

HYDRA HCI Throttling Valve

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Hydroplex HCI TWIN DISC Valves are engineered with a specific purpose to manage high-pressure liquids and gases, offering precise control, dependability, and prolonged service. The valve's body and control element are designed to maximize the time between services. The modular design ensures that all worn-out parts can be replaced, making the valve easy to service and fully repairable. This valve is built to exceed your process requirements.

The design is flexible enough to allow field conversions from manual to automated operations, and from single-stage to multistage pressure drop. An optional wear sleeve is available to mitigate the effects of cavitation and mechanical erosion, which are common in the fluid recovery process following pressure reduction. The unique hub design allows for a mix or match of inlet and outlet connections to suit process piping configurations or replacements due to wear.

Principle of Operation

The valve features two adjacent twin discs, each CLOSED position 0° equipped with two precision orifices that can be to a either round hole or pie-shaped. **OPEN** position 90° 0° When the valve is in the fully closed position, the orifices are positioned 90 degrees out of alignment, forming an ANSI Class IV seal. Full Closed 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 Throttling than 30% for gas and 40% for liquid service. When the valve is in the full open position, the 90° orifices align with each other, facilitating the maximum rated flow through the valve Full Open

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.



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The Hydra HCI 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 assembly provide a variety of end connections, potentially removing the need for line swages and fitting oversized pipes. The valve trim and rotator 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: Pressure: Nominal Size: Material Construction: End Connections: Operation: MultiStage Construction			Inline "Thru" body 5000 PSI 2 Inch ion: 316 Stainless Steel 1" and 2" Threaded 1", 2" and 3" Flanged Automated / Manual Iction: 1 or 2 Stage		
		Part	Purpose		
	1	Body	Pressure containment		
	2	Rotator	Adjustment of disc to control fluid		
	3	Disc Upstream	Fluid Control Element		
	4	Disc Downstream	Fluid Control Element		٣
	5	Segmented Ring	Structural Ring to Retain Hub		
	6	Hub Retainer Ring	Support Ring attaches Hub Assembly		1
	7	Hub	End Connection and Sleeve or Choke Bean		1
	8	Bolt, Hub (6 ea)	Fastener to attach Hub Assembly to body		
	9	Wear Sleeve	Wear element to reduce damage to outlet hub	$\overline{2}$ (1) ()	
	10	Choke Bean	Control element additional pressure reduction		
	11	Handle	Adjusting for manual operation		
	12	Calibration Plate	Indicates orifice opening and position		

Optional Features

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

HCI Assembly Dimensions

Size	Connection	Inches
	1FNPT	7.950
	150RF	11.623
	300RF	12.143
	400/600RF	12.643
1 :	900/1500RF	13.523
i in.	150RTJ	12.003
	300RTJ	12.523
	400/600RTJ	12.643
	900/1500RTJ	13.523
	Bevel for Weld	7.013
	2MNPT	7.950
	2FNPT	9.002
	150RF	12.263
	300RF	12.763
	400/600RF	11.253
	900/1500RF	15.765
2	2500RF	17.763
	150RTJ	12.643
	300RTJ	13.267
	400/600RTJ	13.647
	900/1500RTJ	15.887
	2500RTJ	17.887
	Bevel for Weld	7.013

Major Component Standard** Materials

Description	Material				
Hub Assemb	316 Stainless Steel				
O Dingo	Alloy Steel				
Backup Rings	PC Buna N PTFE				
Control Discs	Tungsten Carbide				
Rotator	17.4 H 1150 Stainless				
Sleer Doils	and PTFF coated				
Body	316 Stainless Steel				
Moor Sloovo*	Alloy Steel				
Fix Bean*	17.4 H 900 Stainless Steel				
 * Optional * ** For material ot 	ner 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	Round		
2 ea 3/8"	6.63	33.9	Round		
2 ea 1/2"	11.78	45.3	Round		
2 ea 3/4"	22.31	62.3	Pie		

Applications

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

Automation

The HCI Twin 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 HCI 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 HCI 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 HCI valve can be modified from a manual operation to an automated valve in the field. The Bracket and linkage will mate with most electric actuation systems, The low torque requirements reduce the power draw making this product ideal for low voltage applications such as solar powered installations.

Torque Rating

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



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



HCI Exploded View



#	DESCRIPTION	#	DESCRIPTION	#	DESCRIPTION	#	DESCRIPTION	
0	DATA PLATE	5	HUB	10	SPLIT RING	15	O-RING	
1	BODY	6	O-RING	11	O-RING	16	FIXED BEAN	
2	ROTATER	7	BACKUP RING	12	SNAP RING	17	SLEEVE*	
3	CONTROL DISC	8	O-RING	13	ADJUSTING HANDLE			
4	RETAINING RING	9	O-RING	14	HUB BOLTS		cfrooney 2	023

* Not shown

HCI THROTTLING VALVE



Configuration:Inline SegmenPressure:5000 PSINominal Size:2 InchMaterial Construction:316 Stainless IEnd Connections:1" and 2" ThreOperation:Manual / AutoMultiStage Construction:1 or 2 StagesDesign Function:Fluid MaintenApplication:Oil / Gas ProdLocation:Upstream gath

Inline Segmented Body Thru port 5000 PSI 2 Inch 316 Stainless Steel (Bar) 1" and 2" Threaded / 1", 2" and 3" Flanged Manual / Automated n: 1 or 2 Stages Fluid Maintenance (WOG) Oil / Gas Production and Injection Upstream gathering system

HCA THROTTLING VALVE



SUMMAR

ALVE

Configuration:Angle 90 degreePressure:5000 PSINominal Size:2 InchMaterial Construction:316 Stainless SEnd Connections:1" and 2" ThreaOperation:Automated / Mathemated / Ma

Angle 90 degree body highly configurable 5000 PSI 2 Inch 316 Stainless Steel (CF8M cast) 1" and 2" Threaded / 1", 2" and 3" Flanged Automated / Manual h: 1, 2 or 3 Stage Fluid Maintenance (WOG) Oil / Gas Production and Injection Upstream gathering system

HCY THROTTLING VALVE



Configuration:Inline "Y" body fPressure:5000 PSINominal Size:2 InchMaterial Construction:316 Stainless SIEnd Connections:1" and 2" ThreadOperation:Automated / Material Construction:MultiStage Construction:1, 2 or 3 StageDesign Function:Fluid MaintenarApplication:Oil / Gas Production:Location:Upstream gather

Inline "Y" body highly configurable 5000 PSI 2 Inch 316 Stainless Steel (CF8M cast) 1" and 2" Threaded / 1", 2" and 3" Flanged Automated / Manual : 1, 2 or 3 Stage Fluid Maintenance (WOG) Oil / Gas Production and Injection Upstream gathering system

CSX CONTROL VALVE



Configuration:Inline Globe StyPressure:5000 PSINominal Size:2 InchMaterial Construction:Carbon Steel (VEnd Connections:1" and 2" ThreatOperation:Automated / Material Construction:Ind Connections:1, 2 or 3 StageDesign Function:Fluid MaintenatApplication:Oil / Gas ProduLocation:Upstream gath

Inline Globe Style body 5000 PSI 2 Inch n: Carbon Steel (WCB cast) 1" and 2" Threaded / 2" Flanged Automated / Manual tion: 1, 2 or 3 Stage Fluid Maintenance (WOG) Oil / Gas Production and Injection Upstream gathering system Gaslift and Plunger Lift

HYDRAMAX CHOKE VALVE



Configuration:Inline SegmentsPressure:5000 PSINominal Size:3 InchMaterial Construction:Carbon Steel (BEnd Connections:3" and 4" FlangOperation:Automated / MaMultiStage Construction:1, 2 or 3 StageDesign Function:Fluid MaintenatApplication:Oil / Gas ProduLocation:Upstream gather

Inline Segmented EXO Body 5000 PSI 3 Inch Carbon Steel (Bar) Body / 316 Stainless Steel (Bar) Wetted 3" and 4" Flanged Automated / Manual : 1, 2 or 3 Stage Fluid Maintenance (WOG) Oil / Gas Production and Injection Upstream gathering system, pump pressure maintenance Midstream Plant and Facility fluid control

MINIMAX THROTTLING / DUMP VALVE



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

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