ON	cm	9	41	19	39	59	
Peak load OFF	cm	7	34	12	32	52	
High water	cm	11	44	22	42	62	

4.32 Setting values for flexible inlets (part 1)

The switching values of the pumps at base load, peak load and flood alarm depend on the zone in which the lowest inlet was installed. Zones (1) to (4) are labelled on the tank with line markings (5). For exact dimensions see Chap. 6.14 “Scale drawing”.

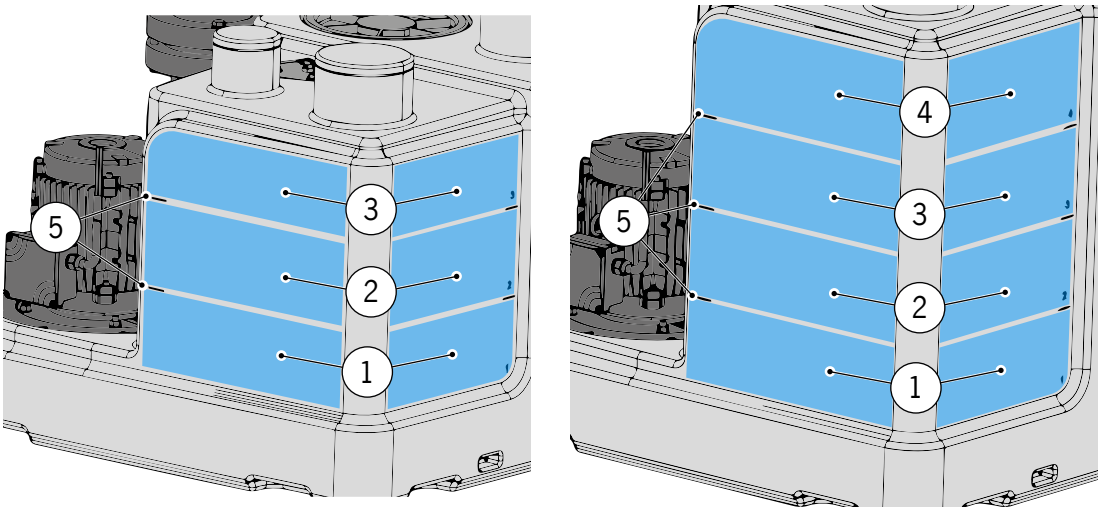


Figure: Inlet zones for Muli-Nova 1.x and Muli-Nova 2.x

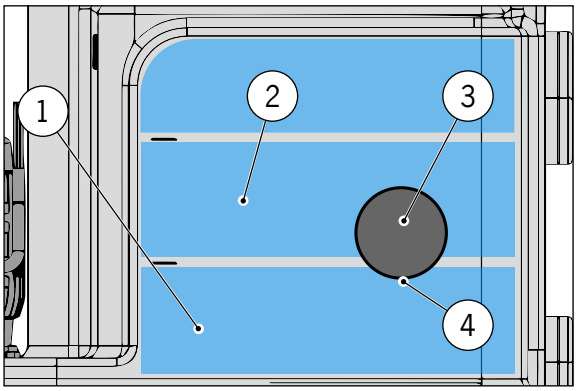
1 = Inlet zone 1
2 = Inlet zone 2
3 = Inlet zone 3
4 = Inlet zone 4 (Muli-Nova 2.x only)
5 = Zone markings

Menu items	Unit	Setting values Commissioning Muli-Nova 1.x Zone 1	Zone 2	Zone 3	Muli-Nova 2.x Zone 1	Zone 2	Zone 3	Zone 4	Adjust-ments Inlet
Base load ON	cm	10	25	40	10	25	40	55	
Base load OFF	cm	2	2	2	2	2	2	2	
Peak load ON	cm	13	27	42	13	27	42	57	
Peak load OFF	cm	11	25	40	11	25	40	55	
High water	cm	15	29	44	15	29	44	59	

- If the flexible inlet (3) covers two inlet zones (1) and (2), the setting values of the lower zone must be selected.

→ Determine in which zone (1) the pipe bottom (4) of the lowest inlet (3) is located.

→ Enter the values of the calculated zone (1) in the pump control. For exact dimensions see Chap. 6.14 “Scale drawing”.



4.33 Further basic settings (part 2)

Once the switching values for the pumps have been set according to the inlet, the remaining settings in the pump control unit must be made according to the following table.

Menu items	Unit	Setting values	Adjustments
Run time altern.	Minimum	5	
Max run time	Minimum	0	
Delay	s	0	
Stop delay	s	4	
Max. current – 1 and Max. current – 2	A	■ 3.7 A (Muli-Nova DDP x.1) ■ 6.6 A (Muli-Nova DDP x.2) ■ 11.2 A (Muli-Nova DDP x.3)	
Test Pump run 24h	s	5	
Acoustic alarm	–	activated	
Interm. alarm	–	deactivated	
Pump changeover	–	activated	

Menu items	Unit	Setting values	Adjustments
Thermal overload P1 malfunction 1	–	deactivated	
Thermal overload P2 malfunction 1	–	deactivated	
rot. field error	–	activated	
ATEX mode	–	deactivated	
Service mode	–	deactivated	
Level control	–	■ Internal transducer (only for version with pitot tube and optional air bubble injection) ■ 4 – 20 mA Interface (only for versions with pressure transducer)	
20 mA => level	0 – 1,000 cm	200 (only for versions with pressure transducer)	
Language	German, English...	German	

IMPORTANT After completing the settings, several test runs must be carried out to check the switching values and adjust them if necessary. Ideally, the pump should start before the water reaches the bottom of the pipe at the lowest inlet and flows back.

4.4 Execute trial run

Requirements:

- The shut-off valve in the discharge line is open.
- The pump control is connected to the power supply.
- The setting values of the pump control were set according to the inlet level.

During the trial run, pay attention to the following:

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

IMPORTANT If knocking noises/vibrations occur in the pressure line when the pump is switched off, the stop delay period must be increased.

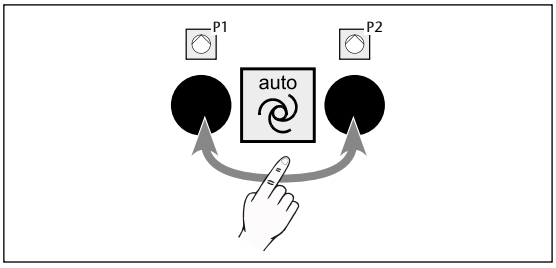
Water level for level “After-running period OFF” (check through inspection opening):

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

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

Starting automatic mode:

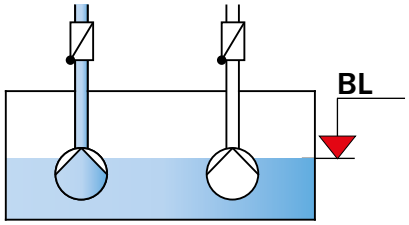
➔ Press both buttons to start automatic operation of Pumps 1 and 2.



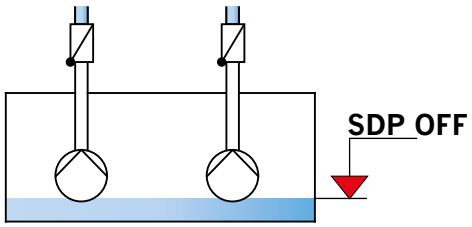
➔ Fill the collection tank.

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

➔ Interrupt the inlet.



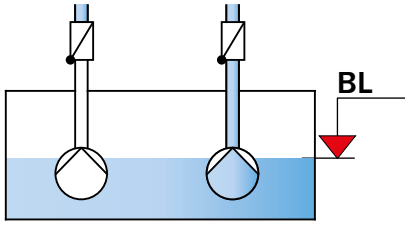
When the water reaches the “Base load OFF” level, the water level is reduced by the stop delay period to the level “Stop delay period OFF” (SDP OFF) pump. Then the pump 1 switches off.



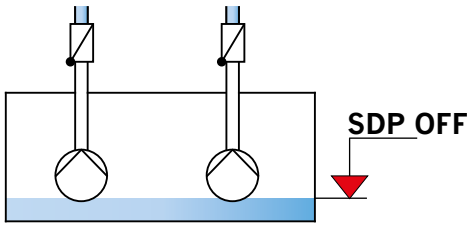
➔ Fill the collection tank.

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

➔ Interrupt the inlet.



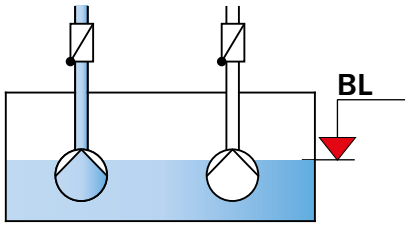
When the water level reaches the “Base load OFF” (GL) level, pump 2 switches off after the “after-running period”.



➔ Fill the collection tank.

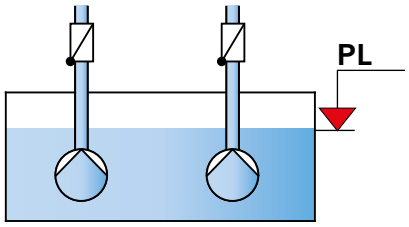
When the water level reaches the “Base load” (BL) level, Pump 1 switches on.

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

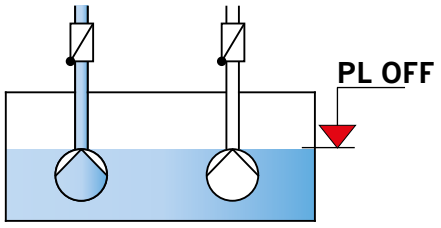


When the water level reaches the “Peak load” (SL) level, both pumps switch on.

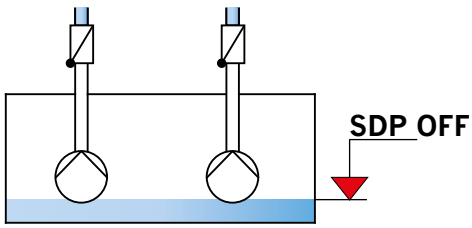
➔ Interrupt the inlet.



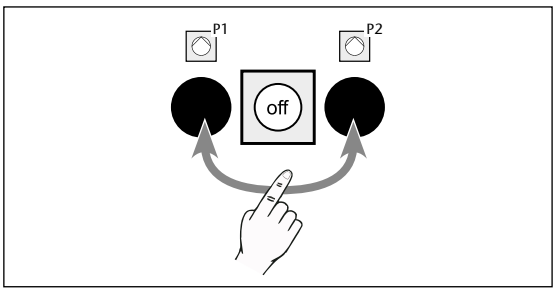
When the water level reaches the “Peak load OFF” (PL OFF) level, pump 2 switches off.



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



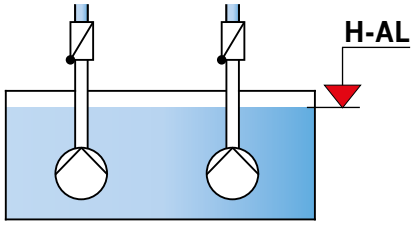
Terminating automatic mode:
Press both buttons in order to end automatic mode of pump 1 and 2.



➔ Fill the collection tank.

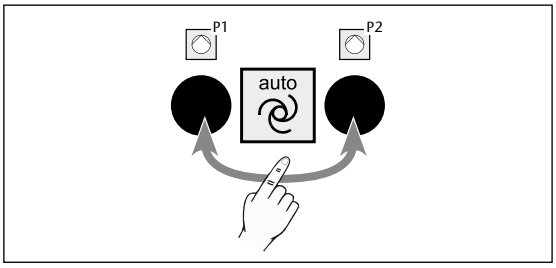
If the water level reaches the “High water alarm” (H-AL) level, an alarm sounds, a fault signal appears in the display panel and the LED for “High water alarm” lights up:





➔ Interrupt the inlet.

Starting automatic mode:
Press both buttons in order to start automatic mode of Pump 1 and 2.

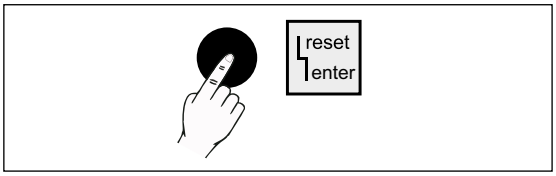


Acknowledging a malfunction:

➔ Press the button to acknowledge the malfunction.

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





The trial run is finished

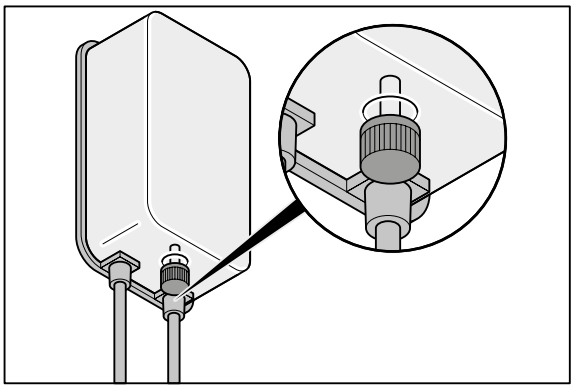
Final work:

- For version with mini compressor (optional): Set air bubble injection 🕮 Chap. 4.5 “Setting the air bubble injection (optional)”
- Document the settings, 🕮 Chap. 4.3 “Commissioning settings”
- Document the commissioning, 🕮 “Appendix: Commissioning report”

4.5 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).



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 facilities may only be carried out by specialised personnel, Chap. 1.3 “Personnel qualifications”.
- Only use original spare parts.
- Have wastewater lifting station 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 protection equipment”.
- Do not carry out work on the connections and pipes unless they are depressurised.

Burns due to hot surfaces

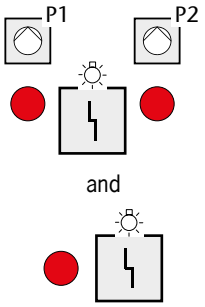
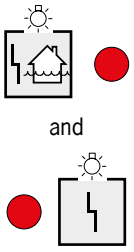
- Allow the pump motors to cool.

Malfunctions on the wastewater lifting station

Malfunction	Cause(s)	Actions
Pump does not deliver or pumps too little or the tank is full	Shut-off valve in the discharge line is not fully open or closed on the intake side	Shut-off valve in the discharge line and/or the intake side is completely open
	Discharge line obstructed	Clean the discharge 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)

Malfunction	Cause(s)	Actions
Pump only runs in manual operation	Control cable of the level switching is leaking, incorrectly laid, kinked or obstructed	Check the control cable
	Pneumatic pipe obstructed	Clean the pneumatic pipe
Knocking noises/ vibrations in the discharge line on switching off the pump(s)	After-running period of the pump(s) is too low	Increase the stop delay of the pump(s)

Malfunction messages on the pump control

Display panel	LED display(s)	Cause(s)	Actions
Maximum current		Exceeding of the maximum current 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)
High water alarm		Shut-off valve in the discharge line is not fully open or is closed on the intake side	Shut-off valve in the discharge 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)
		Discharge line obstructed	Clean the discharge line
		Pump parts are worn	Pump repair required (ACO Service)

6 Technical Data

6.1 Wastewater lifting station

6.11 Key data

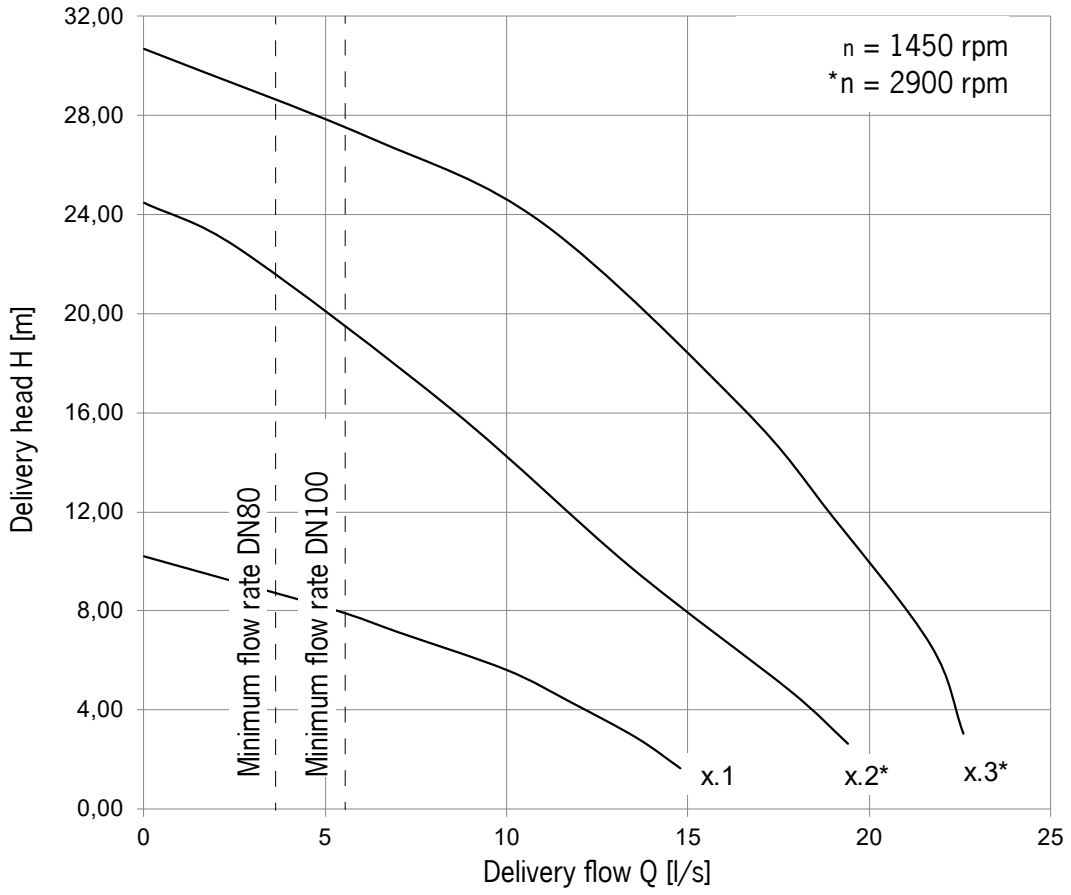
	Motor power		Key data			Granulation size
Type	P1 [kW]	P2 [kW]	Current consumption [A]	Voltage/ frequency [V]/[Hz]	Speed [rpm]	[mm]
Muli-Nova DDP1.1	1.7	1.5	3.7	400/50	1450	40
Muli-Nova DDP1.2	3.5	3.0	6.6		2900	
Muli-Nova DDP1.3	6.3	5.5	11.2		2900	
Muli-Nova DDP2.1	1.7	1.5	3.7		1450	
Muli-Nova DDP2.2	3.5	3.0	6.6		2900	
Muli-Nova DDP2.3	6.3	5.5	11.2		2900	

	Usable volume				Total volume	Empty weight
Type	Inlet height Z1 [l]	Inlet height Z1 [l]	Inlet height Z1 [l]	Inlet from above [l]	[l]	[kg]
Muli-Nova DDP1.1	100	275	–	345	430	105
Muli-Nova DDP1.2						115
Muli-Nova DDP1.3						130
Muli-Nova DDP2.1	120	260	400	455	550	110
Muli-Nova DDP2.2						120
Muli-Nova DDP2.3						135

6.12 Performance data

Type	De-livery head [m]	Delivery flow Q [l/s] with total delivery head H [m]													
		4	6	8	10	12	14	16	18	20	22	24	26	28	30
Muli-Nova x.1	1.6 – 10	11.5	9.5	5.2											
Muli-Nova x.2	2.6– 24.4	18.5	17.0	15.0	13.3	12.0	10.0	8.5	7.5	5.0	2.7				
Muli-Nova x.3	3 – 30.6	22.5	21.5	21.0	19.8	18.5	17.7	16.5	15.2	14.0	12,5	10.8	7.5	4.8	

6.13 Characteristic curves



6.14 Scale drawing

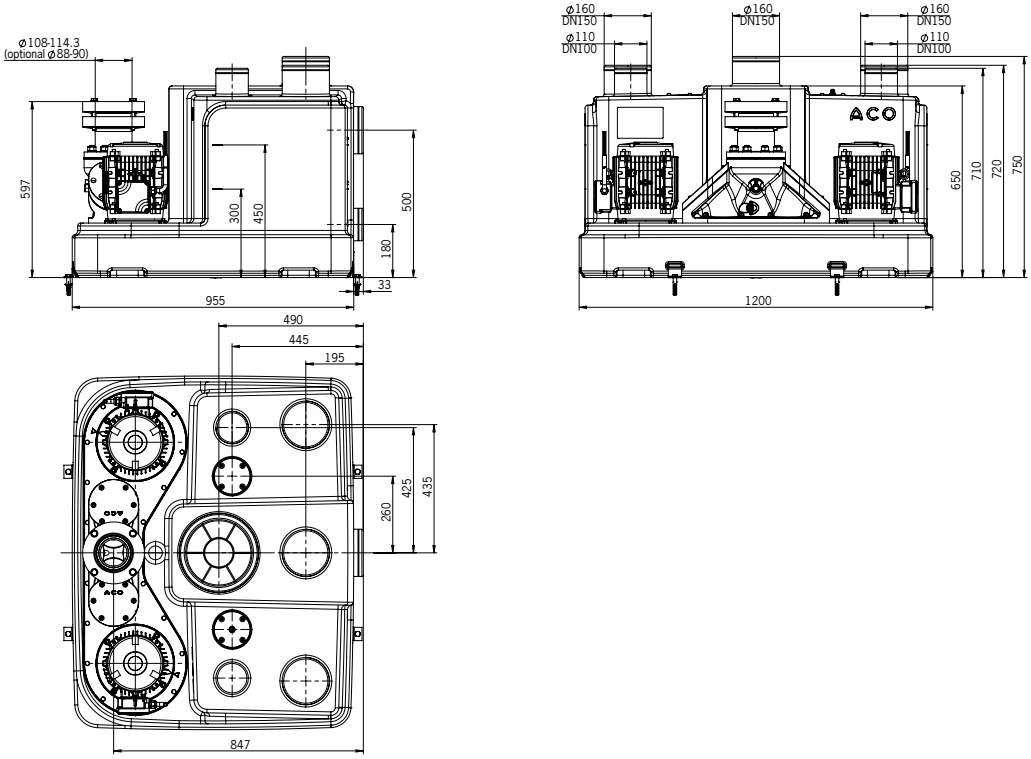


Figure: Muli-Nova 1.x dimensions

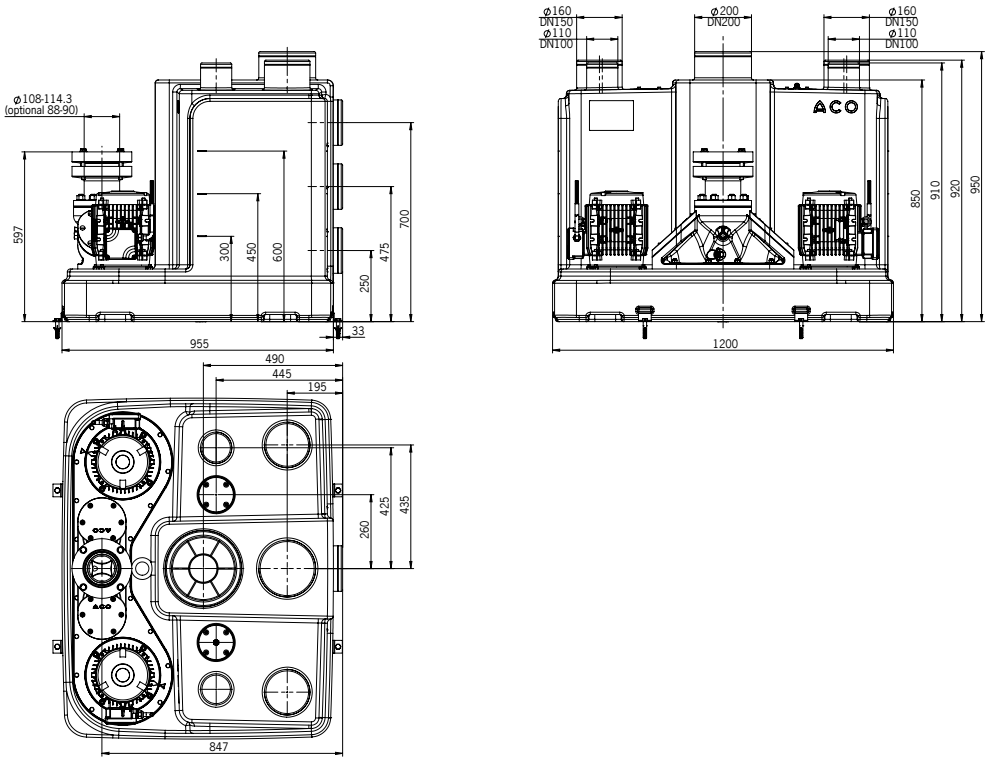


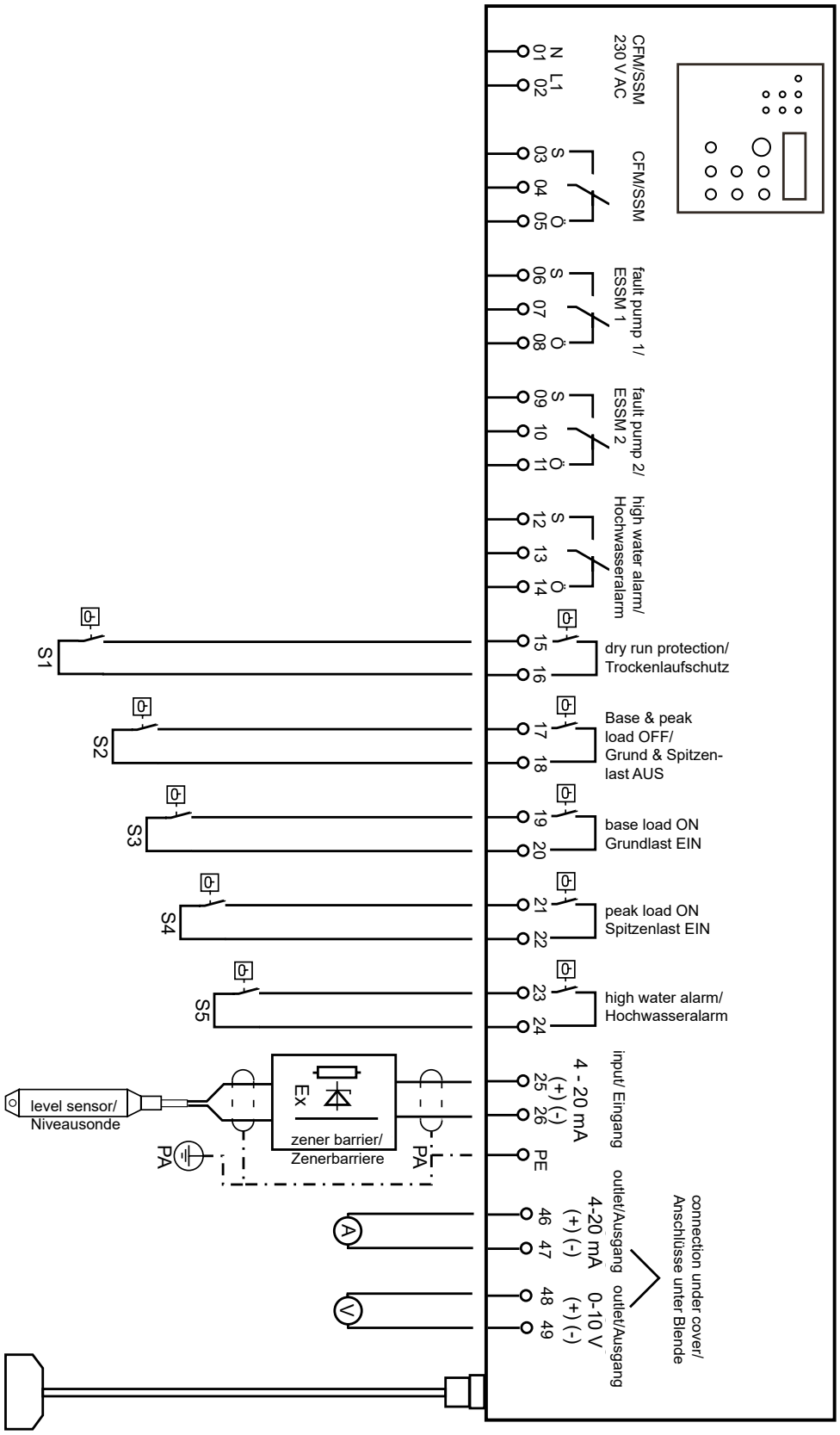
Figure: Muli-Nova 2.x dimensions

6.2 Pump control duo

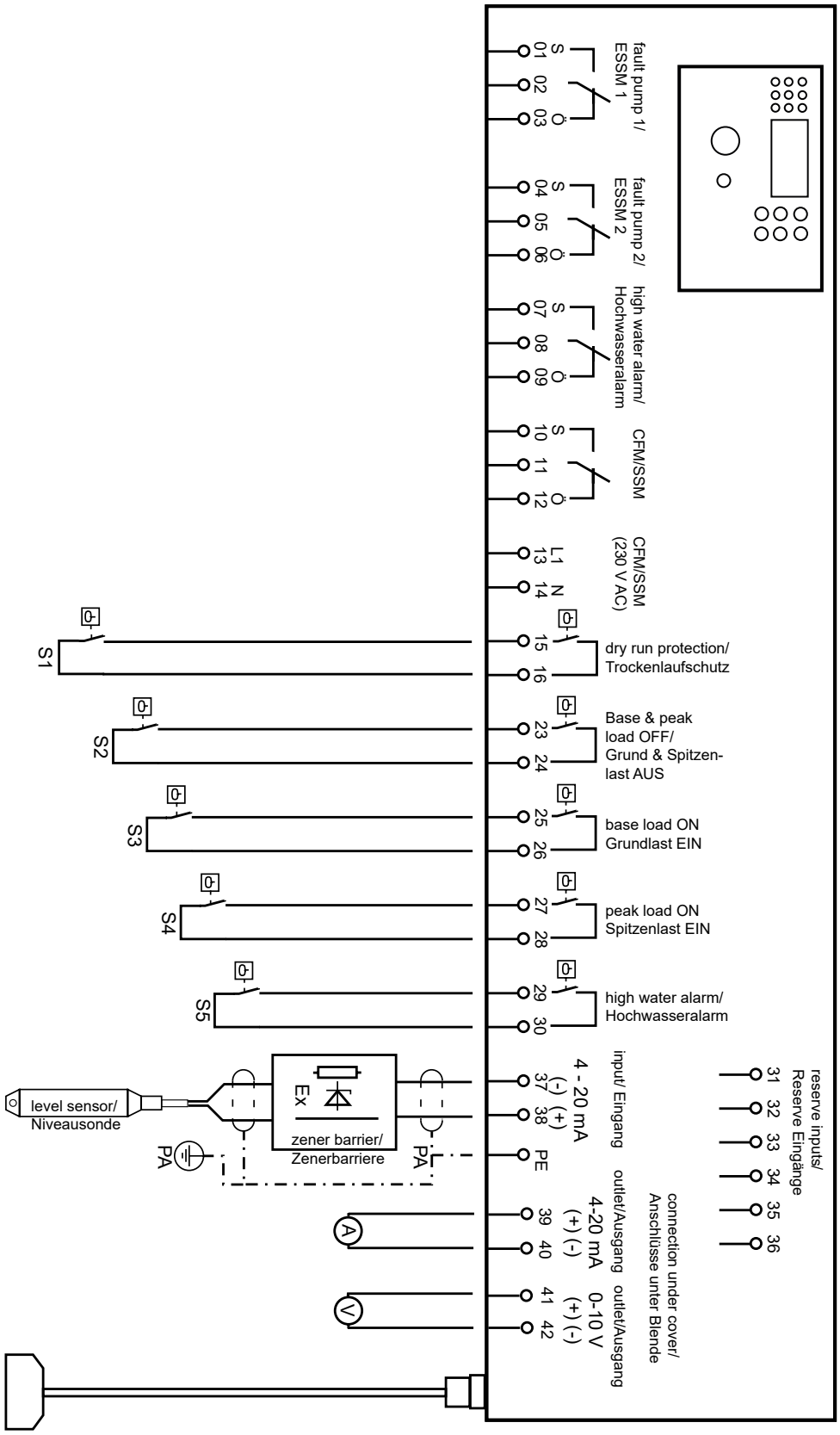
6.21 Key data

Key data	Values
Operating voltage:	~ 400 V (L1, L2, L3, N, PE), 50 Hz
Control voltage:	230 VAC, 50 Hz
Motor current limitation:	Can be set for every pump
Power intake (contactors operated):	< 20 VA
Connected load, maximum:	P2 < 5.5 kW (7.5 kW with soft start up)
Protection type pump control:	IP 54
Isolated alarm contact:	3 A
Fuse (alarm output):	5 x 20 AT
Rechargeable accumulator (mains-independent alarm):	9 V, 200 mAh (approx. 5 to 6 h)
Alarm volume:	85 dB
Dimensions pump control:	310 mm x 128 mm x 120 mm (H x W x D)

6.22 MultiControl duo – circuit diagram



6.23 Circuit diagram - MultiControl Professional duo



Appendix: Commissioning report

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

Commissioning date: _____

Handover date: _____

Wastewater lifting station

Type	Art. no.	Serial no.	Year of construction	Usable volume

Use location

Building/room: _____

Use: Multi-dwelling building ○ Commercial operation ○

Street: _____

Town/city: _____

Responsible persons

	Qualified person	Authorised acceptance representative	Company operating the station
Name:			
Phone no.:			
Fax no.:			
Email:			
Address:			

Check list for commissioning (Qualified person)

Two test runs are required before, during and after commissioning, 🕮 Chap. 4.4 “Execute trial run”.

Checks	OK	Not OK
Electrical fusing of the wastewater lifting station 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)	○	○
Inlet valve in the inlet pipe: Functioning test, actuation, open position, leak tightness	○	○
Shut-off valve and/or gate valve in the discharge line: functioning test, actuation, open position, leak tightness	○	○
Attachment of the inlet and discharge line	○	○
Switching and setting of the switching on levels in the pump control menu	○	○
Leak tightness: Wastewater lifting station, fittings, pipework, connections	○	○
Fault and malfunction signalling equipment: Fault messages in the display panel, LED fault displays, acoustic alarm, telecommunication equipment (group fault)	○	○
Functioning test of the backflow valve	○	○

Instruction (by installer company)

Instruction	Remarks	Yes	No
Instruction:	Functions, pump control unit, operating information, troubleshooting, maintenance obligations	○	○
Handover:	Instructions for Use	○	○

Remarks:

Signature of qualified person: _____

Signature of authorised acceptance inspection representative: _____

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