



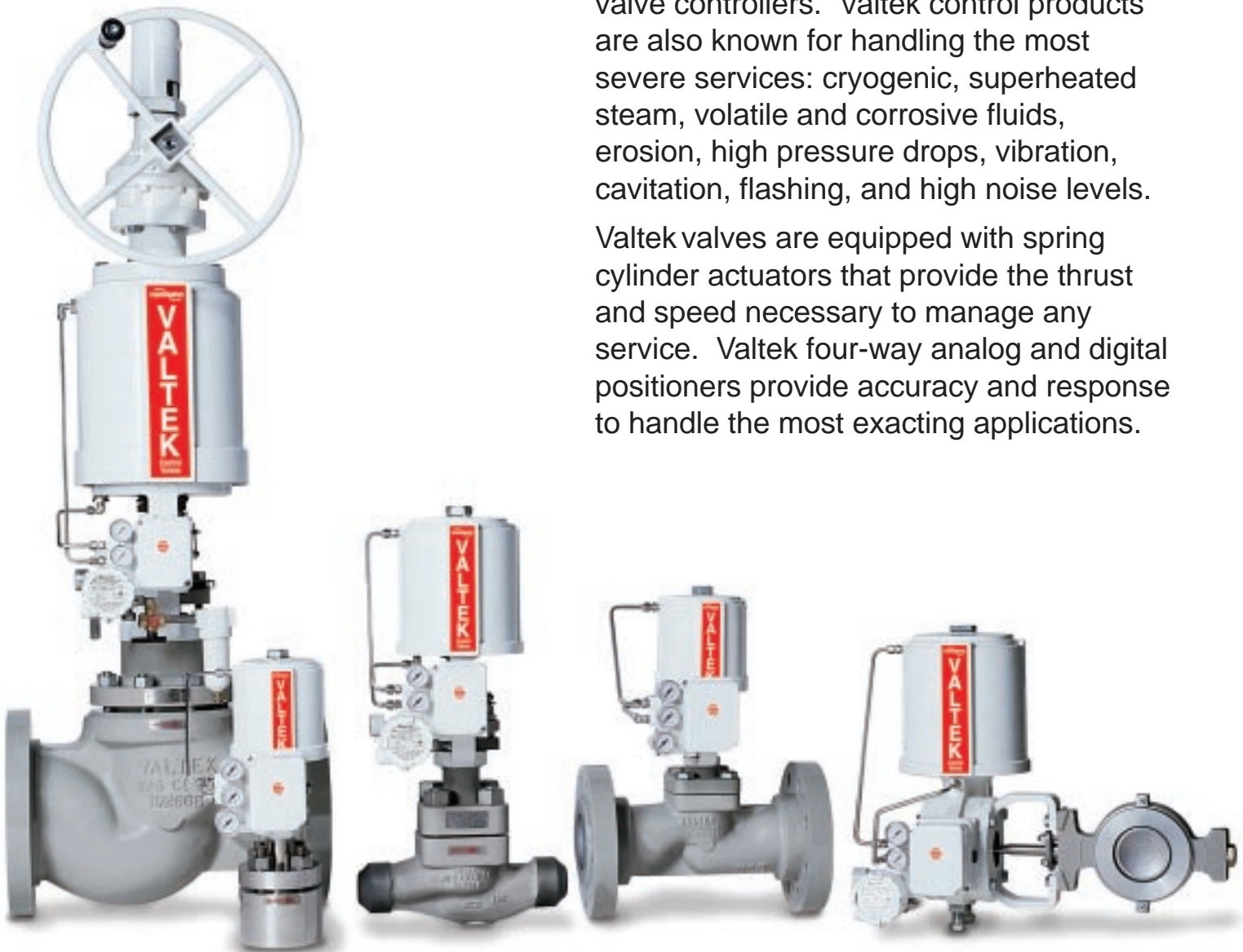
*Valtek Control Products
And Services*

Valtek Control Products and Services

Reliability, long life, parts interchangeability, ease of maintenance, prompt delivery and a fair price – Valtek® control products combine all these essential ingredients to produce the finest line of automatic control valves in the market today.

From Mark One globe valves to Valdisk™ and ShearStream™ rotary valves to custom-engineered valves, Valtek control products have earned a reputation for being high quality control valves. This reputation has been gained not only with standard control valves, but also for Valtek Advanced Products such as StarPac™ intelligent systems and Logix™ digital valve controllers. Valtek control products are also known for handling the most severe services: cryogenic, superheated steam, volatile and corrosive fluids, erosion, high pressure drops, vibration, cavitation, flashing, and high noise levels.

Valtek valves are equipped with spring cylinder actuators that provide the thrust and speed necessary to manage any service. Valtek four-way analog and digital positioners provide accuracy and response to handle the most exacting applications.



From the start, Flowserve built a high degree of parts interchangeability between various Valtek valve designs, which allows for fewer spare part inventories and faster deliveries. Flowserve's commitment to interchangeability along with robust design, means significantly lower costs over the life of the valve.

Because of a commitment to a simple, compact, lightweight design, Flowserve builds valves that permit easy, fast installation and maintenance. Top-entry to the trim, clamped-in seats, double-top stem guiding, and field-reversible actuators are common throughout the rising-stem product line.

This bulletin contains general information about the wide range of Valtek control products and services. For additional or certified information about any specific application, we invite you to contact your Valtek control products representative, visit our web site at www.flowserve.com or call 801 489 8611.



Valtek Mark One Globe Valve



The Mark One comes standard with spring cylinder-actuator and an accurate, four-way positioner.

Mark One Body Specifications

Sizes	½ – 48-inch: ANSI Class 150 thru 600 1 – 24-inch: ANSI Class 900 thru 4500
Forms	Globe, angle, 3-way, Y-body, expanded outlet, sweep angle, offset
End Conn.	Separable flange, integral flange, NPT, socketweld, buttweld, Grayloc, RTJ
Materials	Carbon and stainless steels, chrome-moly, Alloy 20, Hastelloy B, Hastelloy C, Monel, nickel, titanium, bronze, other castable materials
Bonnet Types	Standard, extended, special extended, cold box, metal bellows seal
Trim	Equal percentage, linear or quick-open flow characteristics; pressure-balanced, hard facing and soft seats available; CavControl, MegaStream, ChannelStream and Tiger-Tooth

The Valtek Mark One™ globe valve is noted for its reliability, tight shutoff, positioning accuracy, high thrust and simplified maintenance. It is widely used in many industries.

Designed for the toughest applications, it handles pressures from vacuum to 15,000 psig / 1034 barg and temperatures from -423° to 1500° F / -253° to 816° C.

The spring cylinder-actuated Mark One is stiff and maintains high positioning accuracy, repeatability, controlled high speed and instant response. With 40 to 150 psig / 2.8 to 10.3 barg air supply, it has the thrust necessary to shut off against high pressure differentials.

Many globe valve reliability problems can be traced to cage-guiding. The close metal-to-metal contact between the cage and plug often results in galling and sticking. The Mark One is designed with double-top stem guiding, located out of the flow stream, significantly reducing the potential for galling or sticking. Trim selection is easy and many trim sizes and characteristics are available.

The Mark One uses the spring, supply air pressure, the fluid pressure itself, and a self-aligning seat to produce exceptionally tight shutoff. Mark One actuators are equipped with a spring designed to completely fail the valve as needed without the use of air pressure or fluid forces.

Linear Actuator Specifications

Types	Double-acting cylinder with fail-safe spring action, electric, hydraulic, electro-hydraulic, manual
Sizes	Cylinder: 25, 50, 100, 200, 300, 400, 500, 600, 1000 (sq.in.); manual handwheels: 9, 12, 18, 24-inch diameters
Action	Air-to-open, air-to-close; fail-in-place (field reversible)
Supply Pressure	150 psig* (maximum) 10.3 barg* (maximum)
Auxiliary Handwheels	Side-mounted continuously-connected; top-mounted push-only
Positioners	Beta positioner with pneumatic module for 3-15, 3-9 and 9-15 psig / 0-1, 0-0.6 and 0.6-1 barg input signal (additional range and split-range models available); Beta positioner for electro-pneumatic module with 4-20 and 10-50 mA input signal

* Some restrictions may apply to certain applications.

Valtek StarPac Intelligent Control Valve System

The Valtek StarPac® Intelligent system integrates precision control valves with digital communications, providing local single-loop measurement of flow, pressure or temperature. Any one of these variables can also be controlled with local PID control action and logging and control of the flow parameter is available as well. Remote configuration is easily performed through a simple Windows™-based configuration program.

StarPac digital communication advantages are packaged in two configurations: StarPac is an explosion-proof unit combined with a mechanical positioner. StarPac II has a built-in high-accuracy digital positioner and can be fully configured from the membrane keypad on the front of the electronics unit.

The system provides four distinct advantages:

1. Multiple control modes allow greater control of the process. By distributing measurement and control to the field, load can be reduced on a DCS.
2. Due to reduced engineering as well as a simplified control system, process control systems can be installed and operated at a lower cost while improving plant operation. The system also requires fewer line penetrations, resulting in lower maintenance costs as well as greater reliability and safety.

3. Plant safety is increased with StarPac's continuous "intelligent" monitoring of the process. This enables it to respond to hazardous conditions with preset failure modes as programmed by the user.
4. Maintenance procedures are improved with StarPac's ability to record and report on valve or process equipment performance. Using the included software to capture a valve or process signature and comparing it with previous signatures, the user can determine whether the valve or process needs servicing, thereby reducing and simplifying scheduled maintenance.



A Mark One equipped with a StarPac II intelligent system.



A Mark One equipped with a StarPac intelligent system.

Specifications

	StarPac	StarPac II
Flow Repeatability	0.25% full scale	0.25% full scale
Pressure Accuracy	±0.1% FS max.	±0.25% FS max.
Repeatability	0.1% full scale	
Temperature Repeatability	1° F / 1.8° C	
Drift	1% full scale / 6 months maximum	
Sizes	Same as Mark One, ShearStream and Maxflo control valves	

Valtek Logix Digital Positioner



A Mark One equipped with a Logix 1200 digital Positioner



A Mark One equipped with a Logix 2000 digital Positioner

Logix Series 1000

The Valtek Logix™ Series 1000 digital positioner is a command-loop-powered device, which is unparalleled in its performance. Fundamental positioning control is based upon a two-stage electronic relay (patent pending) coupled with a 16-bit micro-processor that is highly accurate, fast and responsive to large- as well as small-signal changes in the position command.

An on-board Quick-Cal™ button and setup commissioning through DIP switches allows the user to complete setup and calibration in less than 30 seconds without the need for ancillary devices. On-board local status LEDs provide immediate visual indication of system status, alerting personnel to potential problems and resulting in improved plant safety and less down time.

The full features of the Logix 1000 are best viewed using ValTalk™ software. This software provides such tools as user-defined limits and alarms, signatures and in-process diagnostics of the valve, as well as the actuation system. Customized parameters such as a 21-point custom characterization allow the user to tailor the positioner to any particular process.

The Logix 1000 positioner is available in either HART® (Logix 1200) or Fieldbus (Logix 1400) communications protocols with an aluminum or stainless steel explosion-proof housing.

Logix 2000 Series

The Valtek Logix™ Series 2000 is a digital positioner based on the proven StarPac™ II positioning module in the familiar StarPac II housing. In addition to being the best performing positioner available today, the Logix system provides digital PID control with custom tuning, diagnostics and data logging. The integral keypad allows the user to access all the tuning and operating parameters without the use of any external configuration device. Configuration software is included with the Logix 2000 at no additional cost.

Logix's ability to record and report on valve performance through its signature utility allows changes in performance to be identified and tracked, simplifying preventive maintenance.

Logix technology also offers multiple failure modes including loss of power, air supply or command signal. This ensures greater reliability and safety for the process in case of emergency shutdowns, protecting the process and personnel.

Valtek Trooper Globe Valve



A 1 1/2-inch Trooper globe valve with size 38 actuator and integral P/P positioner

The Valtek Trooper™ valve is a high performance general service control valve with a high thrust diaphragm actuator. It is designed for use in ANSI Class 150 or 300 service applications with temperatures ranging from -20° to 650° F / -30° to 345° C.

In addition to its high thrust, the reversible actuator is compact. An optional integral I/P or P/P positioner ensures high positioning accuracy proportional to the valve instrument signal. The integrally mounted positioner eliminates external tubing requirements, reduces pinch points and keeps moving parts safe from external dirt and damage. Reversing actuator does not require positioner or tubing changes, extra parts, etc.

The actuator accepts air supply pressures up to 60 psig/ 4 barg which allows the valve to shutoff against high pressure drops. Different spring sets are available to meet individual application requirements. Removing the reversible actuator from the valve is easy with its unique yoke design and yoke clamps.

Many of Flowserve's standard Mark One valve features are included in the Trooper general service valve, including: heavy-duty, stem guides; self-centering, clamped-in seat ring; raised face integral flanges; multiple trim reductions and easy top-entry valve accessibility.

The Trooper valve is available in 1, 1 1/2, 2, 3, 4-inch valve sizes and with carbon steel or stainless steel bodies. Valve sizes 1 thru 2-inch are also available in socketweld or NPT end connections.

Trooper Body Specifications

Sizes	1, 1 1/2, 2, 3 and 4-inch, ANSI Class 150 and 300
Form	Globe
Materials	Carbon and stainless steel
End Conn.	Integral flange; NPT or socketweld for 1 thru 2-inch only
Trim	Equal percentage or linear available in 316 Stainless Steel, 316 with TFE seat, 316 with Stellite, 416 heat-treated
Packing	Teflon, AFP, SafeGuard and SureGuard
Bonnet Types	Standard and purge with twin packing
Flow	Flow-under with air-to-open or air-to-close fail direction

Diaphragm Actuator Specifications

Sizes	Diaphragm area: 31 and 77.5 sq.in. /200 and 500 sq. cm.
Action	Air-to-open, air-to-close, reversible
Supply Pressure	20 - 60 psig / 1.4 - 4 barg
Positioners	Optional integral I/P or P/P positioner with 4-20 mA or 3-15 psig / 0-1 barg input signal
Spring Set Range (psig)	3-15, 4-13, 7-16, 13-27, 14-31, 20-43, 25-54
Material	Actuator Cases – aluminum Diaphragms – CR w/ polyimide fabric
Accessories	Top-mounted handwheel, 3-way solenoid valve, Position Pac, external I/P (explosion proof), filter regulator

Valtek Guardian II Globe Valve



A 2-inch Guardian II metal bellows seal valve with size 25 actuator

With increasing concerns about fugitive emissions from hazardous processes, Flowserve is a leader in controlling or eliminating fugitive emissions from control valves.

The Valtek Guardian II metal bellows seal valve is the answer to processes where packing emissions pose a danger to both personnel and the environment.

Using a formed metal bellows design with minimal welded joints, the Guardian II has a full-cycle life of up to 5 million cycles. This ensures years of safe and reliable operation in hazardous processes ranging from -320° to 1000° F / -196° to 538° C and pressures to 1100 psig / 76 barg.

A metal shroud envelopes the bellows acting as a pressure boundary in service, allowing use of a single, pressurized gasket seal and preventing fluid contact with the bellows housing during normal operation. External pressurization of the bellows increases cycle life and the maximum allowable pressure, while eliminating 'bellows squirm.' The replaceable plug head allows trim changes without changing the bellows assembly.

Flowserve assures integrity as it helium leak tests the bellows assembly. Additionally, a 'tell-tale' tape located in the bellows housing may be monitored visually, electronically or by pressure, allowing fast detection of bellows failure.

Guardian II can be retrofitted from a Mark One valve by changing the plug, bolting, bonnet, and adding a bellows assembly, bellows housing and lower guide assembly.

Guardian II Body Specifications

Sizes	1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8
Forms	Globe, angle, expanded outlet
Characteristics	Equal percentage, linear, quick-open
Bellows Material	Inconel 625 (std.), Hastelloy C-22, other materials
Bonnet	One-piece including bellows housing
Packing	Double set
Packing Material	Teflon V-ring, glass-filled Teflon, asbestos-free packing w/Inconel wire, Grafoil, others as required
Gasket Types	Flat: Teflon, Kel-F Spiral wound: stainless steel / Grafoil
Guides	Glass-filled Teflon, Grafoil, bronze, Stellite

Linear Actuator Specifications

Actuators	Spring cylinder: sizes 25, 50, 100, 200, 300, 400, 500, 600 sq. in. Manual handwheel: sizes 9, 12, 18, 24-inch diameters Hydraulic: as required
Positioner Signals	Pneumatic: 3-15, 6-30 psig / 0-1, 0.4-2.1 barg Electro-pneumatic: 4-20, 10-50 mA

Valtek Valdisk Rotary Valve



Six-inch Valdisk rotary valve with size 50 actuator

The Valtek Valdisk® rotary control valve is designed with an eccentric/ clammed disc that provides high capacity with tight shutoff. It performs at pressures from vacuum to 6000 psig / 414 barg, and temperatures from -423° to 1200° F / -253° to 650° C.

With a lightweight wafer-style body, Valdisk is available with pressure-assisted ‘Jam-lever Toggle’ seating, achieving bi-directional bubble-tight shutoff, while maintaining low break-out torque. Each body has a disc stop to prevent overstroking and damage to the seat. The disc pulls out of the seat immediately upon opening, permitting better throttling and minimizing seat wear.

The rotary-motion cylinder actuator is similar to the Mark One’s linear-motion actuator. Many parts are interchangeable between the two designs. The actuator is attached to the disc shaft with a single pivot point, minimizing lost motion.

Valdisk Body Specifications

Style	In-line wafer
Sizes	2 – 36-inch
Ratings	ANSI Class 150, 300, 600, 900, 1500, 2500
Materials	Carbon and stainless steels, chrome-moly, Alloy 20, Hastelloy B, Hastelloy C, Monel, nickel, titanium, bronze, other castable materials
Seat Forms	Soft seat: glass-filled TFE, Teflon, PEEK, Kel-F Metal seat: 316 stainless steel, 17-4 PH, Inconel
Disc Characteristics	Modified equal percent (inherent), linear (easily characterizable with positioner cam)
Bearings	Dual inboard

Rotary Actuator Specifications

Types	Double-acting cylinder with fail-safe spring action; toggle-link cylinder, electric, hydraulic, electro-hydraulic
Sizes	Cylinder sizes: 25, 50, 100, 200, 300 Toggle-link cylinder sizes: 100, 200
Action	Air-to-open, air-to-close; fail-in-place
Supply Pressure	150 psig* (maximum) 10.3 barg* (maximum)
Auxiliary Handwheels	Declutchable side-mounted; manual gear-operated; handlever
Positioners	Beta positioner with pneumatic module for 3-15, 3-9 and 9-15 psig / 0-1, 0-0.6 and 0.6-1 barg input signal (other ranges available); Beta positioner with electro-pneumatic module for 4-20 and 10-50 mA input signal

* Some restrictions may apply to certain applications

Valtek Valdisk 150 Rotary Valve



Four-inch Valdisk 150 rotary valve with size 25 actuator

The Valtek Valdisk™ 150 high-performance rotary valve is designed to control ANSI Class 150 processes. It is available in a wafer or lug-style body providing tight shutoff at a low cost with quick delivery schedules.

The Valdisk 150 rotary valve is available in size 2 thru 12-inches with an operating temperature range of -100° to 400° F / 75° to 205° C.

The typical liquid pressure recovery factor (F_L) of the Valdisk 150 rotary valve is better than most butterfly valves, reducing the tendency to cavitate or choke.

The Valdisk 150 has an eccentric-cammed disc that rotates out of the seat upon opening. This double-offset disc design reduces seat wear and leakage and allows a low break-out torque requirement.

A floating self-centering seat is held in place by an internal seat retainer that increases sealing capacity as it aligns with the disc.

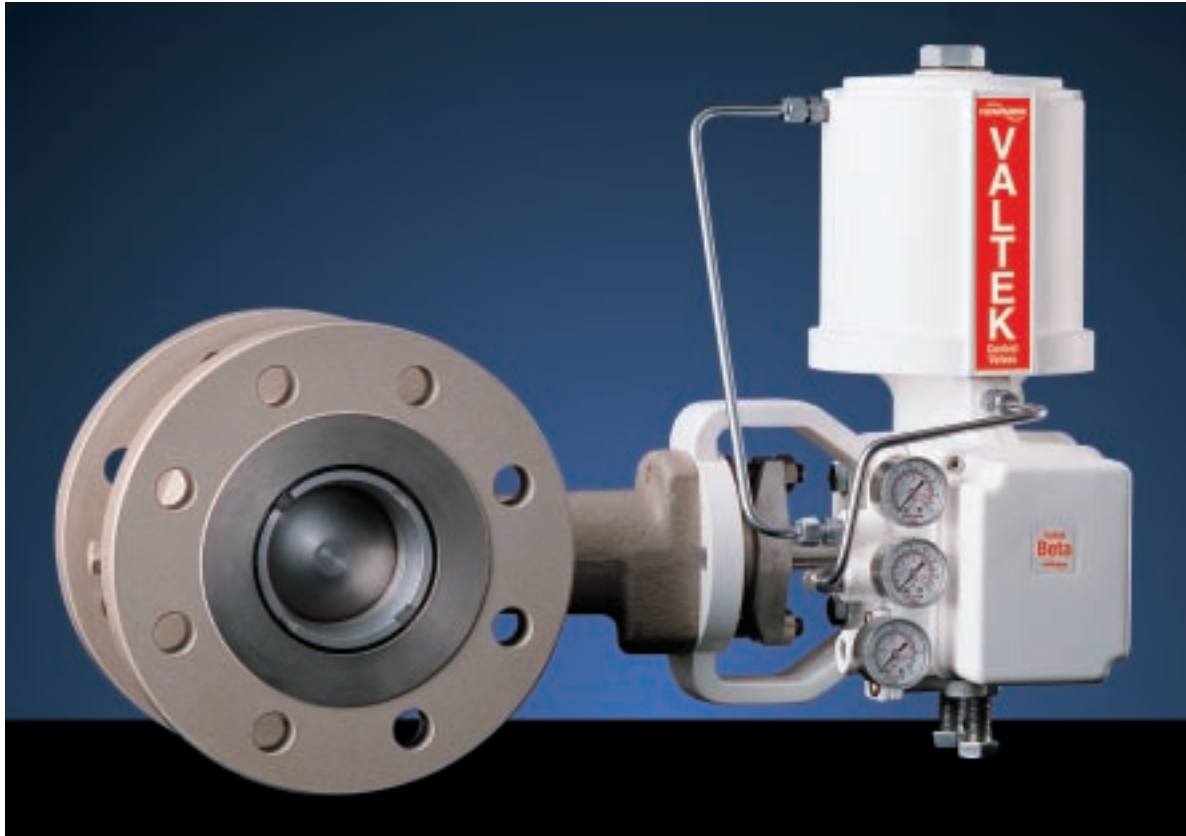
Valdisk 150 Body Specifications

Sizes (inches)	2 – 36-inch
Body Forms	Wafer, lug
Body Rating	ANSI Class 150
Shutoff Rating	ANSI Class VI
Operating Temperature	-100° to 400° F / -73° to 204° C (-20° F / -29° C for carbon steel)
Fire Seat Rating	API 607
Actuator Types	Pneumatic (sq.in.): 25, 50, 100, 200; electro-pneumatic; manual (see rotary actuator specifications, page 8)
Positioner Signals	Pneumatic: 3-15, 3-9, 9-15 psig / 0-1, 0-0.6 and 0.6-1 barg (additional range and split-range models available); electro-pneumatic: 4-20, 10-50 mA

Materials of Construction

Body, disc, retainer	Carbon steel, stainless steel, Alloy 20, Hastelloy C, Inconel, Monel, nickel
Shaft	17-4 PH (std.), stainless steel, Alloy 20, Hastelloy C, Inconel, Monel, Nitronic 50
Bearing	Ryload (rolled stainless steel with Teflon insert)
Packing	Teflon V-ring (std.), Grafoil, SafeGuard, SureGuard
Seat	Teflon energized with Viton O-ring

Valtek MaxFlo Rotary Plug Valve



Four-inch MaxFlo rotary plug valve with a size 25 actuator

The Valtek MaxFlo™ high performance rotary control valve uses an eccentric plug that provides high rangeability, zero breakout torque and durable trim with a significant increase in valve life.

Designed for use in a wide variety of applications ranging from petrochemical to low content slurry and pulp service to severe service, the MaxFlo can handle pressure drops up to 1450 psig / 100 barg. Operation temperatures can range from -150° F to 800° F / -100° C to 430° C.

The eccentric plug provides rangeability greater than 100:1, compared to 50:1 for typical globe valves and 20:1 for most butterfly valves. The shutoff rating reaches Class IV for metal seats and Class VI for soft seats. NACE certification is also available.

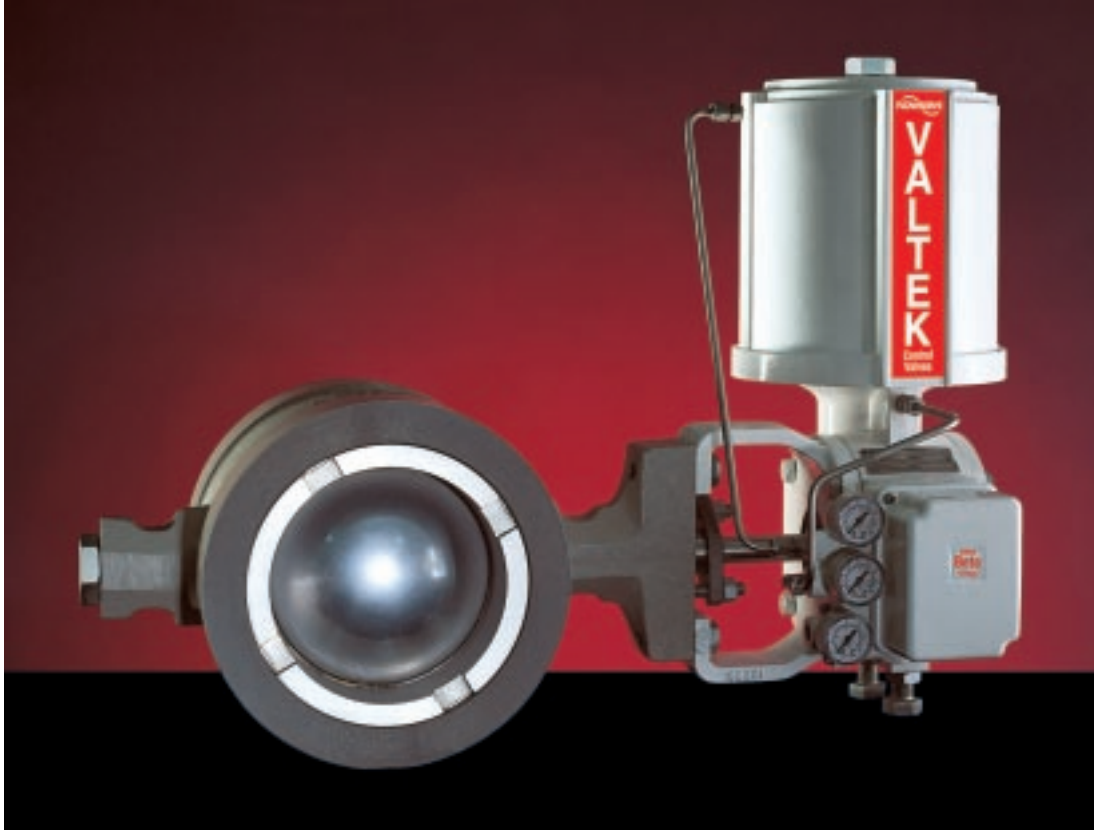
MaxFlo will fail either open or closed in the event of air or signal loss. Flow with the shaft upstream for fail-closed and shaft downstream for fail-open.

MaxFlo's large oversized shaft essentially eliminates shaft failures and provides a large shaft bearing surface that reduces bearing wear and increases reliability.

MaxFlo Body Specifications

Type	Eccentric rotary plug
Sizes	1 – 12-inch
Ratings	ANSI Class 150, 300, 600
Body Materials	Stainless steel, carbon steel
Ends	Flanged, flangeless
Plug Materials	17-4 (std.), 316L with Stellite overlay
Seal Materials	17-4 (std.), 316L with Stellite overlay PTFE (soft)
Packing Materials	Teflon V-ring, braided TFE/Kevlar, Grafoil, SafeGuard, SureGuard
Actuators	High thrust cylinder sizes 25, 50 100, 200-square inch and manual
Positioner	Beta positioner with pneumatic or electro-pneumatic module

Valtek ShearStream Ball Valve



An 8-inch ShearStream ball valve with a size 50 actuator

The Valtek ShearStream is a 'rugged' throttling ball valve designed to overcome the problems of harsh, fibrous processes. ShearStream is also good for high flow, low pressure drop applications.

ShearStream's one-piece body design overcomes many long standing challenges faced by traditional ball valves: piping forces that unevenly load the seal, low rangeability due to limited orifice characterization, and unsatisfactory shutoff capabilities.

At the same time, ShearStream achieves the following advantages:

- One-piece body eliminates one leak path and ensures seal tightness
- Reduced clogging and improved shearing action with 'V' shaped orifice
- Class IV shutoff with Flowserve's Flex-loc™ metal seal
- Class VI shutoff with Flowserve's Flex-loc™ soft seal
- Shimless seal design – reduces maintenance time
- Dependable operation with Flowserve's standard compact, high thrust cylinder rotary actuator

ShearStream Body Specifications

Type	Ball
Sizes	1 – 16-inch
Ratings	ANSI Class 150, 300, 600: 1, 1½, 2, 3, 4, 6, 8, 12-inch; ANSI Class 150, 300: 10, 16-inch
Body Materials	316 stainless steel, carbon steel
Ball Materials	317 stainless steel with hard chrome plating, Stellite-faced
Seal Materials	Soft seal: PEEK, glass filled TFE Metal seal: 316 stainless steel, Stellite flow ring
Actuator	High thrust cylinder (see rotary actuator specifications, page 8)

Valtek Tiger-Tooth Valve

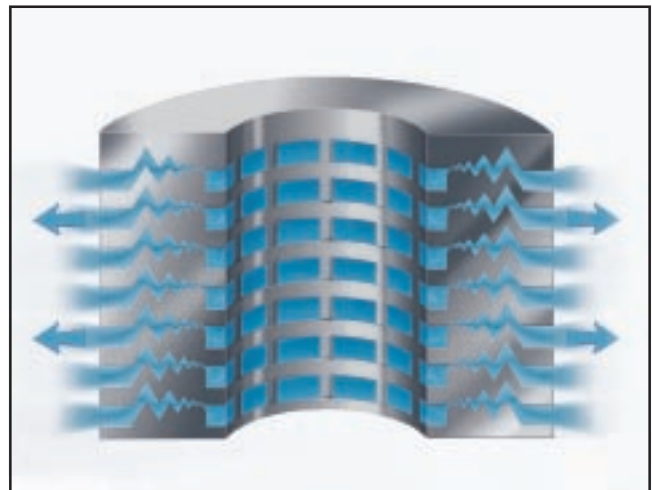


A 10 x 16-inch angle valve with Tiger-Tooth trim.

The Valtek Tiger-Tooth™ control valve effectively attenuates gaseous and hydrodynamic noise, and eliminates the damaging effects of cavitation. Tiger-Tooth trim features a series of circular stacked discs; each of which has concentric grooves (or teeth) machined on the face. Flow passes from the center of the disc stack across the face of the discs, causing a series of expansions and contractions of the flow. This mechanism reduces pressure gradually across the face of the discs without the sharp pressure drop and subsequent pressure recovery typical of conventional, single-throttling-point trims. Tiger-Tooth trim is constructed to be forgiving of small entrained particles that typically plug competitive trims or cause them to stick. The wide acceptance of the Tiger-Tooth valve in the process control industry confirms its ability as a highly successful noise and cavitation reduction device.

Tiger-Tooth Body Specifications

Sizes	1½ – 42-inch thru ANSI Class 600 1½ – 24-inch thru ANSI Class 4500
Forms	Globe, angle, Y-body, expanded outlet
Materials	Carbon and stainless steels, chrome-moly, Alloy 20, Hastelloy B, Hastelloy C, nickel, titanium, bronze, other castable materials
Trim	Tiger-Tooth stack, linear and modified equal percentage characteristics
Linear Actuators	Double-acting cylinder with positioner and fail-safe spring action, electric, hydraulic, electro-hydraulic



Cross-section of stack shows expanding tooth design.

Valtek ChannelStream Valve



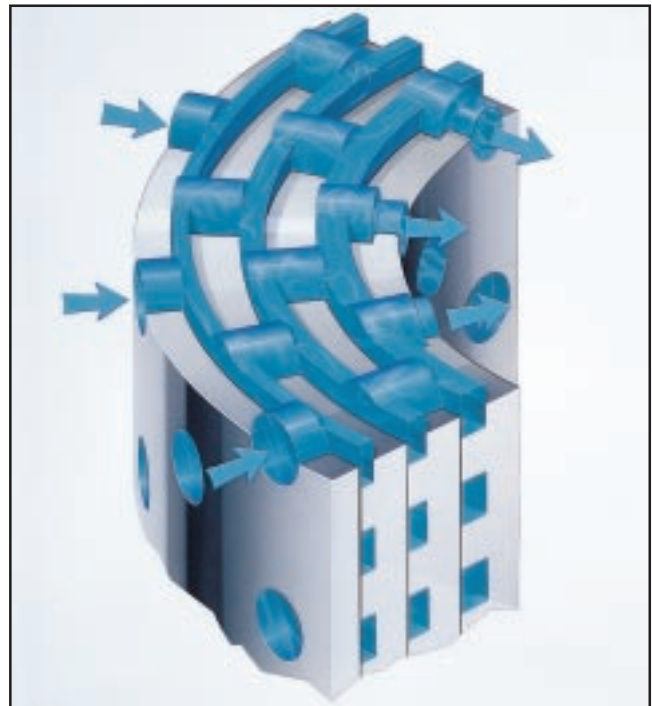
Three-inch Mark One globe valve with ChannelStream trim.

Valtek ChannelStream® control valves eliminate cavitation damage and minimize hydrodynamic noise even under the most severe liquid applications. The ChannelStream cartridge is designed to produce the desired pressure drop, while avoiding cavitation at any point. The cartridge has two or more close-fitting cylinders with drilled expansion holes. Each cylinder has a series of circumferential, restrictive channels machined into the outer cylinder surface that intersect the expansion holes.

The gradual pressure reduction occurs because of the

ChannelStream Body Specifications

Sizes	1 – 42-inch thru ANSI Class 600 1 – 24-inch thru ANSI Class 2500
Forms	Globe, angle, Y-body, expanded outlet
Materials	Carbon and stainless steels, chrome-moly, Alloy 20, Hastelloy B, Hastelloy C, Monel, nickel, titanium, bronze, other castable materials
Trim	linear and modified equal percentage characteristics
Linear Actuators	Double-acting cylinder with positioner and fail-safe spring action, electric, hydraulic, electro-hydraulic



This ChannelStream trim shows its intersecting channels and holes.

following physical mechanisms:

1. Sudden expansion of the flow as the liquid leaves the restrictive channels to each intersecting expansion hole
2. Sudden restriction of the flow as the liquid leaves the expansion holes to the channels
3. Turbulent mixing
4. Mutual impingement of individual streams
5. Frictional losses due to small multiple passageways

Valtek MegaStream Valve



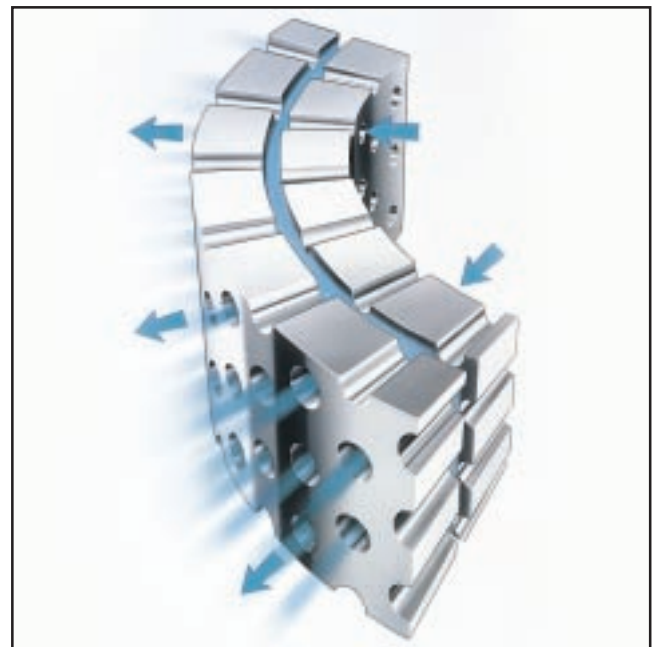
(Above) MegaStream attenuators can be installed in most standard Mark Ones (such as this 3-inch Mark One) without additional or special parts. (Right) MegaStream attenuators can be constructed with one to four stages, depending upon the application requirements.

Valtek MegaStream™ control valves reduce noise by up to 30 dBA in gas applications. The MegaStream attenuator is designed with a series of drilled-hole cylinders which permits staged pressure reduction and controls the turbulence carried into the downstream piping. MegaStream trim can be easily retrofitted to a standard MarkOne valve. Usually only the seat retainer needs to be changed to convert a Mark One to a MegaStream.

Because of Flowserve's high degree of parts interchangeability, many standard Mark One parts are used in MegaStream valves, reducing spare parts inventories. The MegaStream control valve is cost effective in services requiring light to moderate noise attenuation.

MegaStream Body Specifications

Sizes	1 – 42-inch thru ANSI Class 600
Forms	Globe, angle, Y-body, expanded outlet
Materials	Carbon and stainless steels, chrome-moly, Alloy 20, Hastelloy B, Hastelloy C, Monel, nickel, titanium, bronze, other castable materials
Trim	MegaStream attenuator, linear and modified equal percentage characteristics
Linear Actuators	Double-acting cylinder with positioner and fail-safe spring action, electric, hydraulic, electro-hydraulic



Downstream Devices for Gaseous Noise Suppression



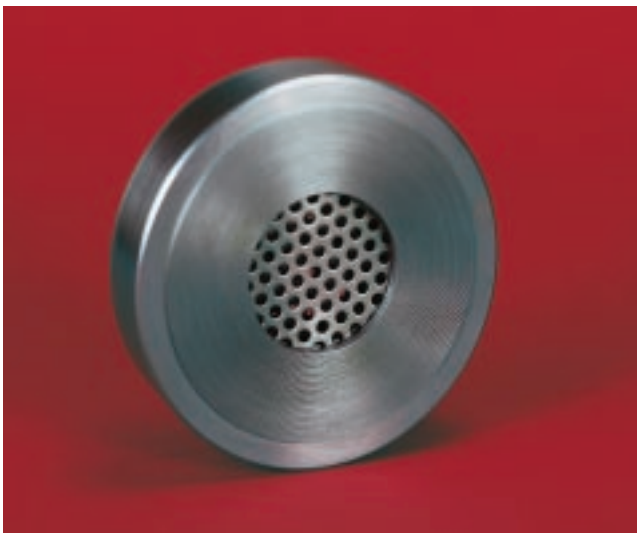
Valtek control products provide a wide variety of economical noise reduction devices, in addition to multi-staged MegaStream and Tiger-Tooth control valves, that reduce gaseous noise levels to acceptable levels:

MegaStream plates and diffusers for SPL reductions up to 15 dBA

In-line silencers for venting applications or for reductions beyond 25 dBA

Often, any one of these noise reduction devices in series with a Mark One, Mega-Stream or Tiger-Tooth control valve can be selected to attenuate noise to the acceptable SPL required and to reduce costs.

A MegaStream plate installed downstream from a 3-inch MegaStream valve.



Valtek MegaStream Plate

Installed between raised-face flanges or welded on immediately downstream from the valve, the Valtek MegaStream plate incorporates a series of stages to control line turbulence and absorb the pressure drop. Up to four stages of pressure reduction can be handled with one intrusion in piping. It is available in sizes 1½ thru 24-inch and constructed from carbon or stainless steels (other materials available).



Valtek MegaStream Diffuser

Valtek MegaStream diffusers share the high pressure drop with the valve. By design, the length of the diffuser and the number of holes vary to accommodate the flow capacity required and provide the required noise attenuation. Available designs include standard diffuser, standard diffuser with outer shell, and a vent diffuser. It is available in sizes 1 thru 42-inch, and in carbon and stainless steels.

Additional Valtek Control Products



Valtek Mark Two™

Fabricated from bar stock, this Valtek valve can be machined quickly in high pressure classes or special alloys for fast delivery. Available in sizes 1/2 thru 6-inch and ratings to ANSI Class 6600, the Mark Two has many configura-

tions including in-line, angle, offset, and three-way body styles. The trim and actuator, in most cases, are interchangeable with the Mark One.



Valtek Mark Eight™

Using a unique 'Y' style globe body, the Valtek Mark Eight provides higher flow capacities and less process turbulence than conventional valves. A less restrictive flow passage permits less pressure to be converted into velocity as fluid

passes through the seat, resulting in a lower valve recovery factor and higher capacity. It is available in sizes 1 thru 18-inch thru ANSI Class 2500.



Valtek Survivor™

When the service is particle-entrained with high pressures or velocities, this Valtek valve is the answer. Its sweep-angle body reduces the damaging effect of entrained solids in many erosive services. To combat the

abrasive elements of these processes, the plug head and venturi seat are made of Stellite, tungsten carbide or hardened ceramic material. The Survivor is available in sizes 1 thru 14-inch through ANSI Class 600.



Valtek Tek-Check™

Used extensively in the oil and gas industry, the Valtek piston check valve features a special non-slamming piston. This valve is also effective in dampening pulsating flow. The Tek-Check valve is manufactured with a

clamped-in seat and top-entry design for easy maintenance, and is built with many standard Valtek control product parts. It is available in sizes 1 thru 36-inch and is rated through ANSI Class 2500.

Special Engineering, Manufacturing and Testing



(Top left) Valtek's clean room permits construction and testing of critical service valves for the aerospace and chemical industries.

(Top right) Special-engineering and extensive testing over several years were required to develop the StarPac Intelligent System, the first of its kind in the industry.



(Left) One of two massive "Titan" valves and hydraulic skids used in high temperature sodium service at a California sodium pump test facility.

(Right) This 8-ton, 30 x 36-inch frosted Tiger-Tooth valve proves that Valtek cryogenic testing capability is nothing less than impressive.



While many control valve manufacturers routinely shy away from applications requiring special engineering – citing a lack of time, engineering expertise, or technology – Flowserve seeks the challenges involved with such projects. These applications test the limits of control valve technology with extreme temperatures, high speed operations, volatile fluids, and high pressure drops.

For example, Flowserve engineered and built the mammoth 30-inch 'Titan' valve, so named for its enormous size: weighing eight tons and measuring 22 feet. Used for pressure reduction at a sodium pump test facility in California, Flowserve supplied two Titan valves for the control of 1100° F liquid sodium at a flow rate of 80,000 gpm. Even under such severe conditions, the valve was built to stroke 32 inches in 30 seconds.

Flowserve designed a sophisticated electro-hydraulic control system for four 30-inch, 600 ANSI Class rotary disc valves. Designed to control the flow of isobutane to a high-speed turbine, the valves were required to close in 1/3 second to prevent the turbine's speed from exceeding its limit. The control system used nitrogen-

charged piston accumulators, along with complex hydraulics and electronics, to achieve the required closing speed.

The aerospace industry also comes to Flowserve for special engineering, manufacturing and testing. Used for the critical fueling of liquid hydrogen and oxygen, the vacuum jacketed Y-body valves were constructed and wrapped in Mylar insulation in Valtek's 'clean room' under stringent quality controls. To test the integrity of the valves, Valtek engineers conducted a series of cryogenic and helium leak tests.

With an in-house engineering flow lab, Flowserve is capable of performing many specialized valve tests: noise, cavitation, seat leak, cryogenic, high temperature, life cycle, corrosion, stroke, seismic static deflection, nozzle loading, vibration, actuator dynamics and environmental.

Flowserve is also ASME authorized to produce Class I, II and III nuclear grade valves and spare parts. Flowserve's quality assurance capability includes maintaining material traceability of component parts and testing.

ServiceRepair Capabilities

Flowserve is dedicated to offering the most comprehensive and efficient service and repair capabilities to the process control industry. To achieve this, it created the ServiceRepair™ Division – an entire division dedicated to providing a wide range of services to any flow management system.

Designed with today's advanced process plants in mind, Flowserve's ServiceRepair program centralizes all feasible service requirements within one convenient resource. Regardless of a plant's location or the manufacturer of its equipment, Flowserve's factory-trained ServiceRepair technicians restore equipment to its original quality and performance for all types of process equipment.

Flowserve's Total Equipment Asset Management (TEAM) reduces and controls operating and maintenance costs – with strict consideration for environmental and safety concerns. In addition, Flowserve's ServiceRepair reduces the total cost of ownership by serving as a single source supplier of asset management solutions or simply as a reliable vendor for spare parts.

A Global Network

Flowserve ServiceRepair has service centers strategically located in all industrial regions of the world. ServiceRepair centers are qualified to maintain and repair all types of flow management equipment, including manual, control, smart and pressure-relief valves; pumps, compressors and other types of rotating

equipment; and fluid sealing systems – regardless of the manufacturer. With a global network of repair facilities, Flowserve provides 24-hour service around the world. For those users who require it, Flowserve will establish a service center 'on-site' to ensure optimum plant efficiency.

In addition, many ServiceRepair facilities include a complete manufacturing facility where valve parts can be machined on the spot. Although the centers carry large inventories of used to repair valves, a complete manufacturing capability allows special-engineered or non-inventoried parts to be made immediately, speeding up the repair process. Should a valve prove not repairable, a new valve can be assembled from stocked parts or manufactured in a short time. Adhering to strict quality control standards, Flowserve maintains several in-process inspections, and all manufactured parts and valve assemblies are 100 percent final inspected prior to delivery.

Customer Benefits

Flowserve's customer-oriented ServiceRepair Division provides total solutions to improve process plant asset management. As one of the world's largest manufacturers of process handling equipment, Flowserve provides unequalled engineering design, advanced diagnostics systems, applications know-how and materials expertise. This high level of expertise and worldwide network assures quality repair work, without delays.



(Left) Despite an oxygen fire, this 4-inch high pressure Mark One properly fail-closed; thus, avoiding a catastrophe at an oxygen plant. Although the excessive heat eventually rendered the actuator inoperable, the flow direction (flow over the plug) allowed the valve to remain closed, preventing the fire to migrate past the seat. (Right) The same valve following servicing demonstrates Flowserve's expert repair services.

Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can (and often does) provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Operation Maintenance (IOM) instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

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