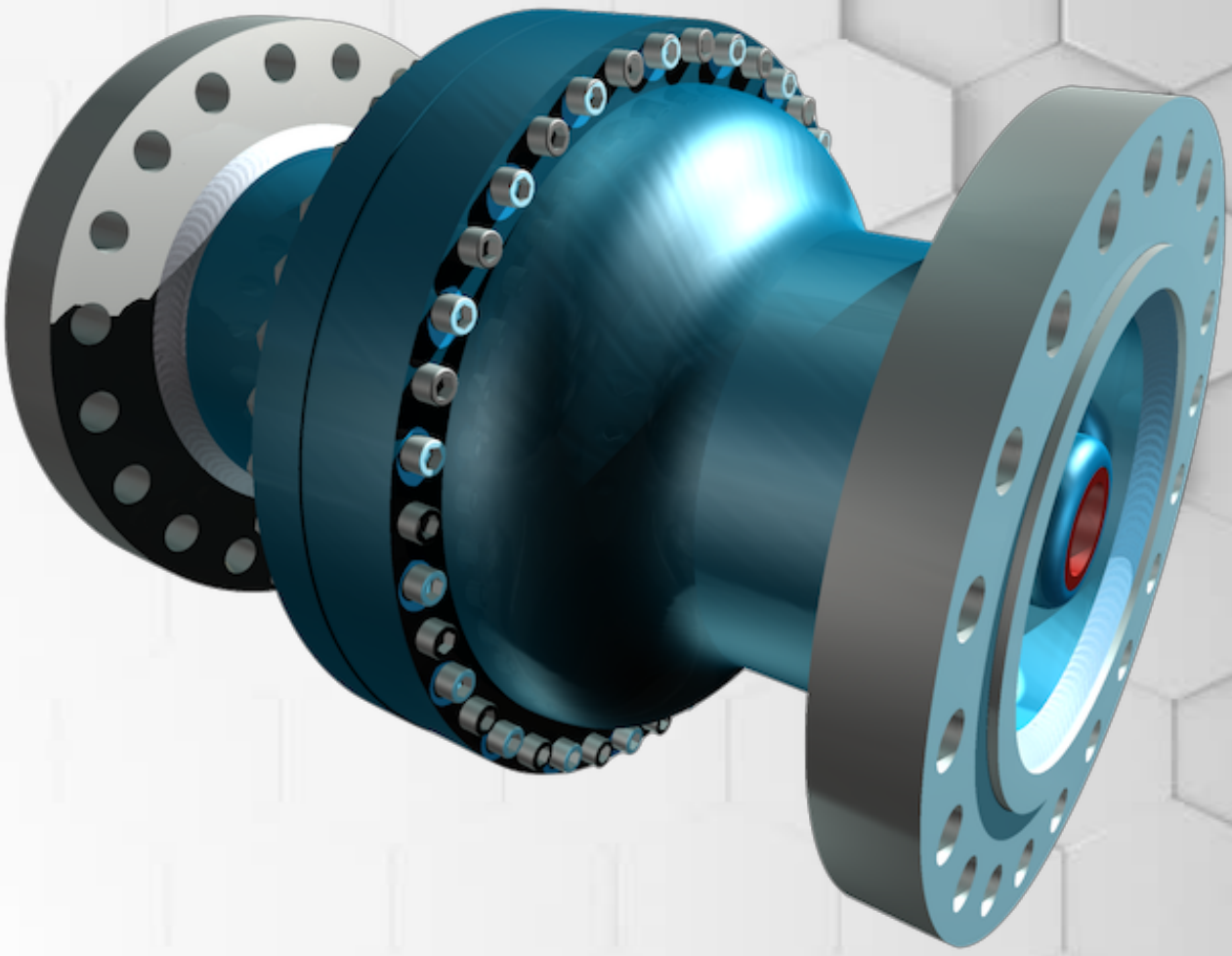
Hydrocore Limited Presents

Hydrocore™ Non-Slam Check Valve



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Hydrocore™ Non-Slam Check Valve

APPLICATION

The Hydrocore™ non-slam check valve prevents back flow while minimizing the water hammer effect during the valve's closure.

PRINCIPLE OF OPERATION

- The Hydrocore™ non-slam check valve gradually opens when the pump starts running.
- Gradually closes at a speed controlled by the valve's speed control orifice.
- Gradually reduces the flow through the valve while closing.
- Utilizes a spring to ensure a valve closed position.
- Can be installed in a horizontal or vertical position.

LONG LIFE & LOW MAINTENANCE

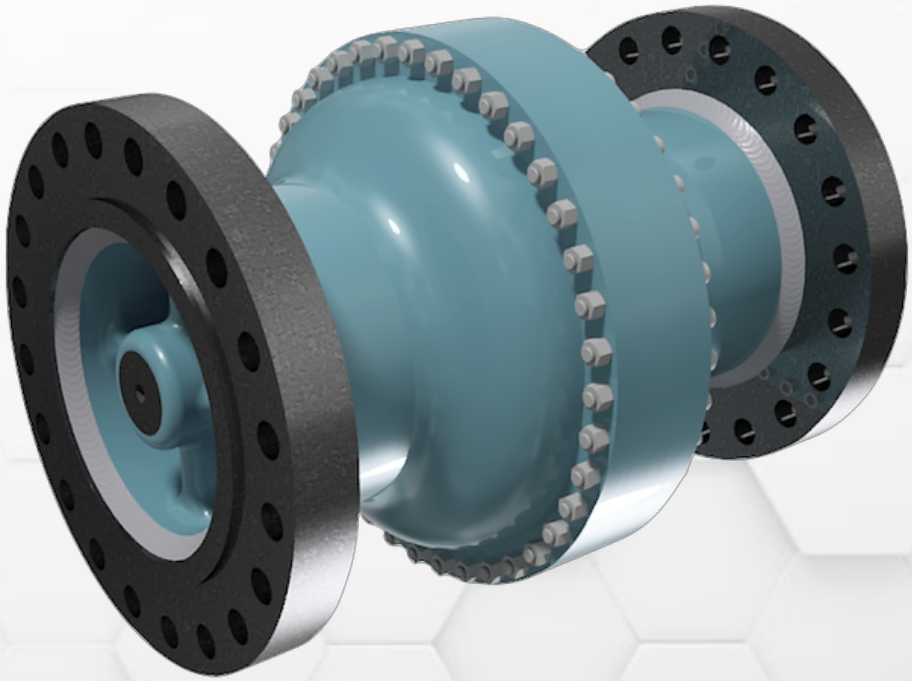
All moving parts and surfaces of the Hydrocore™ non-slam check valve are made from stainless steel in order to minimize corrosion and prevent scale buildup. The valve's shuttle is suspended by bronze bushes.

SPRING LOADED SHUTTLE

The Hydrocore™ non-slam check valve's spring maintains a closed valve position when the valve's upstream is empty. The spring also assists the closing function on reverse flow conditions.

CLOSING SPEED

The Hydrocore™ non-slam check valve speed is determined by the speed control orifice. Decreasing the orifice size slows down the closing speed and vice versa.



MEDIA

Liquid and gas with low content of suspended solids.

PIPE SIZES

1"(25NB) to 24"(600NB)

FLANGES

SABS 1123, BS4504, BS10, ASME B16.34, ANSI B16.5

COUPLINGS

Tapered shoulders and other pipe couplings

PRESSURE

Up to 3750 psi (25MPa) pressure rating.

TEMPERATURE RATINGS

Up to 85°C with standard seals.

PH LEVELS & CHLORIDES

Parts of the valve are made from stainless steel and can withstand a low level of chlorides.

INSTALLATION POSITION

The valve can be installed in any position.

SEATING

Seat Leakage - B16.104 class III, IV, V or VI, depends on valve type and application.

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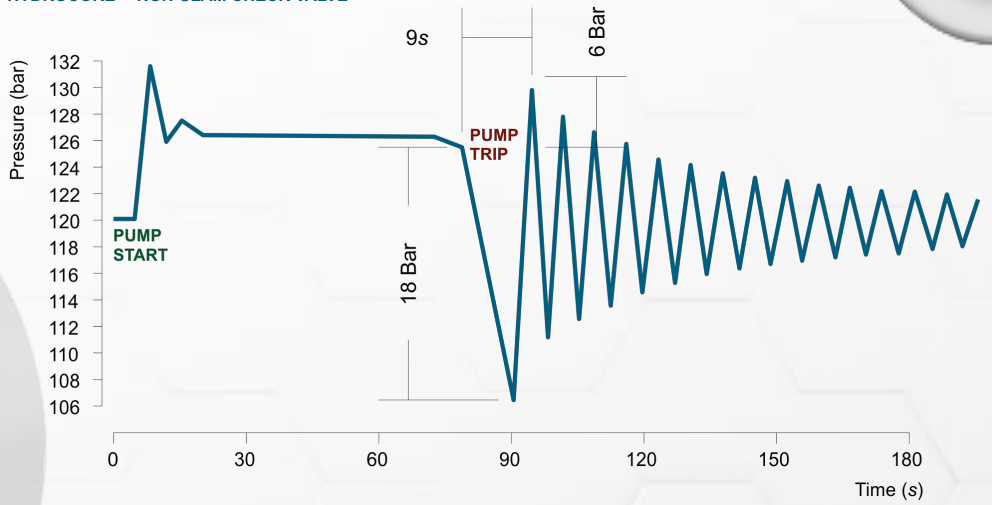
PRESSURE TRANSIENT FOLLOWING A PUMP TRIP

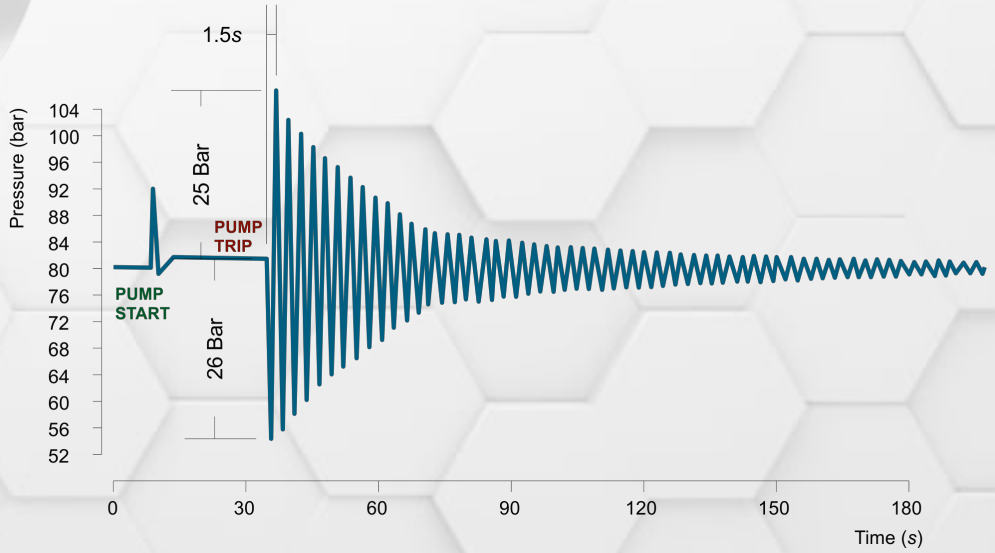
The graphs demonstrate how the Hydrocore™ Non-Slam Check Valve compares to a regular check valve in the event of a pump trip. When the pump trips it creates a water hammer in the system which can cause havoc if the shock is not minimized.

With the use of a speed control orifice in the Hydrocore™ Non-Slam Check Valve, the shock of the water hammer (in the event of a pump trip) is minimized greatly, due to the speed in which the check valve closes. In comparison, a regular check valve does nothing to alleviate the shock in the system due to the fact that the valve closes instantaneously.

HYDROCORE™ NON-SLAM CHECK VALVE



REGULAR CHECK VALVE



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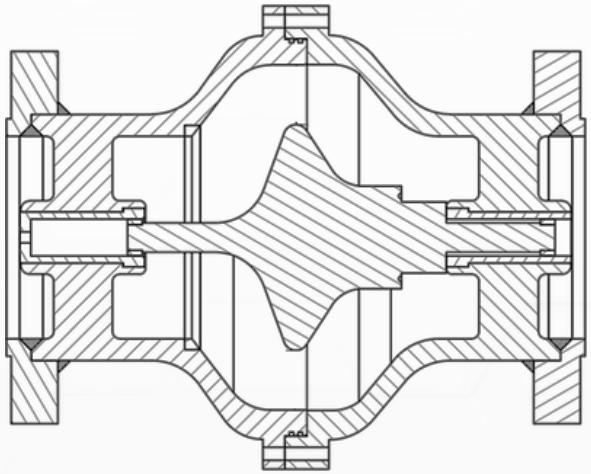
VALVE FLOW CV

One of the primary costs after the initial capital outlay is running costs, especially in a pump station. A valve's Cv determines the pressure drop between the inlet and outlet ports of the valve. The lower the pressure drop the higher the Cv, which in turn results in lower power consumption of the pump.

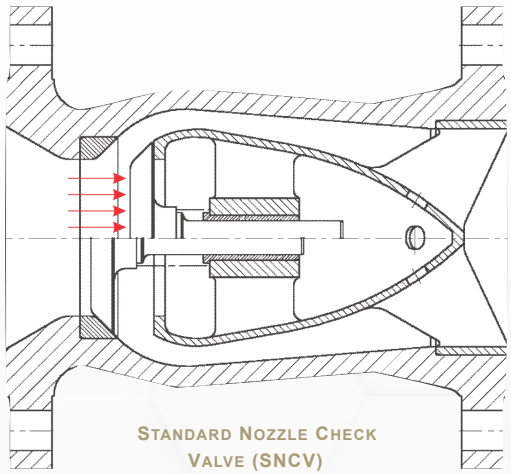
We have modelled a Standard Nozzle Check Valve (SNCV) to determine its Cv (see figures below).

The table on the right shows the power penalty cost of a Hydrocore non-slam check valve versus a SNCV.

As is evident, the cost savings using a Hydrocore non-slam check valve versus a SNCV are astronomical even within the first couple of years. Assuming that the price of electricity is not going to go down in the future, those cost savings will only increase.



HYDROCORE NON-RETURN VALVE (NRV)



STANDARD NOZZLE CHECK VALVE (SNCV)

A TYPICAL 250NB (12") CHECK VALVE USED IN A PUMP STATION

PARAMETERS	UNIT	HYDROCORE	SNCV
Nominal Working Pressure	Bar	120	120
Flow Rate	Lit/Sec	300	300
Flow Coefficient	**Cv**	**2867**	**956**
Cost of penalty per hour	R/kWh	0.82	0.82
Cost of penalty per hour	$/kWh	0.06	0.06
Pump efficiency (%)	%	75%	75%
RESULTS	**UNIT**	**HYDROCORE**	**SNCV**
Differential Pressure Losses	Bar	0.191	1.721
Valve Power Losses	kW	3.000	26.979
Annual Penalty (operating 24 hours per day)	**Rand**	**21,548**	**193,795**
	USD	**1,539**	**13,843**
ANNUAL SAVINGS USING THE HYDROCORE NON-SLAM CHECK VALVE			
	Rand	**172,247**	-
	USD	**12,303**	-

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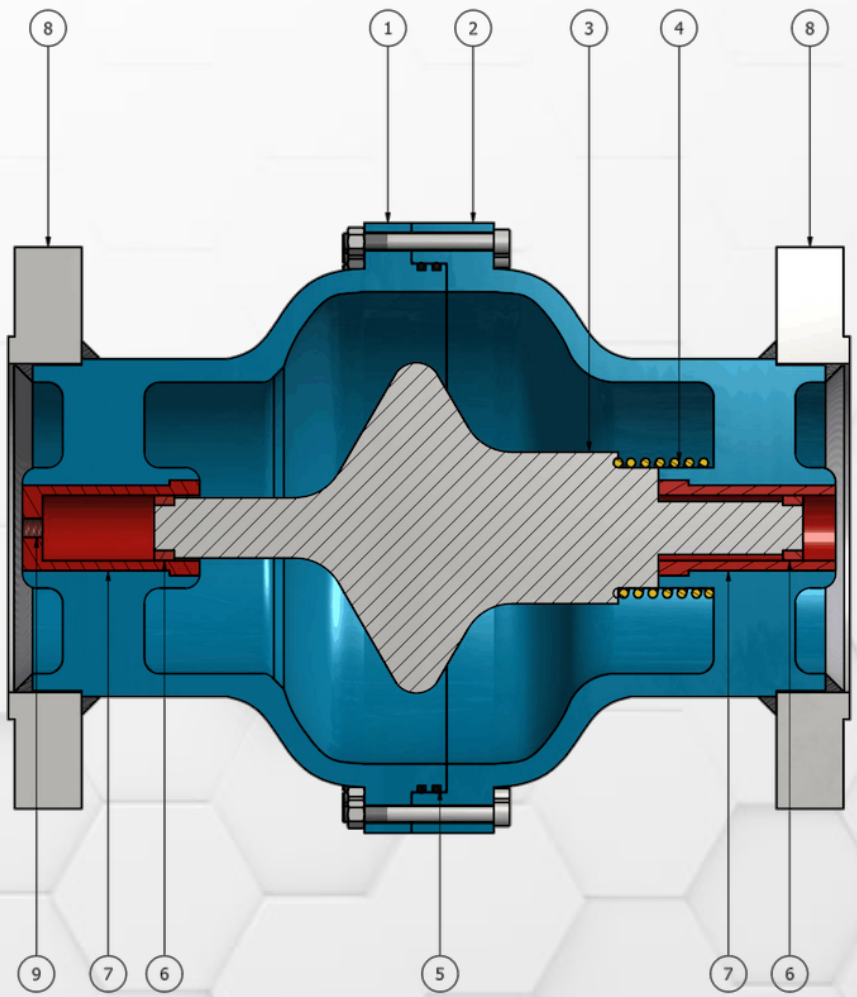
PARTS LIST

PART	DESCRIPTION	50NB - 100NB
1	Inlet	BS-3100 grade A2 Mild Steel or 431SS
2	Outlet	BS-3100 grade A2 Mild Steel or 431SS
3	Shuttle	431SS
4	Spring	309SS
5	Seal	Nitrile
6	Shuttle Bush	Bronze
7	Sleeve	431SS*
8	Flange*	ASTM A105



VALVE DIMENSIONS (FACE-TO-FACE DIMENSIONS IN ACCORDANCE WITH ANSI B16)

NB	MAX FLOW	CV VALUE	ANSI C-600	ANSI C-900	ANSI C-1500
150	117 ℓ/sec	802	559	610	705
200	214 ℓ/sec	1583	660	737	832
250	329 ℓ/sec	2867	787	838	991
300	476 ℓ/sec	2985	838	965	1130