

MULTITUBE

VALVES / NON-RETURN FLAP VALVES FOR THE DRAINAGE AND SEWERAGE BACKWATER PROTECTION

PRODUCT ADVANTAGES

- **Light weight and compact design:** fast and easy to install.
- **Highly resistant:** pressure, corrosion, mechanical stress, UV.
- **Fixing:** on vertical walls or on pipes.
- **Watertight:** even for very low back pressures.
- **Innovative:** designed in composite materials.

PROTECTION AGAINST BACKWATER / FLOODING



NORHAM

CONCEPTEUR ET FOURNISSEUR

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COUPLINGS
& SEALS

PLUGS

**NON-RETURN
& FLAP VALVES**

PENSTOCKS &
REGULATORS

MARCH 2021

MULTITUBE

VALVES / NON-RETURN FLAP VALVES FOR THE DRAINAGE AND SEWERAGE BACKWATER PROTECTION

► SCOPE

For over 25 years, **NORHAM** has designed and manufactured **MULTITUBE** non-return flap valves.

Our range in **glass reinforced plastic** using an **isophthalic polyester resin** is designed to **prevent backflow in sewerage and drainage systems**.

Choosing as the main material GRP, **NORHAM** offers an **innovative, lightweight** and **highly resistant MULTITUBE** range (0,8 to 1 bar by model).

For application in extreme environments (seafront type, pump discharge, etc.), please contact us.

► INSTALLATION

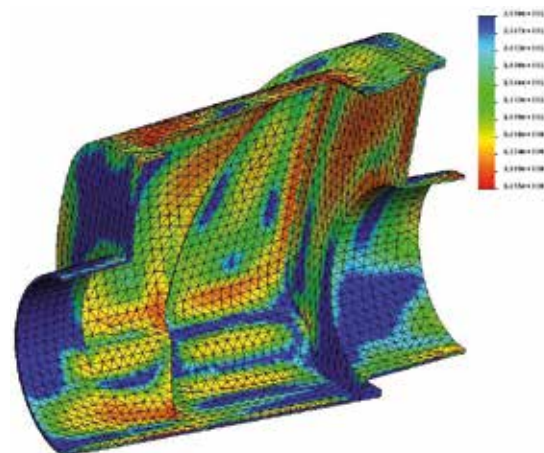
- **Flap valves** are designed to be installed at the end of pipelines either on vertical walls or directly onto the end of the pipe;
- **non-return valves** are designed to be installed in-line and located in inspection chambers or manholes for ease of maintenance;
- **flexible couplings** enable watertight connection to any circular pipe.

► DESIGN

The design of every valve has been modeled and tested by the **NORHAM R&D department** prior to manufacture to ensure optimum performance and durability.



► EXAMPLE OF FINITE ELEMENT ANALYSIS AND VALIDATION TEST OF THE MULTI 315



MULTI 315 finite element computer modeling.

► EXAMPLE OF VALIDATION ON A TEST BENCH OF A MULTITUBE VALVE



Validation of the resistance to pressure of a valve **MULTI 315**. The same type of test is applied to all the **MULTITUBE** range.

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MULTITUBE

MATERIALS

	MATERIALS	ADVANTAGES
Body and flap	Glass reinforced isophthalic polyester resin. Isophthalic Gel-coat.	Low weight combined with strength, durability and corrosion resistance.
Seal	EPDM EN 681-1 grade WC. Optional nitrile (NBR) seal available, consult us.	Long term resistance to ozone, UV and mechanical compression.
Hinge	EN 10088-2 grade 1.4401 AISI 316 stainless steel. Ertacetal (POM) (in-line valves MULTI).	Resistant to normal drainage and sewerage effluents and sea water. Self lubricating plastic.
Eye bolt**	EN 10088-2 grade 1.4401 AISI 316 stainless steel.	Resistant to normal drainage and sewerage effluents and sea water.
Fittings	EN 10088-2 grade 1.4401 AISI 316 stainless steel.	



**Flap valves are supplied with or without eye bolt (see options by product).

MULTITUBE RANGE

INCLINED FLAP VALVES



MULTI-NB DN 200 to DN 600
Inclined flap valve (p. 4).



MULTI-NB DN 800 to DN 1500
Inclined flap valve (p. 5).

INCLINED FLAP VALVES FOR DIRECT PIPE CONNECTION



MULTI-N DN 200 to DN 600
Inclined flap valve (p. 6).

NON-RETURN VALVE



MULTI 250 (p. 7).



MULTI 315 (p. 7).



MULTI 400 and 500 (p. 7).

Due to NORHAM continual improvement policy, sizes and dimensions could be changed. // Non-contractual data and visuals.

Dimensions in mm, weight in kg, back pressure (Bp) in bar. // No contractual illustrations and datas.

MULTITUBE

VALVES / NON-RETURN FLAP VALVES FOR THE DRAINAGE AND SEWERAGE BACKWATER PROTECTION

→ FLAP VALVES

MULTI-NB, FLAP VALVES DN 200 TO 600

► TECHNICAL DATA

- **Inclined flap** (minimum 15°);
- flange ISO PN 10 (drilled on demand);
- **back pressure:** 1 bar (10 mWC, meter water column);
- eye-bolt in option, see below.

► INSTALLATION

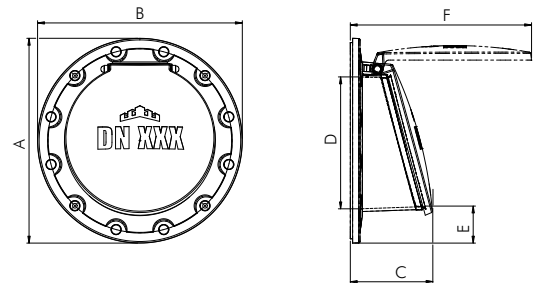
- Integral foamed EPDM rubber gasket for direct fixing to a flange or headwall;
- stainless steel mechanical anchors are provided as standard for vertical wall mounting;
- for flange ISO PN 10 use standard stainless steel bolts and nuts (not provided).

*For ISO PN10 flange mountings, optional drilling to achieve, consult us (bolts not provided).



DIMENSIONS

Ref.	DN	A	B	C	D	E	F	Weight
MULTI200NB	200	343	343	150	183	73	276	1,6
MULTI250NB	250	395	395	160	245	67	332	2,0
MULTI315NB	300	448	448	189	290	68	390	3,7
MULTI400NB	400	570	570	206	375	86	482	6,5
MULTI500NB	500	680	680	240	470	89	582	9,7
MULTI600NB	600	791	791	280	599	78	712	14,3



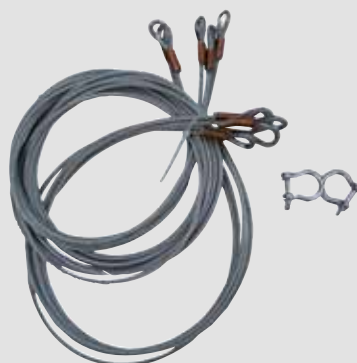
Dimensions in mm, weight in kg.

OPTIONS :

Eye-bolt.
Ref.: ECROU-ANNEAU10-316



Sling + Shackle.
Ref.: CABLE3M-316
CABLE6M-316



► FLANGE ADAPTATOR AR_V_B



For **MULTI NB** flap-valves and any flange ISO PN 10. Adapter flanges in HDPE, EPDM and grade 1.4401 (AISI 316) stainless steel.

Ref. AR_V_B	Ø manhole	DN
200	600 to 1500	200
250	800 to 1500	250
300	800 to 1200	300
400		400

For more information see the documentation on the flanges (downloadable on www.norham.fr) or consult us.

MULTITUBE

VALVES / NON-RETURN FLAP VALVES FOR THE DRAINAGE AND SEWERAGE BACKWATER PROTECTION

MULTI-NB, FLAP VALVES DN 800 TO 1500

▶ TECHNICAL DATA

- **Inclined flap** (minimum 15°);
- flange ISO PN 10 (drilled on demand) for MULTI-NB 1000 (others references, please consult us);
- **back pressure:** 1 bar (10 mWC);
- eye-bolt in option, see below.

▶ INSTALLATION

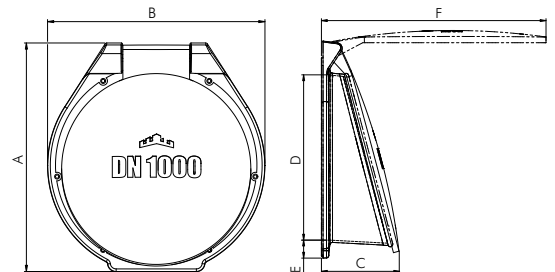
- Stainless steel mechanical anchors are provided as standard for vertical wall mounting;
- for flange ISO PN 10 use standard stainless steel bolts and nuts (not provided).

*For ISO PN10 flange mountings, optional drilling to achieve, consult us (bolts not provided).



DIMENSIONS

Ref.	DN	A	B	C	D	E	F	Weight
MULTI800NB	800	1090	1035	525	800	110	1112	25,0
MULTI1000NB	1000	1330	1265	535	1020	110	1390	102,0
MULTI1200NB	1200	1521	1440	695	1200	100	1620	151,0
MULTI1400NB	1400	1760	1640	800	1400	100	1820	236,0
MULTI1500NB	1500	1855	1740	870	1500	100	1965	285,0



Dimensions in mm, weight in kg.

OPTIONS :

Eye-bolt.
Ref.: ECROU-ANNEAU10-316



Sling + Shackle.
Ref.: CABLE3M-316
CABLE6M-316



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Dimensions in mm, weight in kg, back pressure (Bp) in bar. // No contractual illustrations and datas.

MULTITUBE

VALVES / NON-RETURN FLAP VALVES FOR THE DRAINAGE AND SEWERAGE BACKWATER PROTECTION

MULTI-N, FLAP VALVE FOR DIRECT PIPE CONNECTION

▶ TECHNICAL DATA

- **DN 200 to 600**;
- for connection to any pipe (PVC, PEHD, fibre-cement, ductile iron, clay, concrete, etc.);
- **inclined flap** (minimum 15°);
- **back pressure:** 1 bar (10 mWC);
- eye-bolt in option;
- delivered **ready to install** with **NORHAM flexible coupling**⁽¹⁾: **EPDM** and EN 10088-2 grade 1.4401 (AISI 304) stainless steel (grade 1.4401, AISI 316 in option).

⁽¹⁾The **MULTI N** flap valve is delivered with the appropriate flexible coupling (please confirm the pipe type and outside diameter when ordering).

▶ INSTALLATION

- For installation directly onto spigot end of pipe;
- a **NORHAM** coupling is supplied and already connected on the **MULTI N** valve for an easy and quick installation. It provides a secure and watertight connection to all types of pipes. Make sure to order correctly by quoting both the pipe type and outside diameter.



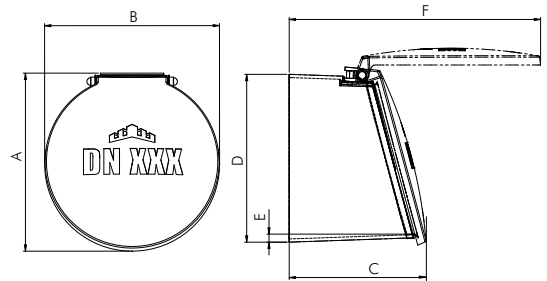
DIMENSIONS

Ref.	DN	A	B	C	D	E	F	Weight
MULTI200N-... **	200	225	218	205	202	11	345	1,2
MULTI250N-... **	250	285	280	223	263	12	399	1,9
MULTI315N-... **	300	344	335	266	318	15	480	3,0
MULTI400N-... **	400	435	424	283	405	16	550	5,5
MULTI500N-... **	500	535	530	320	505	17	665	9,0
MULTI600N-... **	600	667	665	348	640	18	790	13,5

Dimensions in mm, weight in kg.

** According to the type of pipe:

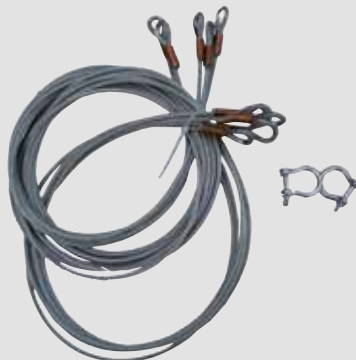
PFF: PVC / fibre-cement / ductile iron // G: clay // BA: concrete / structural walled plastic. These codes enable fixed pricing categories.



OPTIONS :

Eye-bolt.
Ref.: ECROU-ANNEAU10-316

Sling + Shackle.
Ref.: CABLE3M-316
CABLE6M-316



▶ FLANGE ADAPTATOR AR_V_N



AR_V_N range for MULTI N.
In GRP and isophthalic Gel-Coat.

Ref. AR_V_N	Ø manhole	DN
200	600 to 1500	200
250	800 to 1500	250
300	800 to 1200	300
400	800 to 1200	400

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DN 250



MULTI, IN-LINE FLAP VALVES

▶ TECHNICAL DATA

- **DN 250 to DN 500;**
- **in-line non return valve;**
- for connection to any pipe (PVC, PEHD, fibre-cement, ductile iron, clay, concrete, etc);
- **back pressure:** 0,9 bar (9 mWC);
- delivered **ready to install** with **NORHAM flexible couplings⁽¹⁾**;
- EPDM and EN 10088-2 grade 1.4401 (AISI 304) stainless steel (grade 1.4401, AISI 316 in option).

⁽¹⁾The **MULTI** flap valve is delivered with the appropriate flexible couplings (please confirm the pipe type and outside diameter when ordering).

▶ INSTALLATION

- In-line valves should be installed in an inspection chamber (or equivalent) for maintenance;
- **NORHAM** couplings are supplied and are already connected on the **MULTI** valve for an easy and quick installation. It provides a secure and watertight connection to rigid pipes. Make sure to order correctly by precisising the pipe type and outside diameter.

DIMENSIONS

Ref.	DN	A	B	C	D	E	Weight
MULTI250-... **	250	475	450	725	260	60	14,0
MULTI315-... **	300	572	525	726	316	52	17,6
MULTI400-... **	400	595	610	900	396	25	35,0
MULTI500-... **	500	725	700	1202	515	40	43,0

Dimensions in mm, weight in kg.

** According to the type of pipe:

PFF: PVC / fibre-cement / ductile iron // G: clay // BA: concrete / structural walled plastic. These codes enable fixed pricing categories and the references of the flexible couplings.

DN 315



DN 400 and 500



CLOSURE SYSTEM OF THE COVER

It works as a pressure cooker:

more back pressure = more seal compression = optimized watertightness.



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Dimensions in mm, weight in kg, back pressure (Bp) in bar. // No contractual illustrations and datas.

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► TECHNICAL INFORMATION

Head-loss, non-return valve.

Dynamic head loss is a loss of pressure in a pipeline due to friction from pipe walls or as liquids flows through elbows, valves and other fittings.

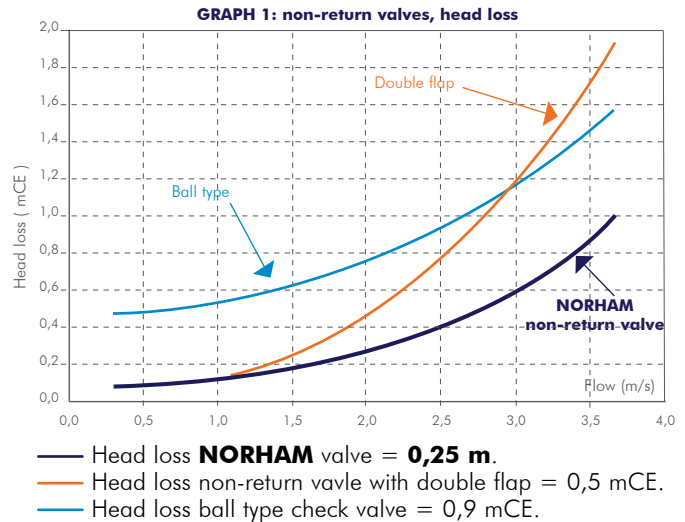
The graph 1 shows head loss in full pipelines and compares different types of non-return valves.

Example: DN 250 non-return valve.

$$\text{Section} = \pi \times \text{Ø}^2 / 4 = 0,05 \text{ m}^2$$

$$\text{Flow} = 100 \text{ l/s} = 0,10 \text{ m}^3/\text{s}$$

$$\text{Speed (m/s)} = \text{flow (m}^3/\text{s)} / \text{section (m}^2) = 0,10 / 0,05 = 2 \text{ m/s}$$



► OPERATING HEAD, FLAP VALVE

The head required to operate (« cracking pressure ») a **NORHAM MULTITUBE** flap valve can be estimated as follows:

$$\text{Operating head } \Delta H = \text{valve diameter (mm)} / 10$$

$$\text{Example: DN 250 flap valve; } \Delta H = 250 / 10 = \mathbf{25 \text{ mmCE}}$$

NB: this value does not take into account any disturbances related to the environment such as eddies, obstacles, etc.

► APPLICATIONS



Riverbank



Retention pond



Riverbank on PVC pipe



Flap valve with overweight



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