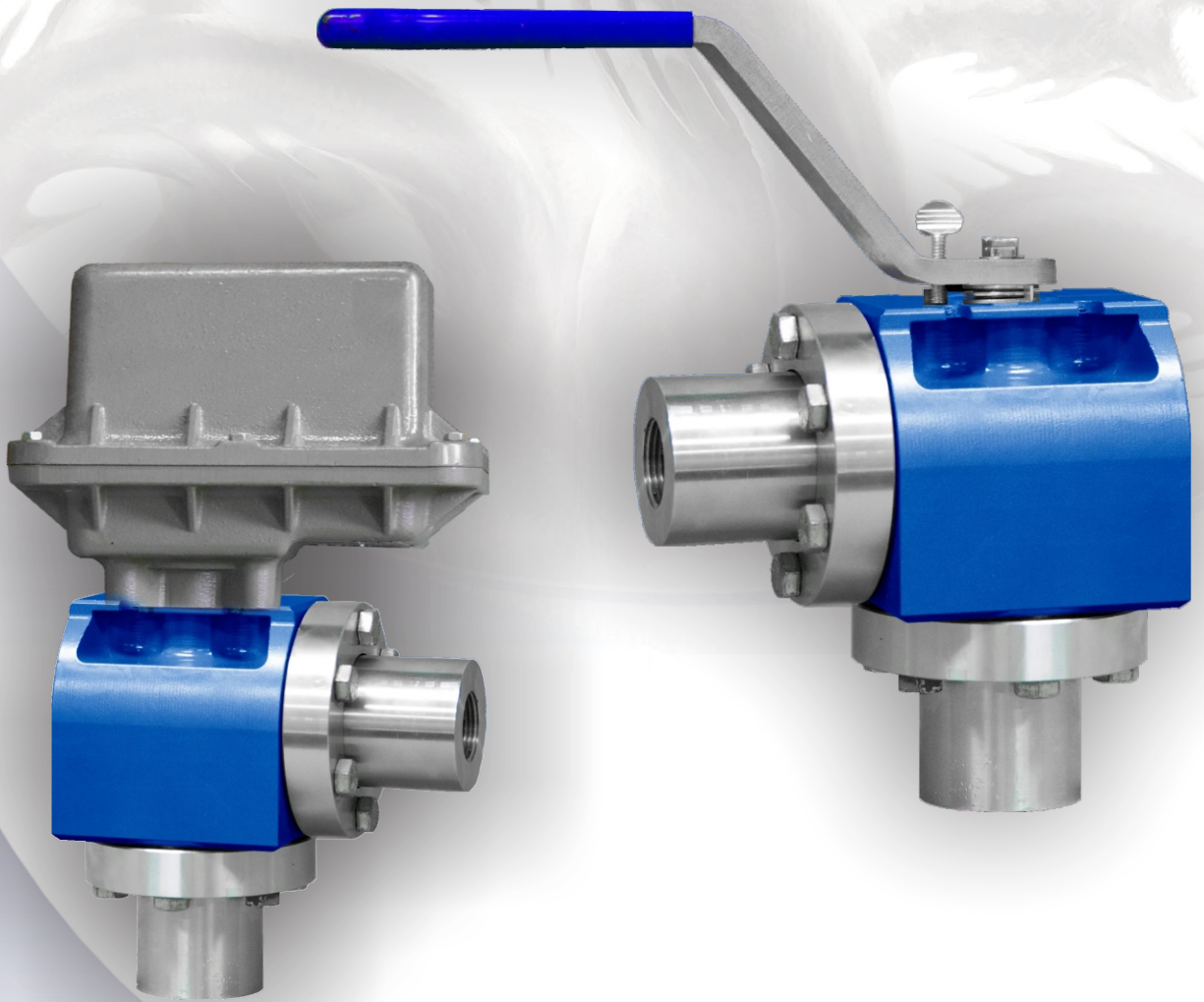


HYDRA HCA Throttling Valve



Hydra HCA Angle Body Throttling Valve

The Twin Disc Valve was initially designed to manage injection fluids in Enhanced Oil Recovery (EOR) projects, as well as to control the production of crude oil and natural gas wells. It can also be used in other applications such as gas lift, gas-assisted plunger lift, and corrosive slurry, essentially any situation that requires the management of high-pressure fluids.

As flow or pressure is regulated, wear is inevitable in any throttling valve. This typically occurs on the surface and around the controlling orifice, especially in globe, gate, butterfly, ball, and plug valves. However, in the Twin Disc, the control surfaces and seal surfaces are distinct. The controlling orifice exposes the smallest amount of control surface compared to other valve types. There are no obstructive shapes in the flow path, which are common in globe style and "needle and seat" valves. As a result, the Twin Disc experiences minimal wear on the throttling and shut-off area.

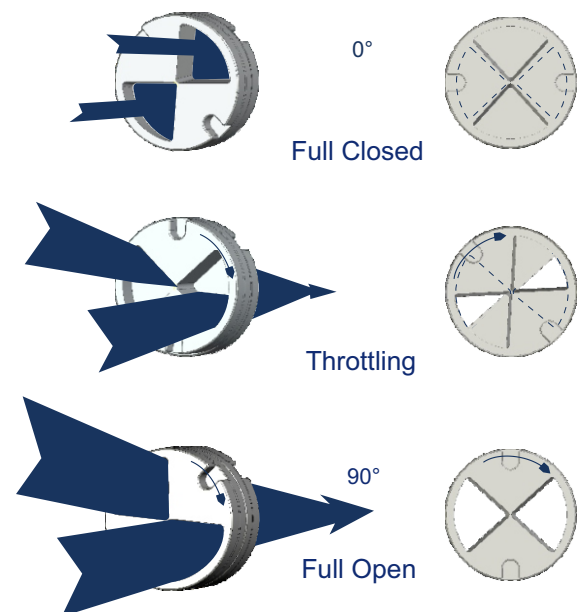
The differential pressure across the discs secures them together, providing a stable control mechanism. There are no loose or unsupported parts that could lead to vibration, noise, or fatigue failures. Each time the valve is rotated, the exposed part of the disc's surface is cleaned of foreign deposits.

Principle of Operation

The valve features two adjacent twin discs, each equipped with two precision orifices that can be either round hole or pie-shaped.

When the valve is in the fully closed position, the orifices are positioned 90 degrees out of alignment, forming an ANSI Class IV seal. When the valve is in the throttling position, the orifices align with each other, forming a precision orifice that supports the flow or pressure requirements of the process. It is advised that for sustained operation, the opening should not be less than 30% for gas and 40% for liquid service.

When the valve is in the full open position, the orifices align with each other, facilitating the maximum rated flow through the valve.

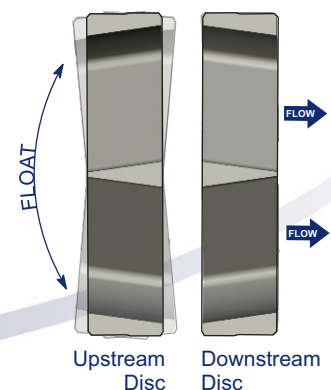


ANSI Class IV Seal

The control discs are lapped to within two light-bands of flatness (± 0.00002 ") to achieve a positive shut-off and maintain precise control.

The upstream disc as a result of differential pressure floats against the downstream disc creating a mated interface and assures a positive Class IV seal.

Additionally, the differential pressure across the disc stabilizes the control surface and eliminates trim noise and vibration.



Hydra HCA Angle Body Throttling Valve

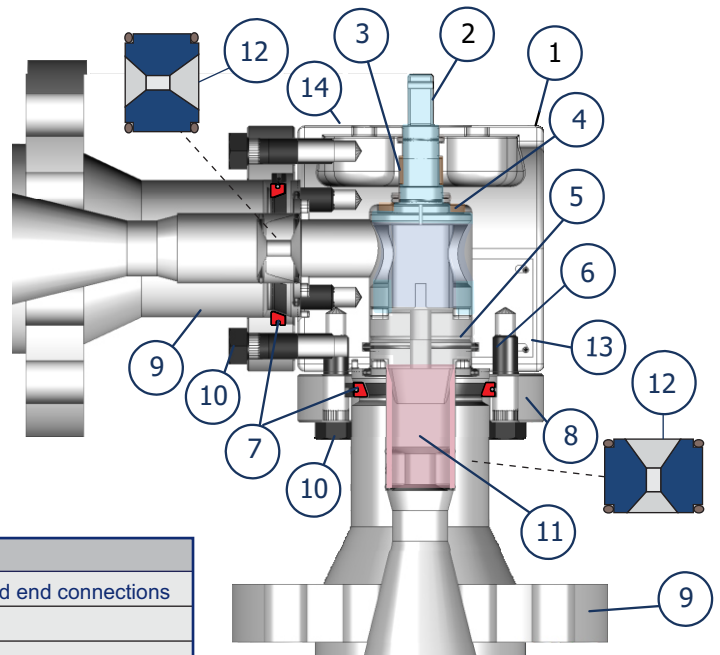
The Hydra HCA throttling valve is a highly adaptable control valve designed to meet a wide range of pressure and flow control requirements, from complex to simple. Its robust modular design ensures durability and straightforward maintenance. The modular approach streamlines the specification process, reducing the inventory of spare parts needed.

All valve and trim components are engineered for a perfect fit, enabling swift customization to accommodate specific process requirements of the user. The hub assemblies provide a variety of end connections, potentially removing the need for line swages and fitting oversized pipes. The valve trim and stem are fully guided, ensuring stability, reducing vibration, and cutting down on mechanical noise. The disc's free-floating design offers superior and lasting valve closure capabilities. The Twin Disc and Multistage system can handle high pressure drops. The design's simplicity also translates to easy and fast maintenance, without the necessity for specialized tools .

The valve allows for precise control with a 90-degree turn from fully closed to fully open. Its robust construction and generous use of hardened materials, combined with efficient flow geometry, ensure maximum production capacity and minimal maintenance needs, extending the mean time between services.

Valve Parts Description And Purpose

Configuration: Angle body
Pressure: 5000 PSI
Nominal Size: 2 Inch
Material Construction: 316 SSI (CF8M)
End Connections: 1" and 2" Threaded
1", 2" and 3" Flanged
Operation: Automated / Manual
Multistage Construction: 1, 2 or 3 Stage



Part	Purpose
1 Body	Pressure containment housing for trim and end connections
2 Turning Fork	Adjustment of disc to control fluid
3 Stem Bushing	Prevent wear of turning fork stem
4 Thrust Bearing	Support bearing for upthrust on turning fork
5 Disc Upstream	Fluid Control Element
6 Disc Downstream	Fluid Control Element
7 Segmented Ring (2 ea)	Structural Ring to Retain Hub in the Hub Retainer Ring
8 Hub Retainer Ring (2 ea)	Support Ring attaches Hub Assembly to the body
9 Hub (2 ea)	End Connection and Sleeve or Choke Bean housing
10 Bolt, Hub (12 ea)	Fastener to attach Hub Assembly to body
11 Wear Sleeve	Wear element to reduce damage to outlet hub
12 Choke Bean	Control element to create additional fluid pressure reduction
13 Product Plate	Product Identification and specification and Serial number
14 Calibration Plate	Indicates orifice opening and position

Hydra HCA Angle Body Throttling Valve

Optional Features

Actuation for automated control
Wear Sleeve for high pressure and abrasive fluids
Multistage DP system utilizing fixed orifice beans for pressure control

HCA Assembly Dimensions

Size Connection		A	B
1 in.	1FNPT	11.53	
	150RF	11.53	
	300RF	13.04	
	400/600RF	13.28	
	900/1500RF	14.04	
	150RTJ	18.56	
	300RTJ	13.42	
	400/600RTJ	13.79	
	900/1500RTJ	14.17	
	Bevel for Weld	18.68	
2 in	2MNPT	11.53	
	2FNPT	11.53	
	150RF	13.04	
	300RF	13.28	
	400/600RF	14.04	
	900/1500RF	18.56	
	2500 RF	20.56	
	150RTJ	13.42	
	300RTJ	13.79	
	400/600RTJ	14.17	
	900/1500RTJ	18.68	
	2500RTJ	20.68	
	Bevel for Weld	9.81	

Major Component Standard** Materials

Description	Material
Hub Assemblies	CF8M Cast SS ASTM A216 WCB CS
O-Rings	PC Buna N
Backup Rings	PTFE
Control Discs	Tungsten Carbide
Turning Fork	17.4 H 1150 Stainless
Steel Bolts	A193 Grade 8 zinc plated and PTFE coated
Body	CF8M Cast SS
Wear Sleeve*	Stellite 6
Fix Beans*	17.4 H 900 Stainless Steel
* Optional	
* ** For material other then Standard consult factory	

Tungsten Carbide Trim Options

Orifices	Cv	64th inch Equiv. Dia.	Hole Geometry
1.75 Inch Diameter Disc			
2 ea. - 1/8"	0.74	11.3	Round
2 ea. - 3/16"	1.66	16.97	Round
2 ea. - 1/4"	2.95	22.6	Roun
2 ea. - 3/8"	6.63	33.9	d
2 ea. - 1/2"	11.78	45.3	Round
2 ea. - 3/4"			

Applications

Well Site Automation
Blow Down and Dump Valve
Pump Bypass
Gas Lift Injection Control
Plunger Lift
Pressure Maintenance Disposal Well
Pump Startup
Water Injection
Enhanced Oil Recovery
Throttling Valve
Remote Control for directional drilling
Manual and Automated Applications

Hydra HCA Angle Body Throttling Valve

Automation

The HCATwin Disc Throttling valves are specifically designed for applications involving control of water, oil, or natural gas. They are sometimes equipped with electric actuators, which protect the environment from the atmospheric venting of control gas typically associated with conventional diaphragm operated control valves. This design also offers a significant improvement in reliability and precision over pneumatics that rely on native gas sources, which can be contaminated with liquids and solids.

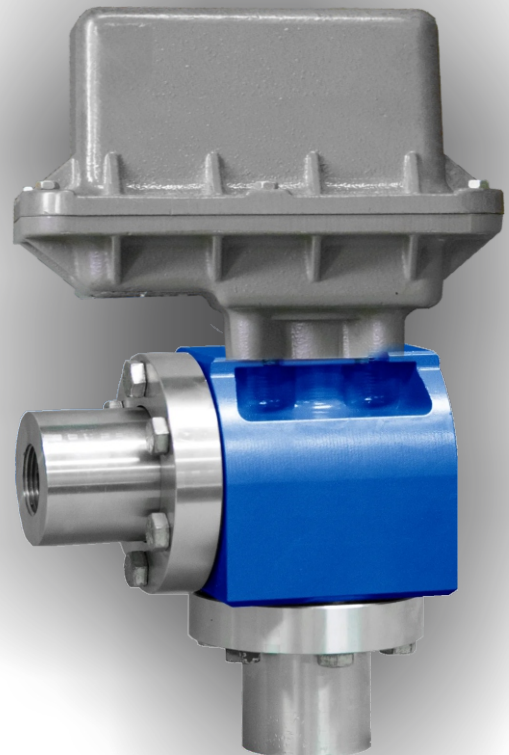
The HCA coupled with an electric actuator is designed for low energy requirements, operating at 12 or 24VDC with minimal current draw during movement. The control signal can be 4-20 mA, 1-5V, or a dry contact. The operating temperature range is -20°C to 70°C (-4°F to 158°F). The HCA valve can control pressures up to 5000 psi and can maintain a Class IV shut-off indefinitely without applied power

The assembly is highly responsive full open to full closed in seconds. In the power failure mode valve can be configured to open, close or remain in position. No power is required to maintain the selected mode.

The Hydra HCA valve can be easily modified from a manual operation to an automated valve in the field without interrupting service. The Direct Mount ISO F07 pad and ISO stem facilitate mounting of most electric and pneumatic actuation systems, it really is just removing the handle, dropping the actuator on and tightening the four mounting bolts. The low torque requirements reduce the power draw making this product ideal for low voltage applications such as solar powered installations.

Torque Rating

Differential Pressure	Operating Torque
1,000 lbs.	160 in.-lbf
2,000 lbs.	210 in.-lbf
3,000 lbs.	270 in.-lbf
4,000 lbs.	360 in.-lbf
5,000 lbs.	480 in.-lbf

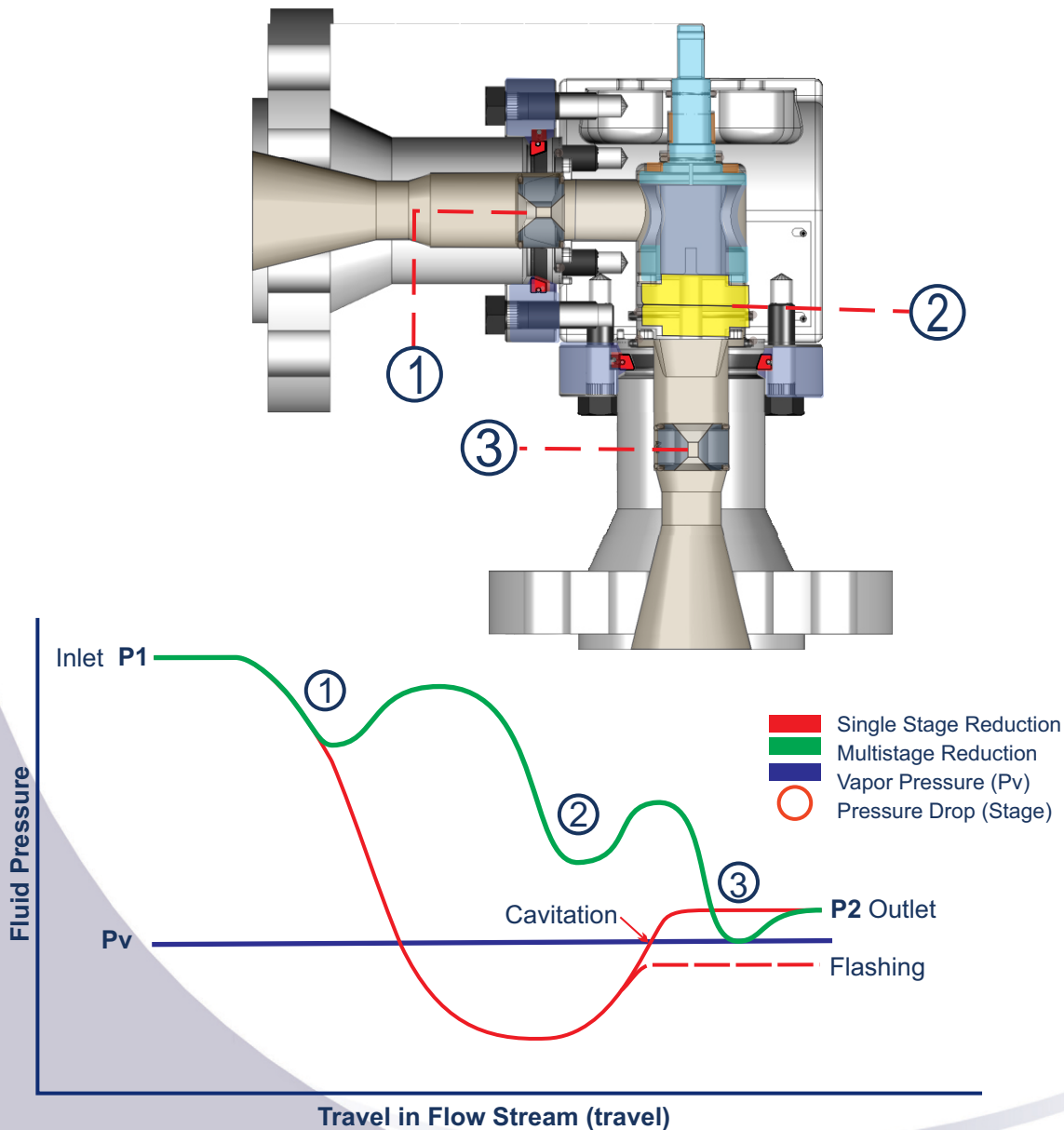


Multistage Pressure Drop (MPD)

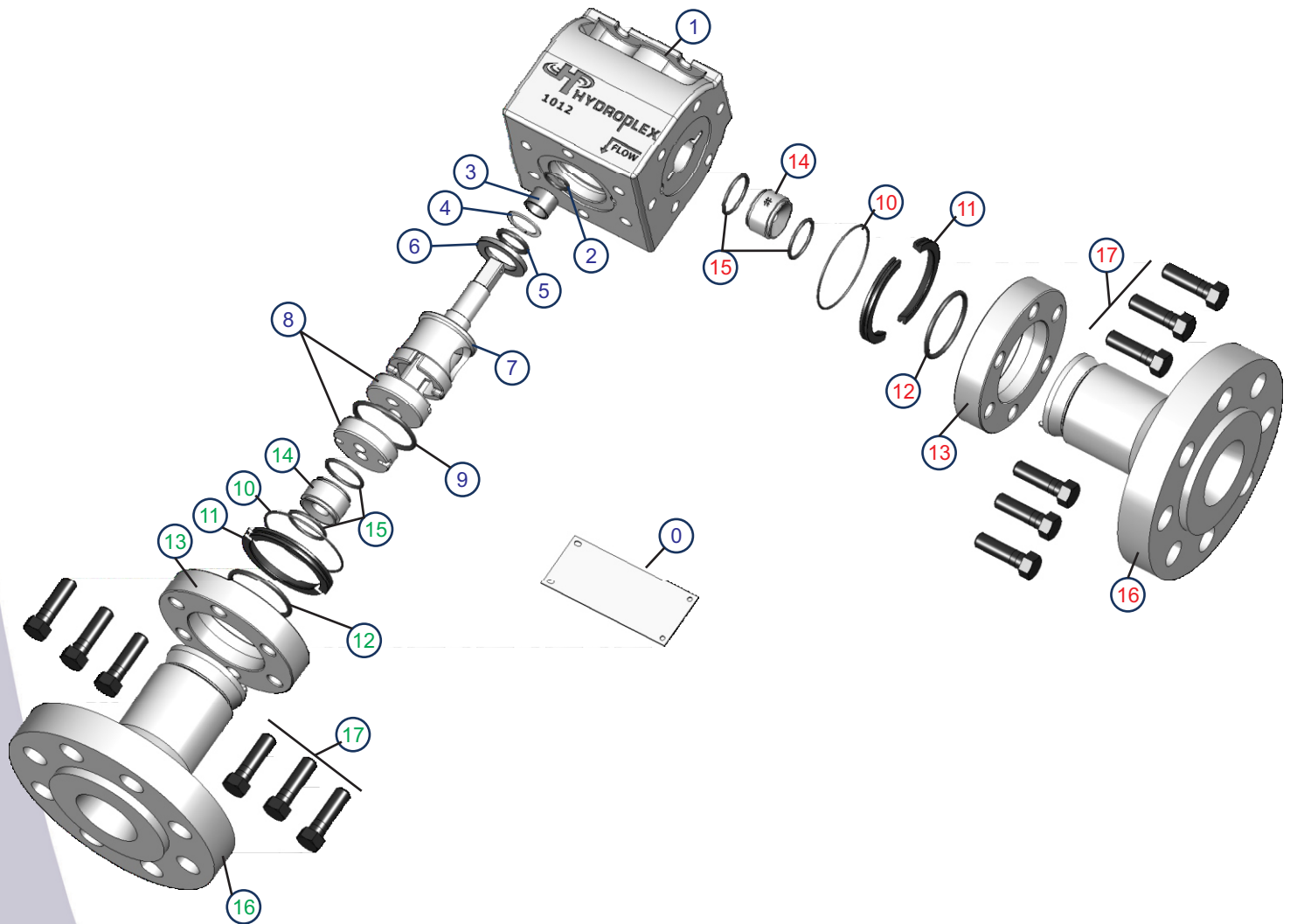
Multistage Pressure Drop (MPD) Configurations are utilized to decrease fluid pressure or flow (velocity). While single-stage trims often suffice, there are instances where a single pressure drop is not suitable due to process conditions. In these cases, an MPD valve is a more effective solution. The primary factor for using multiple restrictions is the pressure drop, irrespective of whether the fluid is a liquid or vapor/gas. A higher pressure drop leads to higher velocities, which can result in erosion, vibration, and noise issues.

For gas applications at critical flow, consideration should be given. If the process condition indicates critical flow with a single pressure drop, MPD valves can be employed to prevent operating at or above the critical pressure. The term “critical” refers to a pressure drop across the device that exceeds 50% of the absolute upstream pressure, at which point sonic velocity is attained.

In situations where high pressure drops in liquid flows are necessary, MPD assemblies should be employed. This allows for the pressure drop to be achieved while minimizing potential issues such as cavitation, flashing, and high noise levels



HCA Exploded View



#	DESCRIPTION	#	DESCRIPTION	#	DESCRIPTION	#	DESCRIPTION
	DATA PLATE	5	O-RING	10	O-RING	15	O-RING
1	BODY	6	THRUST BEARING	11	SPLIT RING	16	HUB
2	O-RING	7	TURNING FORK	12	O-RING	17	HUB BOLTS
3	BUSHING	8	CONTROL DISC	13	RETAINING RING		
4	BACKUP RING	9	O-RING	14	FIXED BEAN		

HCI THROTTLING VALVE



Configuration:	Inline Segmented Body Thru port
Pressure:	5000 PSI
Nominal Size:	2 Inch
Material Construction:	316 Stainless Steel (Bar)
End Connections:	1" and 2" Threaded / 1", 2" and 3" Flanged
Operation:	Manual / Automated
MultiStage Construction:	1 or 2 Stages
Design Function:	Fluid Maintenance (WOG)
Application:	Oil / Gas Production and Injection
Location:	Upstream gathering system

HCA THROTTLING VALVE



Configuration:	Angle 90 degree body highly configurable
Pressure:	5000 PSI
Nominal Size:	2 Inch
Material Construction:	316 Stainless Steel (CF8M cast)
End Connections:	1" and 2" Threaded / 1", 2" and 3" Flanged
Operation:	Automated / Manual
MultiStage Construction:	1, 2 or 3 Stage
Design Function:	Fluid Maintenance (WOG)
Application:	Oil / Gas Production and Injection
Location:	Upstream gathering system

HCY THROTTLING VALVE



Configuration:	Inline "Y" body highly configurable
Pressure:	5000 PSI
Nominal Size:	2 Inch
Material Construction:	316 Stainless Steel (CF8M cast)
End Connections:	1" and 2" Threaded / 1", 2" and 3" Flanged
Operation:	Automated / Manual
MultiStage Construction:	1, 2 or 3 Stage
Design Function:	Fluid Maintenance (WOG)
Application:	Oil / Gas Production and Injection
Location:	Upstream gathering system

CSX CONTROL VALVE



Configuration:	Inline Globe Style body
Pressure:	5000 PSI
Nominal Size:	2 Inch
Material Construction:	Carbon Steel (WCB cast)
End Connections:	1" and 2" Threaded / 2" Flanged
Operation:	Automated / Manual
MultiStage Construction:	1, 2 or 3 Stage
Design Function:	Fluid Maintenance (WOG)
Application:	Oil / Gas Production and Injection
Location:	Upstream gathering system Gaslift and Plunger Lift

HYDRAMAX CHOKE VALVE



Configuration:	Inline Segmented EXO Body
Pressure:	5000 PSI
Nominal Size:	3 Inch
Material Construction:	Carbon Steel (Bar) Body / 316 Stainless Steel (Bar) Wetted
End Connections:	3" and 4" Flanged
Operation:	Automated / Manual
MultiStage Construction:	1, 2 or 3 Stage
Design Function:	Fluid Maintenance (WOG)
Application:	Oil / Gas Production and Injection
Location:	Upstream gathering system, pump pressure maintenance Midstream Plant and Facility fluid control

MINIMAX THROTTLING / DUMP VALVE



Configuration:	Inline or Angle Body Field configurable
Pressure:	3000 PSI
Nominal Size:	2 Inch
Material Construction:	Carbon Steel (WCB cast)
End Connections:	1" and 2" Threaded
Operation:	Automated / Manual
Design Function:	Fluid Maintenance (WOG)
Application:	Oil / Gas Production and Injection
Location:	Upstream gathering system, Separator let down