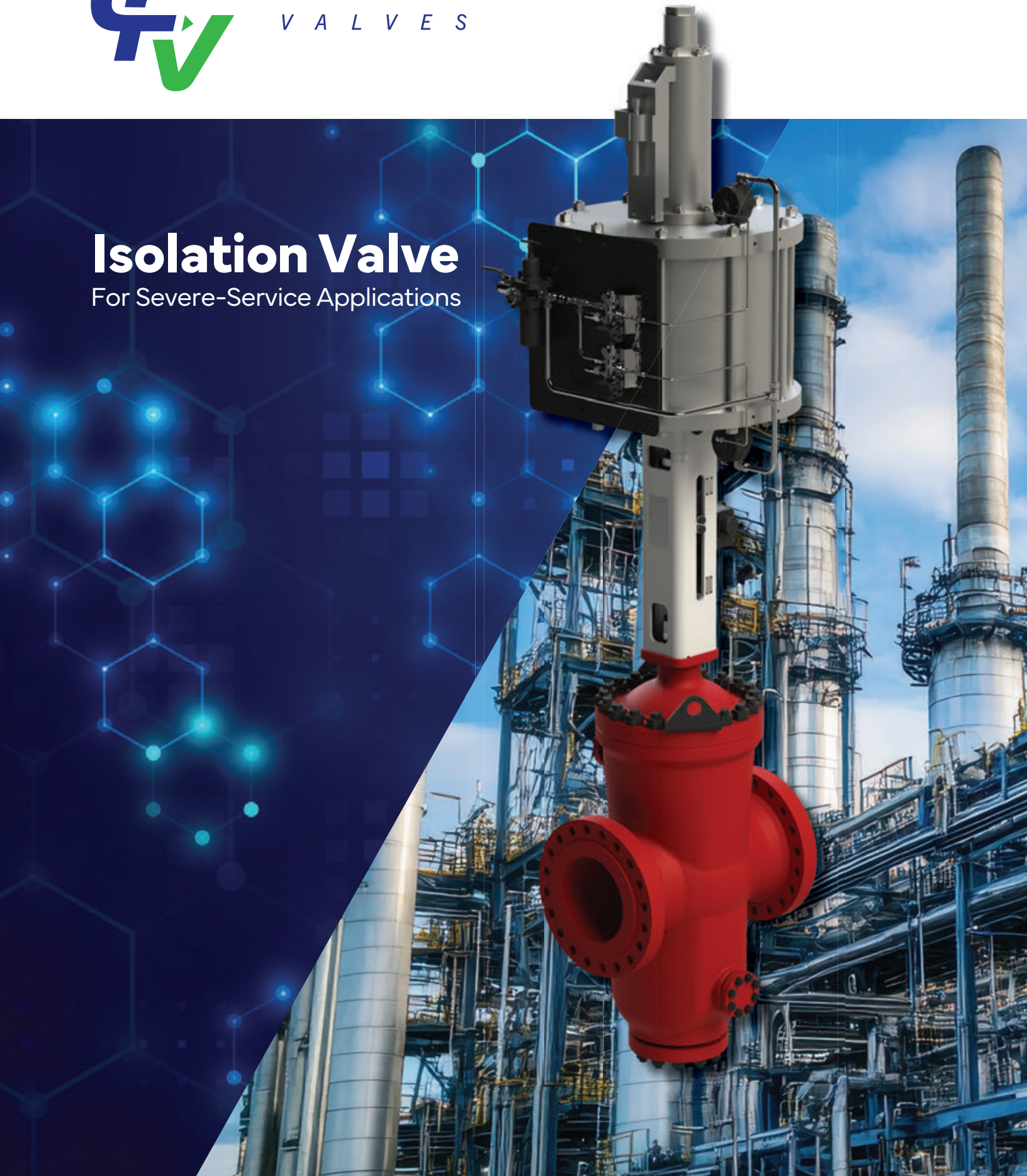
CRITICAL FLOW
VALVES

Isolation Valve

For Severe-Service Applications



A new standard for severe-service performance and reliability

Efficient, Durable Severe-Service Isolation Valves

The Critical Flow Valve (CFV) isolation valve sets a new standard for reliability and performance in high-temperature, severe-service applications. Specifically designed for separation, purification and drying applications, it maximizes efficiency, reduces maintenance, and supports sustainability initiatives. This valve is designed to withstand demanding adsorption processes such as Molecular Sieve Dehydration, where the CFV isolation valve is suitable for both isolation and switching valve applications.

Featuring an anti-fouling design with gate containment plates, isolating process media from the body cavity at all positions of the stroke, ensuring reduced-maintenance operation. Self-cleaning, live-loaded seats provide tight shutoff, independent of process pressure, meeting industry standards. Top-entry design allows the valve to be serviced in-line making it ideal for a variety of applications.

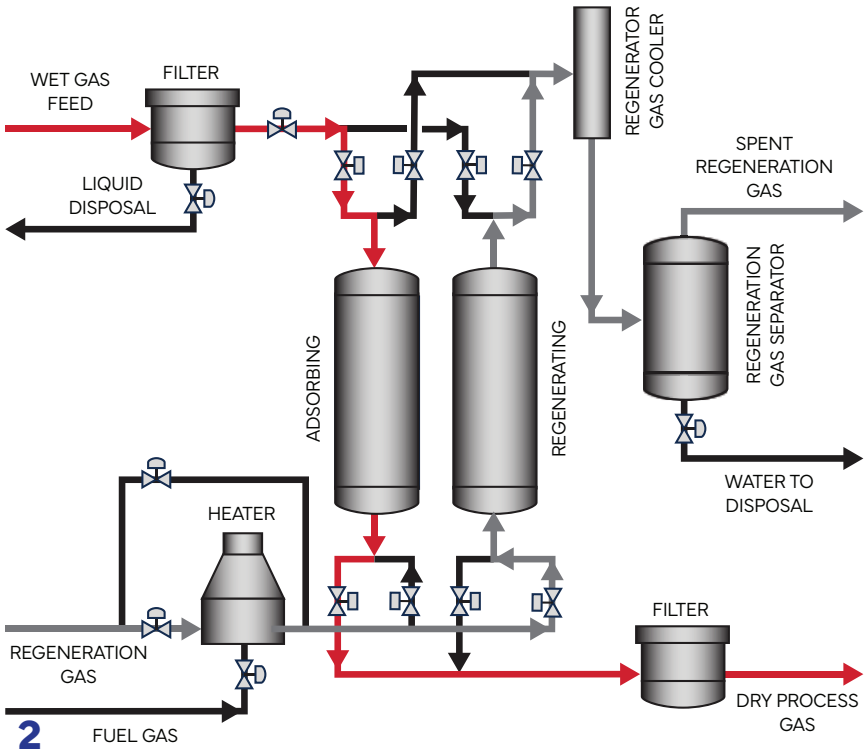
Why Choose the Isolation Valve

- **Tight Bi-Directional Shut-Off and Isolation:** Dual live-loaded seats maintain continuous contact with the gate throughout the full stroke, providing tight bi-directional shut-off and reliable isolation. In industries where even trace amounts of leakage can create safety or environmental risks, zero valve leakage means meeting or exceeding the toughest standards consistently.
- **Gate Containment Plates:** Traps process media within the gate orifice throughout the full stroke preventing fouling and buildup in the body cavity.
- **Position vs Torque Seated:** Our position-seated design does not rely on high seating forces to drive the closure element into the seat, unlike conventional gate and ball valves. This reduces actuator force requirements and minimizes damage to internal components or seizure that can occur when increased torque is applied over time in an attempt to improve valve seating.
- **High Performance:** Fire tested to API 607/6FA standards.
- **Long Service Life:** Hardened, polished, self-cleaning, live-loaded metal seats ensure reliable shut-off and extended service life, helping prevent unplanned shutdowns and reduce maintenance.
- **Top-Entry Design:** Allows in-line servicing and replacement of valve internals through the bonnet flange without removing the valve body from the pipeline.
- **Direct Valve Drop-In:** Designed as a direct replacement for an existing full/reduced-port ball valve, utilizing standard B16.10 face-to-face dimensions. Custom Face-to-Face dimensions are available.
- **Pipeline System Operations:** Supports safe and effective pipeline maintenance by providing full-bore, through-valve passage that results in seamless operations with no downtime.
- **Sustainability:** Designed to reduce fugitive emissions by featuring Low Emission Certified Packing per API 622/624, aligning with industry sustainability goals and regulations.
- **Versatility:** Suitable for hydrocarbons at high temperatures (up to 800°F), solid-laden liquids, and contaminant-bearing vapor streams.

Industry Solution for
MOLECULAR SIEVE PROCESSES

Molecular Sieve Dehydration constitutes a process that serves to eliminate water and impurities from gaseous hydrocarbon streams. The uninterrupted operation of a molecular sieve system is of great importance, given that the presence of moisture or contaminants can have a detrimental impact on downstream processes. A molecular sieve typically takes the form of a porous aluminosilicate, such as Zeolite. Molecular sieve vessels are composed of desiccant spheres, accompanied by ceramic balls and a mesh layer at the top and bottom to preserve the structural integrity of the bed. The micropores of the desiccant retain water and other larger molecules, while enabling smaller molecules to pass through.

Once the molecular sieve becomes saturated, it is necessary to regenerate it by expelling the accumulated moisture. A typical dehydration unit is equipped with two or more vessels arranged in succession. The operational sequence involves one vessel adsorbing moisture from the process stream, while the other undergoes regeneration. The regeneration process is facilitated by recirculating heated process gas to expel moisture and impurities, thereby restoring the molecular sieve to its original state. The entire procedure necessitates the use of several switching and isolation valves that must function reliably under extreme conditions.



INDUSTRY CONDITIONS

- High Process Cycling
- Abrasive Environment
- Thermal Transients
- Corrosion | Erosion

OUR SOLUTIONS

- Tolerates cycling over 2 to 4 cycles per day
- Designed for extreme processes and desiccants
- Operates through excessive temperature swings
- Withstands the presence of trace H2S, CO2 and moisture

World class products for severe-service applications

Key Design Features

United States Patents
US8,282,074; US10,676,673; US11,041,569; US11,067,185; US10,941,345; US12,163,598 and other domestic and international patents pending. Refer to ***www.deltavalve.com/patents*** for more information.

Pneumatic Actuator Assembled With Controls Packages That Meets Your Needs

Live-Loaded Packing Gland
- Compliant with industry low emissions standards

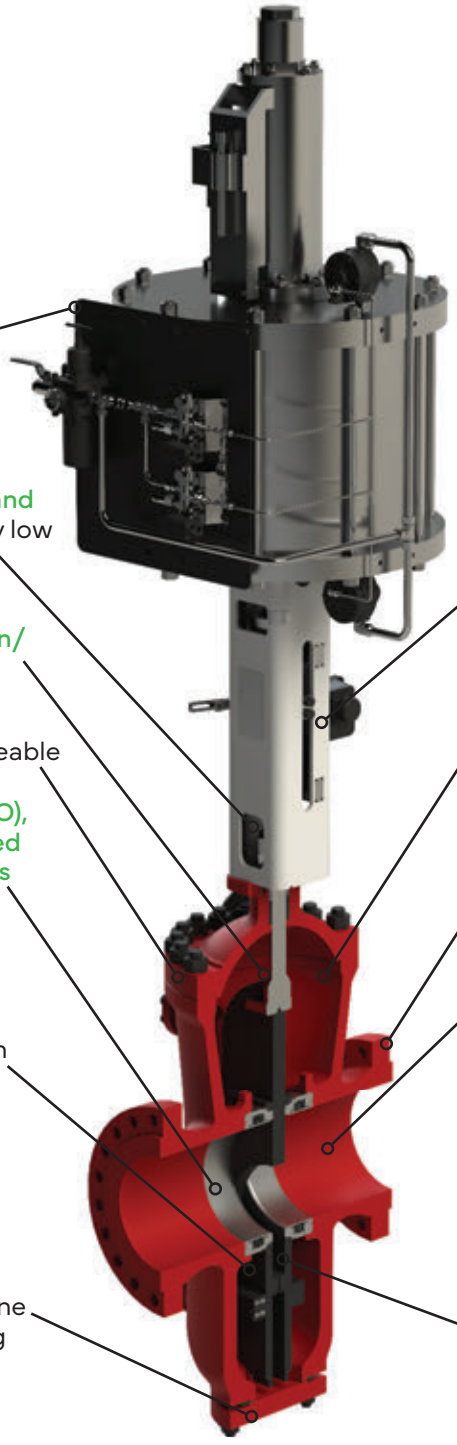
Blowout Prevention/ Back Seat Design

Wide Bonnet Opening
- Top entry, in-line serviceable

Tight Shut-Off (TSO), Double Live-Loaded Self-Cleaning Seats

Containment Plates
- Plates mechanically clamp against the gate, encapsulating process media between the plates and gate opening throughout the entire stroke

Bottom Flange
- Removal of the bottom flange allows access to perform internal inspection during off-line event without removing the valve from the line.



Actuation Options per Customer Requirement
See a Critical Flow Valves representative for height restricted installations, and custom solutions

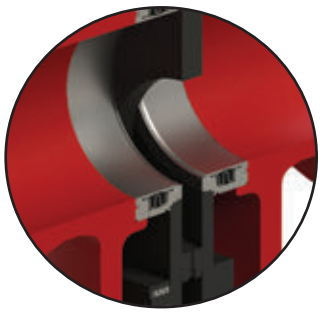
Robust High Temperature Sealing and Seat Design
- Solids, Slurries, Liquids, Vapors

Yoke is Prepped for Your Choice of Instrumentation
- Limit switches, transmitters
- Visual travel indications on both sides

Open Body
- Continuous conduit extending into the lower portion of the body

Industry Standard Face to Face Dimensions per B16.10, B16.5, B16.47
- Enables seamless replacement of existing valves in the field
- Custom face to face dimensions available
- End connections includes Raised Face (RF), Ring Type Joint (RTJ), Butt Weld (BW)

Bi-Directional Flow Control



Process Media Captured and Contained Throughout the Entire Stroke, Reintroduced into Process Media When Opened

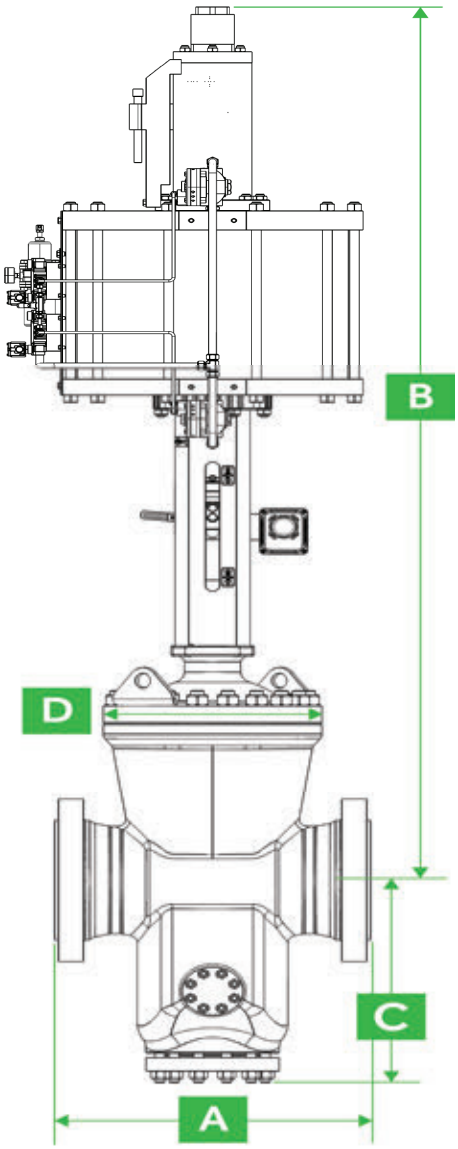


Figure 1

Technical Data

Size:*	2 inch up to 36 inch [50mm up to 900mm]
Pressure Class:	CL150, CL300, CL600, CL900
Body Material:	ASME SA217, SA216, SA351
Seat Material:**	ASME SA182, SA217, SA351, SA387, SA240, AISI 630
Gate Material:**	ASME SA387, SA240
Stem Material:**	Nitronic 50 ASME A479 GRXM-19
Bolting:	ASME SA193, SA194, A479 GRXM-19
Actuation:	Electric, pneumatic, manual, bare stem
Engineering and ASME Standards	
B16.5 / B16.47	Pipe flange and flanged fittings
B16.10	Face-to-face and end-to-end dimensions of valves
B16.34	Pressure / temperature charts per materials
API 598, FCI 70.2, ISO 5208	Valve inspection and testing
API 600	Steel gate valves
API 607 / 6FA	Fire-safe specification
API 624, ISO 15848-1	Fugitive emissions testing

Envelope Dimensions – Class 600

Valve Size	B16.10 F/F*	Envelope Dimensions			Weight
	A	B	C	D	
in [mm]	in [mm]	in [mm]	in [mm]	in [mm]	lb [kg]
2 [50]	11.5 [292]	30.1 [765]	6.7 [170]	7.4 [189]	883 [400]
3 [75]	14.0 [356]	35.3 [897]	8.9 [226]	9.0 [229]	949 [430]
4 [100]	17.0 [432]	38.5 [978]	11.2 [284]	9.8 [248]	1050 [476]
6 [150]	22.0 [559]	64.9 [1648]	15.7 [398]	15.0 [381]	1745 [792]
8 [200]	26.0 [660]	77.1 [1958]	19.7 [500]	17.0 [432]	2435 [1105]
10 [250]	31.0 [787]	86.3 [2192]	23.5 [597]	20.3 [514]	3171 [1438]
12 [300]	33.0 [838]	91.3 [2319]	27.4 [695]	23.0 [584]	3744 [1698]
14 [350]	35.0 [889]	100.8 [2560]	29.0 [737]	23.8 [603]	4544 [2061]
16 [400]	39.0 [991]	108.6 [2758]	34.1 [865]	29.6 [752]	9205 [4176]
18 [450]	43.0 [1092]	117.0 [2972]	37.7 [959]	30.3 [769]	10474 [4751]

(Refer to Figure 1)

*Complete capabilities include Class 150, 300, 600, and 900 ranging from 2"-36" NPS, reference dimensions available upon request
**Other material options available. Consult with Critical Flow Valves for more details

Chart dimensions assume pneumatic actuation.
Dimensions and weights are provided for reference only.

New standard for high-temperature, severe-service applications

How to Order Your Valve

Example

MSIV-106211P-RF = Critical Flow Valves Molecular Sieve Isolation Valve, Full Opening, 10", ASME Class 600, Carbon Steel Body and Bonnets, Stainless Steel Nitrided Seat Assembly and Gate, Low Emissions Certified Packing, Pneumatic Actuator, and Raised Face End Connection

MSIV-10 6 2 1 1 P-RF

Model	Size	ASME Class (PN)	Body/Bonnet Material	Seat Assembly/ Gate Material	Packing Set	Actuation Types	End Connection
MSIV - Molecular Sieve Isolation Valve	02 2" 03 3" 04 4" 06 6" 08 8" 10 10" 12 12" 14 14" 16 16" 18 18" XX XX"	1 150 (20) 3 300 (50) 6 600 (100) 9 900 (150)	1 Stainless Steel (ASTM A351 CF8C) 2 Carbon Steel (ASTM A216 WCC) 3 9Cr (ASME SA217 C12) 4 Other*	1 Stainless Steel Nitrided (ASTM A351 Gr CF8M/ ASME SA240 TYPE 316) 2 9Cr Nitrided (ASME SA182 F9/ SA387 Gr 91 CL 2) 3 Other*	1 Garlock EVSP 9000 Low Emissions (LE) 0 Other*	E Electric Actuator Direct Mount A Electric Actuator with Gearbox G Gearbox with Hand wheel P Pneumatic Actuator H Hydraulic Actuator B Bare Stem Valve (Prepped for E. Act) C Bare Stem Valve (Prepped for Pneu./Hyd.)	RTJ Ring Joint Type RF Raised Face BW Butt Weld

Notes: *Additional sizes, actuator types, materials, and surface hardening methods are available to accommodate various end user requirements.

Critical Flow Valves isolation valves are suitable for:

- Molecular Sieve Dehydration Switching Valves
- Charge Gas Dryer Switching
- Delayed Coker Units (DCU)
- Fluid Catalytic Cracking (FCC) Fractionator Slurry
- FCC Reactor Overhead Line
- Vacuum Distillation Units (VDC)
- Visbreaker Fractionator
- Ethylene Furnace Decoking

OEM Parts and Service

Critical Flow Valves offers a complete range of OEM spare parts, backed by our team of highly trained service technicians and engineers. With extensive product knowledge and direct access to the latest developments, technical drawings, and materials, our team ensures swift and reliable solutions for customer needs.

- Critical Flow Valves equipment installations
- Site acceptance tests and audits
- Commissioning supervision
- Turnaround service
- Maintenance and repair
- Emergency/rapid response
- Equipment rebuilds and storage
- On-site training
- Bolt tensioning/torquing
- Valve/equipment maintenance and service

Critical Flow Valves' global network provides comprehensive support and technical assistance. Contact us at **+1 281.247.8100**

Shown with Electric Actuator

*... emphasis on **safety, quality,** and "**on time**" completion*

Installation Services

Turnkey Engineering & Design Solutions - From Concept to Installation

Critical Flow Valves' Service Group is the standard for valve and actuator service. Our Service Division handles the needs of customers throughout the world with the ability and knowledge to perform a complete valve overhaul in the field with an emphasis on safety, quality and on-time completion.

Our Field Services department oversees all Critical Flow Valve equipment installations, commissioning, maintenance/repair, and on-site training for both valve and control systems. We are focused on attending to our customers' turnaround needs, maintenance and repair requirements.

Our philosophy is that each project requires unique solutions, and our approach is a diverse team with specialized engineering competencies, industry prominent quality control, pioneering research and development and superior field service personnel conducting themselves in accordance with the highest safety standards.

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Quality

Critical Flow Valves complies with all aspects of the ISO 9001:2015 certified quality management system, and provides customers with the highest level of quality.

Critical Flow Valves Design Standards, Stamps and Certifications

Isolation valves

- ASME B16.34, API 598 and API 600
- Pressure Equipment Directive (PED) (2014/68/EU)
- Canadian Registration Number (CRN)

Critical Flow Valves complies with local electrical standards for hazardous areas.

ISO 9001 Quality

Final Assembly and Testing

Our equipment is assembled and tested at our world-class facilities in the United States and India.

As part of our quality control protocol, each critical component is inspected before installation ensuring proper functionality and product quality.

A legacy of Innovation

Critical Flow Valves™ — A DeltaValve Product

As **Critical Flow Valves™, A DeltaValve Product,** we draw on the unmatched engineering expertise of DeltaValve to design and customize severe-service flow control solutions for the most demanding applications. Since the revolutionary introduction of specialized isolation technology in 2001, DeltaValve sealing solutions have reliably isolated hydrocarbons from the atmosphere—enabling refiners to automate critical processes while keeping personnel safely out of harm's way.

Built on this legacy of innovation, Critical Flow Valves delivers high-performance isolation and flow control solutions engineered for reliability, safety, and operational efficiency. Through close collaboration with our customers, we continuously refine and enhance product performance—reducing unplanned downtime, simplifying maintenance during turnarounds, and lowering total cost of ownership compared to conventional valve technologies.

Our mission is to advance severe-service flow control with innovative, field-proven solutions that address real-world operational challenges. Across refining and other heavy industrial sectors, we uphold the highest standards of engineering rigor, quality assurance, and application-specific design.

We invest in advanced engineering tools and manufacturing technologies to produce valves that are durable, efficient, and compliant with the most stringent safety and environmental standards. Our solutions improve process reliability, protect personnel, and increase throughput in critical flow applications.

What distinguishes Critical Flow Valves is the strength of our team and our partnership-driven approach. Backed by DeltaValve's deep domain expertise, our engineers tailor each solution to the customer's operating environment, fostering long-term relationships built on technical trust and performance accountability.

Today, Critical Flow Valves serves global markets with the backing of DeltaValve's reputation for excellence. Together, we deliver severe-service solutions that consistently outperform alternatives—advancing safety, efficiency, and reliability while remaining grounded in integrity, quality, and customer focus.

CRITICAL FLOW VALVES

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