

B21.14.0-I

## QUICK CLOSING NON – RETURN VALVE – AQUAVAR®

Non – Return AQUAVAR® Valve (patented product) is a safety equipment used in the pumping stations, intended for the retention of flow of liquids which may have two mixed phases, such as liquid and gas or liquid and steam. The primary function of this equipment is to prevent or greatly reduce the propagation of pressure variations along the pipes, which could cause them to rupture or damage essential elements, such as gaskets and pumps.

AQUAVAR® is a totally innovative model in the field of check valves, being designed for applications in pipes with diameter ranging from 80 to 1600mm and can operate in all installation positions.

Both the fixed parts and the moving parts of the valve have been carefully studied, resulting in optimized hydrodynamic shapes. With the intention of minimizing the load losses and improving the performance of the same, reducing drastically the shock waves.

Another important feature for the performance of this



equipment is the material used in the moving part of the valve. This material has specific weight near the fluid, thus balancing the Archimedes thrust effect on the shutter, minimizing the effects of its own weight on the opening / closing of the valve.

This valve incorporates a spring that stores potential energy, which is used for the closing maneuver. Presents extremely

short closure intervals, due to the low inertia of the shutter, preventing the return of the flow.

Due to its new geometry and design, this equipment is easy to install, as well as allowing the use of tools and assembly equipment of lower capacity and cost.

In the case of check valves, they often operate in supply networks and pumping installations.

Statistics show that serious damage can occur due to incorrect valve type selection. For example, when a pump is shut off at a pumping station, the flow loses speed until it stops and the flow direction is subsequently inverted. The valve can then close: under the effect of its weight, a return source, or by reversing the flow.

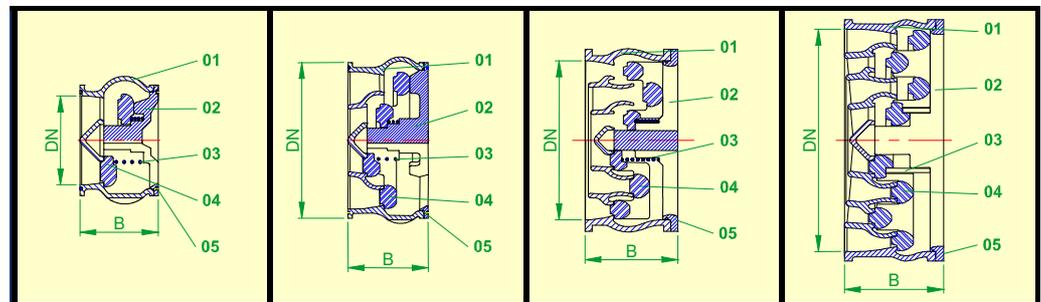
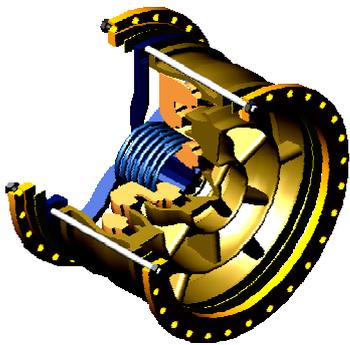
In this case, calculations and experimental tests have shown that the reversal can happen within an extremely short time (on the order of 0.01 to 0.10 of a second). If the valve does not respond immediately, the closing will occur clearly during the inverted flow, resulting in:

- A force acting against the seat

of the obturator in the body, which can generate a strong shock wave.

- The generation of the water hammer, with abrupt wave front.

Shockwaves and water hammer cause stresses that can cause mechanical failure of the valve components.



Type I

Type II

Type III

Type IV

REF.	COMPONENT	DESCRIPTION	MATERIAL
01	Upstream Body	Monobloc cast part with concentric rings with hydraulic profile.	Cast iron DIN 1691 – GG25 ASTM A126 – Class B DIN 1693 – GGG40/GGG50 ASTM A536 – Gr. 65-45-12
02	Downstream Body	Cast part with stop flaps and spring holder.	Cast iron DIN 1691 – GG25 ASTM A126 – Class B DIN 1693 – GGG40/GGG50 ASTM A536 – Gr. 65-45-12
03	Spring	Helps the disc valve closure.	Stainless steel – AISI 302/AISI 304
04	Obturator	With longitudinal movement incorporating profiled concentric rings.	Polyurethane
05	Thoroidal Joint	O'ring"	Synthetic rubber

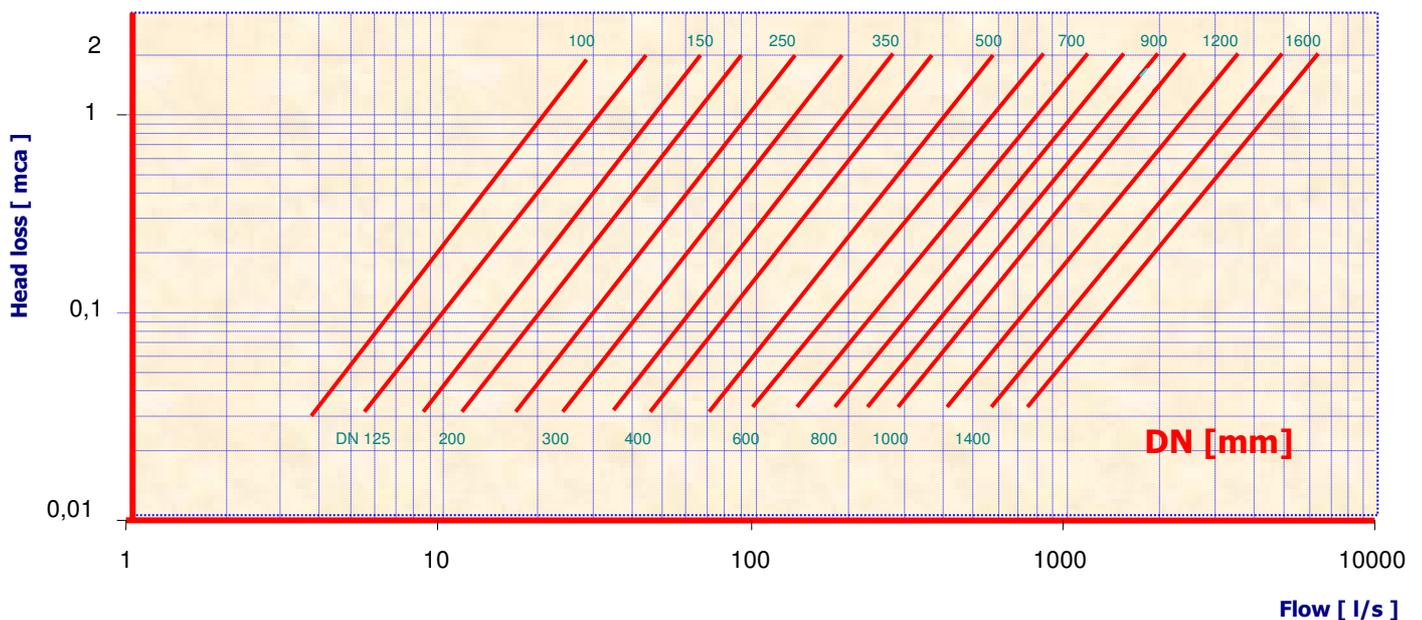
The assembly will be made according to the standard for flanges NBR 7675, ISO 2531, AWWA C-207, ANSI B16.5/47 or other standard on request.

Type	DN	B	PN					Weight Kg							
	(mm)	(mm)	10	16	20	25	40		50						
I	80	86	GG 25						2						
	100	105							5						
	125	127							7						
	150	148							11						
II	200	136							15						
	250	155							25						
	300	190							39						
	350	216							55						
	400	227							75						
	450	261							98						
	500	284							140						
III	600	340							GGG 40						290
	700	369													395
	800	369													480
	900	433													675
	1000	438	815												
IV	1200	585	GGG 50												1660
	1400	620													2135
	1600	697													3120

Used for water and other liquids up to 60 °C.

The information in the table above is subject to change without notice.

### Head Loss Chart



Graph plotted in log log format. The values obtained at the borders should be confirmed directly with the manufacturer.

### Basic requirements of a check valve:

- Shorter closing time limiting the overpressure caused by surging originated by the valve itself;
- No vibration, and ability to operate in maximum aperture, even at low flow speeds;
- No bump operation without impact or bumps on closure;
- Operational durability and safety.

### Quick closing Non-Return AQUAVAR® Valve meets all these requirements because of its innovative design conception assuring:

- Light weight obturator with low inertia;
- Short operation travel limited to 1/10 of nominal diameter;
- Obturator made of polyurethane to absorb the shock;
- No mechanical parts;
- Hydraulically optimized flow passage section.

### Quick Closing Non-Return AQUAVAR® Valve advantages:

- Prevents water hammer with high overpressure values;
- Operates silently;
- Damped closing due to obturator elasticity;
- Good sealing in closed position;
- Optimum hydraulic operation: flow partialization and concentricity;
- Small dimensions: valve width DN/2 (for DN>200mm);
- No maintenance is necessary;
- Simple technical design;

- Operation in all installation positions;
- No wear in operation, therefore no spare parts needed;
- Wide range of diameters: DN 80 to 1600 mm;
- Small disc valve stroke (~DN/10);
- Excellent dynamics response.

Sample of overpressure records taken during water hammer tests of various types of valves operating under the identical conditions (network pressure: 5 bar):

- Single-flap valve,
- Multi-flap valve,
- Quick Closing Non-Return AQUAVAR® Valve.

