

HYDROCORE LIMITED



TRUE INNOVATIONS



Hydrocore Limited



Product Catalog
2020



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CONTROL VALVES

Pressure Reducing Valve
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ABOUT US

WHO ARE WE?

OEM

Hydrocore™ (formally NGD Valves) is an engineering company trading its own designed & developed products since 1986. We manufacture our own range of isolating, safety and control valves and our own patented range of pipe connectors. Our products are truly unique designed for robustness, efficiency, ease of use and long term savings. With years of industry experience and expertise, we have become a reputable brand, and the preferred supplier of specialised valves in the mining industry. All of our products are made by ISO, API, TUR and CE certified manufacturers.



"Any intelligent fool can make things bigger and more complex... It takes a touch of genius and a lot of courage to move in the opposite direction." - Albert Einstein

HOW ARE WE BETTER THEN THE REST?

Our design philosophy is to **simplify the complex** and create more durable, reliable and efficient products. All of our products are borne of this ideology. Our products are revolutionary in terms of their ease of installation and use, robustness, long term cost benefits and maintenance. The purist nature of our designs create **innovations not imitations**. Our products are built from the ground up to deliver distinct advantages over rival products without compromising on performance, ease of use, or standards.



HYDROCORE™ LIMITED
TRULY INNOVATIVE SOLUTIONS



ABOUT US

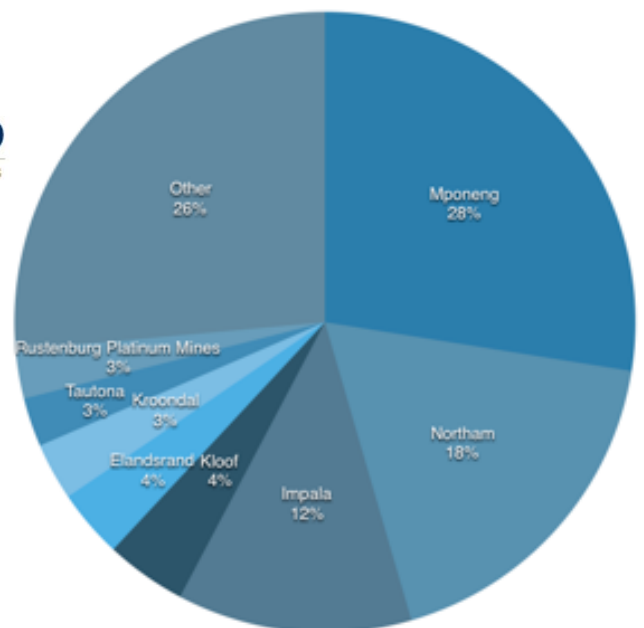
WE HAVE BEEN AROUND THE BLOCK AND BACK

Our products are by no means “new”. They have all been tried, tested, and have many times evolved over the past 30 years. Over 7000 valves have been sold so far. To date, our entire focus was supplying high pressure applications to the mining industry in southern Africa. Mainly SA, but as of recently Australia too. Below is a list of the dominant places where our valves have been commissioned.



VALVES SOLD (BY 2018)

MINE	QTY
Mponeng	1943
Northam	1270
Impala	863
Kloof	297
Elandsrand	252
Kroondal	211
Tautona	180
Rustenburg Platinum Mines	178
Kinross	122
Bambanani	117
BCL	105
Moab Khotsong	87
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OUR PARTNERS



HYDROCORE (LTD)

A BVI registered company. Patent holder, OEM and supplier of original Hydrocore™ products. All products made in China by ISO, API, TUR and CE certified



HYDROCORE MARKETING & TRADING (PTY) LTD.

A South African registered company representing Hydrocore (Ltd) in Southern Africa. Imports the Hydrocore™ products to SA. Provides technical assistance, training, repairs and services locally.



JEWELL INDUSTRIES (PTY) LTD.

A workshop dedicated to the repairs and modification needs of the Hydrocore™ products.



VERLINDE CRANES & HOISTS (PTY) LTD.

The sole distributor of Hydrocore's products in Southern Africa. Handles all sales, marketing and after-sales maintenance services.





VALVE INNOVATIONS

GO WITH THE FLOW



The Hydrocore valve is the only globe valve that breaks away from the standard globe valve and works in an entirely different way. Instead of applying a force on a plug (disc) to regulate the flow, the Hydrocore valve uses a **hydrostatically balanced** shuttle to regulate the flow.

Our hydraulically balanced valve, requires very low operating forces to actuate. Therefore, **no gearbox is required** to assist in the valve's opening or closing. The absence of a gearbox to operate the valve eliminates the risk of malfunctioning and offers a far higher lifetime over traditional valves such as ball valves that rely on gearboxes to operate.

SIMPLICITY OF DESIGN

A complicated valve is a valve that invariably will have issues once the valve is commissioned. The simpler the design the better. This is the curse or blessing of K.I.S.S. (keep it simple stupid). Our valve is **simple and reliable with a robust construction**.

The more moving parts in any valve design the more prone the valve will be to constant maintenance and servicing. This is even more of a concern in a setting where conditions are not optimal for smooth valve functioning. The Hydrocore valve is **simple to maintain and service** compared with a standard globe valve.



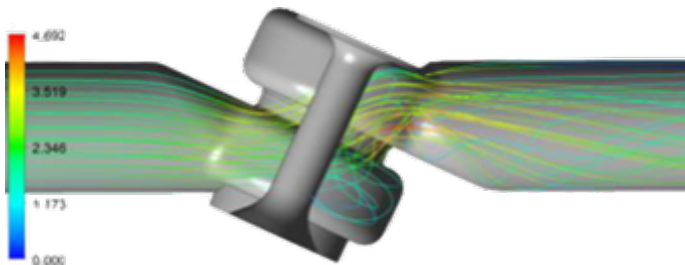
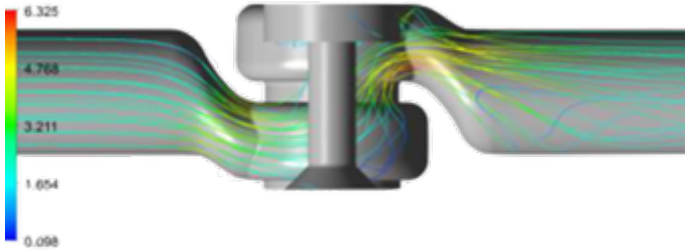


VALVE INNOVATIONS

LOWER RUNNING COSTS

Since 2010 we have been improving the design of our valve range in order to be more **energy efficient**. The cost of electricity in today's economic climate has increased significantly in general, and skyrocketed for the mining industry in particular.

Our new HCA (angular) models have an enlarged, less obstructed opening which minimises the flow resistance. **Our flow coefficient (Cv) is vastly superior to those of standard globe valves**. The electrical cost savings of our valves is absolutely mind boggling. An illustration of these savings is shown on the following page.



VALVE LONGEVITY

If a valve keeps on breaking down and requires constant servicing and maintenance, then the valve is no more an asset. In fact, it is now an obstacle to the smooth running of the entire operation. Inevitably, the valve gets replaced by another brand. The Hydrocore valve, if maintained on a regular basis, will be **keep on functioning indefinitely**.

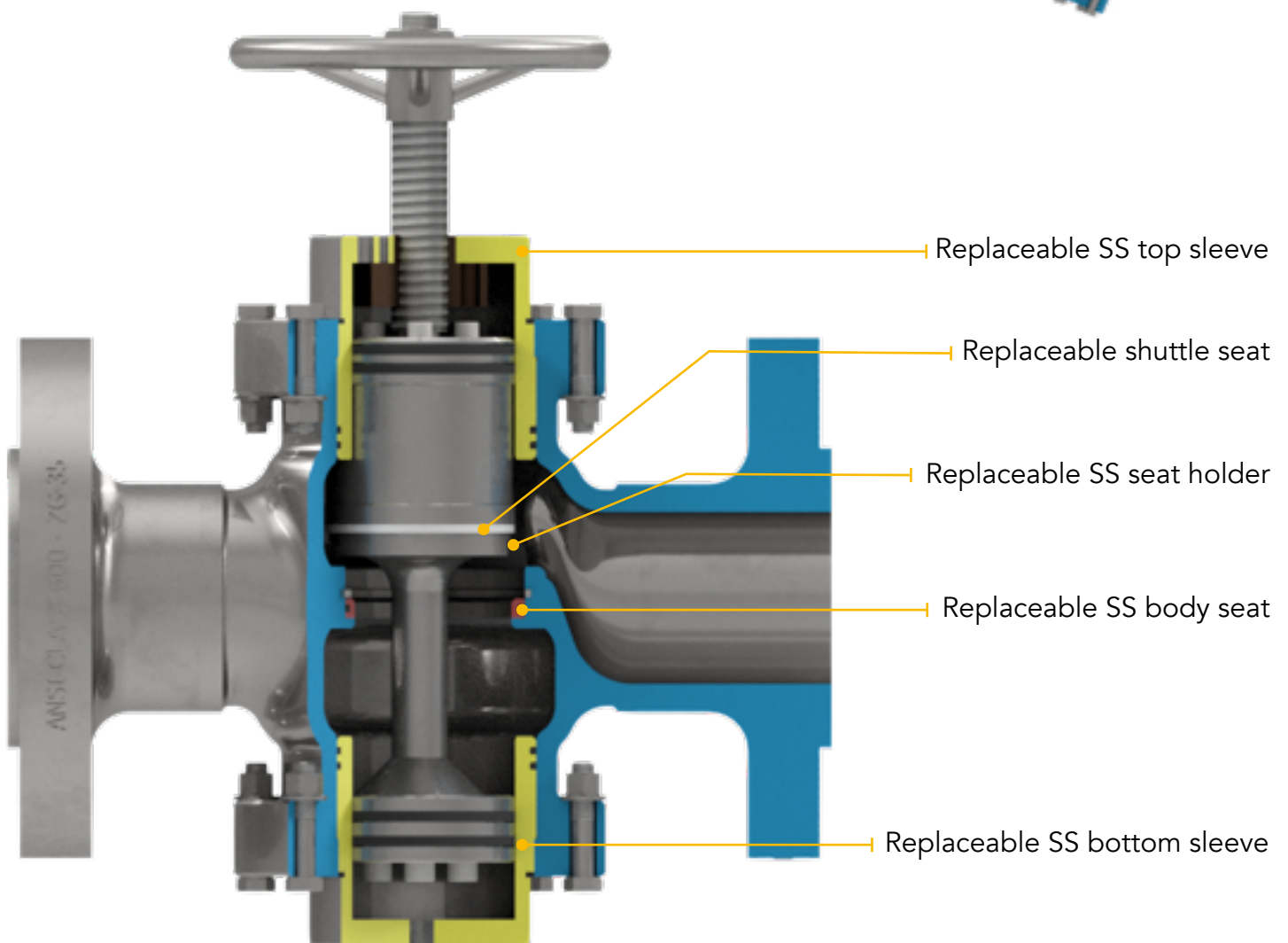
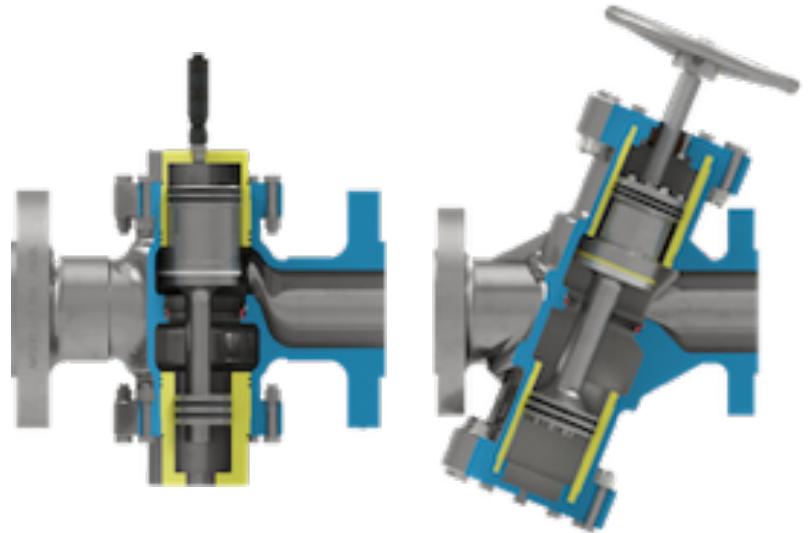




VALVE INNOVATIONS

FOREVER INLINE

The Hydrocore™ valve is the only valve that can be repaired, serviced and maintained while still inline. Our valves have five replaceable parts that can be removed and replaced while the valves remain in place.





ISOLATION VALVES

STANDARD
ISOLATING
GLOBE VALVE



VALVE FLOW CO-EFFICIENT (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 Isolating Globe Valve (**SIGV**) to determine its Cv (see figures below). The table shows the power penalty cost of a Hydrocore Isolating Valve (**HCA**) versus a SIGV. As is evident, the cost savings using a Hydrocore Isolating Valve versus a SIGV 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.

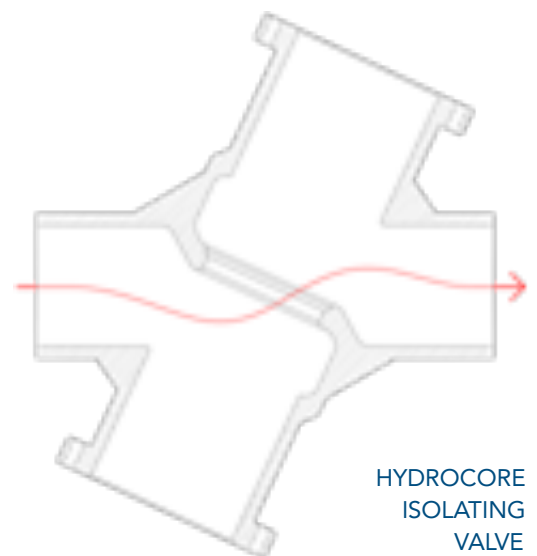
Differential Pressure Losses

$$\left(4.18 \cdot \frac{\text{Nominal Flow}}{C_v}\right)^2$$

Valve Power Losses

$$\frac{(\text{Nominal Pressure} \cdot 9.8 \cdot \text{Valve Pressure Losses} \cdot 10)}{1000 \cdot \text{Pump Efficiency}}$$

PARAMETERS	UNIT	HCA	SIGV
Nominal Working Pressure	Bar	100	100
Flow Rate	Lit/Sec	106	106
Flow Coefficient	Cv	1086	360
Cost of penalty per hour	R/kWh	1.02	1.02
Cost of penalty per hour	\$/kWh	0.07	0.07
Pump efficiency (%)	%	84%	84%
RESULTS	UNIT	HYDROCORE	SIGV
Differential Pressure Losses	Bar	0.166	1.515
Valve Power Losses	kW	1.942	17.673
Annual Penalty (operating 24 hours per day)	Rand	17,352	157,910
	USD	1,157	10,527



HYDROCORE
ISOLATING
VALVE



ISOLATION VALVES



HCA MANUAL ISOLATING VALVE

Description:	A balanced isolating valve that operates the valve manually with a handwheel.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28



HCS MANUAL ISOLATING VALVE

Description:	A balanced isolating valve that operates the valve manually with a handwheel.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 400NB (16")
Max Pressure:	50NB to 100NB — 250 bar (3650 psi) 150NB to 400NB — 160 bar (2320 psi)
Specifications:	Page 29



HCA ELECTRICALLY ACTUATED VALVE

Description:	A balanced isolating valve that operates the valve remotely with an electrical actuator.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28

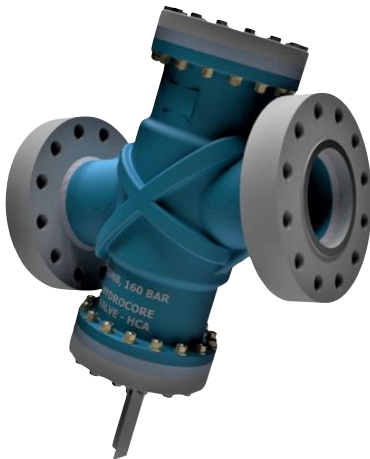


ISOLATION VALVES



HCA DOUBLE ACTING OIL HYDRAULIC ACTUATED VALVE

Description:	A balanced isolating valve that operates the valve remotely by using an oil hydraulic power pack.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28



HCA DOUBLE ACTING PUMP DISCHARGE CONTROL VALVE

Description:	A balanced isolating valve that operates the valve remotely by using the line-fluid pressure.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28

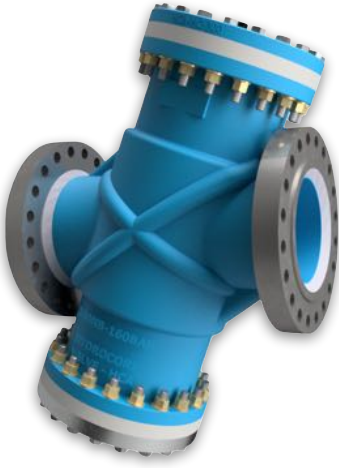


HCA SINGLE ACTING LINE-FLUID ACTUATED VALVE

Description:	An unbalanced isolating valve that operates the valve remotely by using the line-fluid pressure.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28



ISOLATION VALVES



HCA NON-RISING SPINDLE ISOLATION VALVE

Description:	A space-saving balanced isolating valve that operates the valve manually.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28



HCA TAMPER-PROOF ISOLATION VALVE

Description:	A tamper-proof balanced isolating valve that operates the valve manually.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28

Medium: Liquid, petroleum and gas

Temperature: Up to 85°C with standard seals.

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

Flanges: SABS 1123, BS4504, BS10, ASME B16.34, ANSI B16.5, tapered shoulders and other pipe couplings

Materials: External components WCB; Internal components: 304SS/316SS/431SS; Covers: LG-2 or EN-8



CONTROL VALVES

THE COMMON PROBLEM

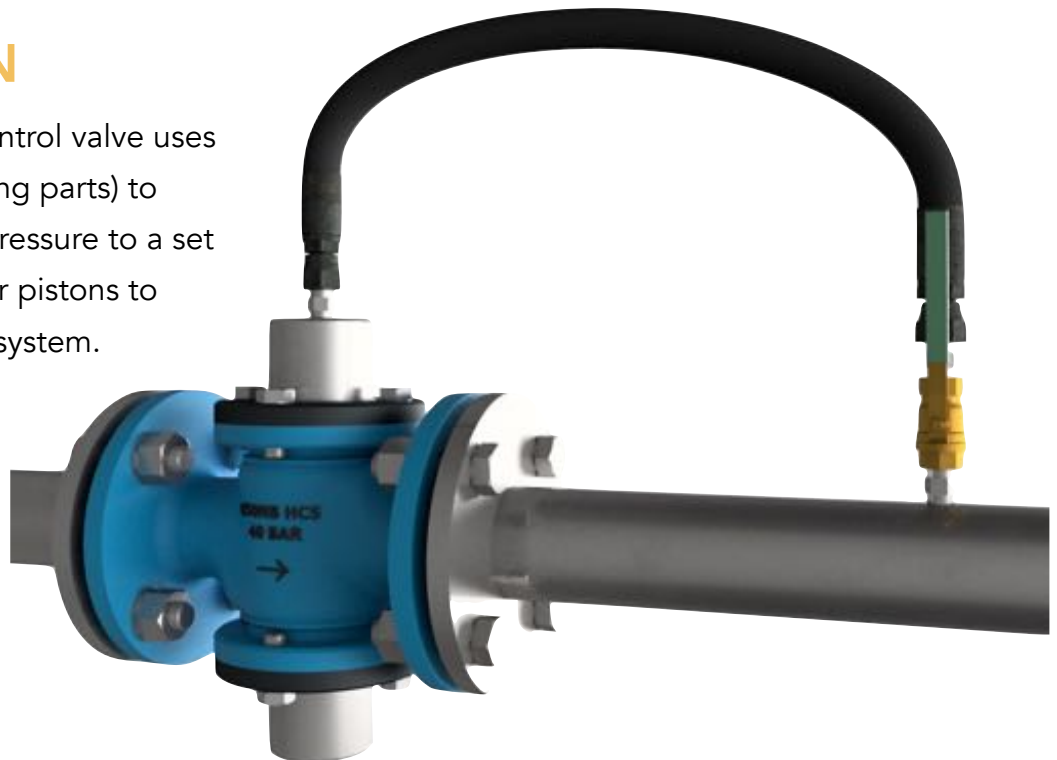
When it comes to pressure control valves the problem with external parts becomes far more problematic. These external parts, pilots and pistons, and are extremely prone to dirt in the line fluid medium. As such they regularly malfunction and therefore require constant maintenance to function properly.



OUR SOLUTION

The Hydrocore pressure control valve uses one sensing hose (no moving parts) to regulate the downstream pressure to a set ratio. It requires no pilots or pistons to reduce the pressure in the system.

The chances of a malfunctioning valve are reduced substantially.





CONTROL VALVES

HCS PRESSURE REDUCING VALVE

Description: A proportional pressure reducing valve maintaining a constant ratio between the upstream and downstream pressures.

Applications: Mining, Industrial, Petrochemical

Size Range: 50NB (2") to 400NB (16")

Max Pressure: 50NB to 100NB — 250 bar (3650 psi)
150NB to 400NB — 160 bar (2320 psi)

Specifications: Page 30



HCS PRESSURE CONTROL VALVE

Description: A proportional pressure control valve that maintains a constant downstream pressures.

Applications: Mining, Industrial, Petrochemical

Size Range: 50NB (2") to 400NB (16")

Max Pressure: 50NB to 100NB — 250 bar (3650 psi)
150NB to 400NB — 160 bar (2320 psi)

Specifications: Page 30



Medium: Liquid, petroleum and gas

Temperature: Up to 85°C with standard seals.

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

Flanges: SABS 1123, BS4504, BS10, ASME B16.34, ANSI B16.5, tapered shoulders and other pipe couplings

Materials: External components WCB; Internal components: 304SS/316SS/431SS; Covers: LG-2 or EN-8



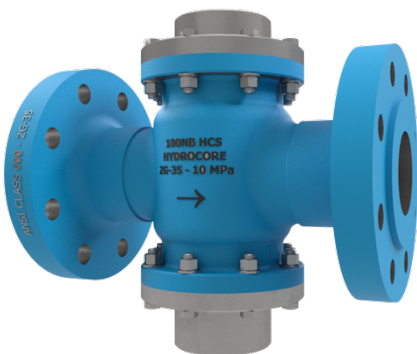
SAFETY VALVES

COMMON SAFETY VALVE ISSUES

The standard safety valve is similar to the standard pressure control valve with one main difference. Where the standard pressure control valve is used for operational purposes, the standard safety valve is used for safety purposes. The malfunctioning of this type of

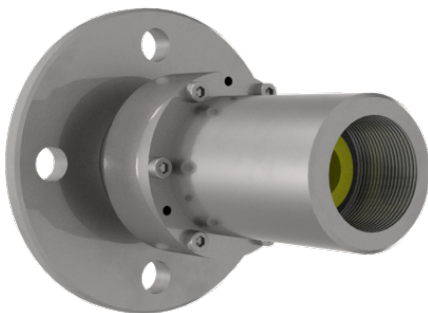
valve can cause for greater damage.

Due to Hydrocore's simplistic design that requires minimal internal parts and no external parts, the chances for malfunctioning has been virtually eliminated.



HCS PRESSURE RELIEF VALVE

Description:	An unbalanced safety valve that opens when the system pressure reaches the relief set point.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 400NB (16")
Max Pressure:	50NB to 100NB — 250 bar (3650 psi) 150NB to 400NB — 160 bar (2320 psi)
Specifications:	Page 30



IT PRESSURE RELIEF VALVE

Description:	An inline safety valve that opens when the system pressure reaches the relief set point.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2")
Max Pressure:	50NB — 40 bar (580 psi)



SAFETY VALVES



HCA EXCESS FLOW SHUTDOWN VALVE WITH MANUAL ISOLATION FACILITY

Description:	A balanced safety valve that isolates a pipeline during excess flow conditions with added manual isolation facility.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28



HCA EXCESS FLOW SHUTDOWN VALVE

Description:	A balanced safety valve that isolates a pipeline during excess flow conditions.
Applications:	Mining, Industrial, Petrochemical
Size Range:	150NB (6") to 400NB (16")
Max Pressure:	160 bar (2320 psi)
Specifications:	Page 28



HCS EXCESS FLOW SHUTDOWN VALVE

Description:	A balanced safety valve that isolates a pipeline during excess flow conditions.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 400NB (16")
Max Pressure:	50NB to 100NB — 250 bar (3650 psi) 150NB to 400NB — 160 bar (2320 psi)
Specifications:	Page 30

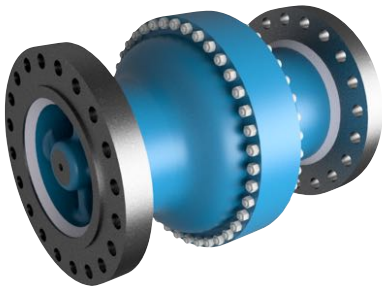


SAFETY VALVES



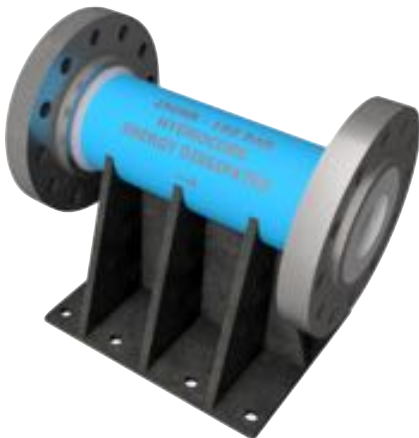
HCS SHOCK PREVENTION VALVE

Description:	A safety valve that prevents the occurrence of water hammer in the pipeline during an abrupt pump stop.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 400NB (16")
Max Pressure:	50NB to 100NB — 250 bar (3650 psi) 150NB to 400NB — 160 bar (2320 psi)
Specifications:	Page 30



HC NON-SLAM CHECK VALVE

Description:	A check valve prevents back flow while minimizing the water hammer effect during the valve's closure.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 400NB (16")
Max Pressure:	50NB to 100NB — 250 bar (3650 psi) 150NB to 400NB — 160 bar (2320 psi)
Specifications:	Page 31



HC ENERGY DISSIPATER

Description:	A valve that reduces high upstream pressure to a low downstream pressure into a water reservoir.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 400NB (16")
Max Pressure:	50NB to 400NB — 250 bar (3650 psi)
Specifications:	Page 32



COMPLETE STATIONS

PUMP AUTOMATION STATION

The operation of pump stations is a multi-task procedure that ensures the station's performance and the safety of equipment & personnel at a minimum cost. The operation of the pump station, in some mines, has not changed for decades and it has become less and less affordable. In fact, most mines that have automated their pump stations, did it by applying expensive technology, which provided the necessary functions at high capital cost and with great dependency on high-tech qualified personnel.

The Hydrocore™ Pump Discharge Control Valve is a new and innovative application of the Hydrocore™ range of valves and combines three basic principles as well as several unique features:



- ❖ Opens automatically on pump startup as a result of the pump's discharge pressure acting on valve's shuttle.
- ❖ Prevents pump surge conditions by maintaining a positive discharge pressure when the pump is running, irrespective of the discharge column fullness level.
- ❖ Closes automatically on pump stop as a result of the valve's top compartment force, acting on the valve's shuttle, against the pump's reduced discharge pressure.
- ❖ Assists Hydrocore™ check valve on the pump's discharge.
- ❖ Can prevent water hammer on pump trip or pump stop occurrences by utilizing an Hydrocore™ check valve.
- ❖ Prolongs the balancing disc life span by maintaining a positive discharge pressure when the pump is running, irrespective of the discharge column fullness level.
- ❖ The pump discharge control valve pneumatically, hydraulically or electrically (by the use of an electrical actuator).



COMPLETE STATIONS

SHOCK PREVENTION STATION

Application

The Hydrocore™ shock prevention valve prevents the occurrence of water hammer when:

- ❖ The entire pump station trips.
- ❖ The last of the running pumps trips.
- ❖ A pump operator abruptly switches the last running pump.

Uniqueness

The Hydrocore™ shock prevention system is a unique solution for high-pressure vertical or inclined pumping

Column Draining

The Hydrocore™ shock prevention valve is used as the column drain valve, enabling cavitation-free draining of the pump discharge column.



Principle of Operation

The shock prevention valve instantaneously opens on pump trip occurrence, to enable a flow passage to the station's reservoir and to avoid abrupt stoppage of the reversing flow, with no need for actuators, pilots, sophisticated instruments or an external power source.

The control system consists of:

- ❖ N/O timer switch closes on pump trip occurrence and reopens after a short interval.
- ❖ N/C Solenoid valve, causing the instantaneous opening of the shock prevention valve when the timer switch closes.
- ❖ The N/C solenoid valve closes after a short time interval and fluid entering slowly to the valve's closing compartment causes the slow closing of the shock prevention valve.

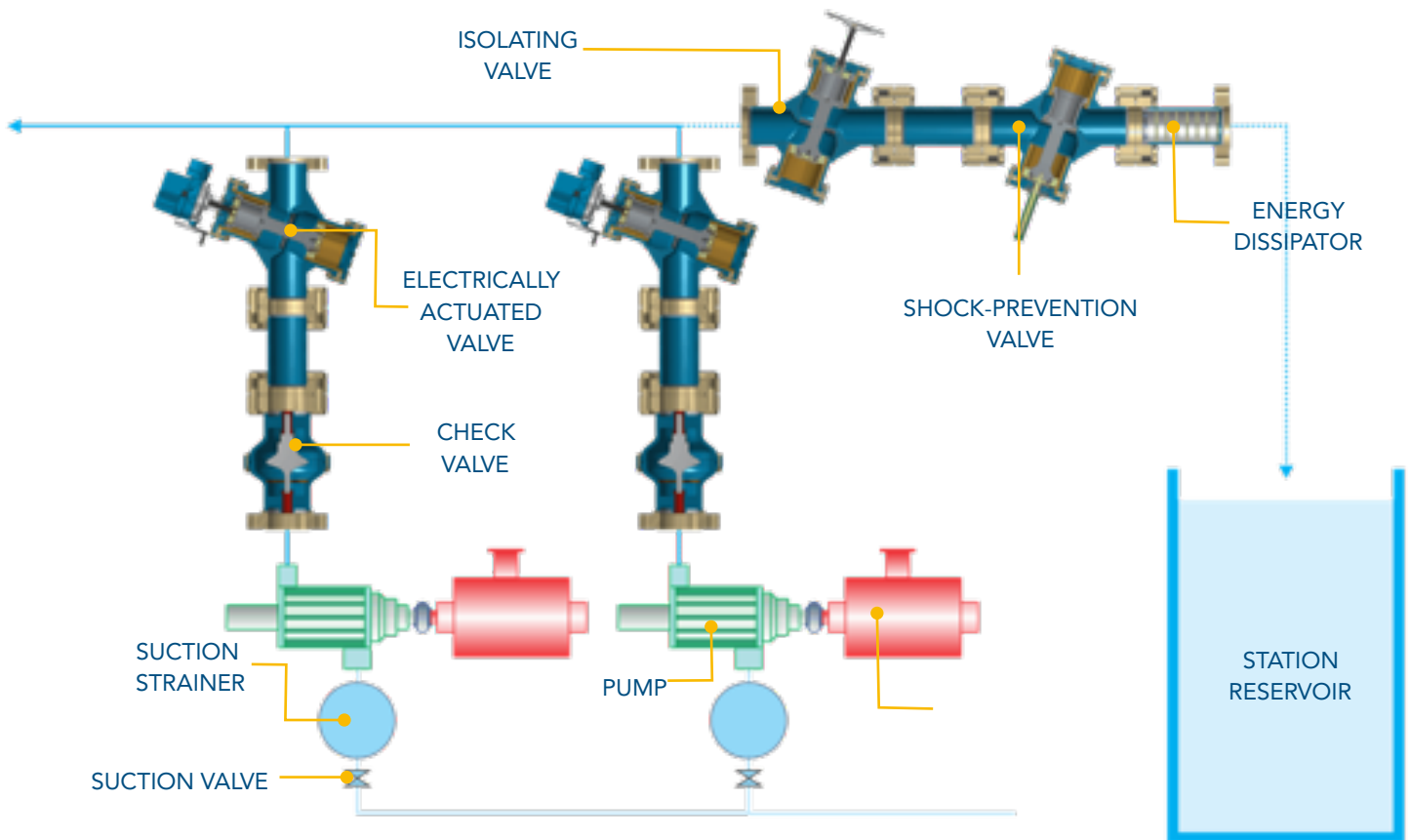


COMPLETE STATIONS

Objectives & Advantages

The automation of the operation of the pump station can be achieved by applying the minimum necessary high-tech equipment, for the purposes of:

- ❖ Automatic opening of the pump discharge control valve, on pump start-up occurrence.
- ❖ Automatic closing of the pump discharge control valve, on pump stops or pump trip occurrences.
- ❖ Prevention of water hammer on pump's stopping or tripping occurrences.
- ❖ Maintaining of sufficient pump discharge pressure, regardless of the operating conditions, in order to:
 - ❖ Prevent pump flow surge conditions.
 - ❖ Reduce wear of the pump's balancing disc.
- ❖ Reduction of the operating cost by optimizing the required manpower for the operation of the pump station, with regards to:
 - ❖ Intensive-labour operating personnel.
 - ❖ High-tech maintenance personnel.
 - ❖ Reduction in the dependency of the mine on high-tech qualified personnel mostly because this type of personnel becomes less available and less affordable.
- ❖ Reduction of the running & maintenance cost, due to the:
 - ❖ Reduction of potential damage to pumps and pipelines.
 - ❖ Reduction of the maintenance cost of pumps, instrumentation and columns.





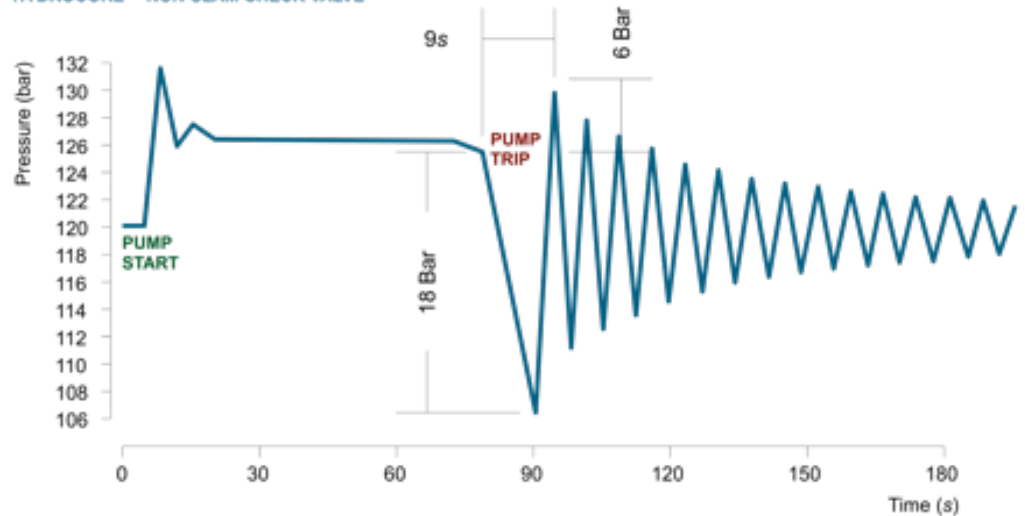
COMPLETE STATIONS

Pressure transient following a pump trip

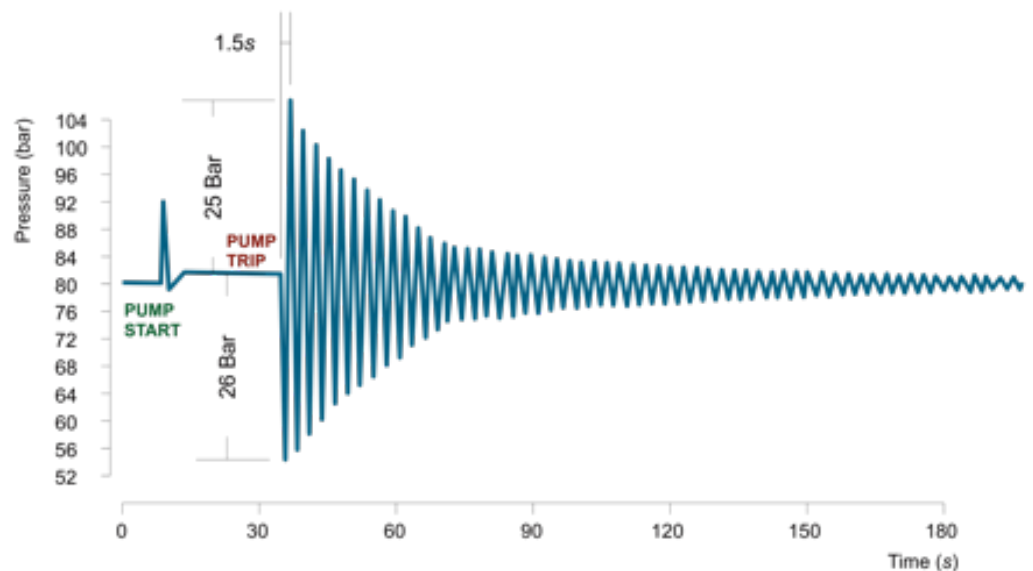
The graphs demonstrate how the Hydrocore™ Non-Slam Check Valve compares to a regular check valve in the event of a pump trip. When the pump trips it creates a **water hammer** in the system which can cause havoc if the shock is not minimized.

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





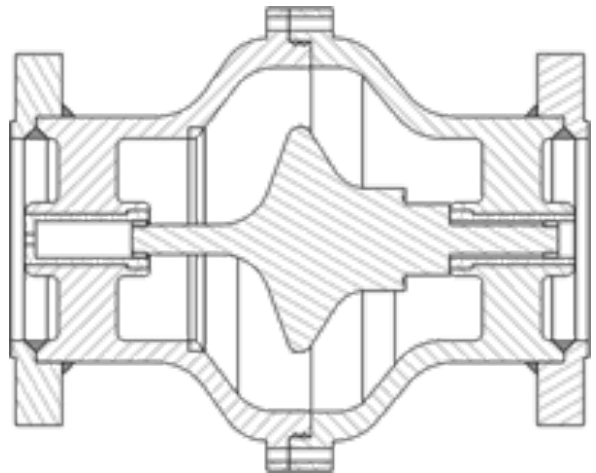
COMPLETE STATIONS

THE HC NON-SLAM CHECK VALVE'S AMAZING COST SAVINGS BENEFIT

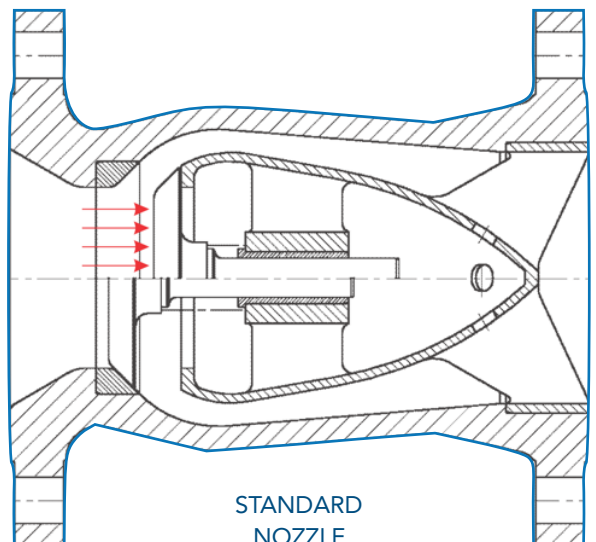
We have modelled a Standard Nozzle Check Valve (**SNCV**) to determine its Cv (see figures below). The table on the right shows the power penalty cost of a Hydrocore non-slam check valve (**HC**) versus a SNCV.

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-SLAM
CHECK VALVE



PARAMETERS	UNIT	HC	SNCV
Nominal Working Pressure	Bar	120	120
Flow Rate	Lit/Sec	270	270
Flow Coefficient	Cv	2867	768
Cost of penalty per hour	R/kWh	1.06	1.06
Cost of penalty per hour	\$/kWh	0.07	0.07
Pump efficiency (%)	%	75%	75%
RESULTS	UNIT	NRV	SNCV
Differential Pressure Losses	Bar	0.155	2.160
Valve Power Losses (per hour)	kW	2.430	33.861
Annual Penalty (operating 16 hours per day)	Rand	15,041	209,615
	USD	1,055	14,696



STANDARD
NOZZLE
CHECK VALVE



COMPLETE STATIONS

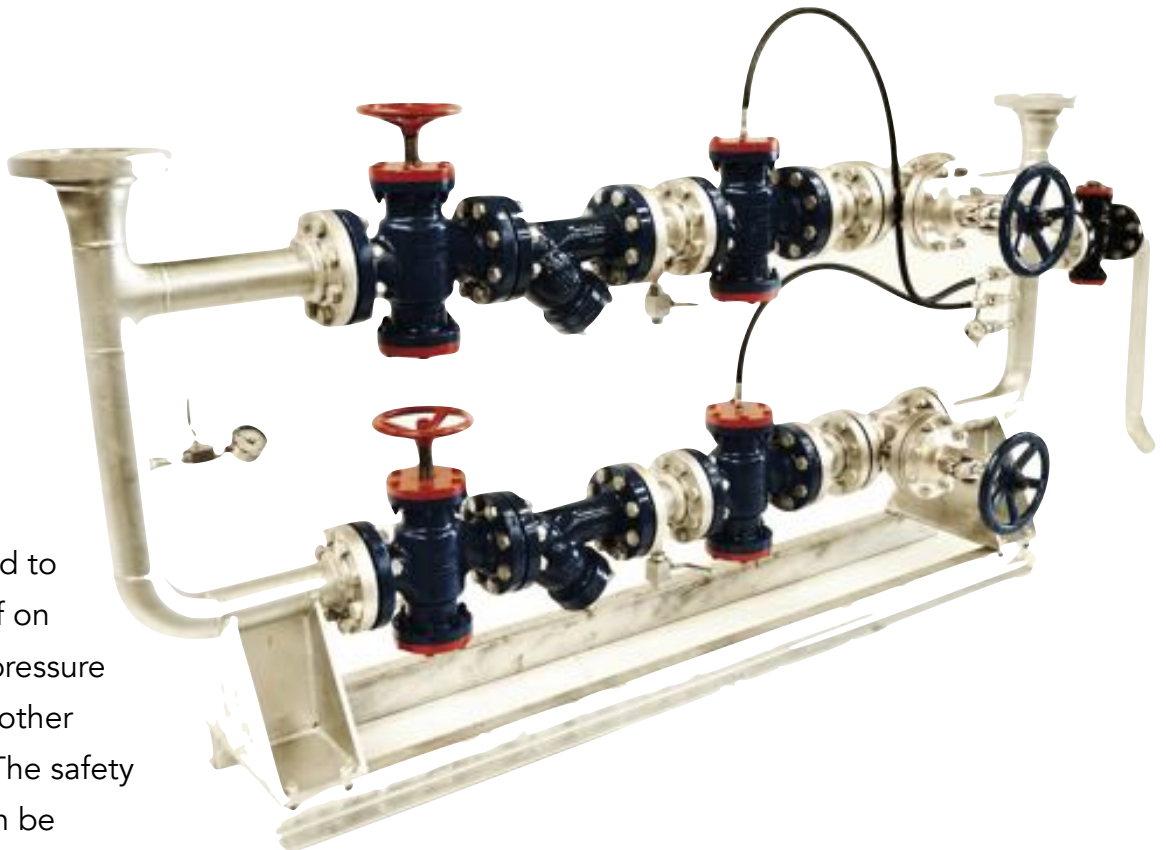
PRESSURE REDUCING STATION - A DUAL LEG OPERATION

The dual leg **Pressure Reducing Station** is a complete pressure reducing station that has a full operating leg backed by a full standby leg. each leg consists of:

- I. Two hand-wheel operated valves to isolate a leg for maintenance.
- II. A strainer to prevent entrance of solids to the safety and control valves.
- III. A pressure reducing/control valve to maintain the required downstream pressure.
- IV. A pressure relief valve is installed on the station's outlet to prevent the rising of the downstream pressure above a specified safe level.

Optional

A safety shutdown valve may be added to each leg to shut off on high downstream pressure excess flow or any other safety conditions. The safety shutdown valve can be utilized for remote stop or start of the station.





COMPLETE STATIONS

FLOW CONTROL STATION - STOPE ARRANGEMENT

Principle of Operation

The cooling coil control system maintains a constant differential pressure 'dP' across the coil, irrespective of the plant's upstream pressure 'Pu' or the downstream water demand Q1.

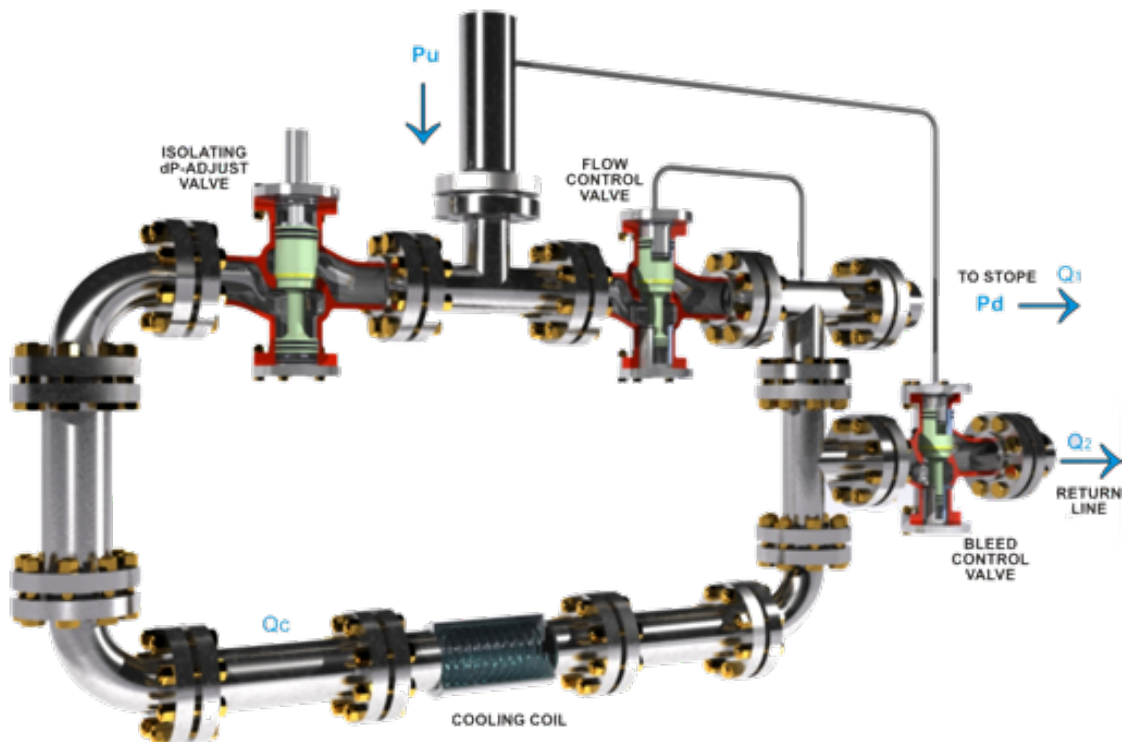
The bleed control valve maintains a constant differential pressure 'dP' across the coil

No actuator, pilots or pistons

The line-fluid pressure powers the valve with no need for external actuators, pilots, instruments or external power source.

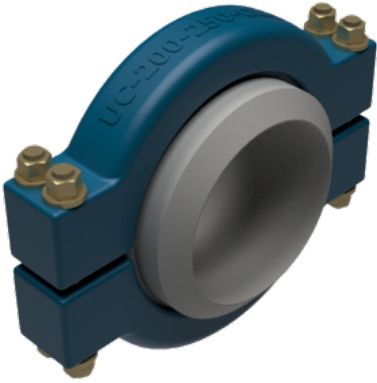
Areas of Application

- ❖ The cooling coil control system maintains a constant flow through an underground cooling coil by:
Maintaining a constant flow through the coil when the downstream demand is higher than the required flow.
- ❖ Discharging the excess flow when the downstream demand is lower than the required flow.





PIPE CONNECTORS



HC U-CONE

Description:	An alternative to flange couplings for any horizontal or inclined pipeline.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 600NB (24")
Max. Pressure:	250 bar (3650 psi)
Specifications:	Page 34 — 35

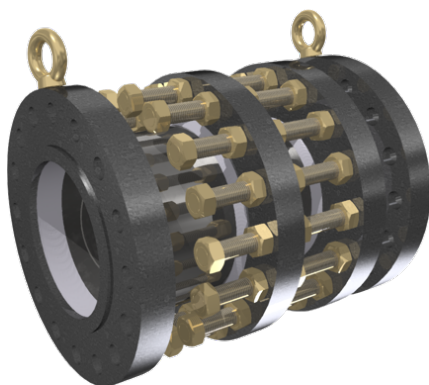
Advantages: Occupies small space, low cost, quick and easy handling of pipes in the shaft.



HC PIPE GROOVE COUPLING

Description:	An alternative to flange couplings for any horizontal or inclined pipeline.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 300NB (12")
Max. Pressure:	250 bar (3650 psi)
Specifications:	Page 33

Advantages: Quick and easy installation, low costs, no need for specialised labour skills, eliminate the risks of fire or fume hazards, on site maintenance and repairs, no losing or misplacing parts.



HC EXPANSION JOINT

Description:	An easy method of joining plain ended pipes in a vertical shaft that allows for expansion and contraction.
Applications:	Mining, Industrial, Petrochemical
Size Range:	50NB (2") to 300NB (12")
Max. Pressure:	250 bar (3650 psi)
Specifications:	Page 36

Advantages: No welding needed, saves space and drastically reduces installation time.



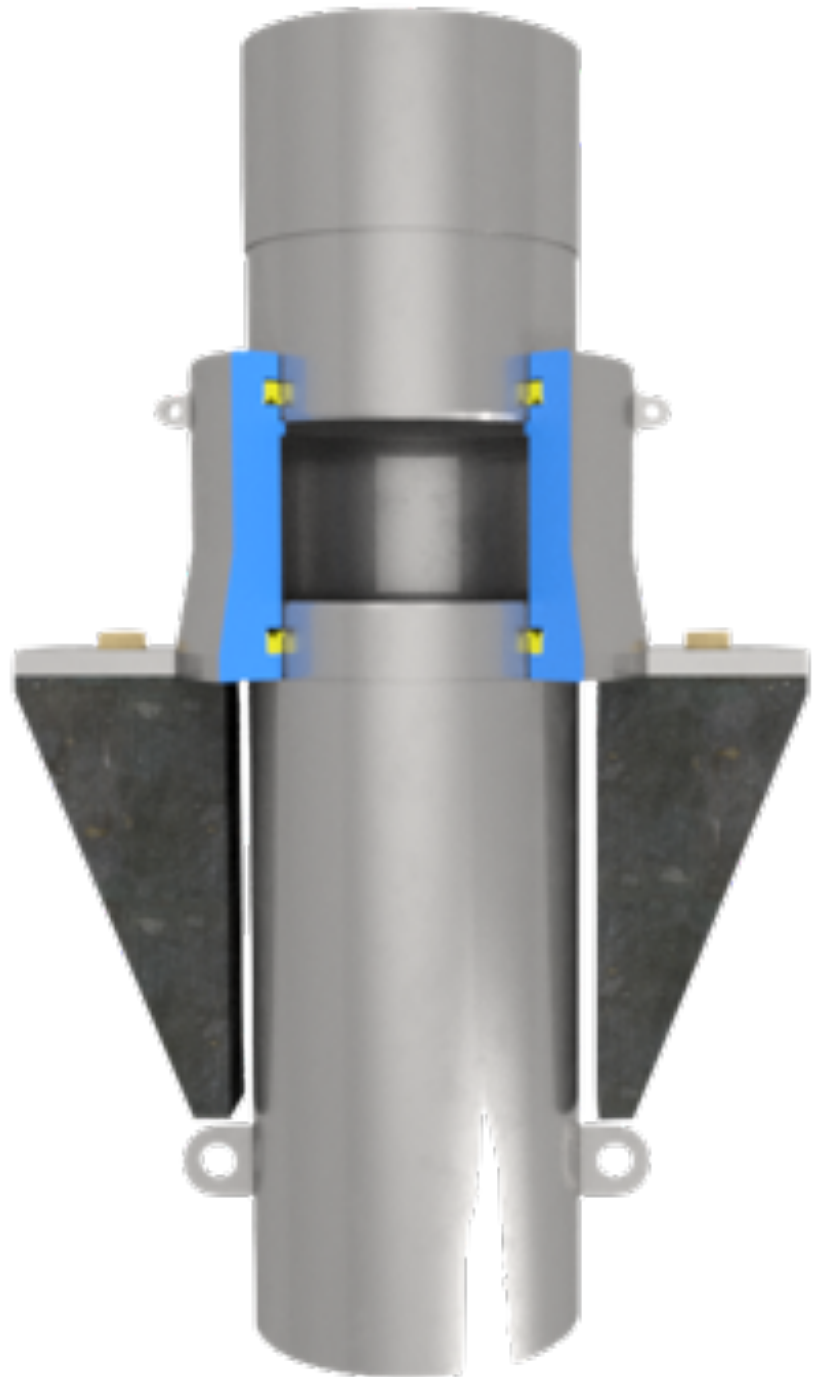
PIPE CONNECTORS

HYDROCORE™

THERCOM COUPLING

The Thercom Coupling is a tailor-made coupling that enables the joining of pipes in a **vertical shaft**, which offers many advantages of which a few are listed below.

- Occupies small shaft space.
- Individual support of each pipe in the shaft.
- The coupling is a natural expansion joint.
- Low cost compared to flanges.
- Integrates the pipe support into the coupling structure.
- No bolting or welding is required for the pipe joining.
- Quick and easy handling of pipes in the shaft.
- Seals are not affected by water hammer occurrence.



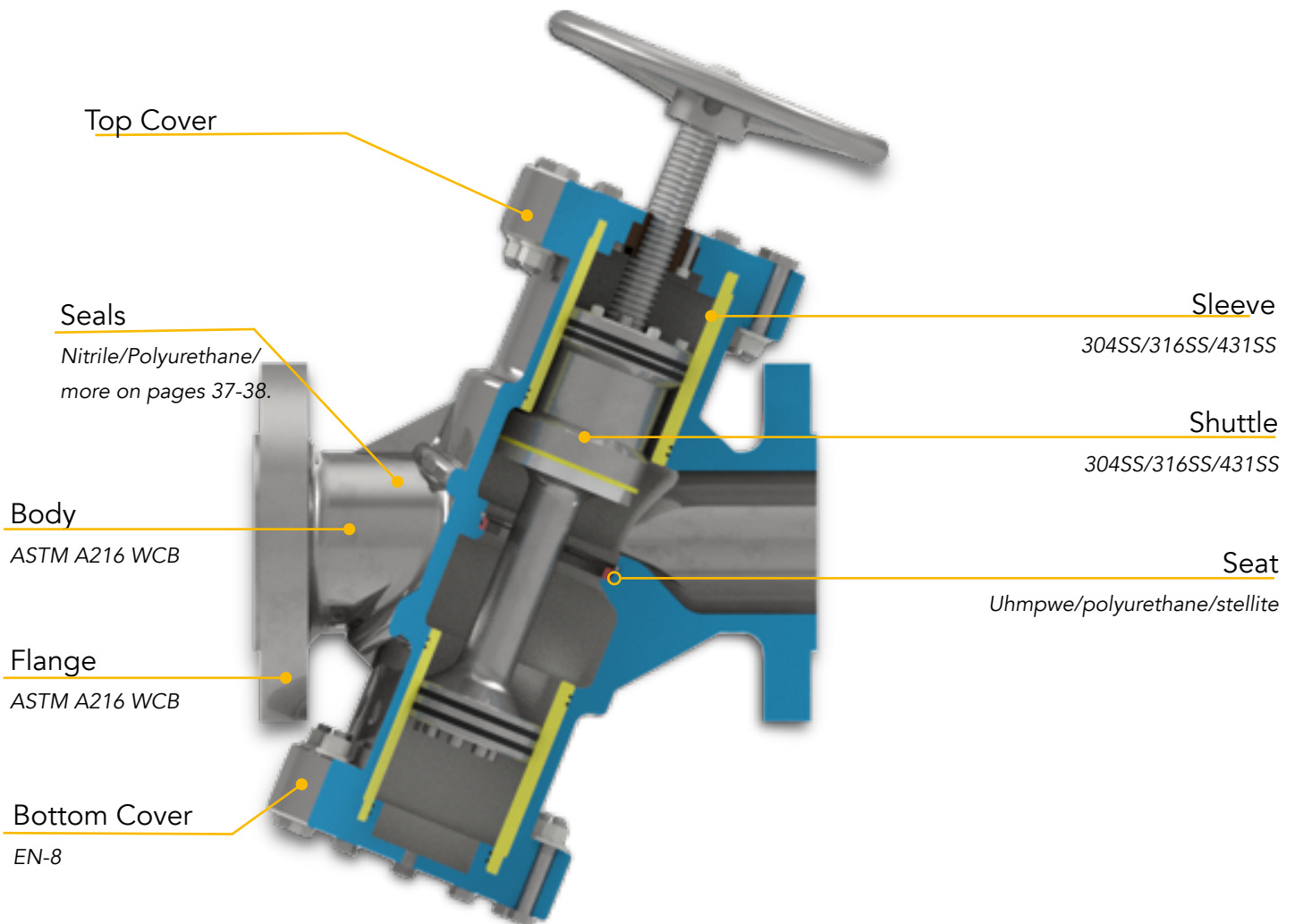
PIPING SPECIFICATION

Sizes: 50Nb (2") - 1000Nb (40")

Rating: Up To 250 Bar (3675 Psi)



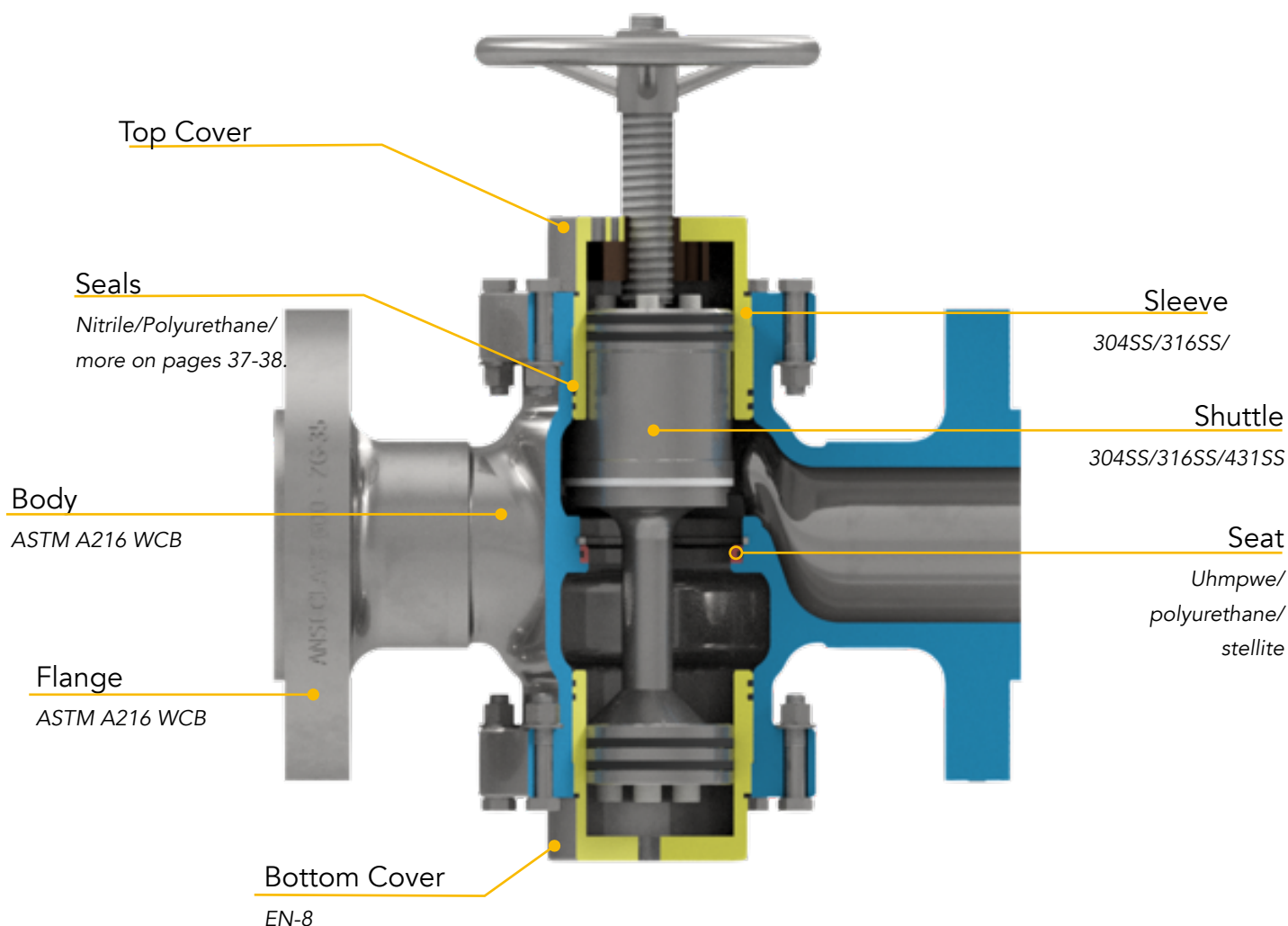
MATERIALS & DIMENSIONS



DN	MAX FLOW RATE	CV	HEIGHT	#150 F-T-F	#300 F-T-F	#600 F-T-F	#900 F-T-F	#1500 F-T-F
mm	ℓ/sec	Cv	mm	mm / kg	mm / kg	mm / kg	mm / kg	mm / kg
150	117	525	839mm - 955mm	559mm / 229kg	559mm / 245kg	559mm / 270kg	610mm / 297kg	705mm / TBD
200	152	1086	1096mm - 1243mm	660mm / 405kg	660mm / 429kg	660mm / 460kg	737mm / 509kg	832mm / TBD
250	233	1433	1232mm - 1407mm	787mm / 744kg	787mm / 778kg	787mm / 840kg	838mm / 891kg	991mm / TBD
300	337	1936	1398mm - 1591mm	838mm / 1052kg	838mm / 1098kg	838mm / 1164kg	965mm / 1277kg	1130mm / TBD



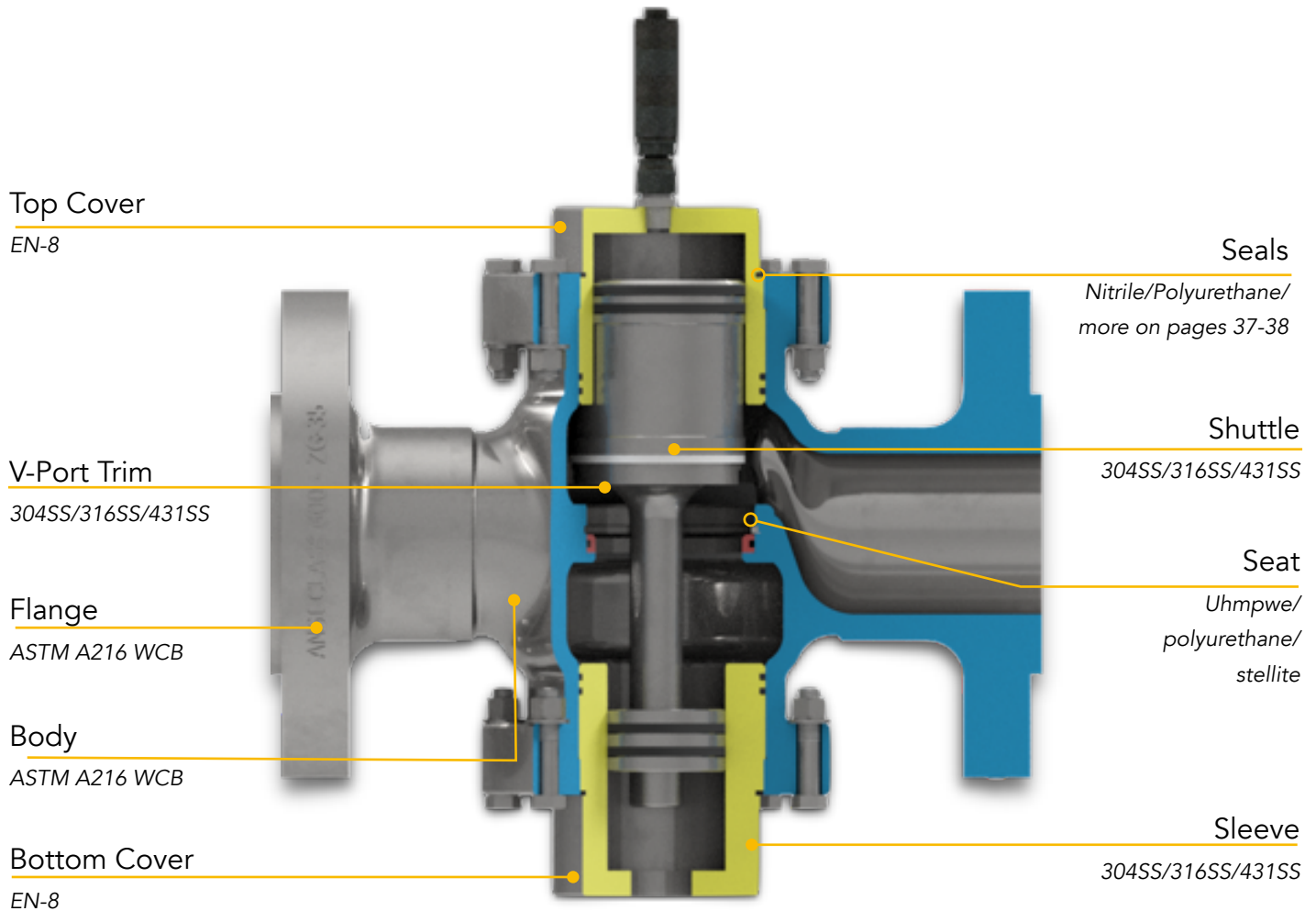
MATERIALS & DIMENSIONS



DN	MAX FLOW RATE	Cv	HEIGHT	#150 F-T-F	#300 F-T-F	#600 F-T-F	#900 F-T-F	#1500 F-T-F
mm	ℓ/sec	Cv	mm	mm / Kg	mm / Kg	mm / Kg	mm / Kg	mm / Kg
50	9 ℓ/sec	50 (41)	329mm - 366mm	203mm / 16kg	267mm / 18kg	292mm / 19kg	368mm / 33kg	368mm / 33kg
80	25 ℓ/sec	97 (86)	426mm - 466mm	267mm / 23kg	318mm / 28kg	356mm / 31kg	381mm / 41kg	470mm / 51kg
100	38 ℓ/sec	132 (119)	508mm - 562mm	292mm / 31kg	356mm / 41kg	432mm / 53kg	457mm / 64kg	546mm / TBD
150	117 ℓ/sec	325 (309)	620mm - 703mm	356mm / 109kg	445mm / 131kg	559mm / 162kg	610mm / 187kg	705mm / TBD
200	152 ℓ/sec	648 (523)	802mm - 880mm	495mm / 245kg	559mm / 275kg	660mm / 316kg	737mm / 358kg	832mm / TBD
250	233 ℓ/sec	871	879mm - 975mm	622mm / 465kg	622mm / 498kg	787mm / 585kg	838mm / 636kg	991mm / TBD
300	337 ℓ/sec	1500	960mm - 1075mm	699mm / 705kg	711mm / 755kg	838mm / 839kg	965mm / 954kg	1130mm / TBD



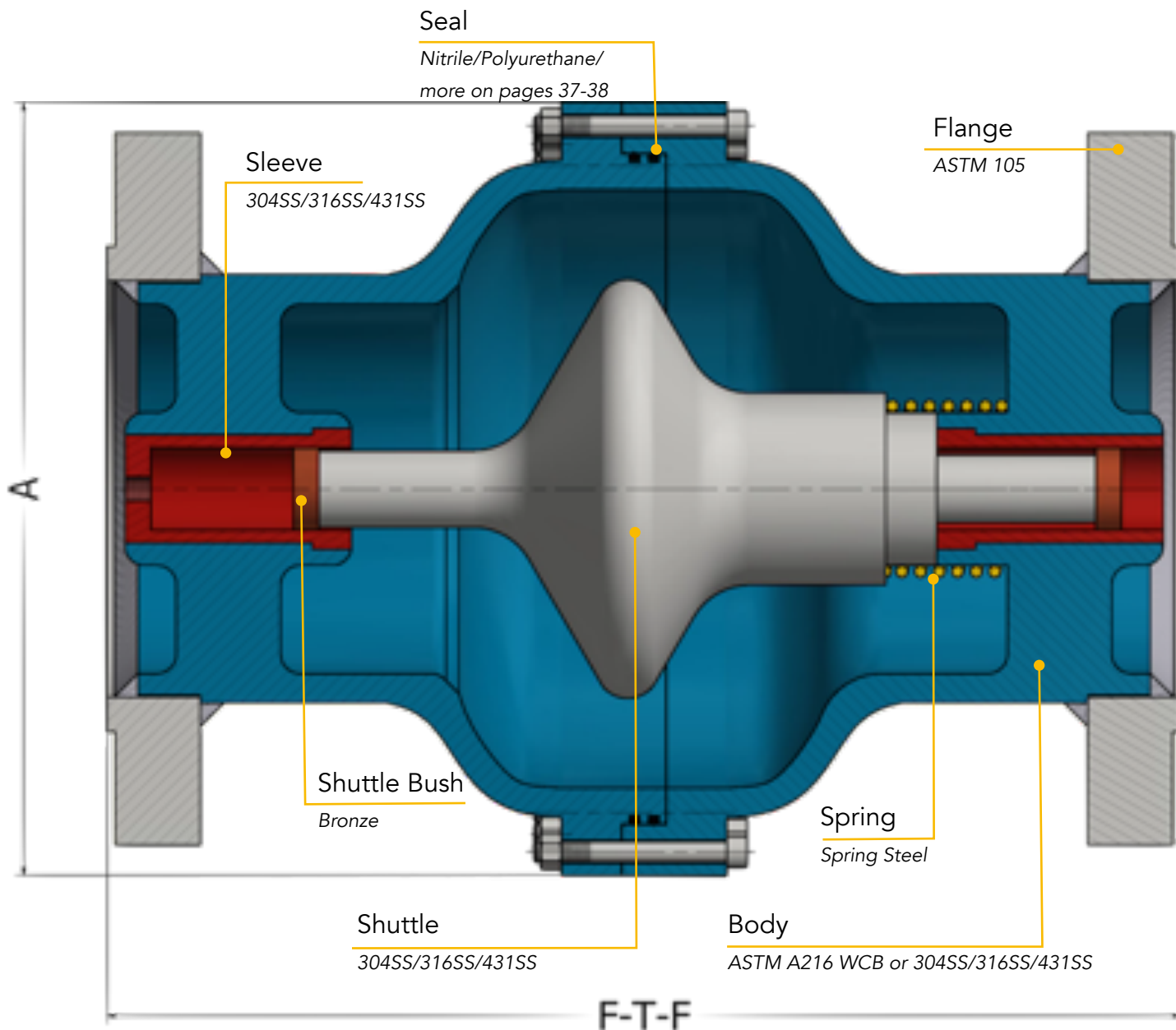
MATERIALS & DIMENSIONS



DN	MAX FLOW RATE	CV	HEIGHT	#150 F-T-F	#300 F-T-F	#600 F-T-F	#900 F-T-F	#1500 F-T-F
mm	ℓ/sec	Cv	mm	mm / Kg	mm / Kg	mm / Kg	mm / Kg	mm / Kg
50	9 ℓ/sec	50 (41)	270mm	203mm / 16kg	267mm / 18kg	292mm / 19kg	368mm / 33kg	368mm / 33kg
80	25 ℓ/sec	97 (86)	336mm	267mm / 23kg	318mm / 28kg	356mm / 31kg	381mm / 41kg	470mm / 51kg
100	38 ℓ/sec	132 (119)	402mm	292mm / 31kg	356mm / 41kg	432mm / 53kg	457mm / 64kg	546mm / TBD
150	117 ℓ/sec	325 (309)	532mm	356mm / 109kg	445mm / 131kg	559mm / 162kg	610mm / 187kg	705mm / TBD
200	152 ℓ/sec	648 (523)	658mm	495mm / 245kg	559mm / 275kg	660mm / 316kg	737mm / 358kg	832mm / TBD
250	233 ℓ/sec	871	755mm	622mm / 465kg	622mm / 498kg	787mm / 585kg	838mm / 636kg	991mm / TBD
300	337 ℓ/sec	1500	850mm	699mm / 705kg	711mm / 755kg	838mm / 839kg	965mm / 954kg	1130mm / TBD



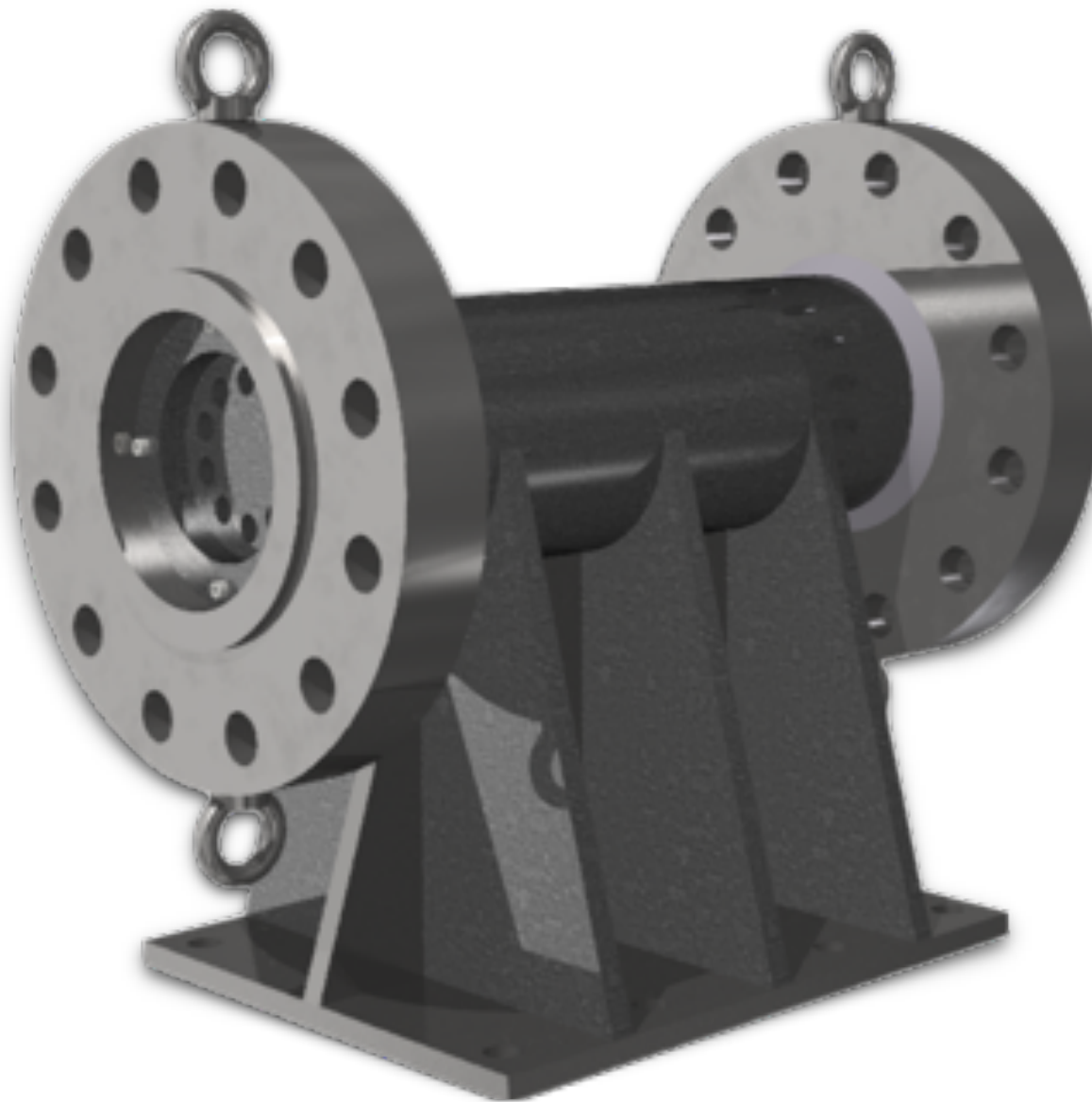
MATERIALS & DIMENSIONS



DN	MAX FLOW	CV VALUE	ANSI C-600	ANSI C-900	ANSI C-1500
mm	ℓ/sec	Cv	mm	mm	mm
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



MATERIALS & DIMENSIONS



DN	Flow
mm	ℓ/sec
12	1 - 2
25	3 - 6
38	7 - 14
50	12 - 24
80	30 - 60
100	47 - 94
150	106 - 212
200	188 - 376
250	294 - 588
300	424 - 848
350	577 - 1154
400	754 - 1508

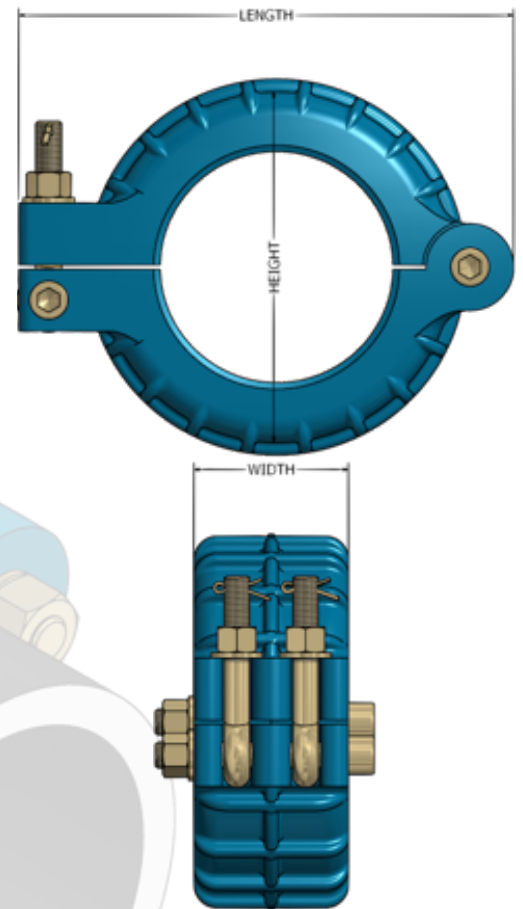
Materials

Body	EN-8 or equivalent
Flanges	Steel
Coating	50μ epoxy on 30μ base zinc
Stages	431SS hardened
Spacers	Steel



MATERIALS & DIMENSIONS

DN Size	Max Pressure	Max Load	Weight	Length	Height	Width	Bolts
mm	Bar	kN	Kg	mm	mm	mm	
50	40	11.6	0.5	110	76	24	M8 x 35
	100	29	1.1	132	84	34	M10 x 50
	200	73	1.5	132	84	46	M10 x 65
65	40	16.8	1.0	137	96	30	M8 x 40
	100	42	1.8	158	103	38	M10 x 60
	200	105	2.4	159	105	50	M10 x 65
80	40	24.8	1.6	167	120	30	M10 x 45
	100	62	3.3	193	125	46	M12 x 70
	200	155	4.2	193	125	58	M12 x 75
100	40	41.2	2.1	204	142	34	M12 x 55
	100	103	5.4	230	150	58	M16 x 80
	200	258	7.7	230	164	72	M12 x 90
150	40	88.8	3.9	261	200	42	M12 x 60
	100	311	9.2	300	214	62	M16 x 90
	200	477	13.5	315	222	78	M16 x 100
200	40	113.1	5.9	347	252	42	M16 x 65
	100	396	15.7	378	271	74	M20 x 110
	175	660	24.8	383	283	100	M20 x 130
250	35	204.8	13.7	420	324	58	M20 x 90
	85	497	31.6	495	343	82	M24 x 120
	170	995	48.3	500	353	112	M24 x 150
300	35	288.1	29.7	515	390	82	M24 x 160
	85	700	63.9	600	424	110	M36 x 180
	160	1317	102.3	640	444	160	M36 x 180



FACTS SHEET

The coupling seal design acts as a natural compression/expansion joint

Support and hanging requirements correspond to ASME B31.1 Power Piping Code and ASME B31.9 Building Services Piping Code.

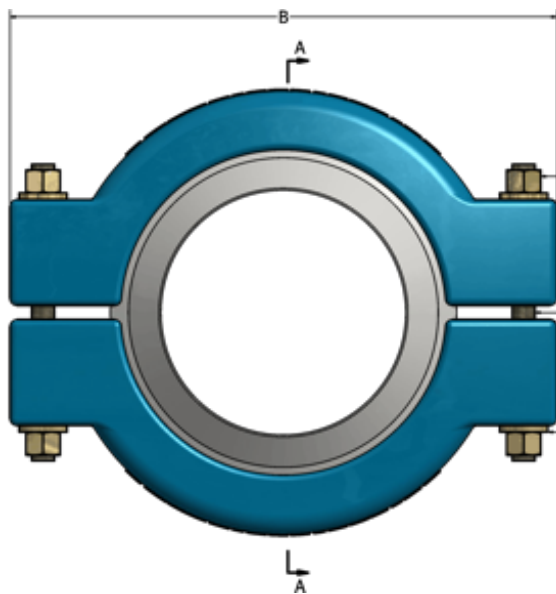
Coupling: Cast steel conforming to ASTM A27, grade 70-60 (BS-3100 Grade A2 or ZG-35) with blue enamel or hot dipped galvanised coating.

Locating Ring: Cast steel conforming to ASTM A27, grade 70-60 (BS-3100 Grade A2 or ZG-35) with hot dipped galvanised coating.

Seal: Polyurethane 90 Shore A (standard seal), EPDM or Nitrile. More options are found on pages 37-38.



MATERIALS & DIMENSIONS

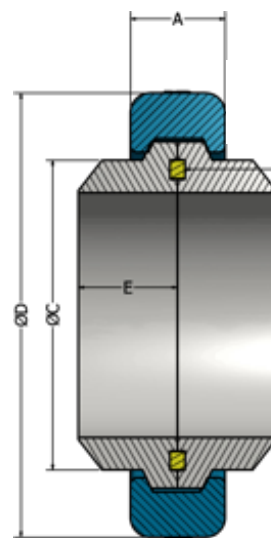


NUT (Grade 8.0, Electro-Galvanised)

CLAMP (Cast Steel B3100 Grade 2, Coated By 200 Of Epoxy On 30 Of Zinc Chromate)

STUD (Grade 8.8 Or Higher, Electro-Galvanised)

WASHER (Grade 8.8 Or Higher, Electro-Galvanised)



SEAL (PTFE or UHMWPE).

More options are found on pages 37-38.

HUB (St52 Or Equivalent). Coated To Client Specification. Hubs are prepared for standard butt welding

SECTION A-A

64 Bar Rating	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500
A (mm)	40	40	42	45	50	55	60	65	70	75	80	85
B (mm)	128	143	196	207	284	349	425	497	552	600	669	750
C (mm)	60	73	89	114	168	219	273	324	356	406	457	508
D (mm)	106	119	141	172	236	295	365	424	458	524	585	644
E (mm)	17	19	21	23	30	32	38	41	45	48	55	57
No. of bolts	2	2	2	2	4	4	4	4	4	4	4	4
Bolt ϕ (mm)	8	8	10	12	16	16	16	20	24	24	27	33
Hub Weight (kg)	0.4	0.6	1	1.3	3.2	4.7	8.5	11.4	15.3	19.4	28.3	34.3
Clamp Weight (kg)	0.7	0.7	1	1.7	3	4.9	7.8	11.5	15.5	20.3	25.8	33.6

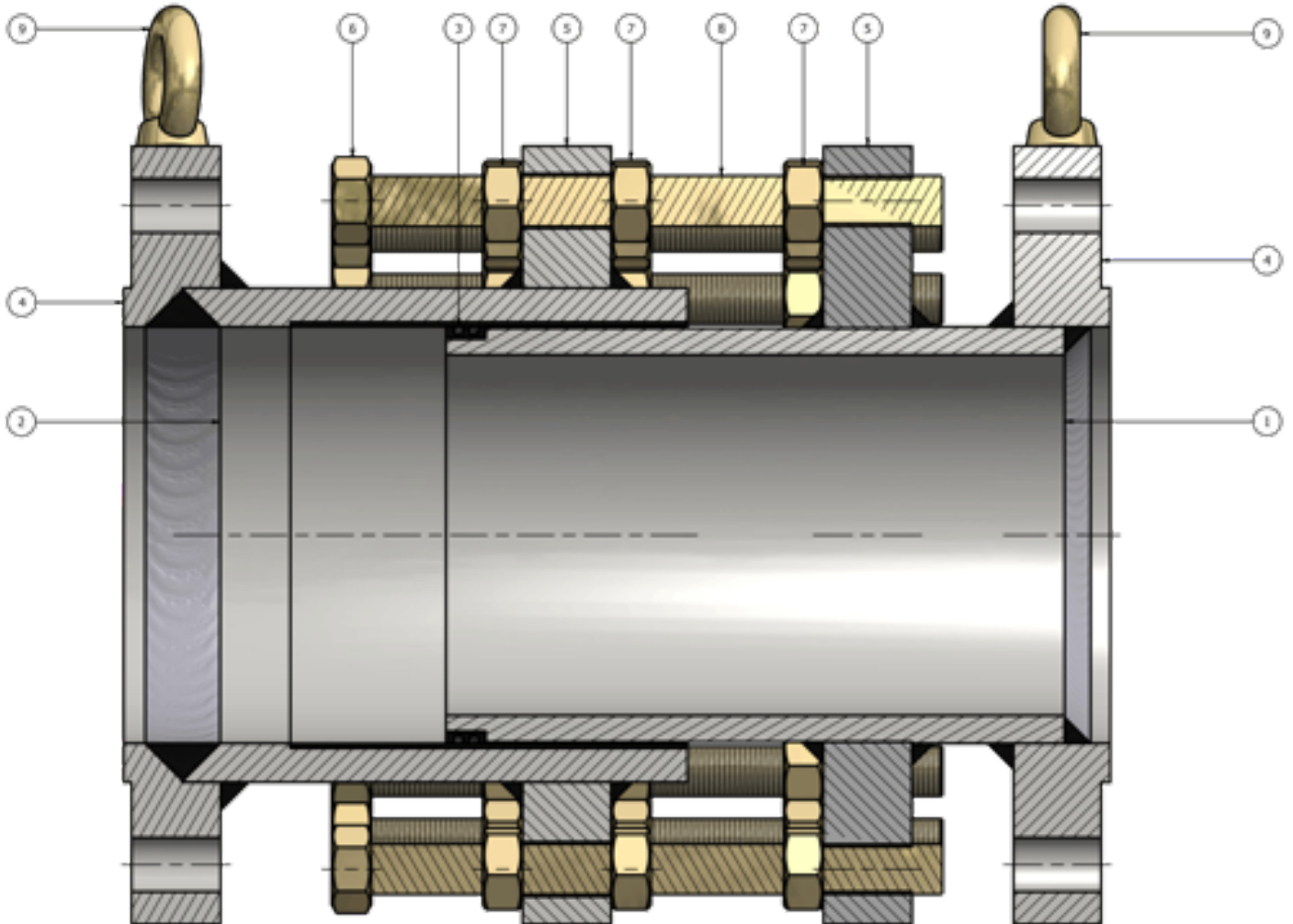


MATERIALS & DIMENSIONS

100 Bar Rating	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500
A (mm)	40	40	42	45	50	60	76	90	100	110	130	140
B (mm)	128	143	169	207	284	349	433	504	548	619	703	764
C (mm)	60	73	89	114	168	219	273	324	356	406	457	508
D (mm)	106	119	141	172	236	295	365	424	460	514	575	630
E (mm)	17	19	21	23	30	32	38	41	45	48	55	57
No. of bolts	2	2	2	2	4	4	4	4	4	4	4	4
Bolt ø (mm)	8	8	10	12	16	16	20	24	27	30	36	39
Hub Weight (kg)	0.4	0.6	1	1.3	3.2	4.7	8.5	11.4	15.3	19.4	28.3	34.3
Clamp Weight (kg)	0.7	0.7	1	1.7	3	5.4	10.5	16.7	20.9	27.2	39.6	49.4
160 Bar Rating	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500
A (mm)	50	65	80	100	150	200	250	300	350	400	450	500
B (mm)	40	40	42	45	50	78	88	98	106	145	•	•
C (mm)	128	142	169	207	284	366	443	509	552	675	•	•
D (mm)	60	73	89	114	168	219	273	324	356	406	•	•
E (mm)	106	119	141	172	236	305	369	424	460	524	•	•
No. of bolts	17	19	21	23	30	34	42	45	50	53	•	•
Bolt ø (mm)	2	2	2	2	4	4	4	4	4	4	•	•
Hub Weight (kg)	8	10	12	16	16	24	27	30	33	39	•	•
Clamp Weight (kg)	0.4	0.6	1	1.3	3.2	5.4	10	13.7	18.7	23.5	•	•
250 Bar Rating	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500
A (mm)	40	40	42	45	65	84	105	120	•	•	•	•
B (mm)	128	144	169	207	298	376	463	532	•	•	•	•
C (mm)	60	73	89	114	168	219	273	324	•	•	•	•
D (mm)	106	123	145	172	248	315	387	446	•	•	•	•
E (mm)	17	21	24	28	37	42	52	57	•	•	•	•
No. of bolts	2	2	2	2	4	4	4	4	•	•	•	•
Bolt ø (mm)	10	12	16	16	20	27	33	39	•	•	•	•
Hub Weight (kg)	0.6	0.7	1	1.9	4.9	8.1	15.4	21.8	•	•	•	•
Clamp Weight (kg)	0.7	1	1	1.8	5.5	11.9	22.1	32.4	•	•	•	•



MATERIALS & DIMENSIONS



Part	Description	Material
1	Slider	EN-8 or ASTM A106 Cladded with 309 SS
2	Stationary	EN-8 or ASTM A106 Cladded with 309 SS
3	Seals	Polyurethane. More options are found on pages 37-38.
4	Flange	ASTM A105
5	Flange Connector	ASTM A105
6	Nylok Nut	Grade 8.8 Hot Dip Galvanized
7	Nut	Grade 8.8 Hot Dip Galvanized
8	Jacking Bolts	Grade 8.8 Hot Dip Galvanized
9	Eye-Bolt	Grade 8.8 Hot Dip Galvanized

DESIGN STANDARDS

The design of the expansion joint complies with various international standards, of which the most important are: ASME Boilers & Pressure Vessels Design Code, ANSI B16.5, ANSI B16.10, ANSI B16.34, ANSI B16.37, ANSI B31.3

VALVE ENDS

Flanges: SABS1123, ANSI B16.5, BS4504, BS10. **Couplings:** U-Cone, Victaulic

COATING

Epoxy or Hot dipped galvanised or other as specified by client



SEALS



NBR | NITRILE BUTADIENE RUBBER

NBR has good resistance to media like hydraulic oils, mineral oils, mineral oil products, oil in water emulsions, water glycols, animal as well as vegetable oils and petrol. NBR has good mechanical properties making it a versatile sealant. Depending on the type of use the temperature range is 30 °C to +130 °C.



FPM | FLUORCARBON-POLYMERE

FPM has excellent resistance to high temperatures, oxygen, mineral oils, synthetic hydraulic fluids, fuels, aromatics, many organic solvents and chemicals. Although for water and steam the temperature limit is approx. +60 °C. Additionally, the low permeability to gas allows the use in high-vacuum applications. FPM is often a substitute material for NBR. Depending on the type of use the temperature range is -20 °C to +200 °C. Certain mixtures achieve values between -40 °C to +230 °C.



EPDM | ETHYLENE-PROPYLENE-DIENE-MONOMERE RUBBER

EPDM has good resistance to oxygen, diluted acids and many chemicals; however it is not applicable with mineral oils. With hot water and steam in closed circuits, temperatures up to 180 °C are possible. EPDM is often used in connection with foodstuffs (Manufacturer authorization according to FDA and elastomer guideline). Depending on the type of use the temperature range is -40 °C to +170 °C.



FFKM | PERFLUORELASTOMER

FFKM is a high performance elastomer with a similar high chemical resistance as PTFE. In addition, it has elastic properties. It is used mainly in applications for O-ring seals in the chemical industry, as well as the food industry with FDA approval. In addition, FFKM is resistant against steam. Depending on the type of use the temperature range is -10 °C to +260 °C.



SEALS



PTFE | POLYTETRAFLUORETHYLENE

FFKM is a high performance elastomer with a similar high chemical resistance as PTFE. In addition, it has elastic properties. It is used mainly in applications for O-ring seals in the chemical industry, as well as the food industry with FDA approval. In addition, FFKM is resistant against steam. Depending on the type of use the temperature range is -10 °C to +260 °C.



PTFE KOHLE | POLYTETRAFLUORETHYLEN COMPOUND WITH CARBON

By admixing carbon, significantly higher tensile strength values are achieved. In comparison to modified PTFE, this material is particularly more suitable with higher pressure loads and has a similar chemical resistance. Depending on the type of use the temperature range is -200 °C to +225 °C.



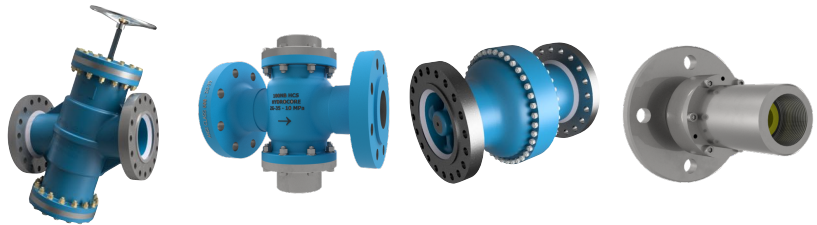
MD | METAL-TO METAL SEALING

In the case of metal to metal sealing, various materials can be used depending on the application. Special advantages are high temperature ranges and the same chemical resistance as the material of the valve body. Depending on the type of use the temperature range is -270 °C to +400 °C.



QUICK REFERENCE GUIDE

Product Applications Reference



ISOLATION APPLICATIONS	HCA	HCS	HC	IT
Manual (handwheel)	●	●		
Electrical Actuation	●	●		
Double Acting Oil Hydraulic	●	●		
Double Acting Pump Discharge	●	●		
Single Acting Line-fluid Actuated	●	●		
Non-rising Spindle	●	●		
Tamper Proof	●	●		
CONTROL APPLICATIONS	HCA	HCS	HC	IT
Pressure Reducing		●		
Pressure Control		●		
SAFETY APPLICATIONS	HCA	HCS	HC	IT
Excess Flow Shutdown	●	●		
Pressure Relief		●		●
Shock Prevention	●	●		
Non-slam Check Valve			●	
Energy Dissipater			●	
Size Range	50NB – 400NB	50NB – 400NB	50NB – 400NB	50NB
Max Pressure	160 bar	250 bar	250 bar	40 bar



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