Protection against backflow

ACO Backflow valves and Lifting stations

ACO. The future of drainage.

The ACO system chain creates the drainage solutions for the environmental conditions of tomorrow

Increasingly extreme weather events require ever more complex drainage concepts. To this end, ACO creates clever system solutions, which function in both directions: They protect people from water – and vice versa. Each ACO product within the ACO system chain secures the direction of the water with the objective of being able to recover it in a way that makes ecological and economic sense.

Within the ACO Group, ACO Building Drainage supports the global system chain and combines system solutions for drainage, separation and pumping to form integrated drainage concepts within buildings.

collect:
Collect and carry

- Floor drainage
- Bathroom drainage
- Roof drainage
- Parking deck drainage
- Balcony and terrace drainage
- Pipe systems

clean:
Pretreat and treat

- Grease separators
- Starch separators
- Light oil separators
- Process engineering

hold:
Hold and retain

- Double backflow valve mam_ACOCM02

release:
Pump, discharge and reuse

- Lifting stations
- Pumping stations

ACO system chain in action

Contents

Backflow protection is always possible

No matter whether the water can get into the basement through the overloaded sewer system, leaking basement windows or under the external door: Protection against water in rooms which lie below the backflow level is a complex undertaking – especially with regard to climate change. In recent years the number of cases of building damage in Germany caused by heavy rainfall and floods has increased sharply. This trend will accelerate even more dramatically in the opinion of the experts. Read on the following pages how you can avoid such an experience.

How does backflow occur?

The public sewers are designed to EN 12056-4 for average rainfall events only for purely economic reasons and not for extreme events such as heavy rainfall. Heavy precipitation overloads the sewers and the backflowing water rises in the sewer manholes up to the backflow level. To the same extent, the backflowing wastewater pushes back into the local drainage system of the surrounding houses.

Reasons for backflow
Apart from heavy rainfall, the following events are also responsible for backflow:

- Sewer blockage or pipe bursts
- Sewer damage, e.g. cross-section reduction due to root growth
- Loss of operation in the pumping stations of the sewer operator, if the local drainage is connected to it
- Unscheduled discharge, e.g. during sewer flushing or fire service deployments
- Increased wastewater inflow due to additional connections (e.g. extension of residential areas)

An exceptional phenomenon?
It does not always have to be a hundred year flood like the flooding of the River Elbe in 2002. In the summer of 2015, many regions in Germany were also affected by heavy rainfall events, the sewers were overloaded and many basements were flooded. Meteorologists agree that floods and extreme rainfall events will continue to increase throughout Europe.

Annual damage amounting to millions – the question of liability and compensation

Municipalities are not liable
In May 2004, the Bundesgerichtshof, the German Federal High Court, issued a decisive judgement: Municipalities are not liable in the event of a an unusual and rare, extreme rainfall event. As there is no fixed "rain limit", many municipalities take the precaution of specifying in their byelaws that developers and home owners are responsible for protecting their properties against backflow and flooding. I.e. home owners must pay for backflow damage themselves. The municipalities cannot be made liable.

Insurance companies pay only conditionally
Apart from damage to private property, house owners are also liable to their tenants.
There are now insurance offers which deal with the problem of backflow. However, if the structural measures are not carried out correctly or even not at all, the insurers largely refuse liability in the event of water damage due to backflow.

- Building contents insurance:
  A normal building contents or building insurance does not cover damage due to floods and heavy rainfall events or resulting backflow.
- Storm and tempest insurance:
  If, in addition to the household contents or building insurance, the insured person has an extended insurance protection that includes storm and tempest damage, they are insured in the event of damage due to force majeure or acts of nature, for example, flooding, landslide, earthquake.

Important!
The risk of backflow is not automatically included in storm and tempest insurance and must be taken out separately!
Insurance protection only exists if safety precautions such as backflow valves or lifting stations are installed for discharge points below the backflow level and these are kept operational.

Legal aspects

For the home owner
Apart from damage to private property, house owners are also liable to their tenants. Therefore, the relevant standards require that sanitary appliances below the backflow level be protected by lifting stations (active backflow protection) or through backflow valves (passive backflow protection).

For the contractor / installer
Guarantee (warranty) is the obligation of a contractor / installer to take responsibility for proper and contractual quality of the work at the time of acceptance (§ 13 VOB/B - German construction contract conditions).

The installer is solely liable for installation defects. They cannot transfer them to the client, even if they, for example for cost reasons, want to have a product installed which does not comply with recognised rules of good engineering practice.

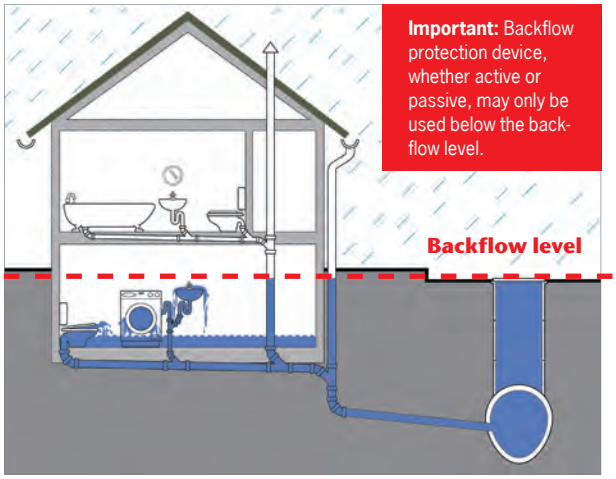
Technical Information

ACO Backflow Valves and ACO Lifting Stations

Find out more about the technical fundamentals in relation to backflow systems and lifting stations. Among other things it covers the areas of use and standards, the ACO innovations in the new backflow product range, installation instructions and product selection according to relevant rules of sound engineering practice. The selection guide for backflow valves and lifting stations can assist you with your project. Suggested installations are described in the following chapters on the respective product groups.

Scope and standard requirements

Without backflow protection



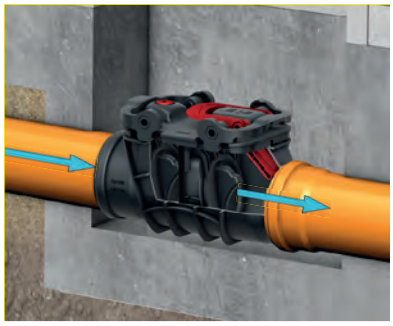
The backflow level is the highest level up to which the wastewater in the drainage system can rise; this is usually up to road level. From this level backflowing wastewater spreads over the surface locally. The backflow level is defined in the byelaws.

Rooms below the backflow level are flooded when the wastewater emerges through floor gullies, showers or WCs. Substantial property damage and financial loss can occur.

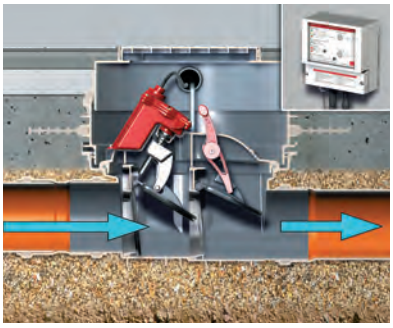
Product selection by type of wastewater...

When selecting the product, attention must be paid to the type of wastewater. A differentiation is made between black water and grey water. Black water contains faecal wastewater and grey water is faecal-free wastewater.

...for backflow valves
In backflow valves for black water the flaps are normally always open. In case of backflow the flaps close automatically. Swing flaps are used in backflow valves for grey water and rainwater. If these are used in faecal wastewater, there is a risk of blockaging, as solids in the faecal water deposit.

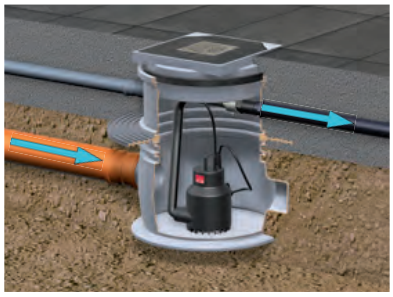


Backflow valve with swing flaps for grey water

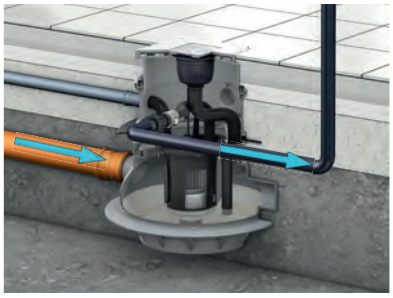


Opened flaps in an automatic faecal backflow valve for black water

...for wastewater lifting stations
The types of lifting stations and type of installed pumps differ depending on the lifting station type and product standard used. According to the standard a cutter pump must be used for faecal wastewater with e.g. pressure line DN 40 or DN 50.

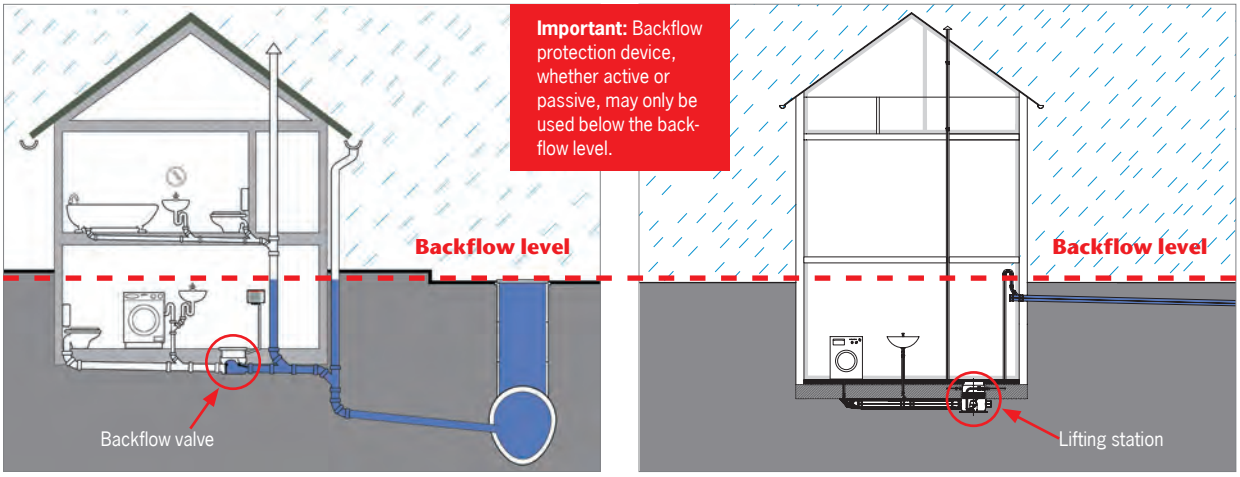


Mono lifting station for grey water



Mono lifting station for black water with cutter pump

With backflow protection to EN 12056 and DIN 1986-100



Backflow valve

- Only stopps the flow of the wastewater
- Are only permitted in an exceptional case (see production selection guide p. 14f.)
- Passive backflow protection through backflow valve in accordance with EN 13564, EN 1253
- In Germany, only types 2, 3 and 5 are allowed to be used for grey water
- Only Type 3 with marking "F" may be used for black water

Wastewater lifting stations

- Also pumps the backflow waste water from the house into the public sewer
- Active backflow protection through wastewater lifting stations in accordance with EN 12050
- Depending on the plant type, wastewater lifting pumps can pump black and grey water (EN 12050, Part 1 & 2)

Standard requirements

According to DIN 1986-100 and EN 12056, discharge points below the backflow level are to be protected against backflow from the sewer by automatically operating wastewater lifting stations with backflow loop in accordance with EN 12056-4 (active backflow protection).
Under certain preconditions, backflow valves in accordance with EN 13564-1 can be used (passive backflow protection).

The following criteria must be fulfilled when installing a backflow valve:

- The wastewater must be able to be removed in the natural gradient
- The rooms must be for secondary use, i.e. which contain no significant material assets and the health of the building occupants must not be impaired if the rooms flood
- Small number of users and a WC above the backflow level must be available to them
- In case of backflow, discharge points can't be used

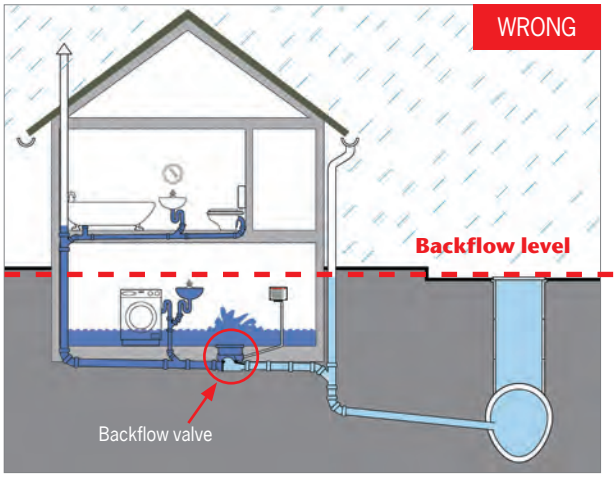
Maintenance in accordance with standard

The choice and use of active or passive backflow valves cannot be based on the maintenance criterion, as all types of backflow protection are subject to regular maintenance intervals. Our ACO Building Drainage service professionals are also available for the maintenance of your backflow safety valves (see p. 56).:

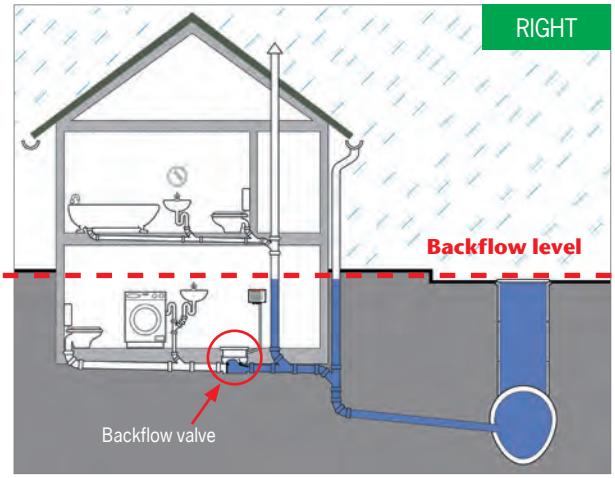
Maintenance interval	Backflow valves to EN 13564	Lifting stations to EN 12050*
Functional check (switching cycles) every 1 – 2 days (operator company)	No	Yes**
Monthly check (operator company)	Yes	No
Half-yearly inspection (properly qualified technician)	Yes	No
Annual maintenance work (qualified contractor)	No	Yes

* For installation in detached house
** In ACO wastewater plants with pneumatic control this takes place automatically.

Installation instructions for backflow valves



Backflow valves seal off the pipe, not only against backflowing water but also against draining wastewater. If, as in this incorrect installation, discharge points above the backflow level are passed via a backflow valve, in case of backflow this results in self-flooding. Therefore, downpipes must always be connected in the flow direction downstream of backflow safety valves.



Discharge points above the backflow level
These also include roof areas and rainwater downpipes.
- Direct discharge
- No discharge via lifting stations or backflow valves

Discharge points below the backflow level
Here the backflow protection closes the pipe off and prevents flooding of the rooms below the backflow level.

Maintenance of the new ACO backflow valves

"On-site leak test" to EN 13564 now also possible for DN 50 and DN 70 backflow valves

The new backflow valves with nominal diameters DN 50 and DN 70 are also equipped with a test port 1/2 AG in accordance with EN 13564. The innovative shape of the emergency valve enables it to be actuated even if the test hopper is screwed in. This enables the leak-tightness to be checked on site.

For the test with the test hopper (included in scope of supply) a backflow is simulated and the leaktightness and function of the automatic closure flaps is tested. Backflow valves are deemed to be adequately leak tight if the test hopper has to be topped up with less than 500 ml water within 10 minutes.

Maintenance made easier by new housing locking device

Stable quick-release fasteners enable fast and toolless opening of the new Triplex backflow valves for cleaning and maintenance work.
The cover can also be additionally raised using the integrated lift function. This makes it easier to open stuck covers, e.g. after long service times without regular maintenance.

ACO backflow valves product overview by type

Type designations of backflow valves to EN 13564-1
EN 13564 defines 6 types of backflow valves (anti-flooding devices) and segments their use for rainwater, grey water and black water.

Type	Figure	Use	Automatic closure device	Emergency closure device	Area of use	Corresponds to the following ACO products
0		For horizontal pipes	1	0	Rainwater harvesting system	**Triplex Type 0**
1		For horizontal pipes	1	1*	Rainwater harvesting system	**Triplex Type 1**
2		For horizontal pipes	2	1*	Rainwater harvesting system / non-faecal wastewater	**Triplex Type 2**
3		For horizontal pipes	1 (pneumatic or electric)	1	Non-faecal and faecal wastewater (marked with "F")	**Quatrix-K-3F**
4**		Installed in floor gullies	1	1*	Non-faecal wastewater	
5		Installed in floor gullies	2	1*	Non-faecal wastewater	**Junior**

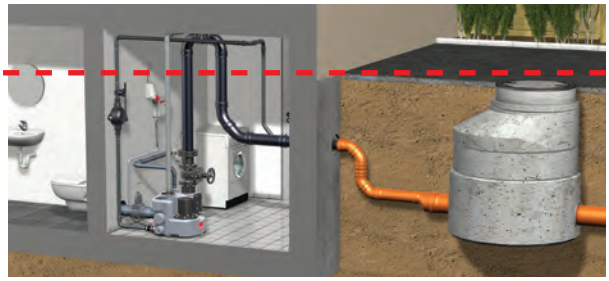
* Emergency closure device can be combined with automatic closure device
** Type 4 is not permitted in Germany

Installation instructions for lifting stations

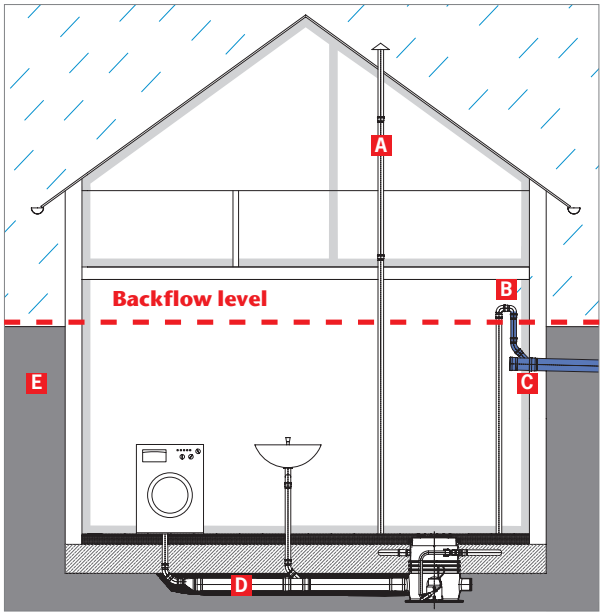
The best possible protection against backflow can be achieved by a wastewater lifting stations whose pressure line, as in these two examples, has been routed above the backflow levels.

Backflow level

Protection against backflow in gradient to the sewer provided by a wastewater lifting station in multiple unit dwellings, commercial properties and detached houses with granny flat



Protection against backflow if the sewer is higher than the sanitary appliances



A Ventilation

- Ventilation of the lifting stations is to be routed and discharged above the roof.
- Ventilation pipe may be installed both in the main vent stack and in the secondary ventilating stack
- Ventilation of lifting stations must not be combined or connected to the ventilation inlet of a grease separator
- For faecal lifting stations a minimum cross-section of DN 50 is to be installed
- Air admittance valves for lifting stations are not allowed

Main stack vent: The vertical grey water downpipe should have an open to the atmosphere extension (without cap) after the last connection

Ventilating stack: Vertical ventilation pipe (vent stack), which is connected to a grey water downpipe, limits pressure fluctuations within the grey water downpipe

B Backflow loop

- Re-routes the pipework to above the backflow level
- Most reliable alternatives against backflow

C Pressure line connection

- Is to be made at drains and collector drains or sewers
- The pressure line must withstand at least 1.5 times the maximum pump pressure of the plant
- EN 12056-2 and 12056-3 describes the design of the drain
- In general: Increase the diameter of the drainpipe, which connects to the pressure line, by one nominal size
- Do not connect any sanitary waste water pipes to the pressure line
- Do not connect grey water down pipes to the pressure line

D Inlet

- The inlet pipe in the wastewater lifting station must not be reduced in the flow direction
- A stop valve is to be installed on the inlet side (repair / maintenance work)
- Drainage pipes are to be connected stress-free to the lifting station
- The weight of the pipes and valves must be supported on site

E Surface water

- Surface wastewater, from below the backflow level outside the building is to be pumped separately from the domestic wastewater via a wastewater lifting station/pumping station

Usable volume
- Pumped volume between the switching on and switching off level of the pump
- Usable volume must be larger than the in situ volume in the pressure line up to the backflow loop

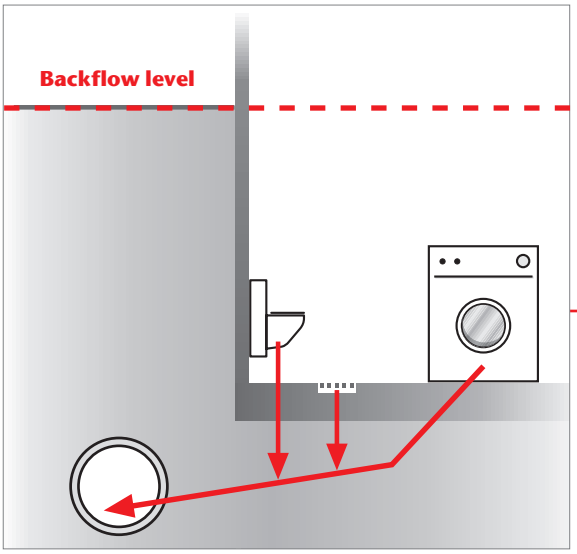
Installation space
- Must be adequately ventilated to avoid condensation
- Must be large enough to provide a working space of at least 60 cm width and height next to and above all parts to be operated and maintained
- Adequate lighting must be available
- A pump sump is to be provided for drainage of the room

ACO (mono) lifting stations product overview

Figure	Use	Area of use	ACO Product
	For underfloor installation	Non-faecal wastewater	**Sinkamat-K mono**
	For freestanding / above-floor installation	Non-faecal wastewater	**Sinkamat-K mono**
	For freestanding / above-floor installation	Non-faecal wastewater	**Muli-Mini mono**
	For underfloor installation	Non-faecal and faecal wastewater	**Muli-UF mono**
	For freestanding / above-floor installation	Non-faecal and faecal wastewater	**Muli-Star mono**

Production selection guide

Discharge point below the backflow level WITH natural fall to the sewer*



The wastewater produced can be drained to the sewer with natural fall. But the discharge point is below the backflow level and is at risk if backflow occurs.

*In case of discharge points below the backflow level WITHOUT natural fall to the sewer, NO backflow valves can be used, only wastewater lifting stations.

Rooms for secondary use

There are no material assets in the rooms at risk (e.g. simple storage rooms). Discharge points can not be used in case of backflow.

Rooms with material assets

There are material assets in the rooms at risk (e.g. storerooms, heating installations, rooms with grease separators, etc.). Discharge points can be used in case of backflow.

NO drainage necessary in case of backflow

Backflow valves for exposed pipes
- Grey water: ACO Triplex backflow valve, type 2
- Black water: ACO Quatrix-K automatic backflow valve

Backflow valves for installation in the floor slab
- Grey water: ACO Junior cellar gully or ACO Quatrix-K automatic backflow valve
- Black water: ACO Quatrix-K automatic backflow valve

For further information see Page 24 – 33

Continuous drainage necessary in case of backflow

Wastewater lifting stations (duo type) for freestanding installation
- Grey water: ACO Muli-Mini wastewater lifting station
- Black water: ACO Muli-Star DDP wastewater lifting station

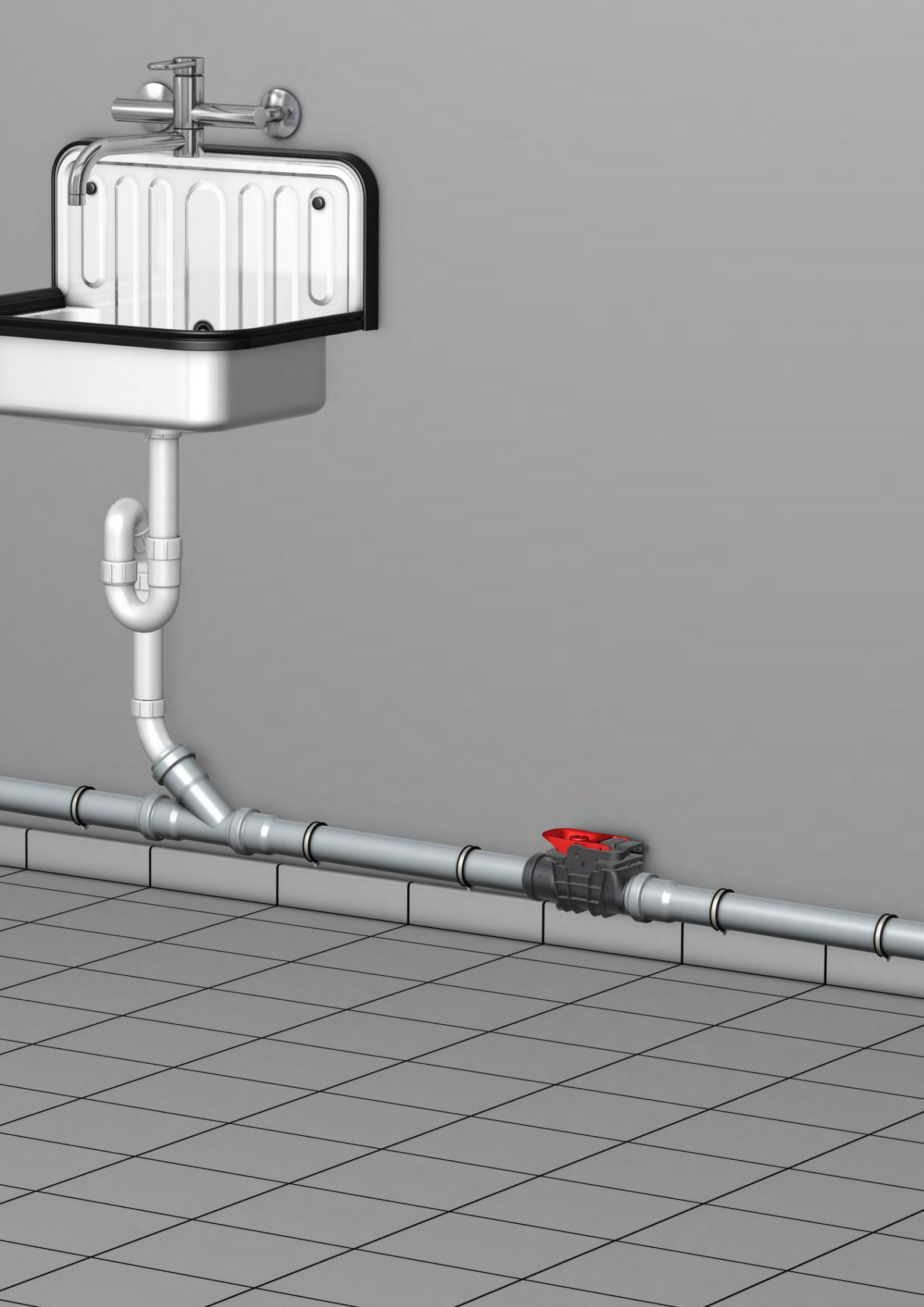
Further information on the ACO DUO lifting stations is provided in the brochure:
"ACO lifting stations and pumping stations for trade and industry"

NO continuous drainage necessary in case of backflow

Wastewater lifting stations (mono type) for free-standing installation
- Grey water: ACO Sinkamat wastewater lifting station or ACO Muli-Mini wastewater lifting station
- Black water: ACO Muli-Star wastewater lifting station

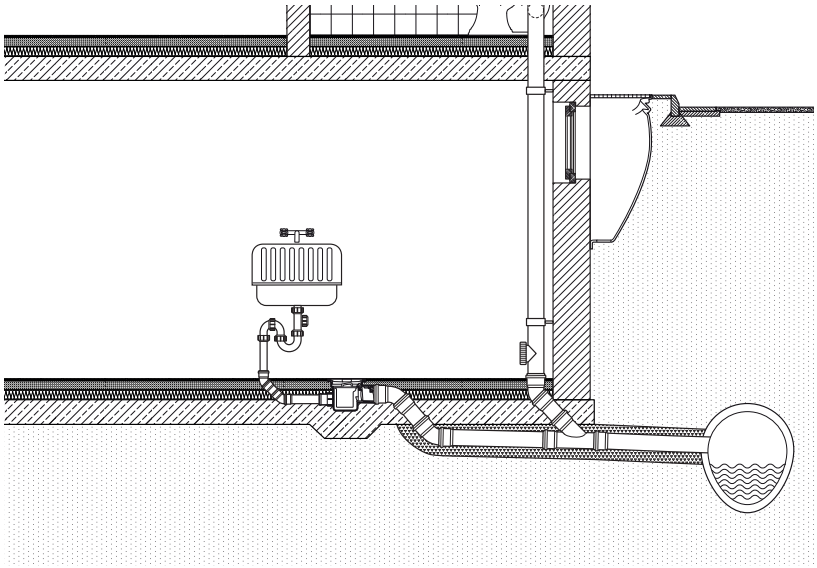
Wastewater lifting stations (mono type) for underfloor installation
- Grey water: ACO Sinkamat-K wastewater lifting stations
- Black water: ACO Muli-UP wastewater lifting station

For further information see Page 40 – 53



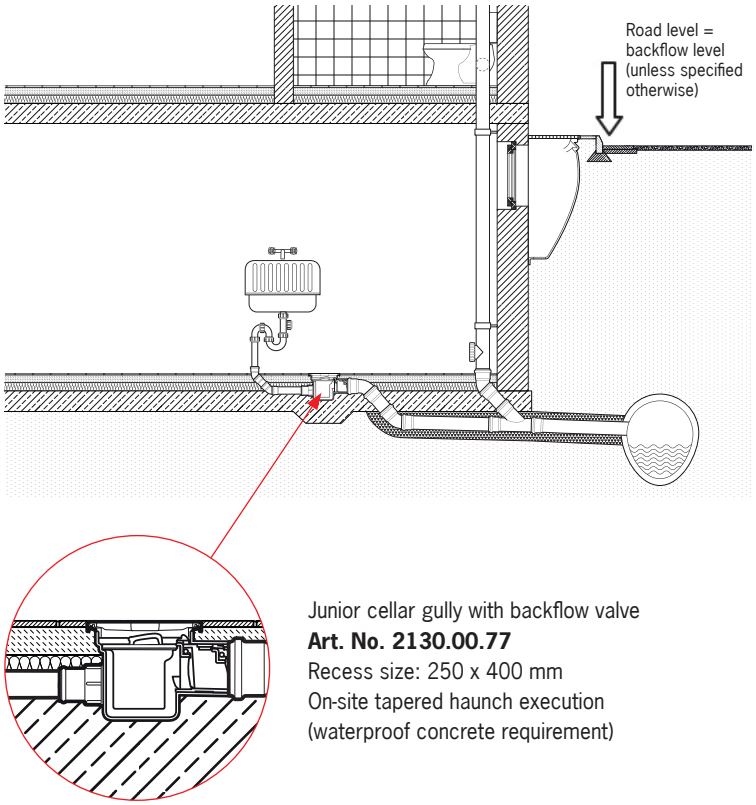
Backflow valves product overview

ACO Junior cellar gully with backflow valve for non-faecal wastewater – for underfloor installation



For product information see Page 24

Installation drawing



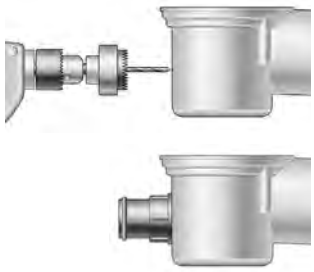
Junior cellar gully with backflow valve
Art. No. 2130.00.77
Recess size: 250 x 400 mm
On-site tapered haunch execution
(waterproof concrete requirement)

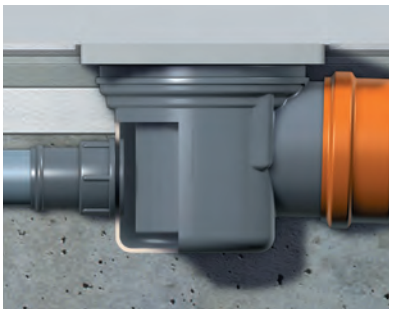
Application case: Floor gully for basement rooms, hobby rooms

- If necessary a DN 50 inlet socket can be attached on site
  Art. No. 2410.00.04
- An extension (130 mm) is available for deeper installation
  Art. No. 2040.00.06

Installation instructions

The smallest of its type – ideal for renovation
The ACO Junior cellar gully is the smallest cellar gully with backflow valve. Old gullies can be replaced with little effort – without damaging the floor slab.



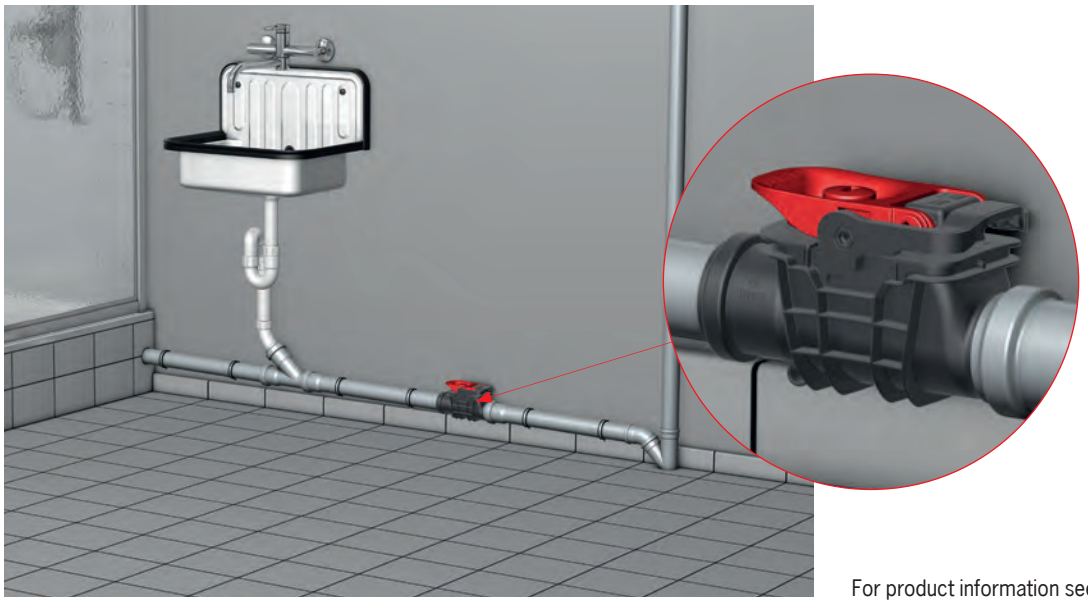


Lateral inlet DN 50 – suitable for every installation
If necessary, a DN 50 inlet can easily be attached on site to connect showers / washing machines A hole saw (Ø 59 mm) is used to make an opening in the specified area and the inlet socket 2410.00.04 with nominal diameter DN 50 is attached.

Toolless disassembly– Junior cellar gulley
After removing the grating, the sludge bucket and the backflow unit of the ACO Junior cellar gully can be taken out without tools. The full pipe cross-section is available for cleaning the drain, or the sewer leak test.

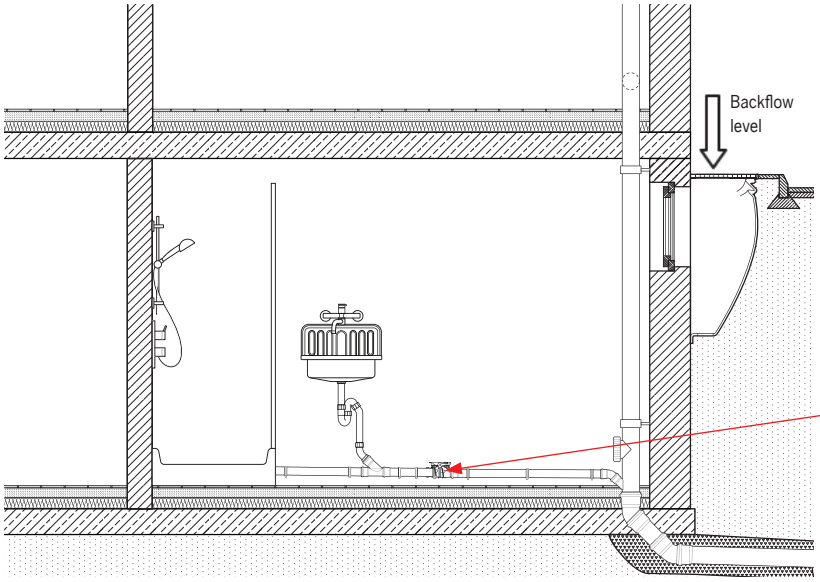
The functionality test of the backflow unit is performed after it has been removed. To test, pour clean water into the hopper until 100 mm water column is reached. If no more than 500 ml clean water has to be topped up within 10 minutes in order to maintain the water column, the backflow valve is watertight complaint to EN 13564.

ACO Triplex DN 50 double backflow valve for non-faecal wastewater – for installation in exposed pipes



For product information see Page 26

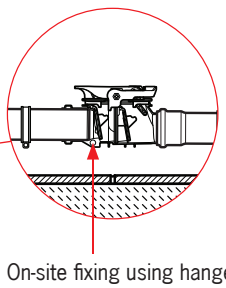
Installation drawing *



Application exposed, for continuous pipes, exposed

Triplex double backflow valve

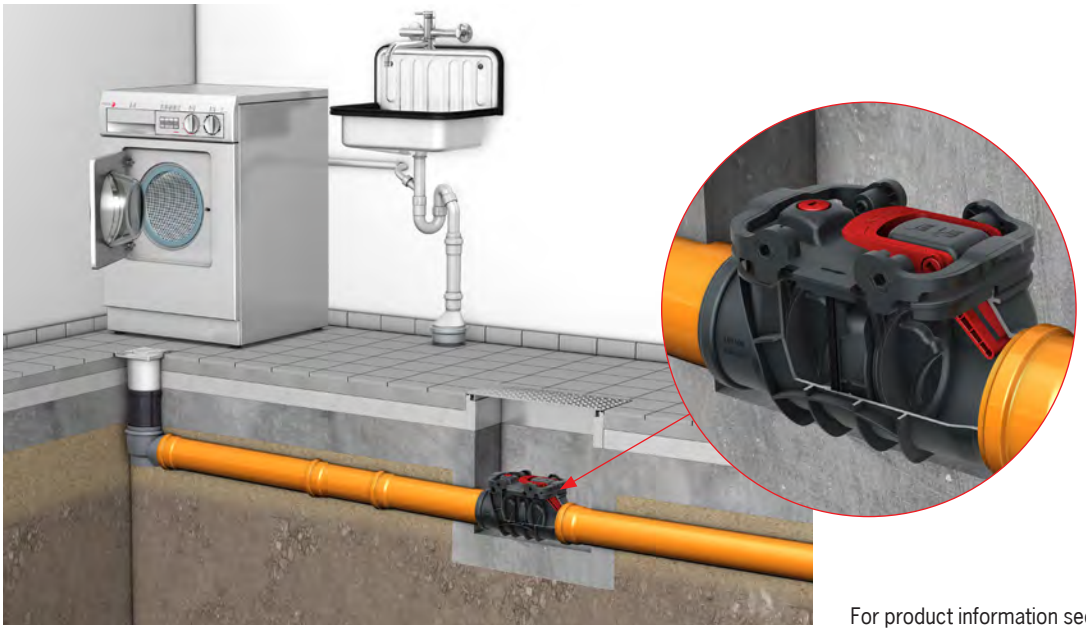
- DN 50, **Art. No. 2105.20.00**
  Recess size: 180 x 410 mm
- DN 70, **Art. No. 2107.20.00**
  Recess size 210 x 475 mm



On-site fixing using hanger bolt (e.g. M8 x 80 mm)

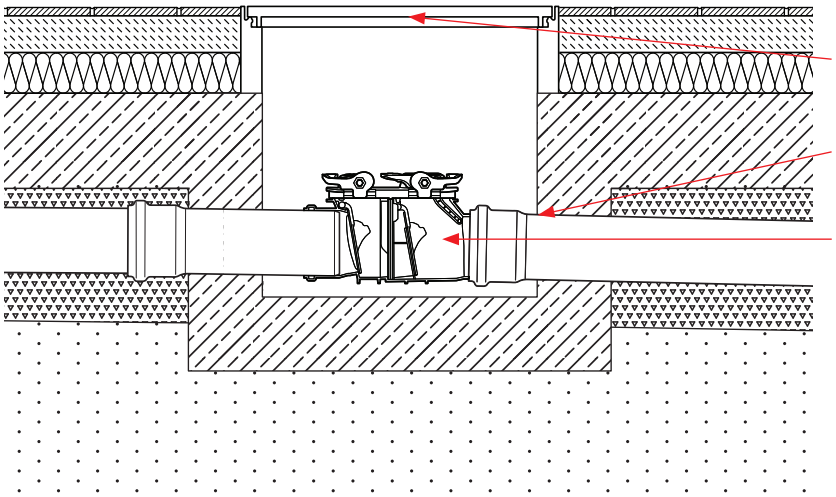
* The drawing shows the installation of Triplex DN 50 and DN 70 in exposed pipes.

ACO Triplex DN 100 double backflow valve for non-faecal wastewater – for installation in exposed pipes, in access chamber



For product information see Page 26

Installation drawing *



Application case: for exposed, continuous pipes in access chamber

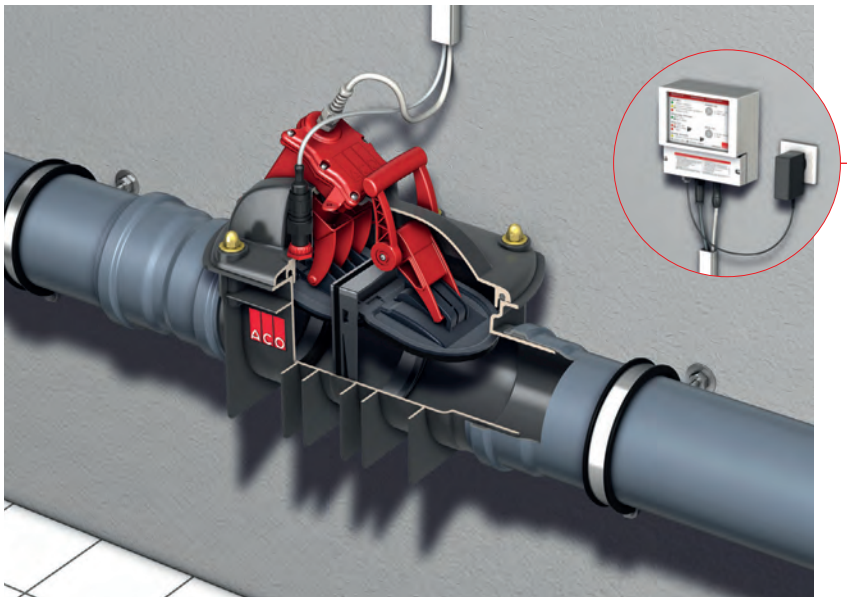
On site cover (e.g. ACO Fi cover, approx. 800 x 800 mm)

Seal is to be implemented in accordance with the on site requirements

Triplex double backflow valve
- DN 100, **Art. No. 2110.20.00**
  Recess size: 260 x 580 mm
- DN 125, **Art. No. 2125.20.00**
  Recess size 320 x 665 mm
- DN 150, **Art. No. 2150.20.00**
  Recess size: 320 x 760 mm

* The drawing shows the installation of Triplex DN DN 100/DN 125 and DN 150 in exposed pipes, in the access chamber.

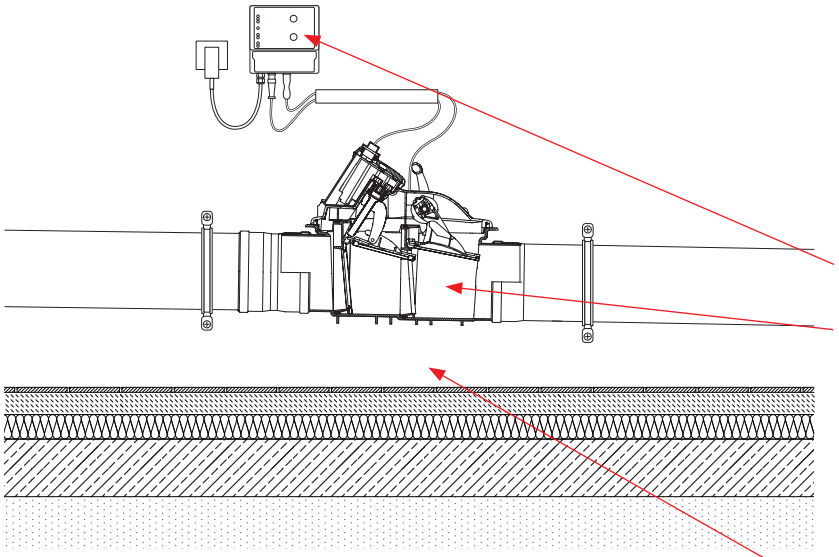
ACO Quatrix-K automatic faecal backflow valve for faecal wastewater – for installation in exposed pipes



Standard ready-to-plug in control
The control is ready-to-plug in (mains plug, motor and sensor connector) and does not require an electrician. The operating mode is shown on the bilingual display (German /English).

For product information see Page 30

Installation drawing



Application: exposed, continuous pipes

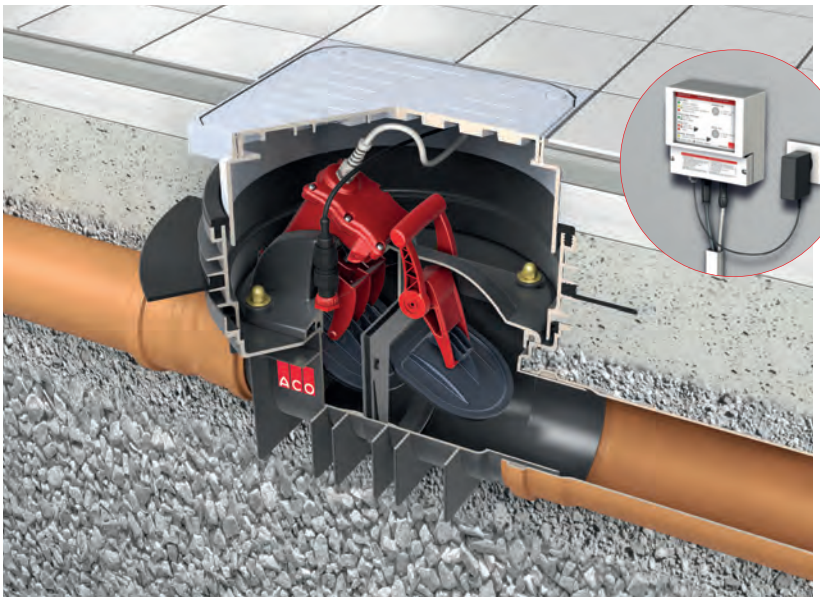
Installation possible without calming region
Backflow detection in the Quatrix-K is provided in the form of a pneumatic measuring system in which the pressure sensor does not come into contact with wastewater.
A calming region is not required.

Electrical control (230 V, 50 Hz)

Quatrix-K automatic faecal backflow valve
- DN 100, **Art. No. 620368**
  Recess size: 350 x 710 mm
- DN 125, **Art. No. 620486**
  Recess size: 560 x 730 mm
- DN 150, **Art. No. 620369**
  Recess size: 350 x 820mm

On site fixing of the backflow valve, e.g. using brackets

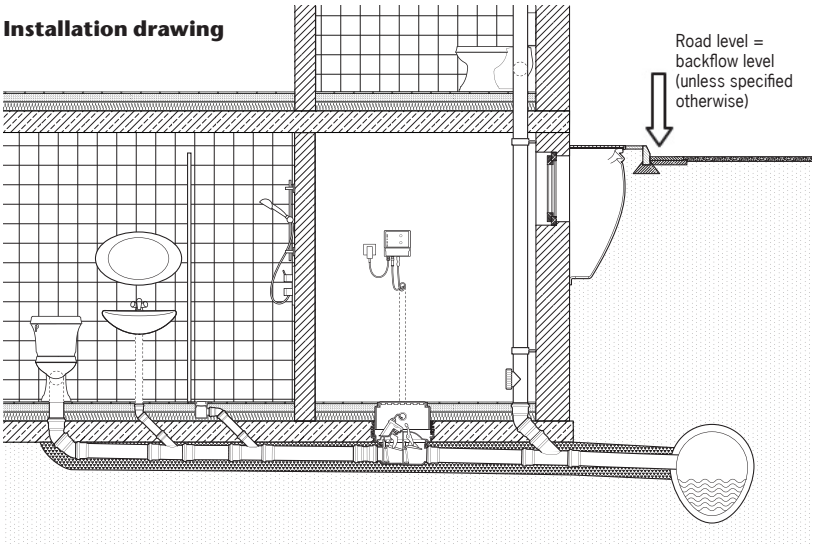
ACO Quatrix-K automatic faecal backflow valve for faecal wastewater – for installation in the floor slab



Standard ready-to-plug in control
The control is ready-to-plug in (mains plug, motor and sensor connector) and does not require an electrician. The operating states are shown on the bilingual display (German /English).

For product information see Page 30

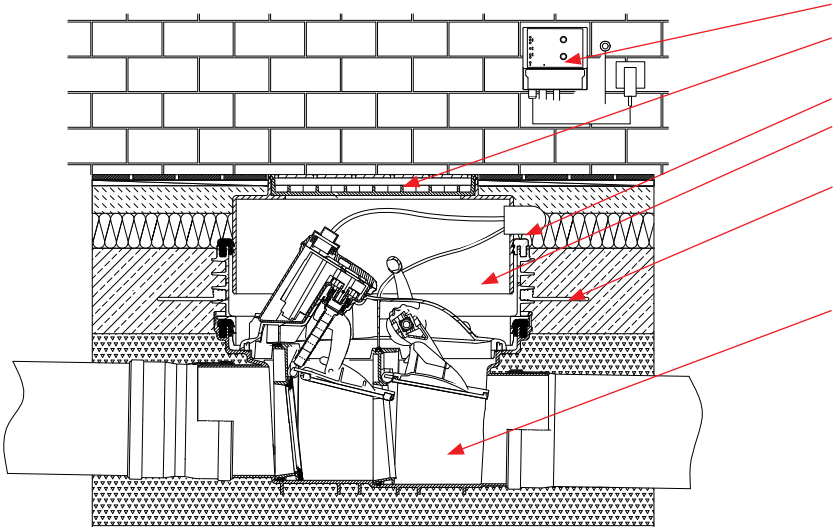
Installation drawing



Application: continuous pipes inside access chamber below floor level

Installation possible without calming region
Backflow detection in the Quatrix-K is provided in the form of a pneumatic measuring system in which the pressure sensor does not come into contact with wastewater.
A calming region is not required.

- An extension (116 mm) is available for deeper installation (max 1 x extension) **Art. No. 620381**
- Optional height-adjustable sealing flange available for waterproof concrete **Art. No. 620510**



Electrical control (230 V, 50 Hz)
Reversible cover plate for selectable surface, Load class K 3
Cable conduit DN 70
Height-adjustable and rotatable top section
Optional incrementally height-adjustable sealing flange for waterproof concrete (cover on top and below at least 60 mm, 150 mm to the side)
Quatrix-K automatic faecal backflow valve, with chamber system

- DN 100, **Art. No. 620370**
  Recess size: 560 x 710 mm
- DN 125, **Art. No. 620487**
  Recess size 560 x 730 mm
- DN 150, **Art. No. 620371**
  Recess size: 560 x 820 mm

ACO Junior cellar gulley with backflow valve – for non-faecal wastewater

The Junior cellar gully, Type 5, has a backflow unit with two flaps including emergency valve and is installed in the floor slab.

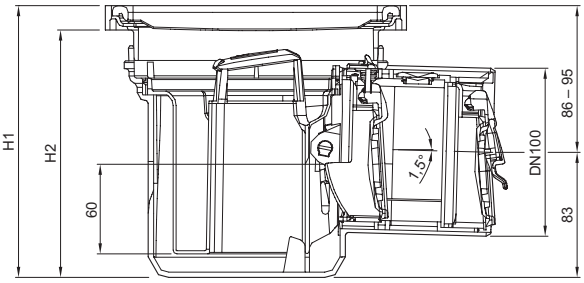
Product advantages

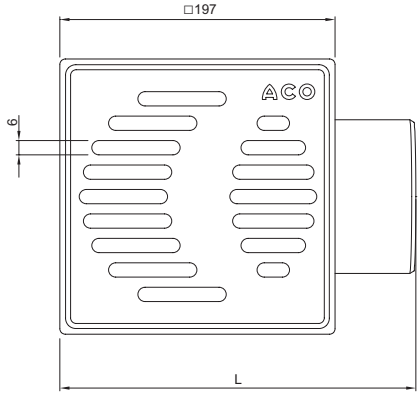
- The compact product dimensions make it ideal for renovation
- Rotatable top section for optimum adjustment to the tiling pattern
- Optionally with extension for flexible deeper installation
- Toolless installation and dismantling of the sludge bucket and backflow unit
- Optional lateral inlet DN 50 to be attached on site

Product information

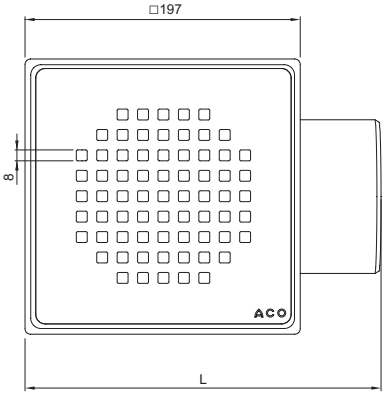
- Type 5 tested to EN 13564
- Plastic
- For non-faecal wastewater
- With removable sludge bucket
- With removable odour trap
  - Water trap: 60 mm
- Valve with 2 backflow flaps
- With 1 manually lockable emergency valve
- Flow rate: 1.4 l/s
- Rotatable top section
  - Made of plastic, frame size: 197 x 197 mm
- Grating
  - Slot grating made of plastic, K3
  - Quadrato design grating made of stainless steel, material grade 304, L15
- Outlet socket
  - DN 100
  - Socket inclination: 1.5°

Dimensional drawings





Art.-Nr. 2130.00.77



Art.-Nr. 2130.00.87

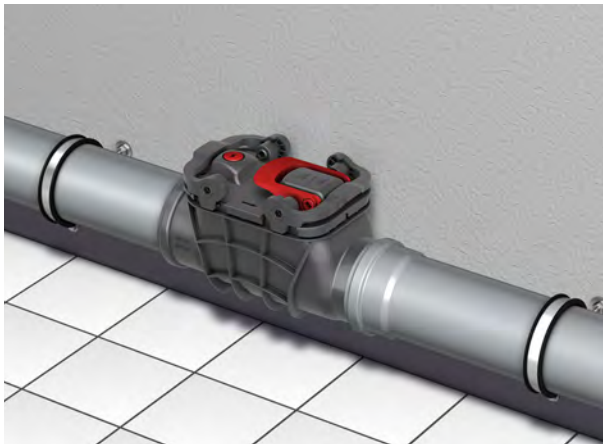
Order information

Figure	Designation	L [mm]	H1 [mm]	H2 [mm]	Recess [mm]	Weight [kg]	Article No.
	ACO Junior cellar gulley with slot grating DN 100	255	168 – 177	152 – 161	250 x 400	1.2	**2130.00.77**
	ACO Junior cellar gully DN 100 with Quadrato design grating	255	168 – 177	152 – 161	250 x 400	2.6	**2130.00.87**

Accessories

Figure	Designation	Suitable for	Description	Article No.
	Inlet socket DN 50	■ Junior cellar gulley with Backflow valve ■ Cellar gully DN 100 ■ Sinkamat-K (freestanding installation)	■ Plastic ■ For lateral inlet options ■ For on-site installation ■ Weight: 0.1 kg	**2410.00.04**
	Plastic extension	■ Cellar gully DN 100 ■ Junior cellar gulley with backflow valve	■ For deeper installation ■ Extension height: 130 mm ■ Weight: 0.2 kg	**2040.00.06**
	Backflow unit	■ Junior cellar gully with backflow valve	■ Maintenance kit ■ With backflow safety valve DN 100	**2120.00.00**
	Test hopper	■ Triplex-K backflow valve ■ Quatrix-K automatic faecal backflow valves Type 3F ■ Junior cellar gully with backflow valve ■ Fuel oil valves	■ Plastic ■ With sealing ring ■ For maintenance inspection on site	**6010.00.15**

ACO Triplex double backflow valve – for non-faecal wastewater



Product advantages

New!

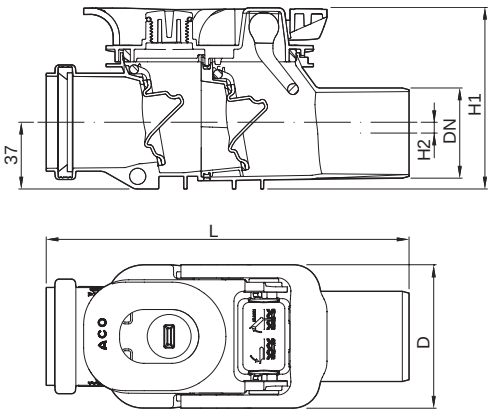
- **"On-site leak testing" to EN 13564 possible for all nominal diameters**
- Compact size
- Toolless maintenance
- Quick-release fastening/fastenings for cover locking
- From 6 mm gradient difference

Product information

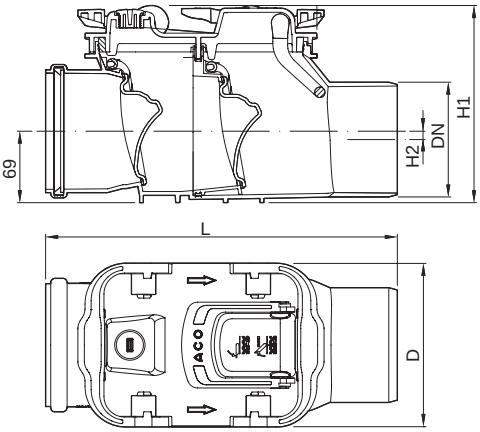
- Plastic
- For exposed pipes
- Type 2 tested to EN 13564
- For non-faecal wastewater, rainwater harvesting systems
- With two automatically closing backflow flaps, one of which is a manually lockable emergency valve
- With cleaning and maintenance opening and test hopper

Dimensional drawings

Triplex DN 50 / DN 70



Triplex DN 100 / DN 125 / DN 150



Order information

Figure	Nominal diameter	Dimensions					Recess	Weight	Article No.
		OD [mm]	L [mm]	B [mm]	H_1 [mm]	H_2 [mm]	[mm]	[kg]	
	DN 50	50	201	80	101	6	180 x 410	0.44	**2105.20.00**
	DN 70	75	256	108	132	6	210 x 475	0.74	**2107.20.00**
	DN 100	110	337	157	189	8	260 x 580	1.7	**2110.20.00**
	DN 125	125	403	214	241	10	320 x 665	2.9	**2125.20.00**
	DN 150	160	457	214	241	10	320 x 760	3.0	**2150.20.00**

The new generation of ACO Triplex backflow valves

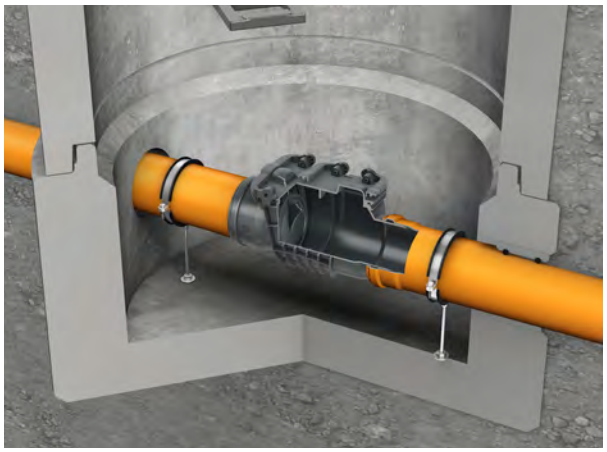
"On-site leak test" to EN 13564 now also possible for DN 50 and DN 70 backflow valves

- From nominal diameter DN 50 test port 1/2 AG compliant to EN 13564
- The innovative shape of the emergency valve enables it to be actuated even if the test hopper is screwed in.
- On site checking of leak tightness possible

Maintenance made easier by new housing locking device

- Stable quick-release handles enable fast and toolless opening of the chamber
- Makes cleaning and maintenance work easier
- The cover is lifted by the integrated lift function in the handles
- Makes it easier to open stuck covers, e.g. after long service intervals

ACO Triplex single backflow valve DN 125 / DN 125 / DN 150 – for rainwater harvesting systems



Product advantages

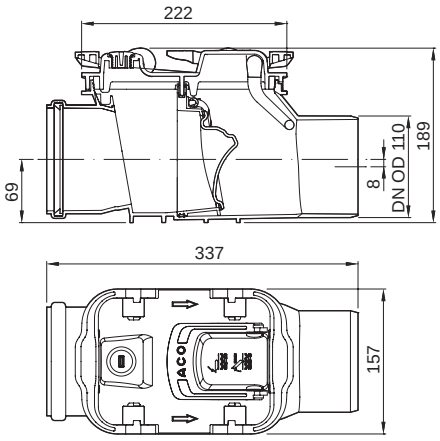
- Compact size
- Toolless maintenance
- Quick-release handles for cover locking
- From 8 mm fall over valve housing
- Large cleaning and maintenance opening
- Emergency valve (for Type 1 only)

Product information

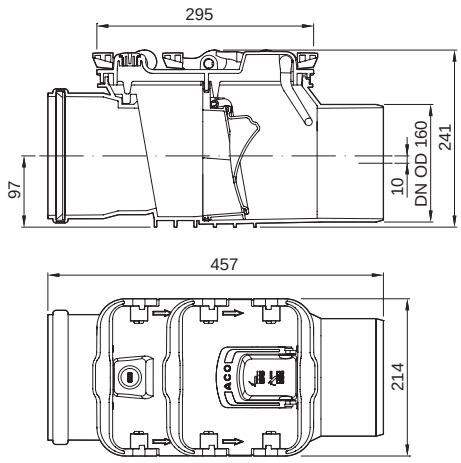
- Type 1 and Type 0 according to EN 13564
- For rainwater harvesting systems
- With an automatically closing backflow flap and emergency valve (for Type 1 only)
- For exposed pipes

Dimensional drawings

Triplex DN 100 – with two quick-release handles for cover locking, Type 1*



Triplex DN 125 / DN 150 – with three quick-release handles for cover locking, Type 1*



* The same dimensions apply to Type 0, however it has no emergency valve or test port.

Order information

Figure	Nominal diameter	Dimensions OD [mm]	L [mm]	B [mm]	H [mm]	Weight [kg]	Recess [mm]	Article No.
Type 1								
	DN 100	110	337	157	189	1.7	260 x 580	**2110.10.00**
	DN 125	125	403	214	241	2.9	320 x 665	**2125.10.00**
	DN 150	160	457	214	241	3.0	320 x 760	**2150.10.00**

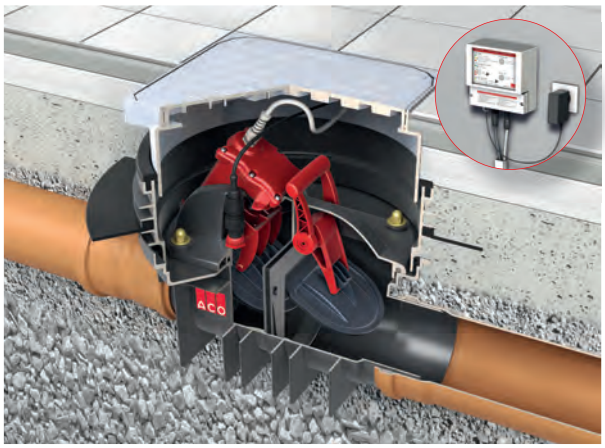
Order information

Figure	Designation	Dimensions OD [mm]	L [mm]	B [mm]	H [mm]	Weight [kg]	Recess [mm]	Article No.
Type 0								
	DN 100	110	337	157	189	1.7	260 x 580	**2110.00.00**
	DN 125	125	403	214	241	2.9	320 x 665	**2125.00.00**
	DN 150	160	457	214	241	3.0	320 x 760	**2150.00.00**

Triplex product range accessories

Figure	Designation	Suitable for	Description	Article No.
	Locking cover	■ ACO Triplex single backflow valve, DN 100 ■ ACO Triplex double backflow valve, DN 100	With emergency valve	**2110.20.11**
	Locking cover	■ ACO Triplex single backflow valve, DN 125 / DN 150 ■ ACO Triplex double backflow valve, DN 125 / DN 150	With emergency valve	**2150.20.11**
	Cover	■ ACO Triplex cleaning pipe DN 100 ■ ACO Triplex single backflow valve, DN 100	With seal	**2110.00.11**
	Cover	■ ACO Triplex cleaning pipe DN 125 / DN 150 ■ ACO Triplex single backflow valve, DN 125 / DN 150	With seal	**2150.00.11**
	Push-in part	■ ACO Triplex backflow valves DN 100 DN 125/DN 150	For installation in the housing	**2110.20.15** **2150.20.15**
	Backflow flap	■ ACO Triplex backflow valves DN 100 DN 125/DN 150	For retrofitting or as a replacement part	**2110.20.12** **2150.20.12**
	Test hopper	■ ACO Triplex backflow valves, type 1 & 2	For maintenance, for all nominal diameters	**2110.20.13**
	Locking screw	■ ACO Triplex backflow valves, type 1 & 2	For all nominal diameters	**2110.20.14**

ACO Quatrix-K automatic faecal backflow valve – for faecal wastewater



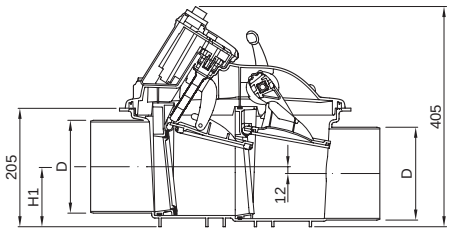
Product advantages

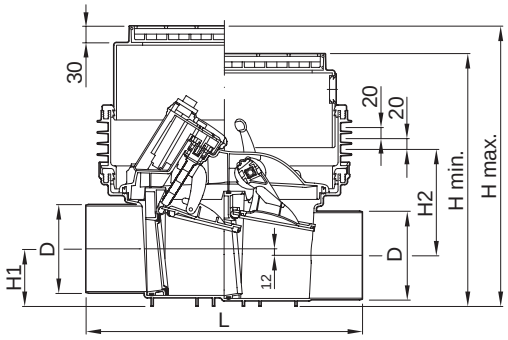
- Only 12 mm fall over valve housing
- Only 71 cm installation opening without reverse gradient
- Optimal for renovation
- CCTV camera accessible
- Optionally with height-adjustable sealing flange for waterproof concrete
- Precise, fault-free backflow detection by pneumatic measuring technology

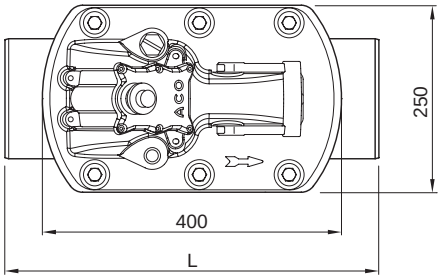
Product information

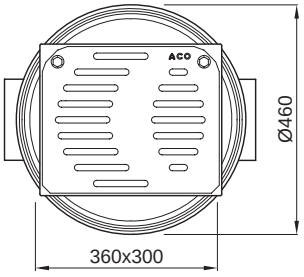
- Plastic
- For installation in the floor or in exposed pipes
- Connection pipes made with spigots in the factory
- Type 3F tested to EN 13564
- With double backflow safety valve
  - With 1 automatic operating seal
  - With 1 manual emergency valve
- With large cleaning and maintenance opening and test hopper
- With ready to plug in, electrical control unit IP 56 with integrated 4-week self-monitoring
  - With pressure sensor (IP68)
  - With visual and acoustic backflow signal
  - With emergency power supply
  - With floating contact for remote messaging
  - Motor is flood-proof IP 68 (3 m, 24 h)
  - Cable length: 5 m (extension to 30 m possible)

Dimensional drawings









Order information

Figure	Nominal diameter	Dimensions						Recess	Weight	Article No.
		D [mm]	L [mm]	H1 [mm]	H2 [mm]	H min [mm]	H max [mm]	[mm]	[kg]	
Installation in the floor slab*										
	DN 100	110	460	79	217	460	512	560 x 710	15.4	**620370**
	DN 125	125	469	86	210	460	512	560 x 730	15.4	**620487**
	DN 150	160	504	104	192	460	512	560 x 820	15.4	**620371**
Installation in exposed pipes										
	DN 100	110	460	79	–	–	–	350 x 710	9.1	**620368**
	DN 125	125	469	86	–	–	–	350 x 730	9.1	**620486**
	DN 150	160	504	104	–	–	–	350 x 820	9.1	**620369**

* Height-adjustable and rotatable top section, surface water-tight reversible cover for tile or plastic sheet, Load class: K3

Figure	Designation	Suitable for	Description	Article No.
	GSM module	■ Wastewater lifting stations ■ Quatrix-K automatic faecal backflow valve, Type 3F	■ Mains independent ■ Visual and acoustic alarm signalling ■ Forwarding of the alarm to mobile phones by SMS text messaging ■ Ingress protection IP54 (with mounted antenna connector IP44)	**0150.46.94**
	Signalling unit	■ Quatrix-K automatic faecal backflow valve, Type 3F ■ Sinkamat-K (underfloor) ■ All Muli lifting stations	■ Self-charging ■ With floating contact ■ Visual and acoustic ■ Without contactor ■ For installation outside the Ex zone ■ Housing: 125 x 175 x 75 mm ■ Ingress protection: IP 65 ■ Operating voltage: 230 V/AC, 50/60 Hz ■ Ready to plug in, with cable: 2 m	**0150.26.73**
	Add-on module with flood detector	■ All wastewater lifting stations ■ Quatrix-K automatic faecal backflow valve, Type 3F	■ For signalling a leakage ■ Visual and acoustic signalling ■ Ready to plug in, 1.4 m ■ Incl. 10 m detector cable	**0150.34.75**
	Extension set	■ Quatrix-K automatic faecal backflow valves, Type 3F	■ Extension ■ For cable conduits DN 70 ■ Angles and bends ≤ 45° ensor cable (10 m) Motor cable (5 m) Weight: 1.0 kg Sensor cable (20 m) Motor cable (15 m) Weight: 2.0 kg Sensor cable (30 m) Motor cable (25 m) Weight: 3.2 kg	 **620515** **620516** **620517**

Figure	Designation	Suitable for	Description	Article No.
	Extension part	■ Backflow valves and cleaning pipes for floor installation ■ Sinkamat-K (underfloor)	■ With lip seal ■ Incremental increase by 116 mm each step, maximum 1 no. for Quatrix	**620381**
	Sealing flange	■ Backflow valves and cleaning pipes for floor installation ■ Sinkamat-K (underfloor) ■ Muli-UF	■ For installation in waterproof concrete □ maximum groundwater level: 2 m	**620510**
	Reversible cover plate	■ Backflow valves and cleaning pipes for floor installation	■ For tiles or plastic sheet, load class K3	**620384**
	Test hopper	■ Quatrix-K automatic faecal backflow valve, Type 3F ■ Junior cellar gulley with backflow valve ■ Fuel oil valves	■ Plastic ■ With sealing ring ■ For maintenance inspection on site	**6010.00.15**
	Signal horn	■ Signalling unit ■ Signalling unit with GSM module	■ Operating voltage: 12 V AC ■ Current consumption: 150 mA ■ 172 x 70 x 78 mm (L x W x D) ■ Ingress protection: IP33 ■ 92 dB(A)	**0150.58.14**
	Flashing light	■ Wastewater lifting stations with ACO Multi Control switching device	■ 230 V ■ Current consumption: 70 mA	**0178.62.08**

Lifting Stations product overview

ACO provides lifting stations for non-faecal wastewater and rainwater. Wastewater from washing machines or washbasins, so-called grey water, does not contain any large solids and is therefore easy to pump.
The ACO Sinkamat-K mono small lifting station is introduced in the following.
For underfloor installation you can choose between the ACO Sinkamat-K mono small lifting station and the ACO Muli-Mini mono small lifting station.

Lifting stations for wastewater are designed to easily transport solids, without blocking – so-called black water, which is contaminated with human faeces.
The ACO Muli-UF mono lifting station can be used for under floor installation.
The ACO Muli-Star mono small lifting station can be used for above-floor installation.

An overview of installation examples for lifting stations

ACO Sinkamat-K mono small lifting station
for non-faecal wastewater – for underfloor installation

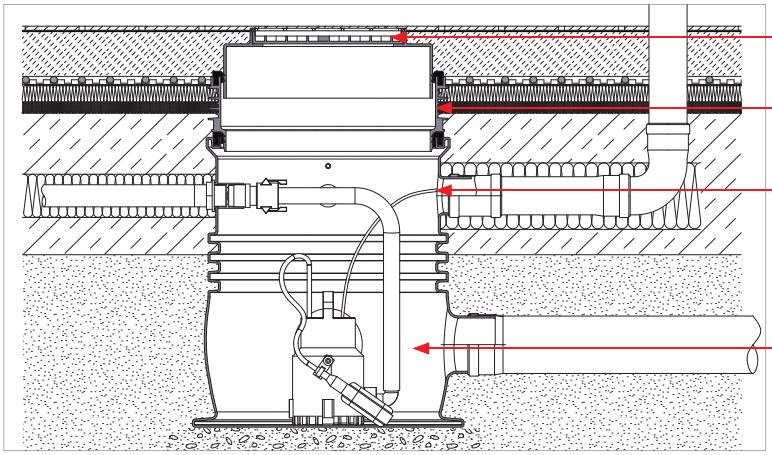
The ACO Sinkamat-K small lifting stations for underfloor installation has several connection options and can be optionally equipped with a height-adjustable sealing flange for waterproof concrete.

Backflow loop

For product information see Page 40

Installation drawing

Application: Floor build-up with thermal insulation



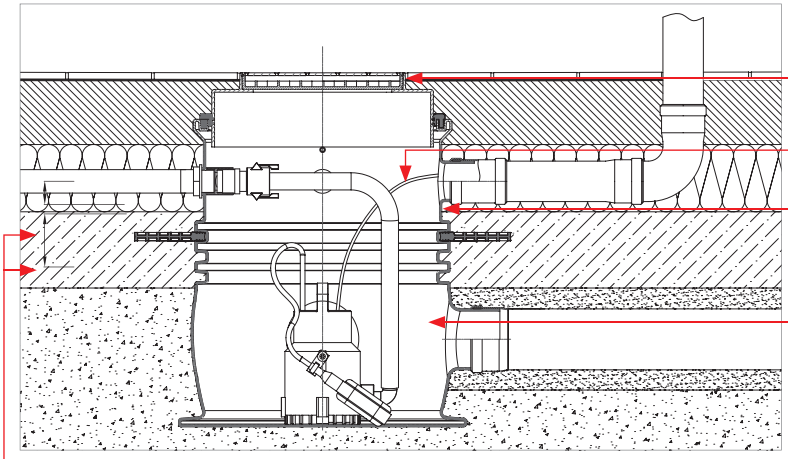
Telescopically adjustable top section with K3 reversible plate

Extension part

Pump cable

ACO Sinkamat-K small lifting stations for underfloor installation in frost free space below the backflow level with sealing flange
Art. No. 620491

Application case: Floor build-up with thermal insulation, sealing in the waterproof concrete
The lifting station can be optionally equipped with a height-adjustable sealing flange for waterproof concrete.



Telescopically adjustable top section with K3 reversible plate

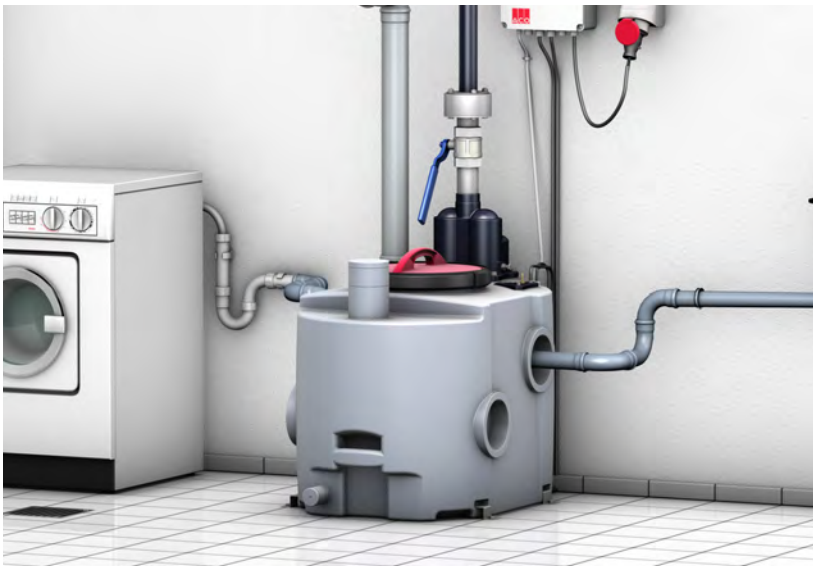
Pump cable

Sealing flange for waterproof concrete, height adjustable

ACO Sinkamat-K small lifting station for underfloor installation in frost free space below the backflow level with sealing flange
Art. No. 620492

Cover at the top and bottom at least 60 mm, 150 mm at the side

ACO Muli-Mini small lifting station
For non-faecal wastewater – for freestanding installation

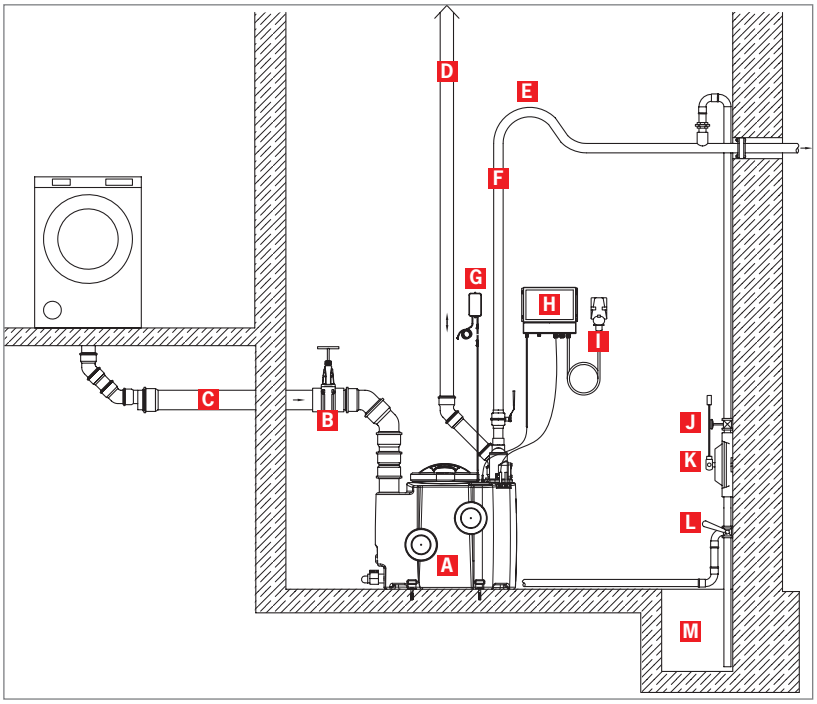


The Muli-Mini small lifting station is suitable for pumping non-faecal domestic wastewater from laundry rooms or basement rooms. Despite its large usable volume the plant is designed with small dimensions for installation even in small rooms or spaces.

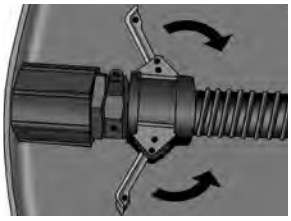
For product information see Page 46

Installation drawing

Application : Freestanding installation in the shaft



- **A** ACO Muli-Mini mono small lifting station for freestanding installation in a frost free space below the backflow level **Art. No. 1206.00.06**
- **B** Inlet stop valve (optional)
- **C** Inlet line
- **D** Ventilation line
- **E** Backflow loop
- **F** Pressure pipe
- **G** Air bubble injection (optional)
- **H** Pump control
- **I** CEE plug (400 V)
- **J** Stop valve (optional)
- **K** Manual diaphragm pump (optional)
- **L** Three-way valve (accessory)
- **M** Pump sump (on site requirement)



Toolless installation
The pump can be installed and dismantled without tools thanks to a quick-release coupling.

An overview of installation examples for lifting stations

ACO Muli-UF mono wastewater lifting station for faecal wastewater – for underfloor installation

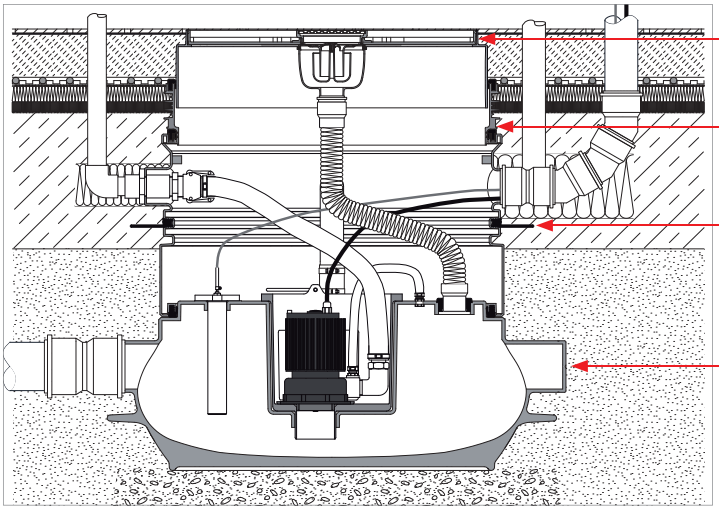
The Muli-UF wastewater lifting station for faecal wastewater has been especially designed for installation in detached houses. It has three inlet options for optimum connection. The height-adjustable flange for sealing in waterproof concrete is available as an accessory.

Backflow loop

For product information see Page 48

Installation drawing

Application: Floor build-up without insulation below the concrete floor, sealing in the waterproof concrete



Telescopically adjustable top section with integrated floor gully (water trap height = 50 mm)

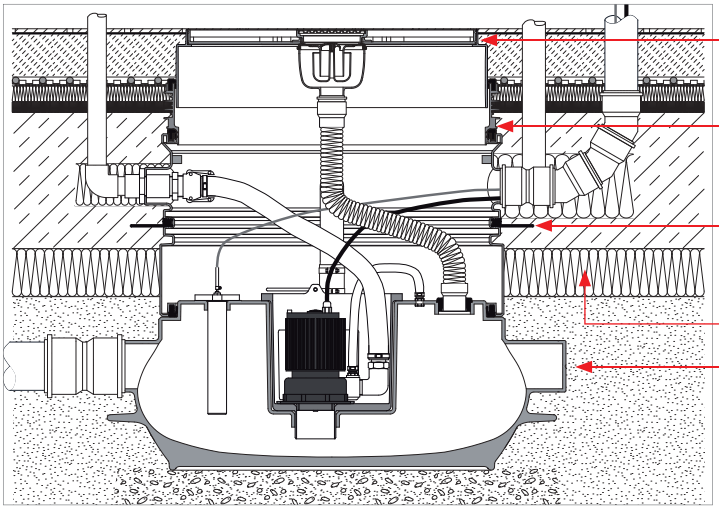
Extension part

Sealing flange for waterproof concrete, height-adjustable, concrete cover at top and bottom: 60 mm – side cover: 150 mm

ACO Muli-UF small lifting station for underfloor installation in frost free space below the backflow level with sealing flange

Art. No. 1203.00.00

Application: Floor build-up with insulation below the concrete floor, sealing in the waterproof concrete



Telescopically adjustable top section with integrated floor gully (water trap height = 50 mm)

Extension part

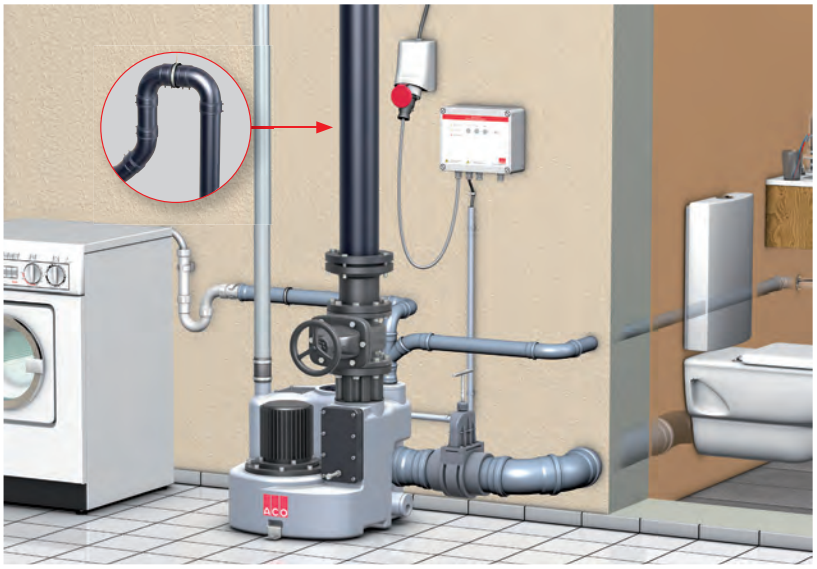
Sealing flange for waterproof concrete, height-adjustable, concrete cover at top and bottom: 60 mm – side cover: 150 mm

Insulation underneath the concrete slab

ACO Muli-UF small lifting station for underfloor installation in frost free space below the backflow level with sealing flange

Art. No. 1203.00.01

ACO Muli-Star mono wastewater lifting station
for faecal wastewater – for freestanding installation / above-floor installation

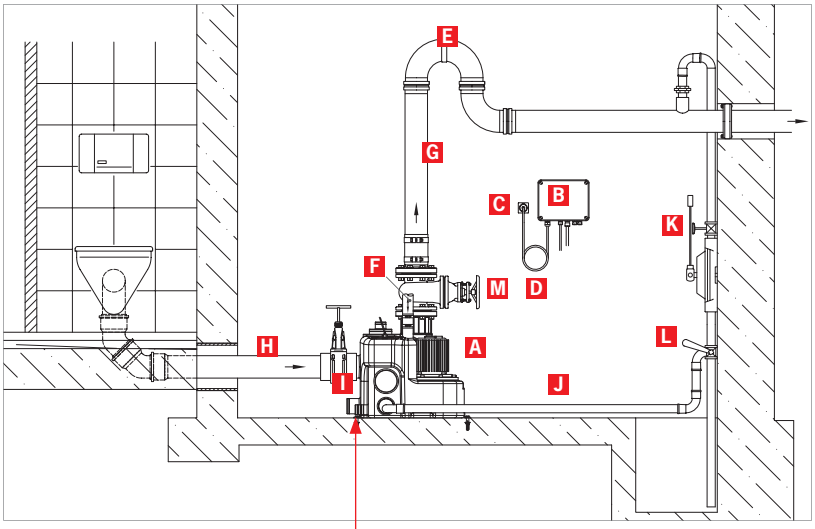


The ACO Muli-Star mono wastewater lifting station has been especially developed for use in detached houses or basement flats: Compact dimensions and five connection options from different places enable use even in the most difficult installation situations.

For product information see Page 50

Installation drawing

Application case: Granny flat, freestanding installation



- **A** Muli-Star MWP1 lifting station
- **B** Switchbox
- **C** Socket with earth contact
- **D** Connection cable with plug
- **E** Backflow loop
- **F** Chamber ventilation
- **G** Pressure pipe
- **H** Inlet line
- **I** Inlet stop valve (accessory)
- **J** Chamber ventilation line
- **K** Manual diaphragm pump (accessory)
- **L** Three-way valve (accessory)
- **M** Pressure line stop valve (accessory)

Buoyancy protection

- The plant must stand firmly on the floor and must be locked against rotation
- To prevent floating in case of flooding
- For preventing damage to connections / pipes

ACO Sinkamat-K mono small lifting station for non-faecal wastewater – for underfloor installation

Several connection options and can be equipped with a height-adjustable sealing flange for waterproof concrete.

Product advantages

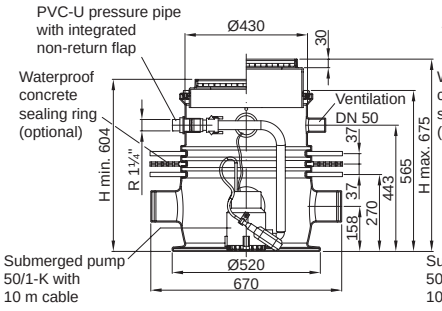
- Quick-release coupling for toolless installation / dismantling of the pump
- Optional waterproof concrete sealing possible
- Several connection options available
- Top section optionally with frame size 198 x 198 mm or 360 x 300 mm (telescopically height-adjustable)
- Optional cover for selectable surface and odour trap

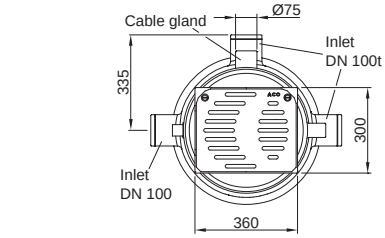
Product information

- Areas of use
  - In frost free rooms below the backflow level, e.g. in basement, hobby and laundry rooms
  - For domestic non-faecal wastewater, e.g. from showers, washbasins, etc.
- Tested to EN 12050-2
- Housing made out of polyethylene
- Usable volume: 15 l
- With 3 inlet sockets DN 100
- With height-adjustable top sections
- Motor housing and shaft made of stainless steel
- Pump housing and impeller made of plastic
- Mechanical seal between pump housing and motor
- With 10 m connection cable and earthed safety plug
- With ball float switch
- With integrated non-return flap R 1¼"
- Pressure line connection to EN ISO 15493
  - PVC-U; 50-40-R 1¼"
- Voltage 220 V, speed 2,800 rpm, particle size 10 mm, total volume 70 l

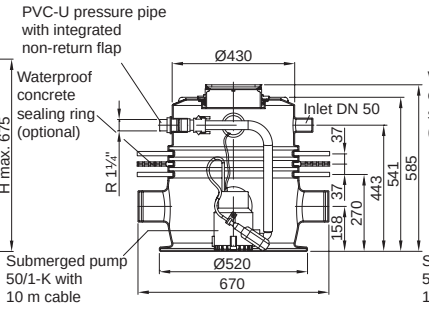
Dimensional drawings

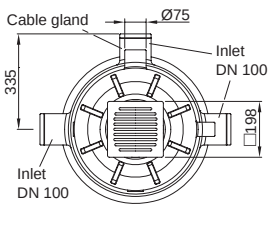
Sinkamat-K with closed cover, 360 x 300 mm
Article No. 620441, 620491



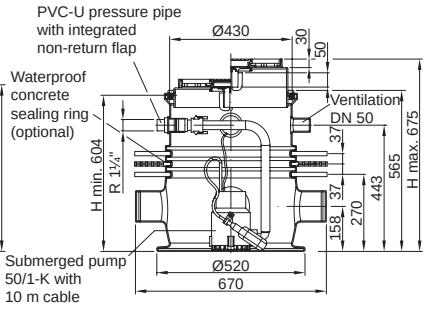


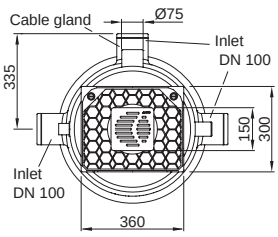
Sinkamat-K with top section without odour trap, 198 x 198 mm
Article No. 620387, 620490



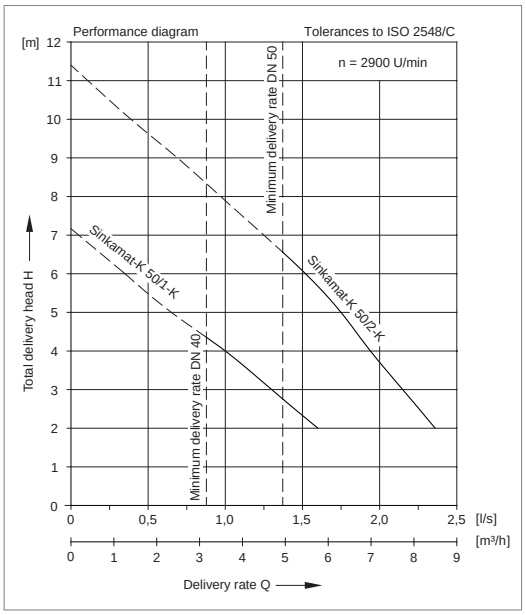


Sinkamat-K with floor gully and odour trap, cover 360 x 300 mm
Article No. 620442 and 620492





Performance parameters



Type	Head	Flow Q at total head H							Delivery media temperature	
	[m]	2 m [l/s]	3 m [l/s]	4 m [l/s]	5 m [l/s]	6 m [l/s]	7 m [l/s]	8 m [l/s]	Normal [°C]	Maximum [°C]
50/1-K mono	2 – 4.5	1.6	1.3	1.0	0.65	0.35	–	–	40	70
50/2-K mono	2 – 8.5	2.3	2.2	1.9	1.7	1.5	1.2	0.9	40	70

Note: The maximum pumped media temperature may only be reached for a short period.

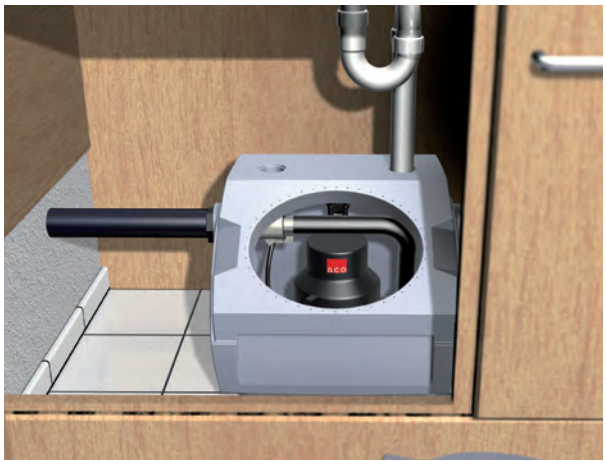
Order information

Figure	Type	Top section	Motor rating P1 [kW]	Motor rating P2 [kW]	Current consumption [A]	Weight [kg]	Article No.
	50/1-K 50/2-K	■ Frame size: 360 x 300 mm ■ Reversible cover plate, Load class K3	0.35	0.2	1.8	23.1	**620441**
			0.65	0.35	3.7	24.6	**620491**
	50/1-K 50/2-K	■ Frame size: 198 x 198 mm ■ Slot grating, Load class K3	0.35	0.2	1.8	23.1	**620387**
			0.65	0.35	3.7	24.6	**620490**
	50/1-K 50/2-K	■ Frame size: 360 x 300 mm ■ Cover for selectable surface ■ With odour trap ■ With slot grating, Frame size: 150 x 150 mm, Load class K3	0.35	0.2	1.8	23.1	**620442**
			0.65	0.35	3.7	24.6	**620492**

Accessories

Figure	Designation	Suitable for	Description	Article No.
	GSM module	■ Wastewater lifting plants ■ Quatrix-K automatic faecal backflow valve, Type 3F	■ Mains independent ■ Visual and acoustic signalling ■ Forwarding of the alarm to mobile phones by SMS text messaging ■ Ingress protection IP54 (with mounted antenna connector IP44)	**0150.46.94**
	Signalling unit	■ Quatrix-K automatic faecal backflow valve, Type 3F ■ Sinkamat-K (underfloor) ■ All Muli wastewater lifting stations	■ Self-charging ■ With floating contact ■ Visual and acoustic ■ Without contactor ■ For installation outside the Ex zone ■ Housing: 125 x 175 x 75 mm ■ Ingress protection: IP 65 ■ Operating voltage: 230 V/AC, 50/60 Hz ■ Ready to plug in, with cable: 2 m	**0150.26.73**
	Contactor	■ Sinkamat-S/Z/K	■ With 10 m cable ■ For separate signalling unit / isolated fault signal ■ Suitable for signalling unit 0150.26.73	**0159.12.46**
	Plug-in module with flood detector	■ All wastewater lifting plants ■ Quatrix-K automatic faecal backflow valves, Type 3F	■ For signalling a leakage ■ Visual and acoustic signalling ■ Ready to plug in, 1.4 m ■ Incl. 10 m detector cable	**0150.34.75**
	Pressure line set	■ Sinkamat-K ■ Muli-UF	Pressure line set consisting of: ■ Socket 1¼" ■ Flexible hose 5 m	**620493**
	Sealing flange	■ Backflow valves and cleaning pipes for under-floor installation ■ Sinkamat-K (underfloor) ■ Muli-UF	■ For installation in waterproof concrete ■ Maximum groundwater level: 2 m	**620510**
	Complete cover plate	■ Sinkamat-K (underfloor)	■ Cover for selectable surface ■ With slot grating ■ Frame size: 150 x 150 mm, Load class: K3 ■ With odour trap ■ Water trap: 50 mm	**620385**
	Extension part	■ Backflow valves and cleaning pipes for under-floor installation ■ Sinkamat-K (underfloor)	■ With lip seal ■ Incremental increase by 116 mm each ■ Install maximum two extension pieces in the Sinkamat-K	**620381**

ACO Sinkamat-K mono small lifting station for faecal wastewater – for freestanding installation



For appliances installed in the basement at a later date, e.g. sinks, washing machines or showers.

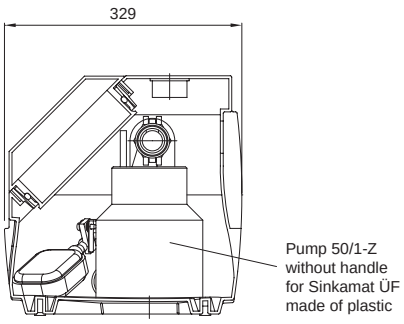
Product advantages

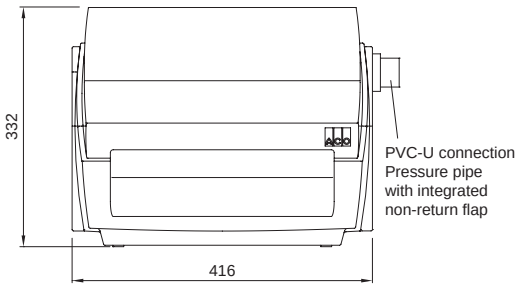
- Quick-release coupling for toolless installation / dismantling of the pump
- Compact due to innovative shape
- Maintenance without removing the inlet trap

Product information

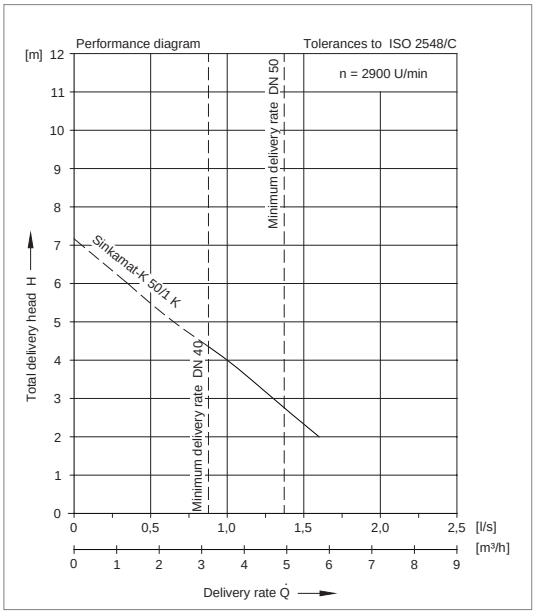
- Area of use:
  - For underfloor installation in frost free space below the backflow level, e.g. in basement, hobby and laundry rooms
  - For domestic non-faecal wastewater, e.g. from showers or washbasins, etc.
- Housing made out of polyethylene
- With several connection options up to DN 50
- With inspection opening at the front
- Housing ventilation through activated charcoal filter
- Grey water submerged pump with robust a.c. motor
- Motor housing and shaft made of stainless steel
- Pump housing and impeller plastic
- Mechanical seal between pump housing and motor
- With 10 m connection cable and earthed safety plug
- With ball float switch
- With integrated non-return flap R 1¼"
- Pressure line connection to EN ISO 15493
  - PVC-U, 50-40-R 1¼"
- Tested to EN 12050-2

Dimensional drawings





Performance parameters



Type	Head	Flow Q at total head H					Pumped media temperature	
		2 m	3 m	4 m	5 m	6 m	Normal	Maximum
	[m]	[l/s]	[l/s]	[l/s]	[l/s]	[l/s]	[°C]	[°C]
50/1-K	2 – 4.5	1.6	1.3	1.0	0.65	0.35	40	70

Note: The maximum pumped media temperature may only be reached for a short period.

Order information

Figure	Type	Motor rating		Current consumption	Volt-age	Speed	Particle size	Total volume	Article No.
		P1	P2						
		[kW]	[kW]	[A]	[V]	[rpm]	[mm]	[l]	
	50/1-K	0.35	0.2	1.8	220	2,800	10	15	**620386**

Accessories

Figure	Designation	Suitable for	Description	Article No.
	Inlet socket DN 50	■ Junior cellar gully with backflow valve ■ Cellar gully DN 100 ■ Sinkamat-K (free-standing installation)	■ Plastic ■ For lateral inlet option ■ For on-site installation ■ Weight: 0.1 kg	**2410.00.04**
	Plug-in module with flood detector	■ All wastewater lifting stations	■ For signalling a leakage ■ Visual and acoustic signalling ■ Ready to plug in, 1.4 m ■ Incl. 10 m detector cable	**0150.34.75**

ACO Muli-Mini small lifting station for non-faecal wastewater – for freestanding installation

Despite the large usable volume, small diameter of less than 70 cm. Can also be installed in small spaces.

Product advantages

- Ready to connect
- Ergonomic handgrip
- Selcetable inlet hights
- High usable volume – up to 140 l
- High chemical resistance of all components
- Toolless dismantling of the pump
- Adapted to minimum door size 700 mm
- Low weight

Product information

- Areas of use:
  - Laundry rooms, basement rooms, storage rooms
- Housing made out of polyethylene
  - Bottom outlet R 1"
  - Inspection opening for easy maintenance, Ø 340 mm
  - Fixing set for buoyancy-proof anchorage
  - Connection for manual diaphragm pump DN 50
  - 4 horizontal/1 vertical inlet sockets DN 100
  - Optional 1 vertical inlet socket DN 50 (accessory)
  - 1 ventilation socket DN 70
- Discharge line connection
  - Special backflow valve with ball in the housing
  - With vent and immobilising screw
  - Connection: Rp 2“
- Grey water submerged pumps
- With three-phase current submerged motor pump: 400 V, 50 HZ – type D
- With alternating current submerged pump 230 V, 50 Hz – type W
  - Ingress protection IP 68 Made of stainless steel
  - Double mechanical seal with oil chamber between the seals
  - With blockage-free free-flow impeller
  - 10 m connection cable
- Level switching
  - Pneumatic level switching with 10 m control cables
  - Optionally with air bubble injection to increase operating reliability if installed downstream of a grease separator (accessory)
- Control
  - Ingress protection IP 54
  - 1.5 m cable and CEE plug (16 A) – type W
  - Isolated group alarm and operation signal
- Tested to EN 12050-2

Dimensional drawings*

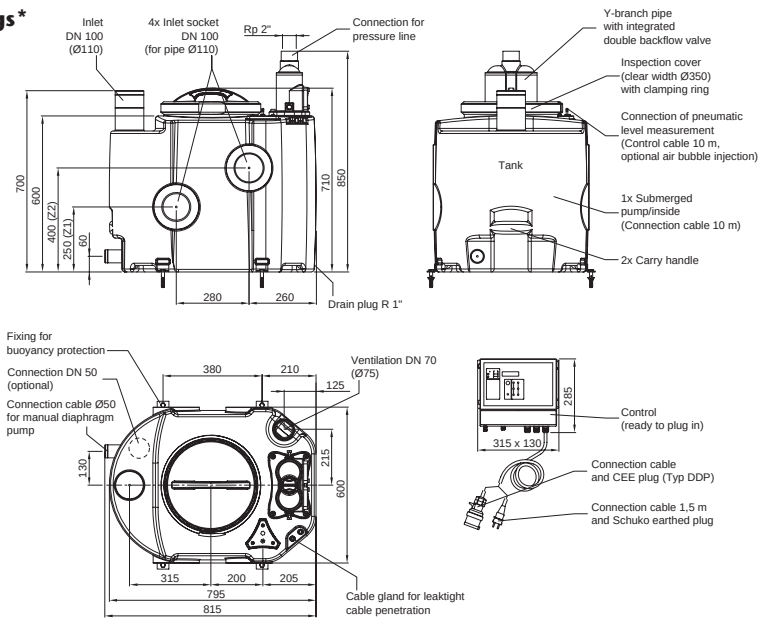
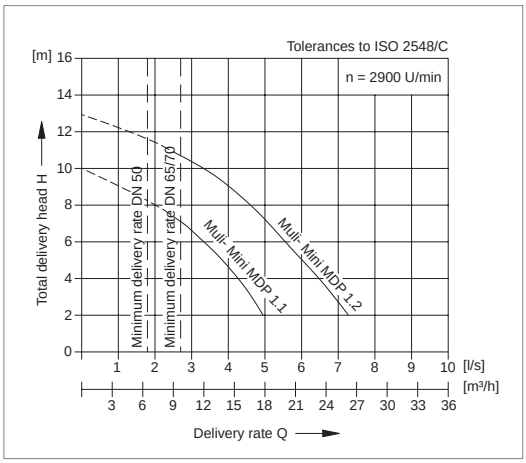


*Figure shows mono control

Performance parameters



Type	Head	Flow Q at total head H						Pumped media temperature	
	[m]	2 m [l/s]	4 m [l/s]	6 m [l/s]	8 m [l/s]	10 m [l/s]	12 m [l/s]	Normal [°C]	Maximum [°C]
MDP 1.1	2 – 8.2	4.9	4.3	3.2	2.0	–	–	40	65
MDP 1.2	2 – 11.6	7.2	6.4	5.5	4.6	3.4	1.5	40	65

Note: The maximum pumped media temperature may only be reached for a short period.

Order information

Figure	Type	Motor rating		Current consumption	Voltage	Speed	Particle size	Total volume	Usable volume			Weight	Article No.
		P1 [kW]	P2 [kW]	[A]	[V]	[rpm]	[mm]	[l]	Inlet height Z1 [l]	Inlet height Z1 [l]	Inlet from above [l]	[kg]	
	MDP 1.1	1.04	0.75	2	400	2900	38	190	60	108	140	50	**1206.00.05**
	MDP 1.2	1.86	1.2	4	400	2900	38	190	60	108	140	54	**1206.00.06**
	MWP 1.1	1.04	0.75	5.5	230	2900	38	190	60	108	140	50	**1206.00.07**
	MWP 1.2	1.93	1.2	9	230	2900	38	190	60	108	140	54	**1206.00.08**

For accessories see Page 52

ACO Muli-UF mono wastewater lifting station for faecal wastewater – for underfloor installation

Three inlet options for an optimum connection. The height-adjustable flange for sealing in the waterproof concrete is available as an accessory.

Product advantages

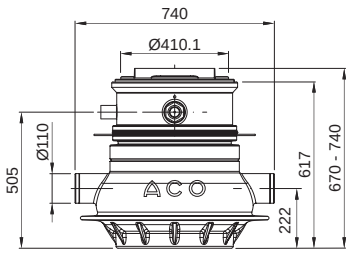
- Easily placed in position due priduct construction
- Choice of 3 inlets
- High usable volume – 27 l
- Easy assembly / disassembly of the pump due to separate pump chamber
- Fully adequate floor drain in top section

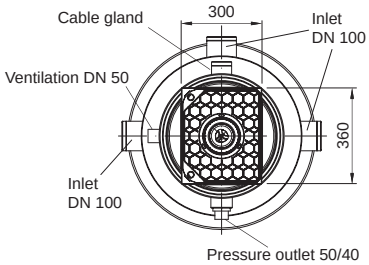
Product information

- Areas of use:
  - Detached houses
  - Basement flats
  - For underfloor installation in frost free spaces
- Housing made out of polyethylene
  - 2 different housing sizes available
  - 3 horizontal inlet sockets DN 100
  - 1 socket for cable penetration DN 50
  - 1 ventilation socket DN 50
- Top section for selectable surface
  - Load class K3
  - Rotatable and height-adjustable
  - Integrated floor gully with water trap height 50 mm
  - Inspection opening 330 x 250 mm
  - Slot grating: 150 x 150 mm
- Discharge line connection
  - Pressure line connection to EN ISO 15493 made of PVC-U; 50 – 40-R 1¼"
  - Integrated non-return flap
- Cutter pump
  - Ingress protection IP 67
  - Installed in separate pump chamber
  - With mechanical seal
  - 10 m connection cable
- Level switching
  - Pneumatic level switching with 10 m control cable
- Control
  - Ingress protection IP 54
  - 1.5 m cable and plug with earthing contact
  - Isolated group alarm and operation signal

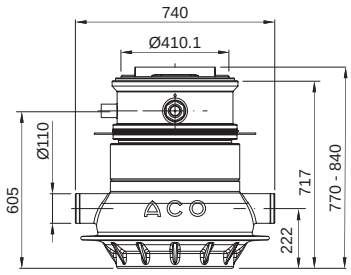
Dimensional drawings

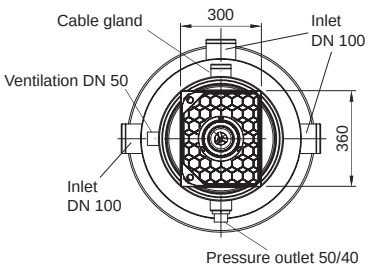
Muli-UF MWP1



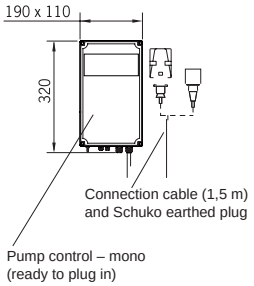


Muli-UF MWP2

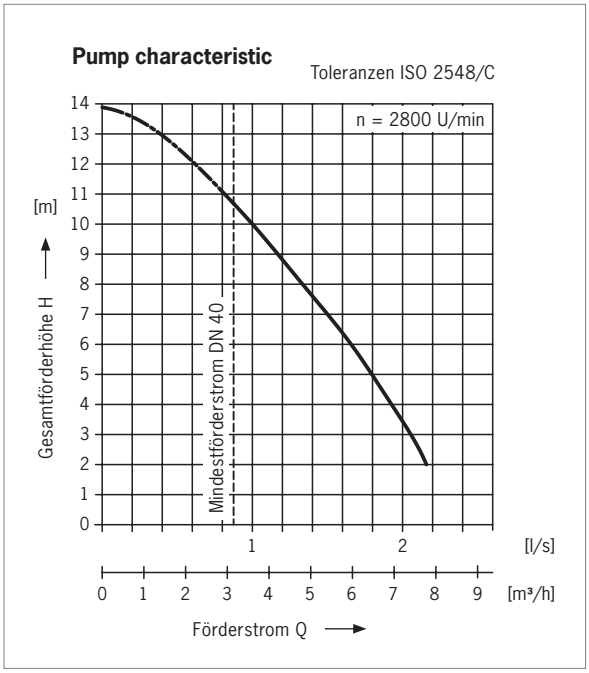




Switchbox



Performance parameters



Type	Head	Flow Q at total head H						Delivery media temperature	
	[m]	2 m [l/s]	4 m [l/s]	6 m [l/s]	8 m [l/s]	10 m [l/s]	10.6 m [l/s]	Normal [°C]	Maximum [°C]
Muli-UF MWP 1/2	2 – 10.6	7.8	6.9	6	4.8	3.6	3.17	40	60

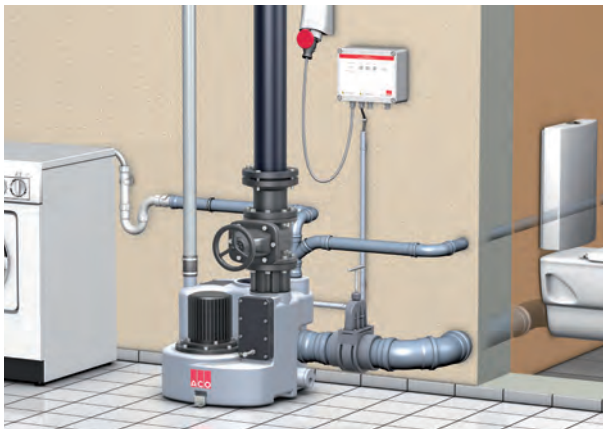
Note: The maximum pumped media temperature may only be reached for a short period.

Order information

Figure	Overall height	Motor rating		Current consumption	Voltage	Frequency	Speed	Total volume	Usable volume	Weight	Article No.
		P1	P2								
	[kW]	[kW]	[kW]	[A]	[V]	[Hz]	[rpm]	[l]	[l]	[kg]	
	670 – 740 mm	0.9	0.6	4	230	50	2,800	58	26	38	**1203.00.00**
	770 – 840 mm	0.9	0.6	4	230	50	2,800	58	27	39	**1203.00.01**

For accessories see Page 52

ACO Muli-Star mono wastewater lifting station for faecal wastewater – for freestanding installation



Compact dimensions and five connection options from different places enable use even in the most difficult installation situations.

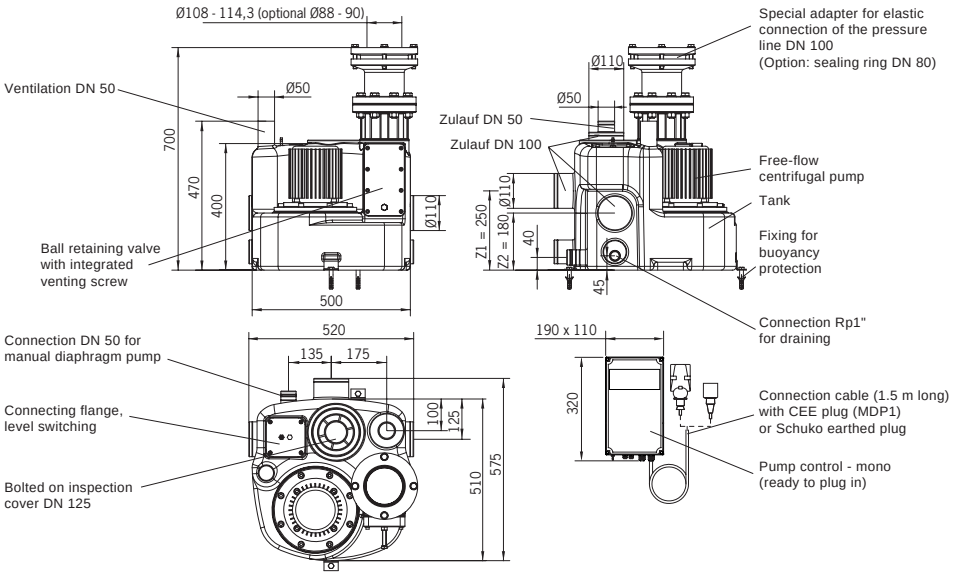
Product advantages

- Low weight: 31 kg
- Smooth and quiet running due to low speed
- Free passage: 57 mm
- Fast installation
- Ready to connect
- Can be installed through cover KM 600
- Blockage-free free flow impeller

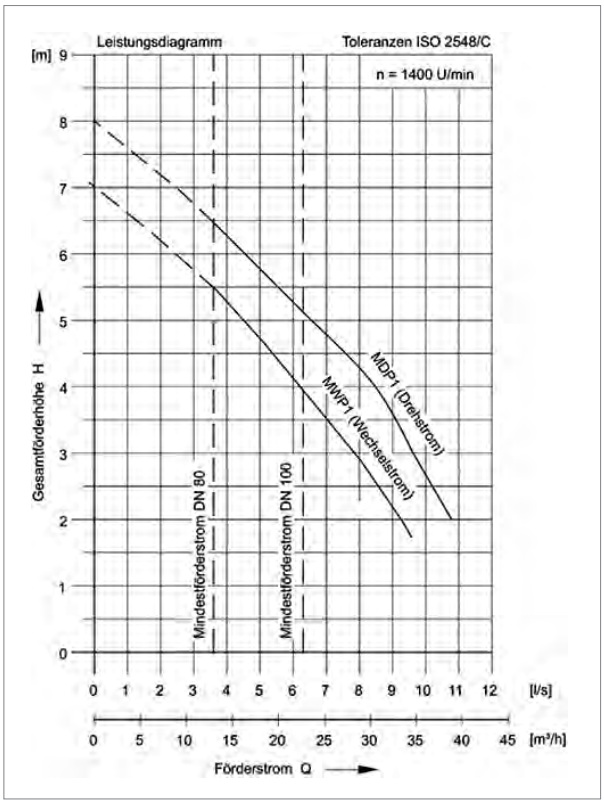
Product information

- Area of use
  - Detached houses, basement flat
- Housing made out of polyethylene
- With bottom outlet Rp 1"
- With inspection opening for easy maintenance, Ø 133 mm
- With fixing set for buoyancy-proof anchorage
- Connection for manual diaphragm pump DN 50
- With 3 inlet horizontal sockets DN 100
- With 1 vertical inlet socket DN 50 / DN 100
- With ventilation connection DN 50 for connection to plastic pipe
- Discharge line connection
  - Special backflow valve with ball integrated in the housing with screw drain plug
  - With integrated special adapter DN 100 for elastic connection of the pressure line of 108 – 114.3 mm outside pipe diameter
  - With connecting flange for stop valve DN 80 PN 10
- Pump unit
  - 3-phase motor (MDP1): 400 V, 50 Hz
  - A.C. motor (MWP1): 230 V, 50 Hz
  - Ingress protection IP 68
  - With blockage-free free-flow impeller
- With pneumatic level switching with 5 m control cable, adjustable to inlet height
- Switching and warning device
  - Ingress protection IP 54
  - With 1.5 m cable and CEE plug (for MDP1) and with plug with earthing contact (MWP1)
  - With isolated group alarm and operation signal
- Tested to EN 12050-1

Dimensional drawings



Performance parameters



Type	Head	Flow Q at total head H			Pumped media temperature	
		2 m	4 m	6 m	Normal	Maximum
	[m]	[l/s]	[l/s]	[l/s]	[°C]	[°C]
MDP1	2.5 – 6.5	10.9	8.6	4.5	40	60
MWP1	2.5 – 5.5	9.7	7.0	–	40	60

Note: The maximum pumped media temperature may only be reached for a short period.

Order information

Figure	Type	Motor rating		Current consumption	Voltage	Frequency	Speed	Particle size	Total volume	Usable volume			Weight	Article No.
		P1	P2							Inlet height Z1 [l]	Inlet height Z2 [l]	Inlet from above [l]		
		[kW]	[kW]	[A]	[V]	[Hz]	[rpm]	[mm]	[l]				[kg]	
	MDP1	1	0.75	1.93	400	50	1,380	57	60	20	25	30	31	**1200.50.00**
	MWP1	1.1	0.75	5.05	230	50	1,410	57	60	20	25	30	31	**1200.50.01**

For accessories see Page 52

Figure	Designation	Suitable for	Description	Article No.
	GSM module	■ Wastewater lifting plants ■ Quatrix-K automatic faecal backflow valves, Type 3F	■ Mains independent ■ Visual and acoustic signalling ■ Forwarding of the alarm to mobile phones by SMS text messaging ■ Ingress protection IP54 (with mounted antenna connector IP44)	**0150.46.94**
	Signalling unit	■ Quatrix-K automatic faecal backflow valves, Type 3F ■ Sinkamat-K (underfloor) ■ All Muli wastewater lifting stations	■ Self-charging ■ With floating contact ■ Visual and acoustic ■ Without contactor ■ For installation outside the Ex zone ■ Housing: 125 x 175 x 75 mm ■ Ingress protection: IP 65 ■ Operating voltage: 230 V/AC, 50/60 Hz ■ Ready to plug in, with cable: 2 m	**0150.26.73**
	Connection and flood module set	■ Triplex-K backflow valves DN 100 – N 150 ■ Quatrik-K backflow valves ■ All wastewater lifting stations ■ All separators	■ Leak detection alarm, e.g. by pipe burst ■ For electrically conductive liquids ■ With floating contact ■ Visual and acoustic alarm signalling (approx. 80 dB) ■ Dimensions (width x height x depth): 160 x 120 x 75 mm ■ Ingress protection: IP 65 ■ Operating voltage: 230 V/AC 50/60 Hz ■ Ready to plug in: 1.4 m ■ Flood detector with 10 m cable	**0150.34.75**
	Signal horn	■ Signalling unit with isolated fault signal	■ Operating voltage: 230 V AC ■ Current: 15 mA ■ Dimensions: 172 x 70 x 78 mm (L x W x D) ■ Ingress protection: IP33 ■ Noise level: 92 dB(A)	**0178.61.94**
	Air bubble injection	■ Muli-Mini duo ■ Muli-Star DDP 1/2	■ For retrofitting in Muli-Mini and Muli-Star DDP wastewater lifting stations ■ With mini compressor and connection materials ■ To increase operating reliability ■ In case of formation of floating surface cover (greasy wastewater)	**0154.81.27**
	Hex double nipple 2" x 2"	■ Muli-Mini	■ Pressure pipe adaptor from IG 2" to AG 2"	**0155.00.44**
	Special mounting adapter DN 70	■ Muli-Mini	■ Supplementary component for pressure line DN 70	**0175.07.79**
	Special mounting adapter DN 50	■ Muli-Mini	■ Supplementary component for pressure line DN 50 (OD: 57 – 61mm)	**0175.16.84**

Figure	Designation	Suitable for	Description	Article No.
	Ball valve 2"	■ Muli-Mini	■ Supplementary component for pressure line	**0159.31.79**
	Flashing light	■ Signalling unit with isolated fault signal	■ Voltage: 230 V	**0178.62.08**
	Inlet valve DN 50	■ Eco-Mobil ■ Muli-Mini	■ Made out of PVC ■ Seal ring to DIN 19538	**0175.18.33**
	Inlet valve DN 100	■ Wastewater lifting plants	■ Made out of PVC ■ Overall length: 176 mm ■ Weight: 2.75 kg	**0175.13.84**
	Manual diaphragm pump R 1½"	■ Wastewater lifting plants	■ For wall mounting incl. hose ■ Clear opening 48 x 80 mm ■ Incl. hose clamps Clear opening: 50 x 70 mm Width: 12 mm 2 no. required	**0175.23.73**
	Stop valve R 1½"	■ Wastewater lifting plants	■ For manual diaphragm pump	**0159.10.12**
	Sealing flange	■ Backflow valves and cleaning pipes for underfloor installation ■ Sinkamat-K (underfloor) ■ Muli-UF	■ For installation in waterproof concrete□ Maximum groundwater level: 2 m	**620510**
	Pressure line set	■ Sinkamat-K ■ Muli-UF	Pressure line set consisting of: ■ Socket 1¼" ■ Flexible hose 5 m	**620493**

ACO lifting stations for multiple dwelling units or commercial use

For the drainage of commercially used areas or multiple dwelling units the wastewater flow must not be interrupted.
According to DIN 1986-100 a double lifting station must be installed for such application cases. Depending on the type of wastewater a double lifting station must be chosen for non-faecal wastewater or faecal wastewater. For more information about double lifting stations visit **http://catalogue.aco-haustechnik.de/en/Home/Dimensioning-tools**

Versions

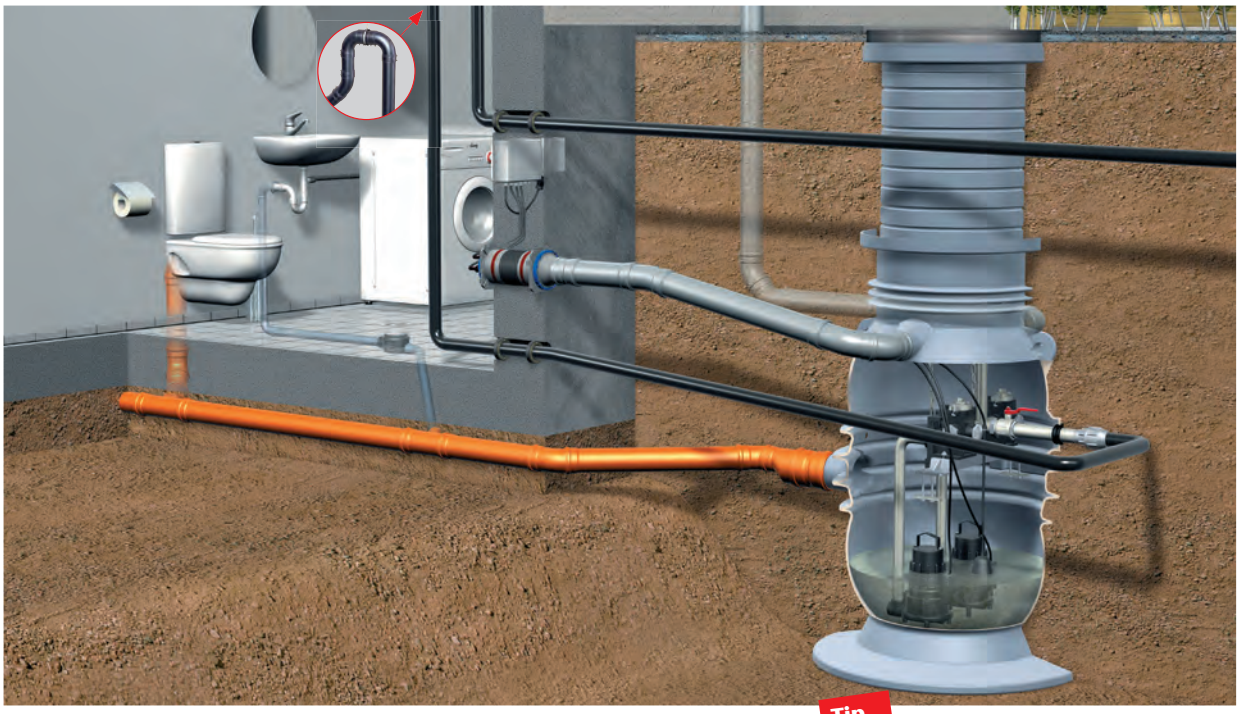
Muli-Mini duo
Maximum usable volume:
140 l

Muli-Star duo
Maximum usable volume:
185 l

Muli-Pro-PE K duo
Maximum usable volume:
330 l

Further information on the ACO lifting stations is provided in the brochure:
"ACO lifting stations and pumping stations for trade and industry"

ACO Muli-Max-F mono/duo prefabricated pumping station



Tip

Prefabricated pumping stations are used for application where it is impossible to assemble on site. They are placed in the ground outside the building, to collect the wastewater and pump it into the sewer system, or they are used to drain separators.

The chamber or manhole can be buried up to 3 metres deep in the ground without on-site concreting works.

Versions

■ Load class A 15

■ Load class B 125

■ Load class D 400

ACO prefabricated pumping stations can be used in any ways. The area of use extends from the drainage of detached houses to commercial facilities through to industrial plants.
ACO pumping stations are made out of polyethylene, and load classes A 15, B 125 and D 400 are available to choose from.
The load class is determined by the cover and not by the type of chamber or manhole.
The prefabricated pumping stations are made as single or double pump systems.
The maximum usable volume is 150 l.
Thanks to their compact design they are easy to install, but nonetheless have optimum stability.
The surface of the plastic is not affected even by aggressive wastewater. The top section of the prefabricated pumping stations is telescopically height-adjustable, the chamber can therefore be buried up to three metres deep in the ground.
For more information about prefabricated pumping stations visit **http://catalogue.aco-haustechnik.de/en/Home/Dimensioning-tools**

ACO service advantages

Each project is different, it has its own requirements and challenges. Apart from our products, we also offer you our know-how and services, to develop tailormade solutions together – from the design through to support following completion.

train:
Information and further training
In the ACO Academy we share the know-how of the worldwide ACO Group with architects, design engineers, installers and traders, for whom quality is important. We invite you to profit from this.

design:
Design and optimisation
The specification and design of drainage solutions allows many variations. Yet which concept produces the economically best and technically most reliable solution? We help you to find the right answer.

support:
Construction advice and support
To ensure that no unpleasant surprises occur between the design and implementation of a drainage solution, we advise and assist you for a specific project on your construction site.

care:
Inspection and maintenance
ACO products are designed and produced for a long life. With our after-sales offers we ensure that ACO continues to fulfil your high quality standards for many years.

ACO Building Drainage on the internet

The **www.aco-haustechnik.de** website provides plenty of information on double backflow valves so that you can quickly search for something for your clients.

Subscribe to our newsletter!
www.aco-haustechnik.de/newsletter-anmeldung.html

Video
ACO Quatrix-K in use
http://aco.me/rueckstau

Online catalogue
With the new online catalogue on our website you can easily download dimensioned drawings and tender specification texts. Here the product can be chosen by using appropriate selection criteria.
- Product finder
- Simple keyword search and article number
- Tender specification texts (TXT, Datanorm and GAEB)
- Dimensioned drawings (DXF)
- Product illustrations
- Installation and assembly instructions

http://www.aco-haustechnik.de/support/downloads-dokumente-prospekte-usw/englisch-dokumente-eng-

eServices
Wastewater lifting station design
With the help of the design tool for wastewater lifting stations you can determine the suitable plant for your special application case. This is done by entering a few parameters under:
http://catalogue.aco-haustechnik.de/en/Home/Dimensioning-tools
You determine the suitable wastewater lifting station in only three steps
- Enter the on site use conditions
- Select a lifting station with corresponding usable volume
- Design and dimensioning of the pumps
- Output of the calculated values and filling in of the PDF form

Each product made by ACO Building Drainage supports the ACO system chain

collect

- Floor drainage
- Bathroom drainage
- Roof drainage
- Parking deck drainage
- Balcony and terrace drainage
- Pipe systems

clean

- Grease separators
- Starch separators
- Light liquid separators
- Process engineering

hold

- Backflow valves

release

- Lifting stations
- Pumping stations

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