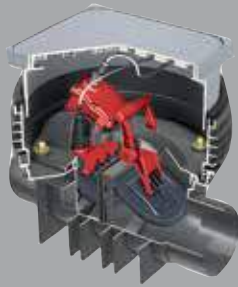
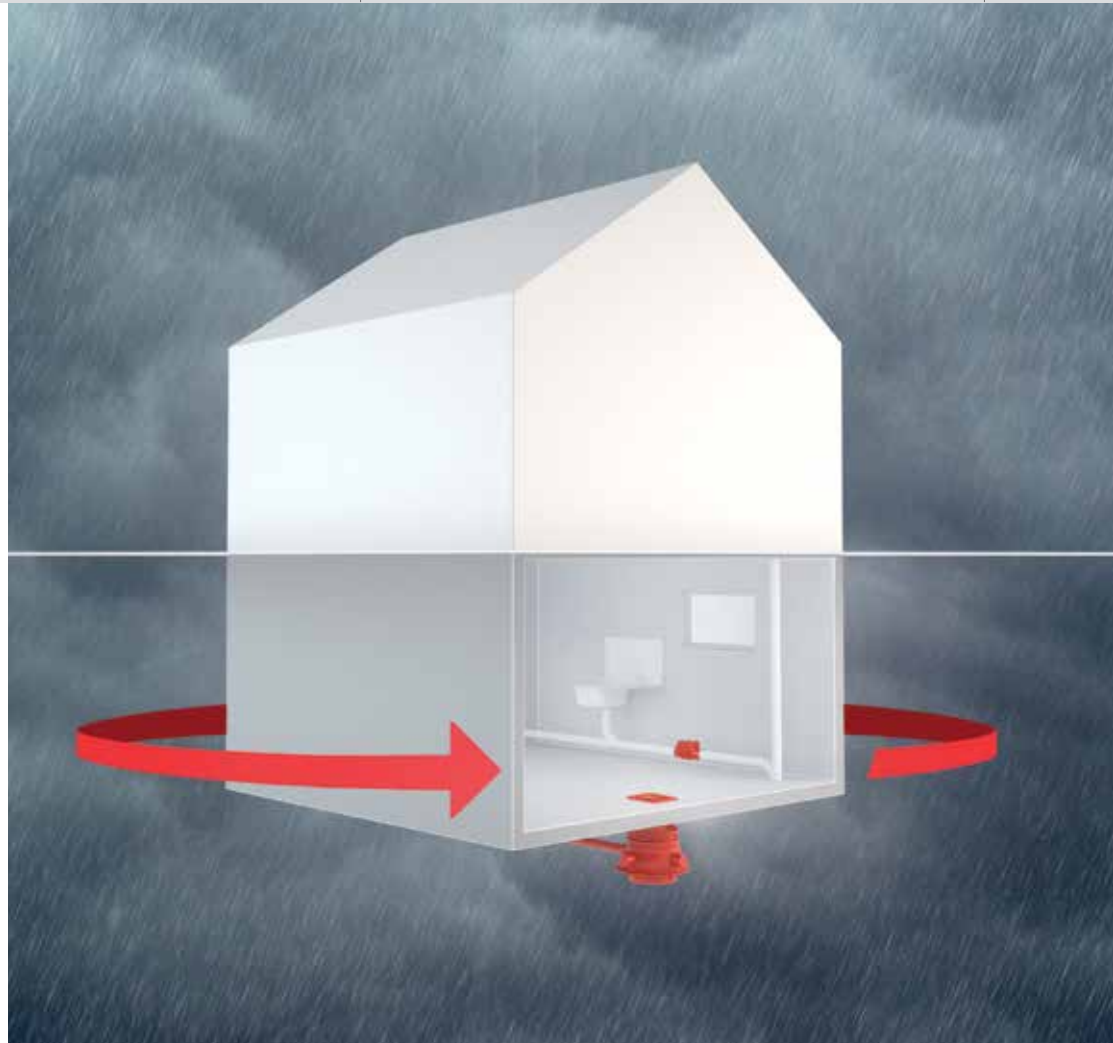


Uniclass L7312	July 2017
CI/SfB (52.9)	

Backflow systems



Protection against backflow

ACO Backflow valves



ACO Building Drainage

Our built environment is becoming ever more complex. Applications are becoming more sophisticated and the increasing pressure of regulations and standards makes achieving design, performance and financial goals ever tougher.

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ACO Building Drainage

Enquiries Team:

Tel: +44(0)1462 810421

Email: abdestimating@aco.co.uk

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hold:

- Anti-flood Backflow Protection Systems



release:

- Lifting Stations

Office address and contact details:

ACO Building Drainage
ACO Business Centre
Caxton Road
Bedford
Bedfordshire
MK41 0LF

Tel: +44(0)1462 810400
Email: abdinfo@aco.co.uk

Company Registration No: 1854115
VAT No: GB 650 7977 05

www.acobd.co.uk

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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 UK 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:

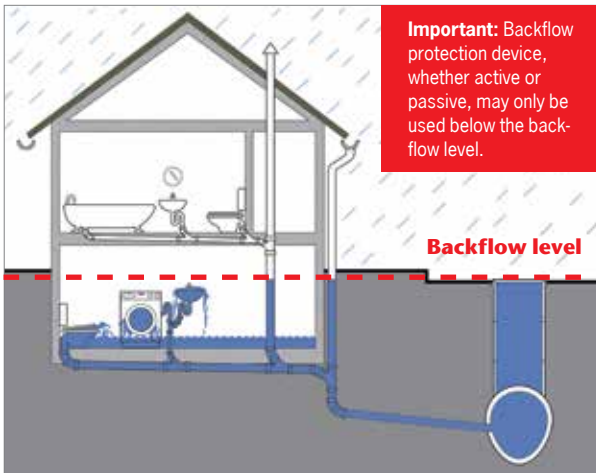
- Sewer blockage or pipe bursts
- Sewer damage, e.g. cross-section reduction due to root growth
- Loss of operation in the pumping stations of the sewer operator, if the local drainage is connected to it
- Unscheduled discharge, e.g. during sewer flushing or fire service deployments
- Increased wastewater 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 Severn in 2014. In the autumn of 2016, many regions in UK were also affected by heavy rainfall events caused by storm 'Angus', the sewers were overloaded and many basements were flooded. Meteorologists agree that floods and extreme rainfall events will continue to increase throughout Europe.

Scope and standard requirements

Without backflow protection

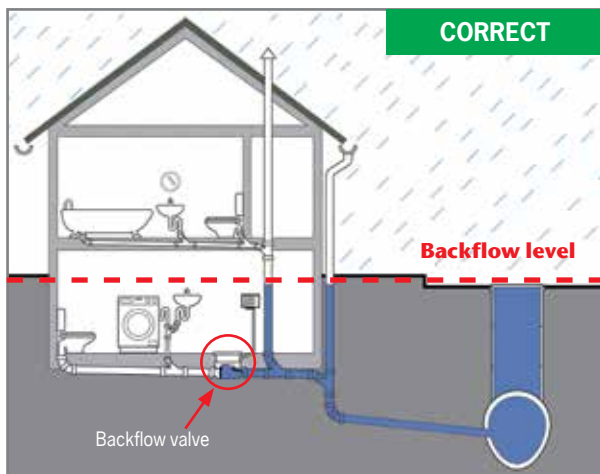


The backflow level is the highest level up to which the wastewater in the drainage system can rise; this is usually up to road level. From this level backflowing wastewater spreads over the surface locally. The backflow level is defined in the byelaws.



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.

With backflow protection to EN 12056



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.

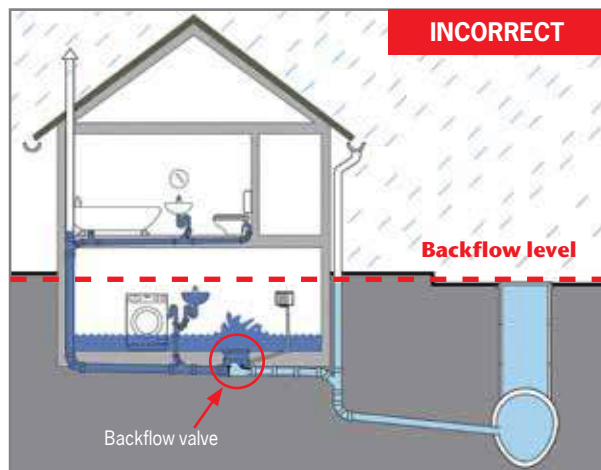
- Direct discharge
- No discharge via backflow valves

Discharge points below the backflow level

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

Backflow valve

- Only stops the flow of the wastewater
- Are only permitted in an exceptional case (see product selection guide, page 7)
- Passive backflow protection through backflow valve in accordance with EN 13564, EN 1253
- Only Type 3 with marking "F" may be used for black water



Technical Information

Standard requirements

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:

- Residential use only

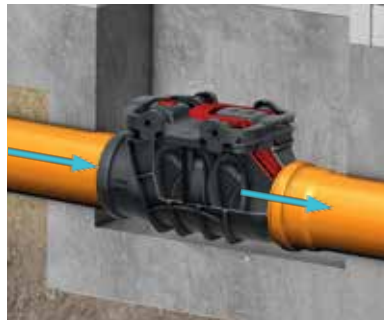
- The waste water must flow using a natural gradient
- The function of the room must be secondary, i.e. not contain significant assets and not impair the health of the users in case the room floods

- A W.C. above the backflow level must be available
- In case of backflow, discharge points can't be used

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.

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

ACO backflow valves product overview by type

Type designations of backflow valves to EN 13564-1

EN13564 defines 6 types of backflow valves (anti-flood devices) and segments their use for rain, grey and black water.

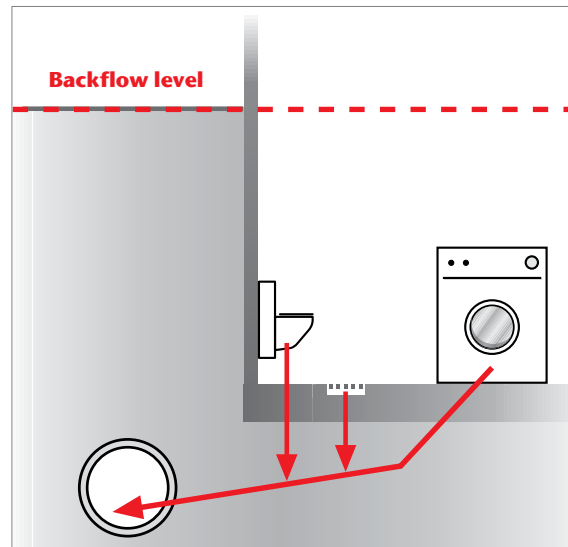
ACO Building Drainage selected 3 types of backflow valves applicable for the UK, see below table with category compliance and application:

Type	Figure	Use	Automatic closure device	Emergency closure device	Area of use	Corresponds to the following ACO products
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
5		Installed in floor gullies	2	1*	Non-faecal wastewater	Junior

* Emergency closure device can be combined with automatic closure device

Production selection guide

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



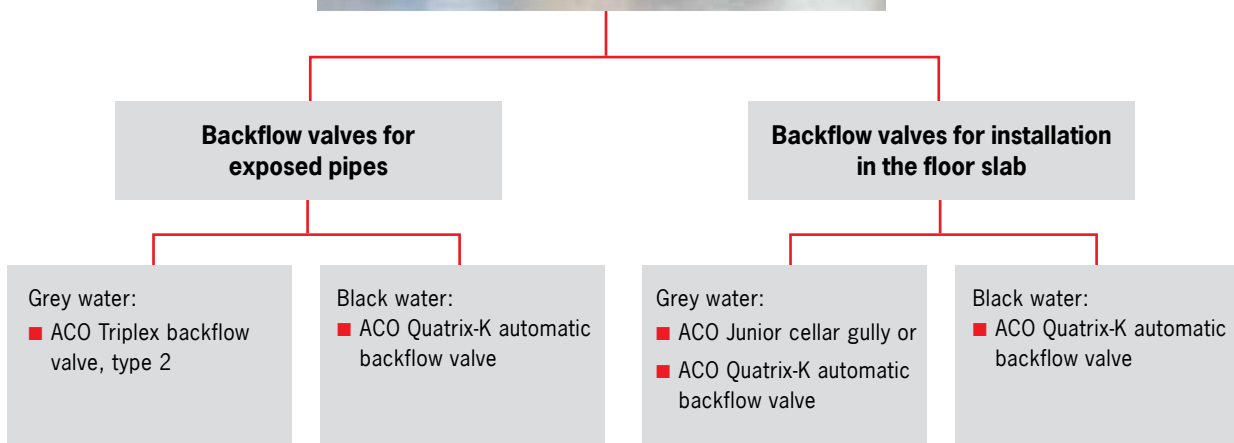
The wastewater produced can be drained to the sewer with natural fall. Discharge points are below the backflow level and are a risk when backflow occurs.

* 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. NO drainage necessary in case of backflow



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.



ACO Junior cellar gully 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

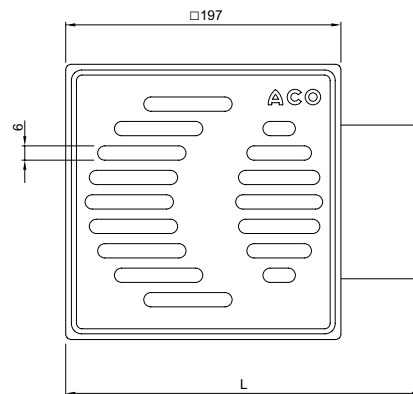
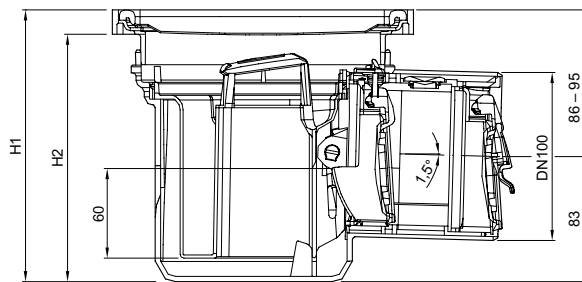
- The compact product dimensions make it ideal for renovation
- Rotatable top section for optimum adjustment to the tiling pattern
- Toolless installation and dismantling of the sludge bucket and backflow unit
- Optional lateral inlet socket DN 50 to be attached on site

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

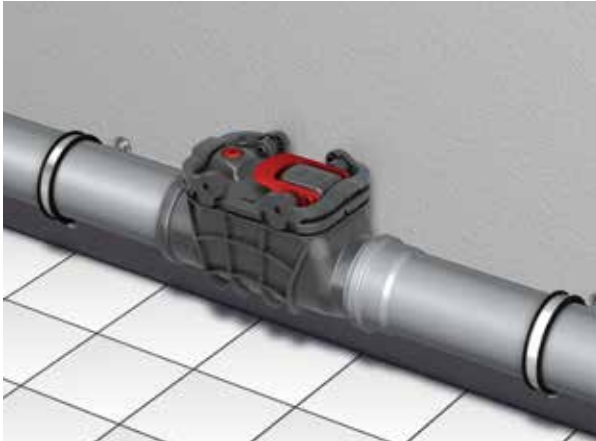
Order information

Figure	Designation	L [mm]	H1 [mm]	H2 [mm]	Recess [mm]	Weight [kg]	Part No.
	ACO Junior cellar gully with slot grating DN 100	255	168 – 177	152 – 161	250 x 400	1.2	105602

Accessories

Figure	Description	Specification	Part No.
	Junior Quadrato grating	<ul style="list-style-type: none"> ■ Stainless steel 304 ■ Linished finish ■ No locking ■ Load class L15 ■ Dim.: 187 x 187 x 6 mm ■ Weight: 1.46 kg 	105440
	Inlet socket DN 50	<ul style="list-style-type: none"> ■ Plastic ■ For lateral inlet options ■ For on-site installation ■ Weight: 0.1 kg 	105603
	Plastic extension	<ul style="list-style-type: none"> ■ For deeper installation ■ Extension height: 130 mm ■ Weight: 0.2 kg 	105601
	Backflow unit	<ul style="list-style-type: none"> ■ Maintenance kit ■ With backflow safety valve DN 100 	105607

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

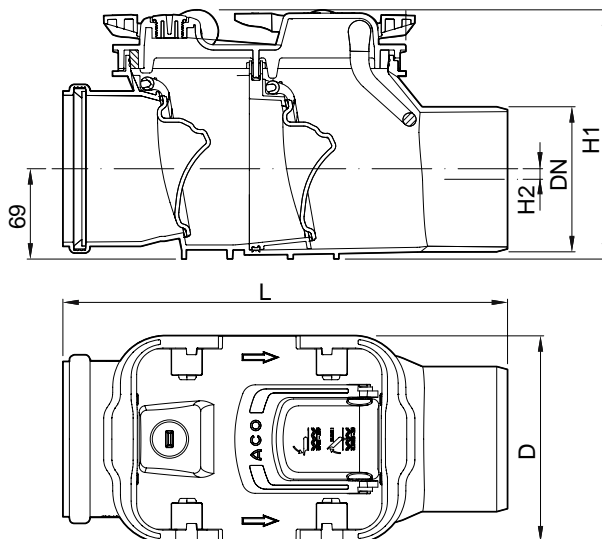
Product information

- Plastic
- For exposed pipes
- Type 2 tested to EN 13564
- For non-faecal wastewater, rainwater harvesting systems



- With two backflow flaps closed by gravity, one of which is a manually lockable emergency valve
- With cleaning and maintenance opening and test hopper

Dimensional drawings

Triplex DN 100 / DN 150



Order information

	Nominal diameter	Dimensions					Recess [mm]	Weight [kg]	Part No.
		OD [mm]	L [mm]	B [mm]	H ₁ [mm]	H ₂ [mm]			
	DN 100	110	337	157	189	8	260 x 580	1.7	107000
	DN 150	160	457	214	241	10	320 x 760	3.0	107001

The new generation of ACO Triplex backflow valves







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

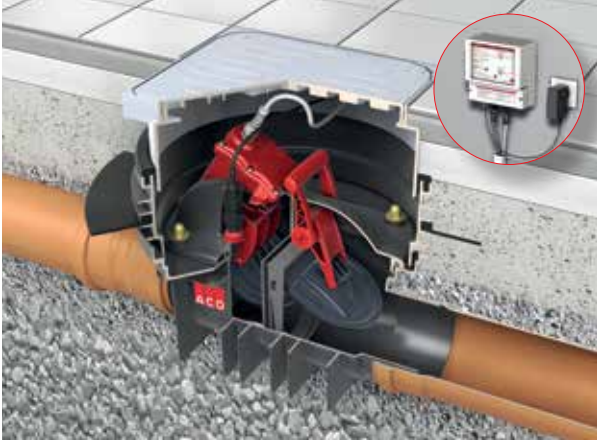


Accessories

Triplex product range accessories

	Description	Suitable for	Specification	Part No.
	Locking cover	■ ACO Triplex double backflow valve, DN 100	With emergency valve	107002
	Locking cover	■ ACO Triplex double backflow valve, DN 125 / DN 150	With emergency valve	107003
	Push-in part	■ ACO Triplex backflow valves DN 100 DN 150	For installation in the housing	107006 107007
	Backflow flap	■ ACO Triplex backflow valves DN 100 DN 150	For retrofitting or as a replacement part	107004 107005
	Test hopper	■ ACO Triplex backflow valves, type 2	For maintenance, for all nominal diameters	107008
	Locking screw	■ ACO Triplex backflow valves, type 2	For all nominal diameters	107009

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



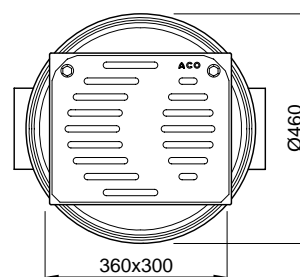
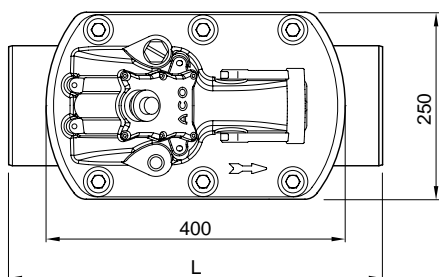
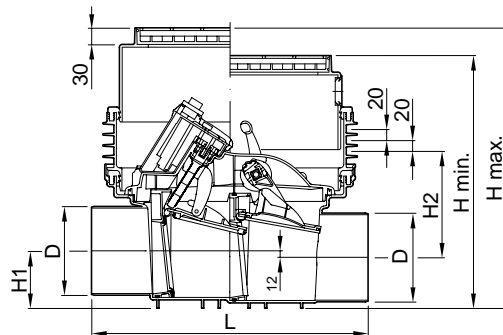
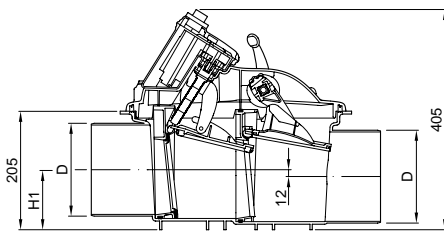
Product advantages

- Only 12 mm fall over valve housing
- Only 71 cm installation opening without reverse gradient
- Optimal for renovation
- CCTV camera accessible
- Option for height-adjustable sealing flange for water-proof 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 non-powered 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









Backflow valves / Faecal wastewater

Order information

	Nominal diameter	Dimensions						Recess	Weight	Part No.
		D [mm]	L [mm]	H1 [mm]	H2 [mm]	H min [mm]	H max [mm]			
Installation in exposed pipes										
	DN 100	110	460	79	-	-	-	350 x 710	9.1	620368
	DN 150	160	504	104	-	-	-	350 x 820	9.1	620369
Installation in the floor slab*										
	DN 100	110	460	79	217	460	512	560 x 710	15.4	620370
	DN 150	160	504	104	192	460	512	560 x 820	15.4	620371

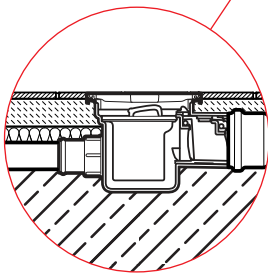
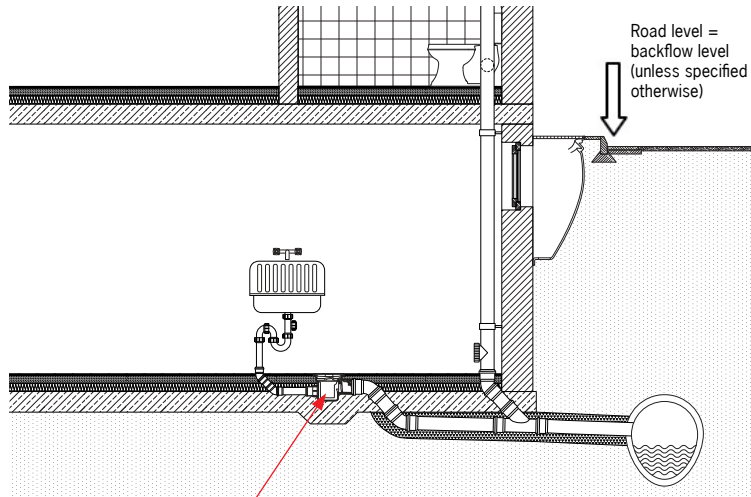
	Description	Specification	Part No.
	Signalling unit with GSM module	<ul style="list-style-type: none"> ■ Mains independent ■ Visual and acoustic alarm signalling ■ Forwarding of the alarm to mobile phones by SMS text messaging ■ Ingress protection IP54 (with mounted antenna connector IP44) 	0150.46.94
	Signalling unit	<ul style="list-style-type: none"> ■ 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

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

	Description	Specification	Part No.
	Add-on module with flood detector	<ul style="list-style-type: none"> ■ 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	<ul style="list-style-type: none"> ■ Extension ■ For cable conduits DN 70 ■ Angles and bends $\leq 45^\circ$ <p style="text-align: right;">Sensor cable (10 m) Motor cable (5 m) Weight: 1.0 kg</p> <p style="text-align: right;">Sensor cable (20 m) Motor cable (15 m) Weight: 2.0 kg</p> <p style="text-align: right;">Sensor cable (30 m) Motor cable (25 m) Weight: 3.2 kg</p>	<p style="text-align: right;">620515</p> <p style="text-align: right;">620516</p> <p style="text-align: right;">620517</p>
	Extension part	<ul style="list-style-type: none"> ■ With lip seal ■ Incremental increase by 116 mm each step, maximum 1 no. for Quatrix 	620381
	Sealing flange	<ul style="list-style-type: none"> ■ For installation in waterproof concrete □ maximum groundwater level: 2 m 	620510
	Reversible cover plate	<ul style="list-style-type: none"> ■ For tiles or plastic sheet, load class K3 	620384
	Test hopper	<ul style="list-style-type: none"> ■ Plastic ■ With sealing ring ■ For maintenance inspection on site 	6010.00.15
	Signal horn	<ul style="list-style-type: none"> ■ 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

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

Installation drawing



Junior cellar gully with backflow valve
Part No. 105602
 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
Part No. 105603

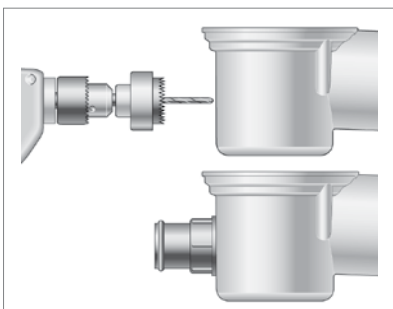
For product information see Page 8

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

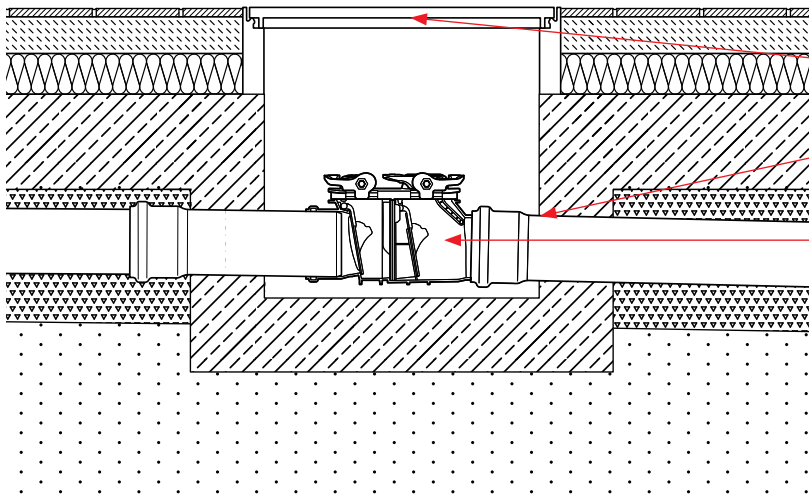
If necessary, a DN 50 inlet can easily be attached on site to connect showers / washing machines. A hole saw (Ø 59 mm) is used to make an opening in the specified area and the inlet socket 105603 with nominal diameter DN 50 is attached.

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)

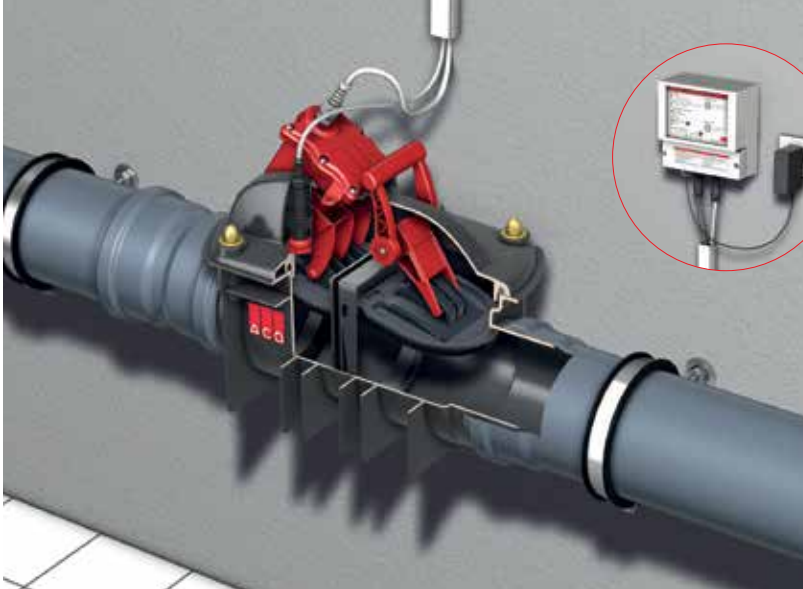
Seal is to be implemented in accordance with the on site requirements

- Triplex double backflow valve
- DN 100, **Part No. 107000**
Recess size: 260 x 580 mm
- DN 150, **Part No. 107001**
Recess size: 320 x 760 mm

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

Installation examples

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

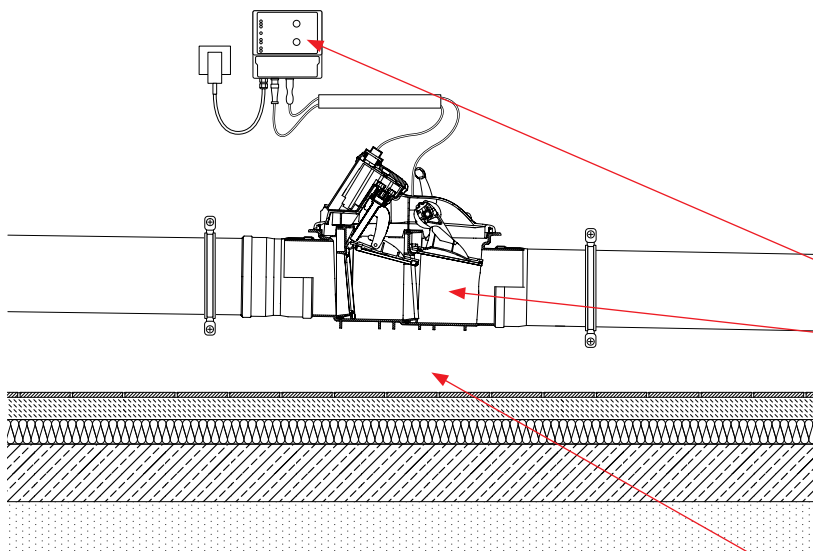


Standard ready-to-plug in control

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, **Part No. 620368**

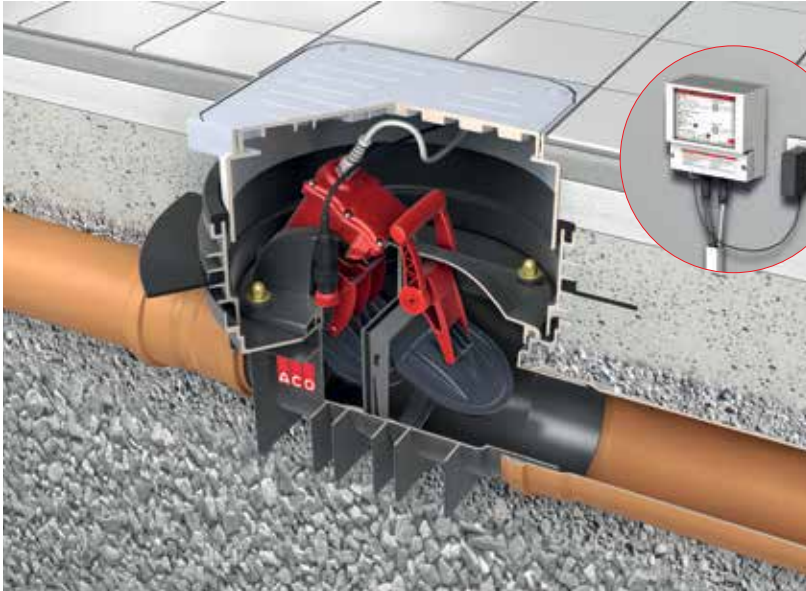
Recess size: 350 x 710 mm

■ DN 150, **Part 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

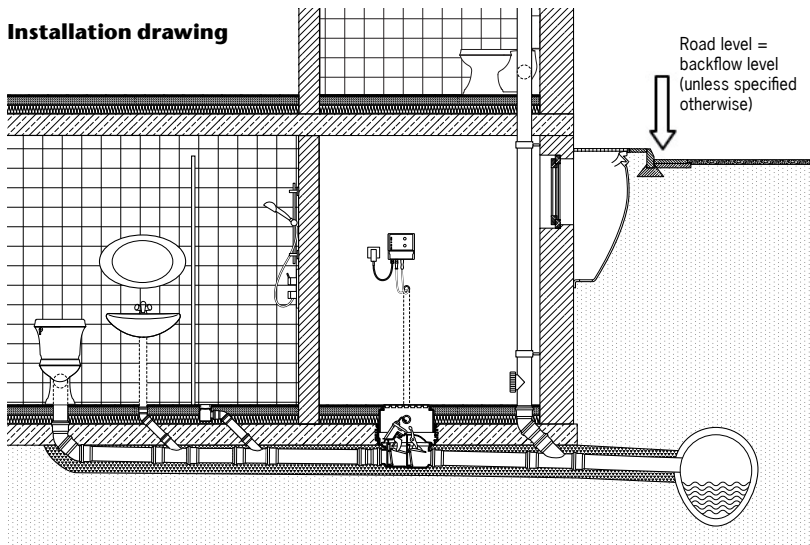


Standard ready-to-plug in control

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

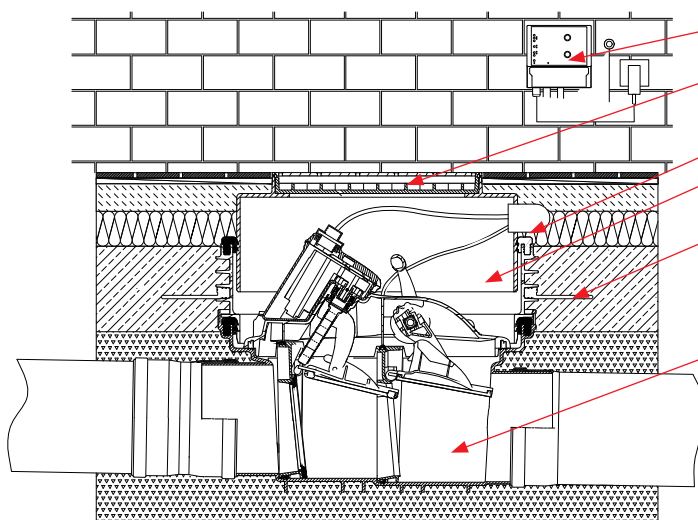


Application: continuous pipes inside access chamber below floor level

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)
Part No. 620381
- Optional height-adjustable sealing flange available for waterproof concrete
Part 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, **Part No. 620370**
Recess size: 560 x 710 mm
- DN 150, **Part No. 620371**
Recess size: 560 x 820 mm

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- ACO Sport
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ACO Building Drainage

A division of ACO Technologies plc
ACO Business Centre
Caxton Road
Bedford
Bedfordshire
MK41 0LF
Tel: 01462 810400

e-mail: abdinfo@aco.co.uk
www.acobd.co.uk

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