

NORVAL Non-Return Valve

CD/F – CD/WF – CD/M

Other body material and connection options available



UNIQUE • NO NOISE • TIGHT SHUT OFF



NORVAL Non-Return Valve

Most pipeline systems require some form of check valve device to maintain flow in one direction to prevent either contamination of liquids already in the system or damage to the pipework and its ancillary components. Quite a simple function you might think! – bitter experience however tells us a different story.

What are the features that the piping engineer is looking for?

- Tight shut off under minimum back pressure
- Quick response to no-flow or reverse flow conditions
- Low resistance to forward flow
- Lightweight construction
- Ease of installation with unskilled operators
- No maintenance

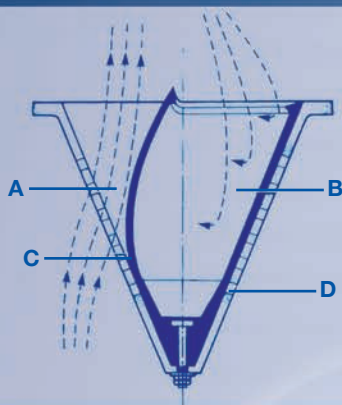
The NORVAL Non-Return Valve has all these features plus one or two less obvious benefits!

- It is extremely simple
- It operates in any direction, vertically up or down, or horizontal
- High material specification
- Less noise due to slamming shut under reverse flow
- Can be incorporated in a variety of body configurations or simply built into original equipment as a cone and diaphragm assembly

Method of Operation

Flow takes place in the direction of the arrows under forward and reverse flow.

A – Valve Open C – Diaphragm
B – Valve Closed D – Cone



With flow in the forward direction the diaphragm deflects inwards (A) allowing easy passage of the liquid with little pressure loss. When a no flow, or back pressure, condition occurs the diaphragm returns to its relaxed position (B) sealing off all flow in the reverse direction.

This action is unaffected by the orientation of the valve.



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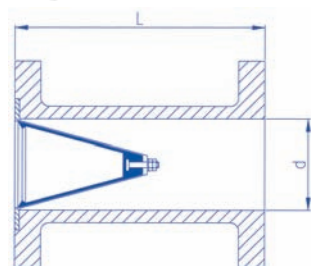
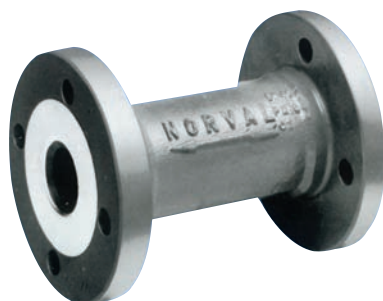
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NORVAL Non-Return Valve

CD/F – CD/WF – CD/M



Type CD/F

A flanged check valve incorporating the basic cone and diaphragm assembly is housed in a flanged cast iron, carbon steel or stainless steel body. Available in size range 40mm (1½") to 200mm (8") diameter with flanges to PN16 or equivalent. Diaphragms to suit application.

Type CD/F

d	mm	40	50	65	80	100	125	150	200
L	mm	165	203	216	241	292	330	356	495

Flange details to suit PN10/16 or ASA 125/150.

Frequency of Operation

When selecting NORVAL particular attention should be given to the period that the valve will remain in the open position without a flow reversal taking place. The elastic memory of the diaphragm is time dependant and if left open for long periods will result in slow closure of the valve under reverse flow with subsequent leakage.

The degree of diaphragm deformation is a function of the service, temperature and material. Unlike conventional valves, the more arduous and frequent the operating cycle the better NORVAL works.

Velocity Limitations

Liquids:

NORVAL valves are designed for maximum continuous liquid velocities of 10ft/sec. Where velocity conditions exceed these maximums you are recommended to fit a larger valve.

Gas & Compressed Air:

Since NORVAL is essentially a liquid services valve you should consult our technical dept. before considering for gas or air applications.

Diaphragm Selection

By careful selection from one of the standard series of rubber diaphragms it is possible to control a wide range of industrial and process fluids effectively and economically. The combination of 316 stainless steel cones and specially formulated polymers makes NORVAL a truly universal check valve for neutral and aggressive liquids.

Grade	Material
3	Fluorocarbon
6	Nitrile (Buna Type)
7	E P D M Ethylene Propylene
4	Silicone

Fluid Application

E P D M: Water, dilute acids and alkalis up to 121°C (200°F)

Nitrile (Buna type): Mineral oils up to 80°C (175°F)

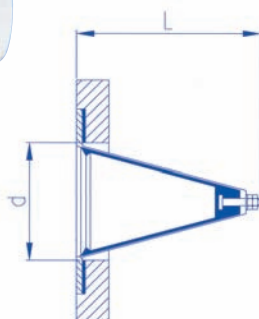
Fluorocarbon: Hydrocarbons, concentrated acids organic solvents up to 200°C (392°F) (not suitable for water)

The above list gives our recommended diaphragm materials for a wide grouping of fluids. For other fluids and more detailed chemical resistance data consult our 'Diaphragm Application Guide'.

Pressure/Temperature Rating

All NORVAL valves are rated for 16 bar at 21°C (70°F). For intermittent operation it is permissible to extend the maximum temperature in accordance with the following table.

Diaphragm Material	Normal Working Temp.	Maximum Peak Temp.
Silicone	302°F 150°C	355°F 180°C
Fluorocarbon	355°F 180°C	395°F 200°C
Nitrile	175°F 80°C	212°F 100°C
Ethylene Propylene	248°F 120°C	302°F 150°C



Type CD/WF

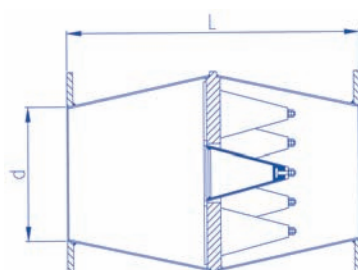
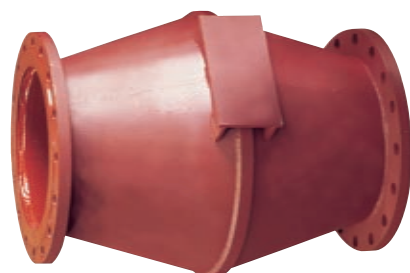
Essentially for 'foot valve' applications where single flange bolting to the end of a pipe is necessary. May also be used for bolting to the sides of tanks or bulkheads. Size range 40mm (1½") to 200mm (8").

Note: Should not be used for clamping between adjacent pipe flanges. First choice for which should be the type CD.

Type CD/WF

d	mm	40	50	65	80	100	125	150	200
L	mm	57	78	95	120	170	218	265	353

Flange details to suit PN10



Type CD/M

For large bore installations we offer the NORVAL in modular form, in sizes 250mm - 600mm diameter. These valves are constructed by mounting a number of small cone diaphragm assemblies onto a centre plate which is housed in a mild steel fabricated body.

The number and size of the individual NORVAL cone is determined by the flow requirements and by using one of our standard mounting plates and fabricated ends, a permutation to meet all requirements can be achieved. If required a hand hole cover can be incorporated in the body.

Type CD/M

d	mm	250	300	350	400	450	500	600
L	mm	600	700	800	900	1000	1100	1300