



Rainwater



PATENTED PRODUCT
NO. EP4141299

OZO[®]

CHECK VALVES

Anti-backflow and anti-odour check valves for in-pipe installation in rainwater networks.

- **Multimaterial:** fits all pipes.
- **Minimum maintenance:** self-cleaning membrane.
- **Quick and easy to install:** no civil engineering required.
- **French design and manufacture.**

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→ INTRODUCTION

AREA OF USE

Protection against backflow flooding from **rainwater (RW)**⁽¹⁾ networks in public, private and industrial infrastructures is a priority and a necessity.

On existing networks, the installation of flap check valves may be limited by:

- difficult access to the installation;
- the absence of water fall (a culvert, etc.);
- a sloping or uneven surface that prevents surface- mounted installations (damaged surface, etc.).

For these and all other configurations, **OZO®** is the ideal solution, because it **can be installed inside the pipe itself**, whatever the material, in the networks **RW networks**⁽¹⁾.

Quick and easy to install, it provides optimum protection for homes and buildings against flooding.

Unpleasant odours from the sewer system are also confined to the pipe thanks to the check valve's innovative, patented membrane.

⁽¹⁾As with any network-integrated solution, it is essential to check and clean the inside pipe valve regularly to prevent the build-up of debris or waste that could compromise the valve's operation. Please contact us for more information.

TECHNICAL DATA

- **Body:** 30% glass bead reinforced PP.
- **Membrane and ring:** EPDM;
- **Compression plates:** AISI 304 stainless steel;
- **Fasteners:** A4 stainless steel;
- **Pressure resistance:** up to 0.5 bar (5 mCE);
- **DN:** available from DN 100 to 200



PRESSURE LOSSES

The head losses for the **OZO[®]** correspond to the loss of pressure in the effluent when the membrane is opened. Head losses are expressed in water head pressure.

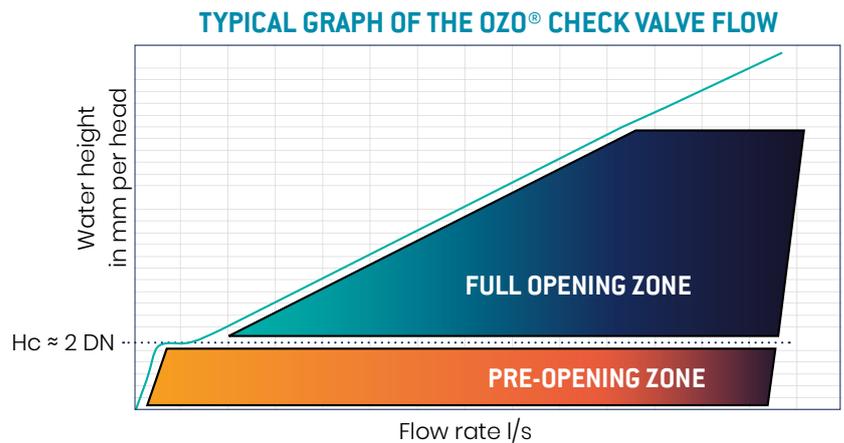
Δh = Pressure upstream of the membrane, pressure downstream of the membrane.

The pressure losses are directly related to the fluid velocity flowing through the **OZO[®]**.

The performance of **OZO[®]** valves has been verified on a hydraulic test bench.

The characteristic graph of an **OZO[®]** valve consists of two zones.

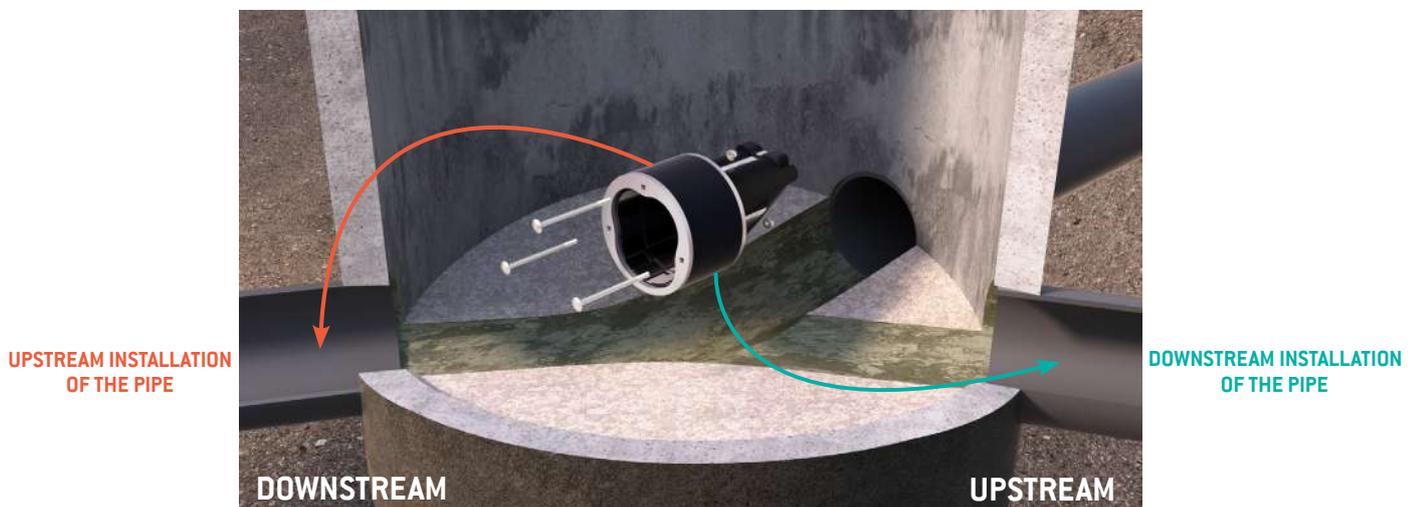
- A pre-opening zone where a trickle of water flows freely;
- A full-opening zone once the opening pressure H_c is reached ($\approx 2 \text{ DN}$).



For use in discharge stations, Norham can study and recommend **OZO[®]** check valve solutions (contact us)

ADVANTAGES

- **Simple:** installation without civil engineering, for all configurations (manhole inlet or outlet, horizontal or vertical);
- **Minimum maintenance:** self-cleaning membrane;
- **Space-saving:** easy insertion into the pipes;
- **No overhang:** the check valve does not protrude from the pipe;
- **Private or public;**
- **Automatic:** the membrane opens and closes automatically;
- **Multimaterial:** the check valve adapts to all pipes. (PVC/PP, cast iron, clay, concrete, GRP, fibre cement, etc.);



DESIGN

All OZO® check valves are designed by our R&D department.

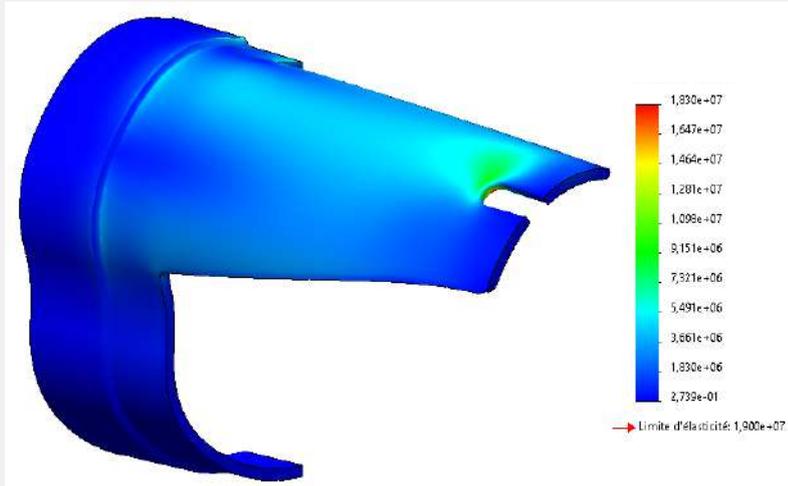
It has the computing resources (CAD) to model the hydraulic and mechanical behaviour of each valve.

Each new design is also tested on test benches to validate its behaviour under maximum pressure.



conception et fabrication
FRANÇAISE

EXAMPLE OF COMPUTER MODELLING AND VALIDATION TEST



Validation of the mechanical strength of the PP body: visualisation of the maximum stress.
DN 150 check valve.

OPERATION

For more details on how the OZO® works, watch the video on our YouTube channel.



Drain a trickle of water



Large flow discharge



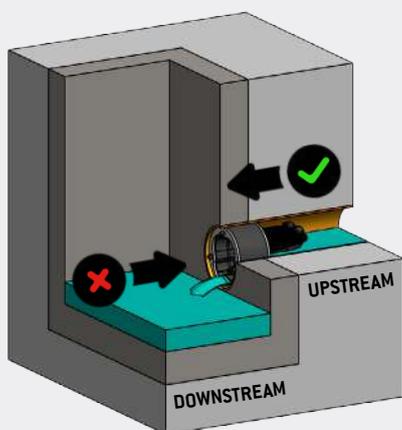
Blocked backflow

To ensure optimal operation of the OZO[®], a slope of at least 2% is required.

1) NORMAL DIRECTION OF DISCHARGE: OZO[®] OPENING

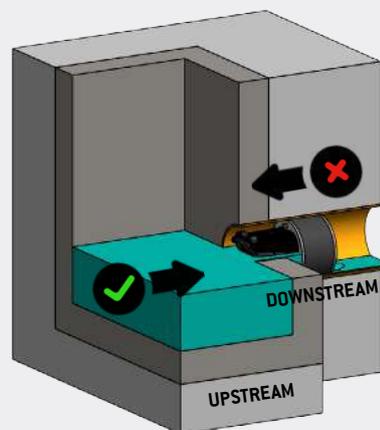
- A. The check valve allows a single stream of water to drain out.
- B. When the water level upstream of the membrane reaches the opening pressure (**HC** rating), the 'flushing' effect cleans the pipe downstream of the OZO[®].
- C. Once the membrane is fully open, the flow is drained off.

Installation configuration N°1: **DOWNSTREAM** of the pipe⁽¹⁾



(1) This is the standard delivery configuration.

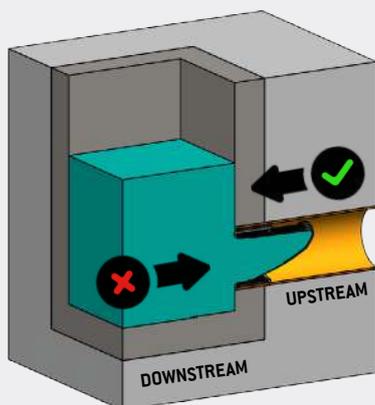
Installation configuration N°2: **UPSTREAM** of the pipe



2) BACKFLOW: OZO[®] CLOSING

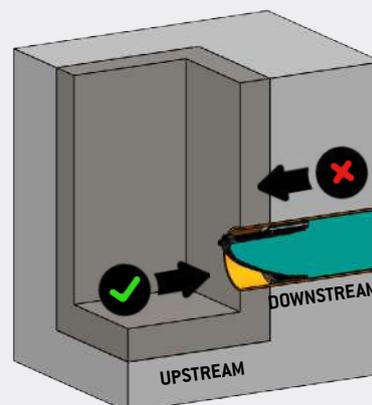
In the event of backflow, the membrane completely blocks the backflow and prevents flooding. Upstream is perfectly protected.

Installation configuration N°1: **DOWNSTREAM** of the pipe⁽¹⁾



(1) This is the standard delivery configuration.

Installation configuration N°2: **UPSTREAM** of the pipe



3) ANTI-ODOUR PROTECTION

As standard, the membrane of the OZO[®] check valve is in the closed position, which **stops any rising odours**. This keeps unpleasant odours **inside** the collector.

→ THE RANGE

REF.	DN	RANGE OF USE Ø INT. ⁽¹⁾		HC (mmCE)	P (mCE)	A	B	C	D	WEIGHT (KG)
		Ø MIN.	Ø MAX.							
OZO100_1	100	93	98	200	5	144	75	5	93	0.37
OZO100_2	100	98	103	200		144	75	9	98	0.45
OZO125_1	125	114	119	250		164	80	10	114	0.65
OZO125_2	125	123	128	250		164	80	11	123	0.90
OZO150_1	150	140	145	300		217	95	12	140	1.20
OZO150_2	150	147	152	300		217	95	13	147	1.50
OZO200_1	200	182	187	400		286	110	18	182	2.60
OZO200_2	200	198	203	400		286	110	20	198	3.70

(1) Data currently being validated.

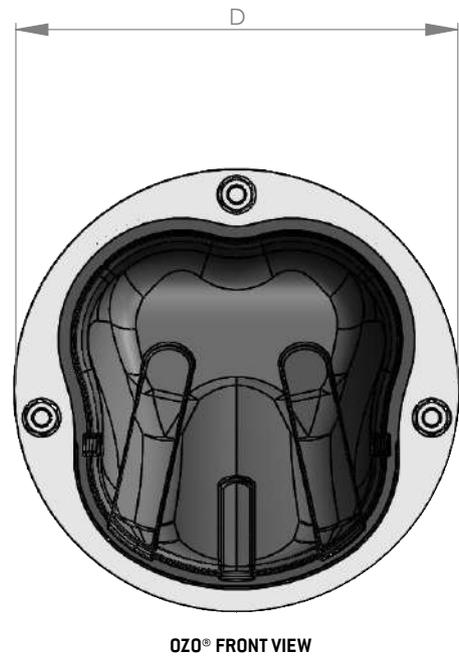
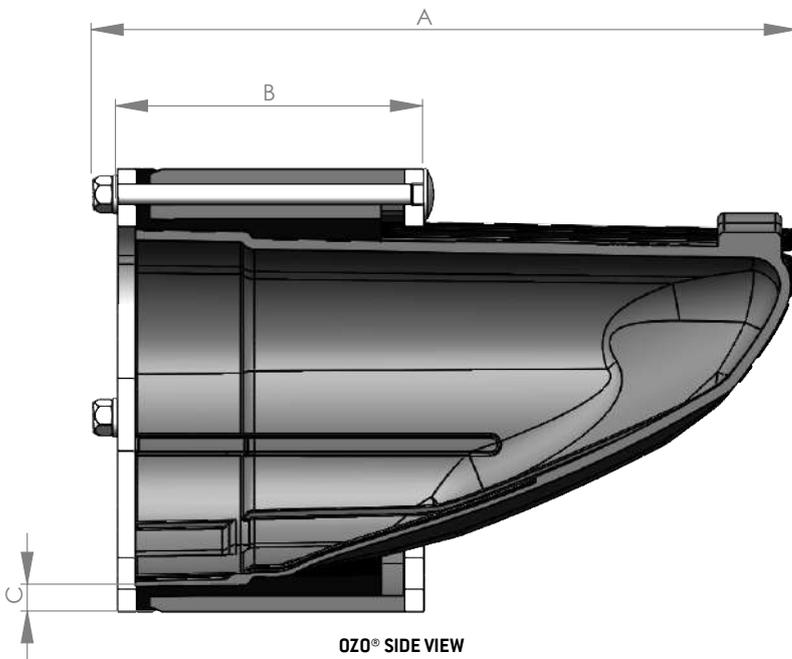
HC: 'flush' pressure = height of water required to open the membrane completely (see p.7).

P: maximum counter-pressure to which the OZO® can withstand.



It is essential to specify:

- internal diameter of pipes;
- operating pressure;
- back pressure.



→ INSTALLATION

POSSIBLE CONFIGURATIONS

Depending on the site configuration, OZO[®] check valves can be installed in either direction, at the manhole inlet or outlet.

Installation configuration N°1:
DOWNSTREAM of the pipe⁽¹⁾



Installation configuration N°2:
UPSTREAM of the pipe



(1) This is the standard delivery configuration.

INSTRUCTIONS FOR REVERSING THE DIRECTION OF INSTALLATION

STEP 1

a) The check valve is supplied for installation at the **DOWNSTREAM** of the pipe.



b) To install it **UPSTREAM**, remove the plate fasteners.

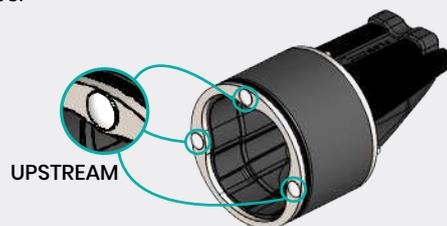


STEP 2

a) Reposition the fasteners in the opposite direction.



b) The check valve is ready to be installed **UPSTREAM** of the pipe.



OZO® INSTALLATION

OZO® check valves can be installed in just a few minutes. To do this:

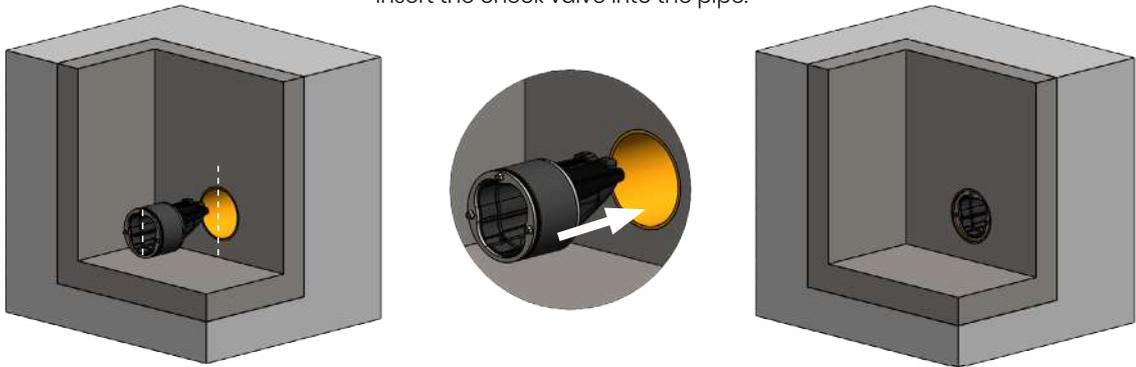
- The inside of the pipe must be clean and free of any defects that could cause a sealing problem or even damage the check valve body;
- The pipe must be circular;
- The internal diameter of the pipe to which the check valve will be fitted must be within the operating range of the check valve (see p.8).
- Identify the type of installation (upstream or downstream of the pipe) and change the direction of the screws accordingly (see p.9).

CHECK VALVE INSERTION (example of installation DOWNSTREAM of the pipe)

STEP 1

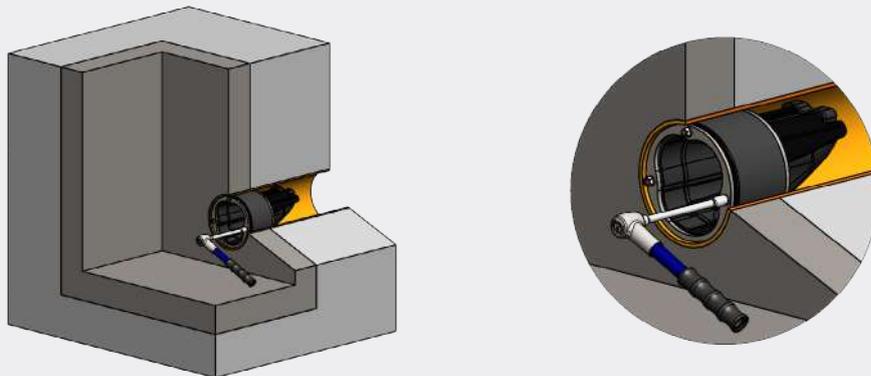
Align the mark at the top of the check valve with the top of the pipe.

Insert the check valve into the pipe.



STEP 2

Tighten the fasteners to the recommended torque.



Each OZO® check valve is supplied with its own installation instruction sheet.

MAINTENANCE PROCEDURES

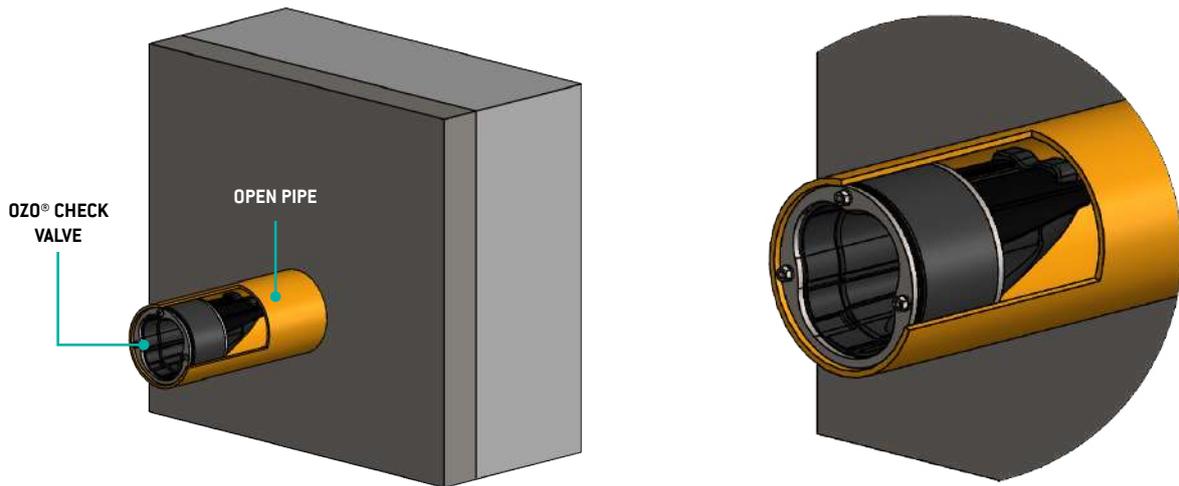
OZO® check valves should be checked every six months or after exceptional events such as flooding, high water, accidental pollution, etc.

- Visually check the condition of the membrane
- Open and close the membrane to check that it is firmly in place.
- If necessary, clean up any logjams that could interfere with closure.

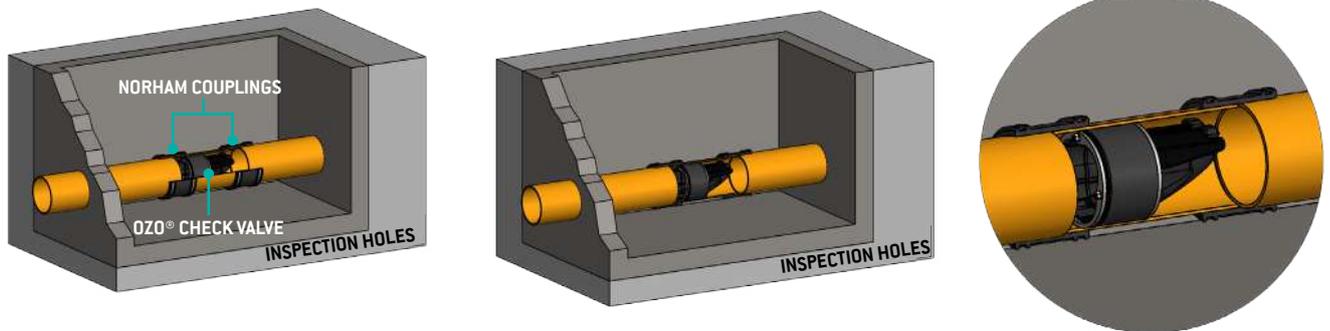
OTHER INSTALLATION OPTIONS

One of the other advantages of OZO® check valves is that they can also be adapted to a wide range of installation configurations:

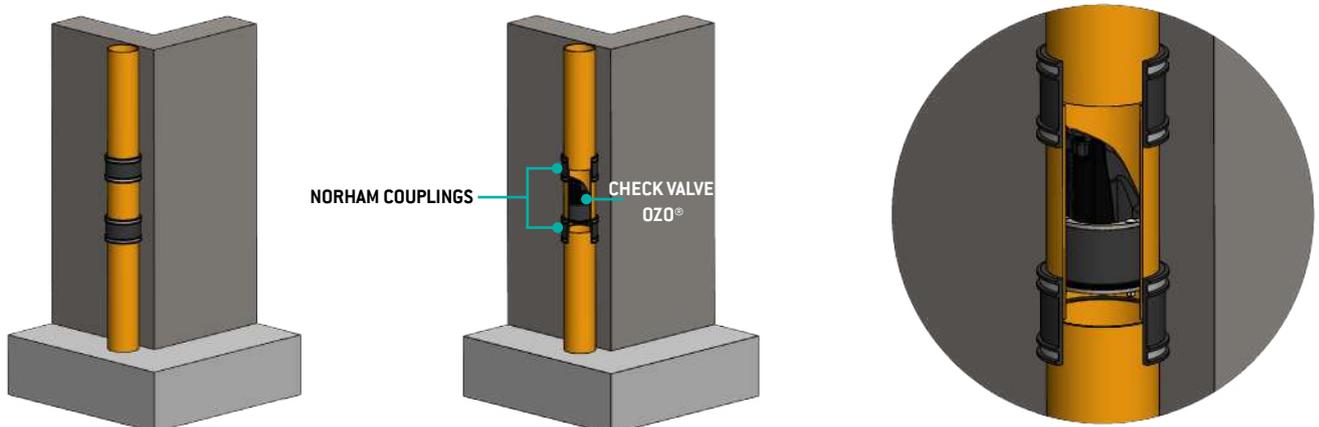
- Installation at the end of a pipe:



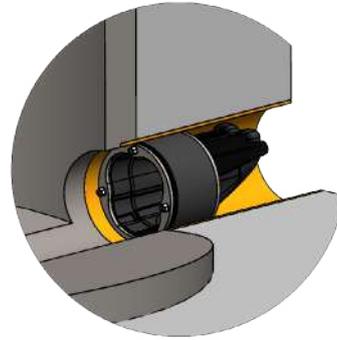
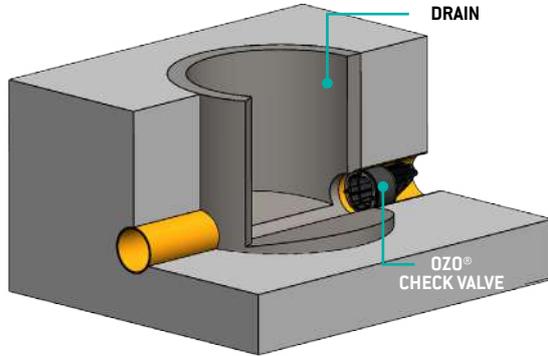
- In-line installation between 2 pipes, using NORHAM couplings:



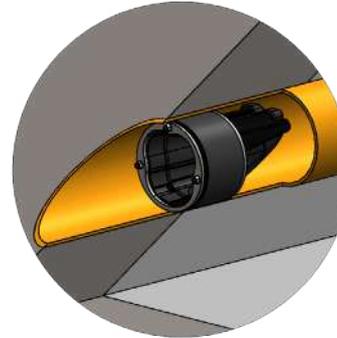
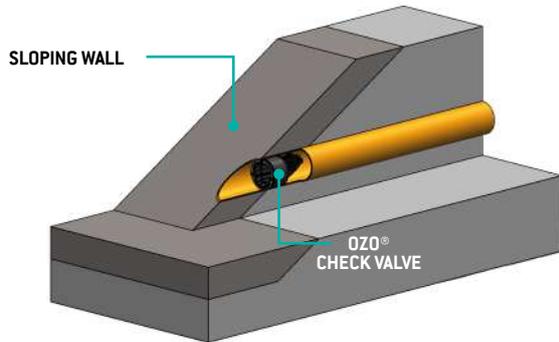
- Vertical mounting using NORHAM couplings:



- Installation in an inspection hatch:



- Installation on a sloping wall:



→ OTHER NORHAM SOLUTIONS

ECO-FLAP [®]	MULTITUBE	STINK SHIELD [®]
		
<p>Preventive anti-backflow solution for domestic networks</p>	<p>Anti-backflow valves for rainwater and wastewater networks</p>	<p>Anti-odour valves for combined systems</p>
 <p>DOWNLOAD THE DOCUMENTATION</p>	 <p>DOWNLOAD THE DOCUMENTATION</p>	 <p>DOWNLOAD THE DOCUMENTATION</p>



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