



## *Control Valve Product Guide*



***Experience In Motion***

资料整理：广州捷皓机械设备有限公司  
[www.gz-keephope.com](http://www.gz-keephope.com)

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**PERFORMANCE!<sup>TM</sup>**  
**VALVE SIZING AND SELECTION SUITE**

*Performance!* puts the power of on-demand control valve selection and sizing at your fingertips. It's the right tool for finding the right product, every time.

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**GENERAL SERVICE**

Flowserve general service control valves combine platform standardization, high-performance, and simplified maintenance to deliver a lower total cost of ownership.

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**SEVERE SERVICE**

Flowserve severe service products are engineered for durable functionality wherever harsh service conditions exist. From extreme temperature and pressure differentials, to cavitation, flashing, and beyond, our severe service solutions take the problem out of problematic applications.

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**CUSTOM ENGINEERED**

Flowserve offers a comprehensive suite of custom-engineered solutions, as well as unique product designs that meet your exacting specifications.

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**POSITIONERS**

Flowserve's portfolio of ultra-high precision positioners support a range of communication protocols and hazardous area classifications to help facilitate dramatic improvements in process uptime, reliability, and yield.

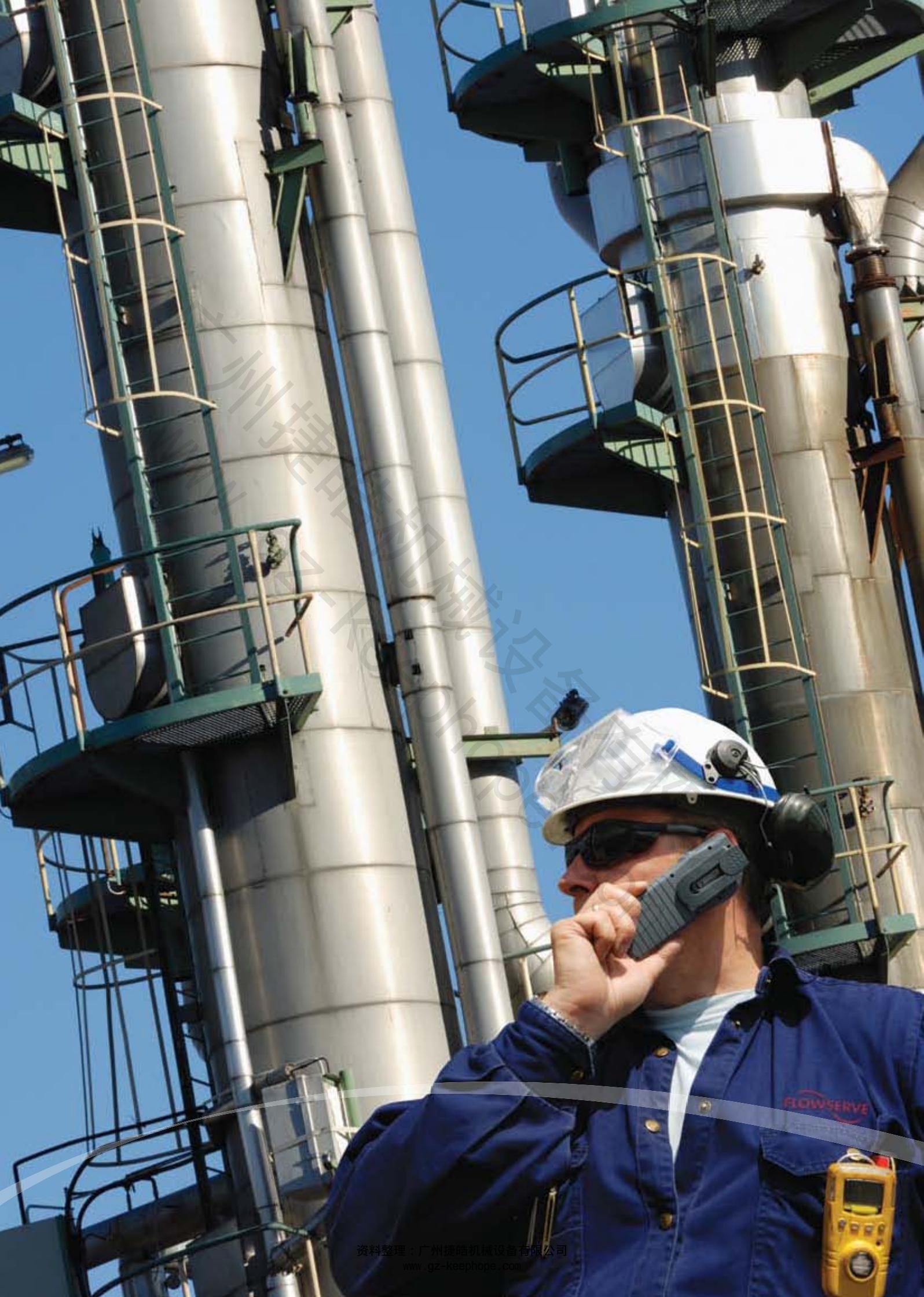
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**SALES & SERVICE**

Around the clock, around the world. Flowserve manufactures, sells, and services precision-quality pumps, control valves, seals, and automation equipment for a diverse range of industries.

Flowserve® is one of the world's leading providers of fluid motion and control products and services to oil and gas, power generation, chemical, and general industries. Globally, we produce engineered and industrial pumps, valves, seals, systems, and automation equipment, and provide a range of related flow management services. Our solutions move even the most volatile and caustic fluids safely and securely. We believe in the value of long-term relationships and are committed to providing optimal quality products and solutions to the industries we serve. When you need to move liquids, look to Flowserve for experience in motion.





# FLOWSERVE® – SOLUTIONS TO KEEP YOU MOVING

Flowserve® is one of the world's leading providers of fluid motion and control products and services. Globally, we produce engineered and industrial pumps, valves, seals, systems, and automation equipment, and provide a range of related flow management services. Our solutions move even the most volatile and corrosive fluids safely and securely through some of the most extreme temperatures, terrain, and challenging operating environments on the planet.

Flowserve markets are large, diverse, and worldwide. Our products and services are specified for use in a vast range of industries, including oil and gas, chemical, power generation, and various general industries.

## GLOBAL REACH, LOCAL PRESENCE

Flowserve's global expertise, deep understanding of the flow control industry, and customer-centric focus, enable us to deliver targeted strategic solutions, products, and services that meet diverse application requirements worldwide.

We have the dedicated infrastructure and global workforce needed to partner with you on projects as routine as day-to-day operations and as challenging as spearheading new ventures in remote regions of the world. At Flowserve, our global reach provides a truly local presence when and where you need it most.

## EVOLUTIONARY PRODUCTS

Flowserve's industrial and highly engineered pumps, precision mechanical seals and systems, automated and manual quarter-turn valves, control valves, and valve actuators serve a constantly evolving set of applications. We continually leverage our engineering, application, and applied technology capabilities to design solutions that effectively and efficiently help you achieve your project goals and desired outcomes. Our product design, manufacturing and service capabilities ensure that we deliver the right product, at the right time and right place with dependable service. Flowserve also provides comprehensive life cycle management services and a full range of training and engineering solutions to optimize the performance and longevity of your operations around the globe.

## MOVE WITH FLOWSERVE

From Angola and Nigeria to the Sakhalin Islands, and from China to Latin America and beyond, rely on Flowserve fluid motion and control products, services, and solutions to move your industrial liquids point to point.

# FLOW CONTROL INDUSTRIES



## OIL AND GAS INDUSTRY

Upstream, downstream, and in between, Flowserve® control valves exceed the performance demands required for harsh environments and difficult applications. Our products and services support a wide range of industry functions, including exploration, production, pipeline transmission, storage, and refining.

### Products

- Linear and rotary control valves for general service and severe applications involving high pressure drops, cavitating or flashing services, or extreme temperatures
- Trunnion-mounted ball valves to support gaseous and liquid services
- Lubricated plug valves to accommodate zero-leakage applications

## POWER GENERATION

Flowserve solutions – nuclear, fossil fuel, renewable, steam, and more – are at work in every phase of power generation. Flowserve provides on-the-spot availability, 24/7 technical support, and unmatched service wherever flow control is required.

### Products

- Multi-turn gate and globe valves, and check valves to manage high temperature and high-pressure steam services
- Thermostatic steam traps and electronic controls for high efficiency boilers
- Heavy-duty electric actuators and controllers to support valve automation

## BRANDS

Accord™  
Darling™  
Argus™  
Atomac™

Automax™  
Durco™  
Edward™  
Gestra™

Kämmer™  
Limitorque™  
Logix™  
McCANNA/MARPAC™



## CHEMICAL PROCESSING

Flowserve control valves control the movement of some of the world's most hazardous and corrosive liquid chemicals via traditional synthesis and catalysis, as well as new age bio and cryogenic processing and reactor and separation technologies.

### Products

- 1/4-turn ball, plug, and butterfly valves designed for isolation of highly corrosive, erosive, or lethal processes
- Pneumatic valve actuation and automation solutions



## GENERAL INDUSTRIES

Flowserve products are renowned for their quality and operational performance in a wide range of industries, including water, food and beverage, mining, pulp and paper, aerospace, agriculture, HVAC, and electronics.

### Products

- 1/4-turn ball, segment, and butterfly valves designed for isolation and control of slurry services
- All-welded ball valves for buried services
- Linear control valves for low-flow and cryogenic applications

NAF™

Naval™

Nobel Alloy™

Norbro™

Nordstrom™

PMV™

Schmidt Armaturen™

Serck Audco™

Valbart™

Valtek™

Vogt™

Worcester Controls™

# PERFORMANCE!™ VALVE SIZING AND SELECTION SUITE

## Put the power of on-demand selection and sizing at your fingertips.

*Performance!*™ Valve Sizing and Selection Suite is the right tool for finding the right product – first time, every time. This comprehensive set of next generation engineering tools allow you to size and select Flowserve control valve products best suited to your applications and service conditions. In just seconds, you get the answers you need to ensure you make the right choice.

### OUT WITH RISKY VALVE SELECTION TECHNIQUES

Until now, selecting the right control valve for your application carried significant risk and ever-increasing engineering costs to ensure decision accuracy. Using existing sizing and selections tools required understanding the precise correlation between valve technology and its intended application, and entering volumes of application data in hopes of achieving precision sizing. Increasingly complicated sizing and selection software and diminished workforce experience further compounded matters.

Starting today, *Performance!* is the new paradigm in control valve selection. Now everyone can have the power of on-demand sizing and selection at their fingertips.

### ***PERFORMANCE!* is fast, flexible, and extremely user-friendly**

- Size, select and generate valve, actuator, and positioner specifications in seconds
- Enter and verify data
- Import and export valve specifications automatically from multiple data formats (InTools, Excel, and more)



**“Flowserve’s VSG solution doesn’t raise the bar, it completely replaces the bar in terms of risk abatement, time to size and select, and delivers Best-In-Class solutions just the way I want them.”**

– Principal Control Valve Engineer at a large international oil company



### **IN WITH *PERFORMANCE!* ON-DEMAND INNOVATION**

*Performance!* uses a Valve Selection Guide (VSG) to significantly reduce sizing and selection inaccuracies, providing the answers you need to improve decision accuracy in record time.

To speed up the sizing and selection process, the *Performance!* VSG requires minimal application data – expected flow, pressure, temperature, process media, and line size – to perform its function. Once entered, the VSG searches all available control valve alternatives to produce a prioritized list of valves that offer best-fit options for the application based on your desired level of controllability, reliability, and delivery.

Available worldwide exclusively from Flowserve, *Performance! Valve Sizing and Selection Suite* is changing the way entire industries size and select Flowserve control valves, actuators, and positioners for a full range of applications. For more information visit [www.flowserveperformance.com](http://www.flowserveperformance.com).



## GENERAL SERVICE APPLICATIONS

**Flowserve general service control valves combine platform standardization, high-performance, and simplified maintenance to deliver a lower total cost of ownership.**

Flowserve delivers a broad range of general service control valves – linear and rotary – with pressure ratings of ANSI Class 150 to 4500 / PN 10 to PN 400. These high-performance control valves offer greater reliability, precision control, and flow capacity, with significantly reduced cavitation, flashing, and noise. Quality production ensures increased process yield and throughput.

Because Flowserve general service control valves are constructed on global platforms using standardized parts and components, up-front engineering is held to a minimum. Simplified operation, maintenance, and service further ensure lower total cost of ownership.

# GENERAL SERVICE QUICK REFERENCE

Valve Type	Size	Pressure	Temperature	Product Type
Linear Globe	DN 15 to DN 915 0.5" to 36"	Class 150 to 2500 PN 10 to PN 400	-196 °C to 815 °C -320 °F to 1500 °F	<b>Mark One</b> Page 11
Linear Globe	DN 150 to DN 750 6" to 30"	Class 150 to 600 PN 10 to PN 63	-196 °C to 815 °C -320 °F to 1500 °F	<b>Mark 100</b> Page 11
Linear Globe	DN 50 to DN 400 2" to 16"	Class 900 to 2500 PN 160 to PN 400	-196 °C to 815 °C -320 °F to 1500 °F	<b>Mark 200</b> Page 11
Linear Globe	DN 15 to DN 400 0.5" to 16"	Class 150 to 300 PN 10 to PN 40	-196 °C to 538 °C -321 °F to 1000 °F	<b>FlowTop</b> Page 12
Linear Globe	DN 15 to DN 100 0.5" to 4"	Class 150 PN 10 to PN 40	-29 °C to 250 °C -20 °F to 482 °F	<b>FlowPak</b> Page 12
Linear Globe	DN 150 to DN 2500 0.5" to 6"	PN 10 to PN 40	-196 °C to 650 °C -321 °F to 1202 °F	<b>TotalFlow - 035000</b> Page 12
Rotary	DN 25 to DN 300 1" to 12"	Class 150, 300, 600 DN PN 10, 16, 25, 40, and 63	-100 °C to 400 °C -148 °F to 750 °F	<b>MaxFlo 3</b> Page 13
TMCBV	DN 75 to DN 1400 3" to 56"	Class 150-2500 API 2000-15000 PN 10 to PN 400	-196 °C to 450 °C -320 °F to 842 °F	<b>Valbart TMCBV</b> Page 13
Rotary	2" to 30"	Class 150-2500	-29 °C to 649 °C -20 °F to 1200 °F	<b>Valdisk</b> Page 14
Rotary	DN 25 to DN 400 1" to 16"	Class 150, 300, 600	-46 °C to 316 °C -50 °F to 600 °F	<b>ShearStream</b> Page 14
Rotary	DN 80 to DN 700 3" to 28"	Class 150 to 300 PN 10 to PN 40	-30 °C to 350 °C -22 °F to 662 °F	<b>Torex</b> Page 14
Rotary	DN 25 to DN 500 1" to 20"	Class 150 to 300 PN 10 to PN 40	-30 °C to 250 °C -22 °F to 482 °F	<b>Setball</b> Page 15
Rotary	DN 25 to DN 400 1" to 16"	Class 150 to 300 PN 10 to PN 40	-30°C to 350 °C -22 °F to 662 °F	<b>Duball</b> Page 15
Rotary	DN 150 to DN 800 6" to 32"	Class 150 to 300 PN 10 to PN 40	-30 °C to 250 °C -22 °F to 662 °F	<b>Trunball</b> Page 15



## MARK ONE

Superior performance in liquid and gaseous services, with easy, fast, and inexpensive maintenance.

### FEATURES

- Small, compact, light-weight body and actuator package
- Stiff and high-thrust cylinder actuator offers position accuracy, repeatability, assured response
- Broad solutions envelope with significant flexibility

### SPECIFICATIONS

**Valve Type:** Linear Globe  
**Size:** DN 15 to DN 915 ; 0.5" to 36"  
**Pressure:** PN 10 to PN 400;  
Class 150 to 2500  
**Material:** Carbon Steel; Stainless Steel;  
Special Alloys  
**Temperature:** -196 °C to 815 °C;  
-320 °F to 1500 °F

### SOLUTIONS

The industry choice for a simple, reliable, tough globe valve. Handles a wide selection of process control applications for flow, pressure, and temperature, including corrosive fluids, cryogenics, steam, water, gases, multiphase, high temperatures, erosion, and high pressure drops.

**For more information** see document number VLENTB0001



## MARK 100

Large control valve design with features suited for maximum capacity Cv and severe application solutions.

### FEATURES

- Higher Cv capacity allows for smaller, more cost effective valve sizes
- Easy maintenance, multiple design options with clamped-in, self-aligning seat ring
- Wide variety of noise abatement and anti-cavitation trims

### SPECIFICATIONS

**Valve Type:** Linear Globe  
**Size:** DN 150 to DN 750; 6" to 30"  
**Pressure:** PN 10 to PN 63;  
Class 150 to 600  
**Material:** Carbon Steel; Stainless Steel  
**Temperature:** -196 °C to 815 °C;  
-320 °F to 1500 °F

### SOLUTIONS

The industry choice for a simple, reliable, tough globe valve. Handles a wide selection of process control applications for flow, pressure, and temperature, including corrosive fluids, cryogenics, steam, water, gases, multiphase, high temperatures, erosion, and high pressure drops.

**For more information** see document number VLATB0100



## MARK 200

Offers high-pressure classes and high flow capacity. Fast, easy maintenance in both gas and liquid control. Accommodates a broad spectrum of severe service trim solutions.

### FEATURES

- High pressure, high flow capacity with smaller and more cost effective valve sizes
- Competitive, economical choice among high pressure, high Cv globe control valves
- Wide variety of noise abatement and anti-cavitation trims

### SPECIFICATIONS

**Valve Type:** Linear Globe  
**Size:** DN 50 to DN 400; 2" to 16"  
**Pressure:** PN 160 to PN 400;  
Class 900 to 2500  
**Material:** Carbon Steel; Chrome Moly;  
Stainless Steel  
**Temperature:** -196 °C to 815 °C;  
-320 °F to 1500 °F

### SOLUTIONS

The industry choice for a simple, reliable, tough globe valve. Ideal for solutions requiring high pressure, high-pressure drops, high Cv, noise abatement, and cavitation control. Handles a wide selection of process control applications for flow, pressure and temperature applications in oil and gas and power industries.

**For more information** see document number VLENTB0200



## FLOWTOP

High-performance, general application valve coupled with high-thrust FlowAct pneumatic diaphragm actuator.

### FEATURES

- Excellent control performance with precision machined plug contours and long stroke lengths
- Easy upgrade from standard trims to low noise or cavitation control trims
- Minimal vibration and wear of trim through sturdy plug design

### SPECIFICATIONS

**Valve Type:** Linear Globe  
**Size:** DN 15 to DN 400; 0.5 "to 16"  
**Pressure:** PN 10 to PN 40;  
Class 150 to 300  
**Material:** Carbon Steel; Stainless Steel;  
Special Alloys  
**Temperature:** -196 °C to 538 °C;  
-320 °F to 1000 °F

### SOLUTIONS

High-performance control valve for use in chemical, refinery, power, HVAC, and food and beverage industries. Zero emissions application options through bellows seal solution. TA-Luft certified for fugitive emission leakage class greater than 10-8 mbarl/s.

**For more information** see document number SAEEBRV740



## FLOWPAK

A general service valve coupled with a high-thrust FlowAct pneumatic diaphragm actuator.

### FEATURES

- Light weight, compact, modular design, low profile, quick delivery
- High Cv capacity minimizes body size and cost
- Easy accessory mounting and repair with direct mounting (no piping required)

### SPECIFICATIONS

**Valve Type:** Linear Globe  
**Size:** DN 15 to DN 100; .5" to 4"  
**Pressure:** PN 10 to PN 40; Class 150  
**Material:** Carbon Steel; Stainless Steel  
**Temperature:** -29 °C to 250 °C;  
-20 °F to 482 °F

### SOLUTIONS

High-performance control valve for use in chemical, refinery, power, HVAC, and food and beverage industries. TA-Luft certified for fugitive emission leakage class greater than 10-8 mbarl/s.

**For more information** see document number SAENBRV725



## TOTALFLOW - 035000

A flexible, versatile control valve with multiple options, including special material, higher pressure classes, and end connection variations.

### FEATURES

- Excellent performance in severe applications with a large degree of flexibility
- Anti-noise, anti-cavitation, hardened trim options
- Bellows seal, TA-Luft packing

### SPECIFICATIONS

**Valve Type:** Linear Globe  
**Size:** DN 25 to DN150; 1" to 6"  
**Pressure:** PN 10 to PN 40  
**Material:** Carbon Steel; Stainless Steel; Special Alloys  
**Temperature:** -196 °C to 650 °C; -321 °F to 1202 °F

### SOLUTIONS

A general service valve that provides a wide range of possibilities. Offers low noise trims, anti-cavitation inserts, high-pressure bellows seals and steam jacket or a low-emission packing system – SureGuard HP – in accordance with German TA-Luft requirements. Made with a special material, this valve becomes a solid solution for high pressure applications.

**For more information** see document number SAEEBRV740



## MAXFLO 3

High-performance, safety focused, feature rich eccentric rotary plug control valve.

### FEATURES

- High Cv capacity allows use of smaller envelope
- Low breakout torque, excellent control
- Lifts immediately off the seat, decreases seat wear

### SPECIFICATIONS

**Valve Type:** Rotary  
**Size:** DN 25 to DN 300; 1" to 12"  
**Pressure:** DN PN 10, 16, 25, 40, and 63; Class 150, 300, 600  
**Material:** Carbon Steel; Stainless Steel  
**Temperature:** -100 °C to 400 °C; -148 °F to 750 °F

### SOLUTIONS

High-performance general service control valve designed for applications demanding higher rangeability, precision control, and higher flow capacity.

**For more information** see document number VLENBR0052



## TRUNNION MOUNTED CONTROL BALL VALVE (TMCBV)

This valve offers greater capacity than comparable globe valves, allowing you to achieve the same flow with a smaller TMCBV that cost less, weighs less, and requires less space.

### FEATURES

- Wide range of trim designs based on industry proven technologies – MegaStream (up to 30 dBA reduction) and Z-Trim (up to 23 dBA reduction) for noise control and CavControl and ChannelStream for cavitation control
- Excellent flow capacity per body size
- Very high rangeability: > 300:1

### SPECIFICATIONS

**Valve Type:** TMCBV  
**Size:** DN 75 to DN 1400; 3" to 56"  
**Pressure:** PN 10 to PN 400; Class ANSI 150-2500, API 2000-15000  
**Material:** Carbon Steel; Stainless Steel; Nickel Alloys  
**Temperature:** -196 °C to 450 °C; -320 °F to 842 °F

### SOLUTIONS

Loading arms, gas storage fill and withdrawal, compressor anti-surge, recycle, gas processing, natural gas regulation, and fuel gas regulation.

**For more information** see document number VLENTB0068

## Reduced Cost of Ownership

Flowserve has helped more than 200 strategic alliance partners reduce equipment ownership costs. In fact, one customer with seven refineries is projected to save in excess of \$20 million over the next five years.





## VALDISK

Rotary control, heavy-duty double offset butterfly valve designed for high capacity and low-pressure loss.

### FEATURES

- High-thrust cylinder actuator coupled with eccentric-cammed disc allows for high performance throttling, even in large pressure drops close to the seat
- Low breakout torque assures accurate throttling, even close to the seat
- Disc lifts out of the seat immediately upon actuation, avoids seat and disc wear and reduces leakage and parts replacement

### SPECIFICATIONS

**Valve Type:** Rotary  
**Size:** 2" to 30"  
**Pressure:** Class 150 to 2500  
**Material:** Carbon Steel; Stainless Steel; Special Alloys  
**Temperature:** -29 °C to 649 °C;  
-20 °F to 1200 °F

### SOLUTIONS

Handles a wide selection of oil and gas industry process control applications for flow, pressure, and temperature applications. Best for fibrous slurries, liquids, gas and steam applications requiring outstanding performance under extreme pressures and temperatures.

**For more information** see document number VLATB031



## SHEARSTREAM

Rugged segmented ball valve solves long-standing traditional ball valve issues such as low rangeability due to limited orifice characterization and piping forces unevenly loading the seal.

### FEATURES

- High capacity and large turndown
- Easily handles abrasive, erosive, and corrosive fluids
- Heavy duty seat provides tight shut-off and reliability for applications requiring high pressure drops

### SPECIFICATIONS

**Valve Type:** Rotary  
**Size:** DN 25 to DN 400; 1" to 16"  
**Pressure:** Class 150, 300, 600  
**Material:** Carbon Steel; Stainless Steel; Other Alloys  
**Temperature:** -46 °C to 316 °C;  
-50 °F to 600 °F

### SOLUTIONS

Robust design overcomes the problems of harsh, particle-entrained processes in applications such as power, chemical, and petrochemical.

**For more information** see document number VLATB027



## TOREX

High performance, triple offset, metal or soft seated butterfly valve. Frequently used for isolation or on-off applications but equally suitable for control, especially on high-flow, low-pressure applications.

### FEATURES

- Triple offset design minimizes seat wear
- Bidirectional, tight shut-off
- Low torque and smooth control

### SPECIFICATIONS

**Valve Type:** Rotary  
**Size:** DN 80 to DN 700; 3" to 28"  
**Pressure:** PN 10 to PN 40;  
Class 150 to 300  
**Material:** Carbon Steel; Stainless Steel; Special Alloys  
**Temperature:** -30 °C to 350 °C;  
-22 °F to 662 °F

### SOLUTIONS

Technically and financially strong alternative to other valve types, especially larger valves. High tightness class in combination with a short face-to-face makes it suitable for many applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, and steel works.

**For more information** see document number Fk41.42



## SETBALL

Excellent rangeability and high flow capacity. Team with a direct-mounted Turnex actuator for a compact rotary control valve package with exceptional characteristics and performance.

### FEATURES

- Compact rotary control valve package
- High flow capacity allows use of smaller valve
- V-shaped port for high rangeability

### SPECIFICATIONS

**Valve Type:** Rotary  
**Size:** DN 25 to DN 500; 1" to 20"  
**Pressure:** PN 10 to PN 40;  
Class 150 to 300  
**Material:** Carbon Steel; Stainless Steel;  
Special Alloys  
**Temperature:** -30 °C to 250 °C;  
-22 °F to 482 °F

### SOLUTIONS

Technically and financially strong alternative to linear control valves. Optional Z-trim for cavitation control and noise reduction. Suitable for applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, and steel works.

**For more information** see document number Fk41.51



## DUBALL

Full port, floating ball valve design suitable for control, on-off, or isolation. Available with metal or soft seats. The Z-trim option can eliminate cavitation and decrease noise when the valve is used for control.

### FEATURES

- Full port results in a high flow capacity
- Bidirectional, tight shut-off
- Compact rotary control valve package

### SPECIFICATIONS

**Valve Type:** Rotary  
**Size:** DN 25 to DN 400; 1" to 16"  
**Pressure:** PN 10 to PN 40;  
Class 150 to 300  
**Material:** Carbon Steel; Stainless Steel;  
Special Alloys  
**Temperature:** -30 °C to 350 °C;  
-22 °F to 662 °F

### SOLUTIONS

Excellent characteristics are beneficial under the most arduous operating conditions where difficult media and demanding pressure conditions make severe demands on the design, materials and performance. Suitable for applications within pulp and paper, chemical and petrochemical, oil and gas, power plants, and steel works.

**For more information** see document number Fk41.61 and Fk41.67



## TRUNNBALL

Full port, trunnion-mounted ball valve design suitable for control, on-off, or isolation. Low torque and smooth, precise control.

### FEATURES

- Full port results in a high flow capacity
- Bidirectional, tight shut-off
- Low torque and smooth control

### SPECIFICATIONS

**Valve Type:** Rotary  
**Size:** DN 150 to DN 800; 6" to 32"  
**Pressure:** PN 10 to PN 40;  
Class 150 to 300  
**Material:** Stainless Steel; Special Alloys  
**Temperature:** -30 °C to 250 °C;  
-22 °F to 662 °F

### SOLUTIONS

Team with Duball for a complete range of full port ball valves: 1" / DN25 up to 32" / DN800. With the Z-trim option it's an excellent control valve for cavitation control or noise reduction.

**For more information** see document number Fk41.66



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www.gz-keephope.com

## SEVERE SERVICE APPLICATIONS

**Flowserve severe service products are engineered for durable functionality wherever harsh service conditions exist.**

Flowserve utilizes a suite of precision engineering solutions and services to generate top-rated severe service applications with pressure ratings of ANSI Class 300 / PN 40 and above. Our severe service product portfolio provides durable functionality and solid stability with a comprehensive range of solutions to neutralize continuous cavitation, flashing, and noise, increasing process yield and uptime.

Flowserve severe service products are constructed on physically optimized global platforms using standardized parts and components to ensure performance stability and longevity – under even the harshest conditions and for years to come.



## MARK FAMILY & FLOWTOP / FLOWPAK FAMILY TRIM OPTIONS



### CAVCONTROL

Contains the cavitating bubbles in the center of the retainer, away from the metal surfaces of the valve – a simple but very effective method of controlling cavitation in low to mild conditions.

#### FEATURES

- Directs cavitation bubbles away from metal surfaces and into opposing streams
- Impinging jets create a column of cavitation in the center of the retainer to remove the collapsing bubbles
- Increases product service life

#### SOLUTIONS

Works best in low to mild cavitation applications. Characterization available to cover a wide range of applications.

**For more information** see document number FCENBR0068



### CHANNELSTREAM

Prevents cavitation from forming and minimizes hydrodynamic noise in the most severe liquid applications. This design also offers easy maintenance and product longevity, even when installed in the most difficult applications.

#### FEATURES

- Restrictive channels prevent fluid recovery from occurring adjacent to a critical trim surface
- Expansion holes connected to the channels create a series of expansions and contractions that effectuate high-pressure drops

#### SOLUTIONS

Staged pressure drop eliminates cavitation in most applications and minimizes cavitation energy that may occur in other designs. Best suited to mild-to-moderate cavitation, but able to handle heavy cavitation applications as needed.

**For more information** see document number FCENBR0068



### MICROCAV

Effectively eliminates cavitation in control valves that require small flow rates – 0.0007 to 1.25 Cv.

#### FEATURES

- Exceptional low-flow capabilities in cavitating applications

#### SOLUTIONS

This design utilizes a plug that bears a series of intersecting diagonal grooves and is closely guided within a seat ring. Fluid passes through the grooves into an expanding flow area that allows for staged pressure reduction as the fluid impinges upon itself when the grooves intersect.

**For more information** see document number FCENBR0068



### MEGASTREAM

Decades of proven service make this heavy-duty, drilled-hole cage one of the most common and effective solutions to control valve noise.

#### FEATURES

- Fluid expansion and velocity are controlled by increasing the flow areas of each subsequent stage
- Each stage takes a small pressure drop, avoiding the high velocities present in single throttle trims

#### SOLUTIONS

Effectively lowers sound pressure levels associated with turbulence generated within the valve, helping to avoid downstream turbulence that can vibrate relatively thin pipe walls and impact surrounding environs.

**For more information** see document number FCENBR0068

## Reliable Products to Keep the World Moving

Flowserve installations have moved more than 123 billion barrels of oil through the Trans-Alaska Pipeline.



### STEALTH

The most sophisticated noise attenuation design available. Effectively reduces sound pressure levels in the most demanding applications.

#### FEATURES

- Gradual reduction of pressure without generating high velocities reduces process line noise
- Small outlet holes leverage frequency shifting to raise the frequency and lower the noise

#### SOLUTIONS

Angled paths direct the flow to the valve exit to reduce exit turbulence, thereby lowering noise and increasing the flow capacity of the valve. Combines pressure reduction and velocity control features with noise elimination features to create the most advanced noise elimination technology available.

**For more information** see document number FCENBR0067



### TIGERTOOTH

One of the most effective cavitation elimination and noise reduction trims available, especially at high-pressure drops. Reduces sound pressure levels in gas applications and prevents the formation of gas bubbles, thereby eliminating cavitation in liquid applications.

#### FEATURES

- Noise reduced through sudden expansion and contraction phenomenon that takes place as the flow passes over the teeth
- Pressure is gradually reduced without generating high velocities, which in turn reduces process line noise

#### SOLUTIONS

Reduces process velocities (which generate noise) at every point across the discs. As the fluid progresses through the stack, the expanding tooth pattern allows the pressure to be reduced in a series of successively smaller pressure drops without excursions below the vapor pressure – avoiding the formation of cavitation altogether.

**For more information** see document number FCENBR0067 & FCDNBR0068



### MULTISTREAM

Available with five stages. Eliminates noise in moderate to high-pressure drops. Drilled hole stages coupled with a contoured plug provide exceptional noise reduction and excellent turndown.

#### FEATURES

- Small holes in each stage for frequency shifting produces lower noise levels while attenuating upstream noise

#### SOLUTIONS

Reduces noise for gas, steam, and liquid services. Eliminates noise in moderate to high-pressure drops.

**For more information** see document number FCENBR0067



### SILENTPAC

Low noise baffles reduce noise generated by moderate pressure drops. Control of the process is through a standard contoured plug, yielding high turndown and excellent control.

#### FEATURES

- Stainless steel attenuator is welded together to form a single robust part
- Process fluid diffuses through the cage with minimal noise generation to silence noise generated upstream

#### SOLUTIONS

Reduces noise for gas, steam, and liquid services. A cost effective solution for moderate noise reduction.

**For more information** see document number FCENBR0067



## TOTAL FLOW FAMILY TRIM OPTIONS

### TYPE I, TYPE II, AND TYPE III TRIM

SoundControl, StreamControl, and CageControl are trim options for selected Kämmer Control Valve Series, including TotalFlow, ColdFlow, SmallFlow and HpFlow.

#### FEATURES

- Cavitation protection and low noise trims and inserts with custom characterization possible

#### SOLUTIONS

##### Type I – SoundControl

For noise reduction only. Combines a standard parabolic plug with a 1- to 3-stage silencer as a non-guided cage around the plug. Retrofittable for applicable valve series.



##### Type II – StreamControl

Similar to Type I – SoundControl but with a multihole plug, which can be used for medium noise reduction for gases and as cavitation reduction for liquids. StreamControl with silencer cages are for gases with improved noise attenuation only.



##### Type III – CageControl

Heavy-duty noise and cavitation reduction. The solid cage guides the plug, which can be parabolic or multihole based on the application. Suitable for use in any version for gases and liquids.



**For more information** see document number VLENTB0001



## MULTI-Z TRIM OPTIONS



### MULTI-Z TRIM

Exclusively for Multi-Z linear valve to accommodate dirty service applications and high pressure drops.

#### FEATURES

- Trash tolerant design accommodates very high-pressure drops with precision control and durability

#### SOLUTIONS

Manage high-pressure drops in applications where intermittent and continuous streams of large particles are entrained in process media. Extremely robust in dirty service applications with excessive noise, cavitation, erosion, and high pressure drops.

**For more information** see document number KMEEBR1613



## TMCBV TRIM OPTIONS



### C2 TRIM

Economical trim based on the CavControl design that minimizes cavitation damage. Controls the location and concentration of the cavitation vapor bubble implosion in an area away from the metal bubble.

#### FEATURES

- Diametrically-opposed flow suppresses the effect of cavitation thru collapsing vapor bubbles away from the metal parts
- Reduces hydrodynamic noise up to 20 dBA

#### SOLUTIONS

Works best in low to mild cavitation applications.  
Characterization available to cover a wide range of applications.

**For more information** see document number VLENTB0068



### N2 TRIM

Multistage trim based on field proven MegaStream designs to minimize noise.

#### FEATURES

- Staged pressure drop through curved plates with optimized holes for smooth flow characteristics
- Small pressure drop with each stage keeps velocity low, reduces cavitation and noise
- Self-cleaning design with noise reductions up to 30 dBA

#### SOLUTIONS

A cost effective method to eliminate control valve noise by dealing with gaseous pressure reduction across multiple stages.

**For more information** see document number VLENTB0068



### Z2 TRIM

Multistage trim based on field proven MegaStream designs to minimize noise and cavitation.

#### FEATURES

- Omni-directional trim for smooth transition without stair stepping in the characteristic curve
- Self-cleaning design with noise reductions up to 26 dBA

#### SOLUTIONS

A cost effective solution for eliminating common cavitation and noise problems in many applications.

**For more information** see document number VLENTB0068



## SETBALL / DUBALL FAMILY TRIM OPTIONS



### Z-TRIM

Can be used in Setball, Duball and Trunnball valve types for cavitation control or noise applications.

#### FEATURES

- Uses proven Megastream technology to eliminate cavitation
- Decreases noise levels during control

#### SOLUTIONS

A cost effective solution for eliminating common cavitation and noise problems in many applications. Retrofits into existing valves.

**For more information** see document number FCENBR0067



# CUSTOM ENGINEERED

Flowserve offers a comprehensive suite of custom-engineered solutions, as well as unique product designs that meet your exacting specifications.

Flowserve's comprehensive suite of proven custom-engineered solutions delivers unmatched performance and fit for unique applications in the areas of cryogenics, ultra-high corrosion and erosion, tank drain, and sanitation. Our design engineers and technicians are always available to help develop, manufacture, install, and maintain novel precision-quality solutions to meet the most demanding project requirements. Creating the right tool for the job at hand is our number one goal.

## CUSTOM ENGINEERED QUICK REFERENCE

Valve Type	Size	Pressure Rating	Temperature Range	Product Type
Linear Globe	DN 15 to DN 300 0.5" to 12"	Class 150 to 4500 PN 10 to PN 640	Down to -218 °C / -425 °F	<b>Mark Six</b> Page 24
Desuperheater	DN 150 to DN 1000; 6" to 40" Cooling water DN 25 & DN 40; 1" & 1.5"	Class 300 to 2500 PN 40 to PN 160	-10 °C to 530 °C 14 °F to 986 °F	<b>VariCool</b> Page 24
Water Injection Spray Nozzle	Mounting Flange: 4" to 12" Cooling Water: 1" to 4"	Class 150 to 2500	-10 °C to 530 °C 14 °F to 986 °F	<b>VaporCool</b> Page 24
Linear	DN 25 to DN 150 1" to 6"	Class 2500 / Up to PN 400	-100 °C to 650 °C -148 °F to 1202 °F	<b>Multi-Z</b> Page 25
Low Temperature / Cryogenic	DN 25 to DN 200 1" to 8"	Class 150 to 600 PN 10 to PN 63	Down to -196 °C / -321 °F	<b>ColdFlow - 041000</b> Page 25
Low Temperature / Cryogenic	DN 4 to DN 150 1/8" to 6"	Class 150 to 600 PN 10 to PN 63	Down to -269 °C / -452 °F	<b>ColdFlow - 241000</b> Page 25
High Pressure	IG NW 3 to 45; 1/4"	PN 4000 / 60000 psi ND 325 to ND 700	-30 °C to 400 °C -22 °F to 752 °F	<b>HpFlow</b> Page 26
Corrosive	DN 15 to DN 150 1/2" to 6"	Class 150 PN 16	-10 °C to 200 °C 14 °F to 392 °F	<b>LinedFlow</b> Page 26
Sanitary / Aseptic	DN 10 to 100 0.38" to 4"	Class 150 PN 10 to PN 25	-25 °C to 130 °C -13 °F to 266 °F	<b>CleanFlow</b> Page 26
Low FLOW / Micro Flow	DN 6 to DN 25 1/4" to 1"	Class 150 to 2500 PN 40 to PN 400	-200 °C to 400 °C -328 °F to 752 °F	<b>SmallFlow</b> Page 27
Tank Outlet	DN 15 to DN 150 1/2" to 6"	Class 150 to 300 PN 10 to PN 40	-30 °C to 250 °C -22 °F to 482 °F	<b>DrainFlow</b> Page 27
Linear Globe	DN 25 to DN 350 1" to 14"	Class 300 to 2500 PN 40 to PN 160	-10 °C to 400 °C 14 °F to 752 °F	<b>Survivor</b> Page 27



## MARK SIX

A globe-style, single-seat, top-entry control valve with bonnet extension for cryogenic applications down to -218 °C / -425 °F.

### FEATURES

- Design permits easy access and removal of the valve trim without breaking down the cold box
- Streamlined, lightweight body for reduced heat transfer

### SPECIFICATIONS

**Valve Type:** Linear Globe  
**Size:** DN 15 to DN 300; 0.5" to 12"  
**Pressure:** PN 10 to PN 640;  
 Class 150 to 4500  
**Material:** Stainless Steels; Nickel; Bronze  
**Temperature:** Down to -218 °C / -425 °F

### SOLUTIONS

During operation, a small amount of liquefied gas passes into the extension bonnet area where it vaporizes and insulates the packing from the liquefied gas temperature. Pressure resulting from the vaporization of the liquid prevents additional liquid from passing into the bonnet area.

**For more information** see document number VLATB0006



## VARICOOL

Integrates the precision of a control valve with a desuperheater to attain maximum rangeability, responsiveness, and control.

### FEATURES

- Multi-stage design with ultra-fine atomization allows the valve to manage a wide spectrum of differential pressures (up to 90 bar / 1305 psi) as it injects atomized cooling liquid directly into cool process steam
- Modular and compact design provides easy disassembly of the nozzle head, helps reduce maintenance costs

### SPECIFICATIONS

**Valve Type:** Desuperheater  
**Steam line:** DN 150 to DN 1000;  
 6" to 40"; Cooling water DN 25 and DN 40; 1" and 1.5"  
**Pressure:** PN 40 to PN 160;  
 Class 300 to 2500  
**Material:** Carbon Steel; Stainless Steel  
**Temperature:** -10 °C to 530 °C;  
 14 °F to 986 °F

### SOLUTIONS

Temperature reduction occurs as the atomized cooling liquid rapidly vaporizes in process steam. Perforated, flow-to-close plug and nozzle design maintain accurate control of varying process conditions through precise throttling of the cooling liquid in response to feedback from a controller and downstream temperature sensor.

**For more information** see document number SAENBRV901 & VLASB101



## VAPORCOOL

The VaporCool fixed nozzle desuperheater cools process steam by injecting atomized cooling liquid directly into the stream.

### FEATURES

- Tight temperature control is maintained by optimizing the temperature, velocity, geometry, and droplet size of the cooling mist
- High cooling water flow rates and complete atomization are optimized for each application

### SPECIFICATIONS

**Valve Type:** Water Injection Spray Nozzle  
**Size Range:** Mounting Flange: 4" to 12";  
 Cooling Water: 1" to 4"  
**Pressure:** Class 150 to 2500  
**Material:** Carbon Steel; Chrome Moly;  
 Stainless Steel  
**Temperature:** -10 °C to 530 °C;  
 14 °F to 986 °F

### SOLUTIONS

Achieves accurate control of varying process conditions through precise throttling of the cooling liquid control valve in response to feedback from a controller and downstream temperature sensor.

**For more information** see document number SAENBRV901 & VLASB101

## Performance You Can Count On

From bone-chilling cold of the arctic to the stifling heat of the tropics, Flowserve solutions can be found anywhere fluid motion and control are mission-critical. Even in these harsh environments, our flow control experts excel in the design, installation and ongoing maintenance throughout the life of the products.



### MULTI-Z

Handles high-pressure drop applications where entrained solids and cavitation are a problem. Designed for dirty service applications with excessive noise, cavitation, erosion, and high-pressure drops.

#### FEATURES

- Trash tolerant design accommodates very high-pressure drops with precision control and durability
- High rangeability with balanced or unbalanced trim design
- Extremely durable due to seat being shielded from high velocities

#### SPECIFICATIONS

**Valve Type:** Linear  
**Size Range:** DN 25 to DN 200; 1" to 6"  
**Pressure Rating:** Up to PN 400 / Class 2500  
**Body Materials:** Carbon Steel; Stainless Steel; Special Alloys  
**Temperature Range:** -100 °C to 650 °C; -148 °F to 1202 °F

#### SOLUTIONS

Easy handling of solids in different sizes. Wear and tear can be minimized by selection of various trim designs and materials. Hardened stainless steel in different grades available, as well as full ceramic trim options. Custom design characteristics and calculations facilitate best solution and longest lifetime.

**For more information** see document number KMEEBR1613



### COLDFLOW™ - 041000

Able to operate at temperatures as low as -196 °C.

#### FEATURES

- Angle valve with flanged extension creates a low-density valve package
- Top-entry design with extended bonnet reduces maintenance costs

#### SPECIFICATIONS

**Valve Type:** Low Temperature / Cryogenic  
**Size:** DN 25 to DN 200; 1" to 8"  
**Pressure:** PN 10 to PN 63; Class 150 to 600  
**Materials:** Aluminum; Stainless Steel; Special Alloys  
**Temperature:** Down to -196 °C / -321 °F

#### SOLUTIONS

Predominantly used for specific demands of air separation units or LNG plants. By using different options, such as different extensions and / or accessories, this valve series becomes the valve of choice for liquid gases.

**For more information** see document number KMEEBR4120



### COLDFLOW™ - 241000

The ColdFlow - 241000 Series can be used to operate as low as 4° Kelvin in liquid Helium service.

#### FEATURES

- Top entry design with available bellows construction creates results in high performance, low leakage product suitable for ultra low temperature applications

#### SPECIFICATIONS

**Valve Type:** Low Temperature / Cryogenic  
**Size:** DN 4 to DN 150; 1/8" to 6"  
**Pressure:** PN 10 to PN 63; Class 150 to 600  
**Materials:** Stainless Steel  
**Temperature:** Down to -269 °C / -452 °F

#### SOLUTIONS

Ideal solution for extremely low temperatures. Flexible plugs and bellows seal options are suitable in solutions and features for cryogenic applications and challenges.

**For more information** see document number KMEEBR4121



## HPFLOW™ - 011000 & 015000

Based on decades of proven experience in ultra high-pressure control valves, with pressure classes up to PN4000 / ANSI - Class 4500 and above.

### FEATURES

- High pressure: Up to PN 4000 / ANSI Class 4500 and above in split body designs; special alloys and high-pressure end connections available
- Ultra-low flow capability and high-pressure bellows seals available

### SPECIFICATIONS

**Valve Type:** High Pressure  
**Size:** IG NW 3 to 45; ¼" to 2"  
**Pressure:** Up to PN 4000 / 60000 psi  
ND 325 to ND 700  
**Materials:** Stainless Steel; Special Alloys  
**Temperature:** -30 °C to 400 °C;  
-22 °F to 752 °F

### SOLUTIONS

High pressure designs from 325 bar to 4000 bar for any kind of media and temperatures, including severe service conditions.

**For more information** see document number KMEEBR1120



## LINEDFLOW™ - 132000

Offers a wide range of options for lined valves and is specifically designed for service in corrosive fluids, including gases and liquids.

### FEATURES

- Thicker, high quality PFA liners provide greater durability in highly corrosive service applications
- Standard PN 16 bellows seal coupled with anti-blowout stem design significantly increases safety and improves emissions

### SPECIFICATIONS

**Valve Type:** Corrosive  
**Size:** DN 15 to DN 150; ½" to 6"  
**Pressure:** PN 16; Class 150  
**Materials:** Lined PFA;  
Lined PFA Conductive  
**Temperature:** -10 °C to 200 °C;  
14 °F to 392 °F

### SOLUTIONS

Ideal for corrosive media where high alloys are typically used. The bellows seal design eliminates any limitations in sizing and selection for this valve. Improved lining procedures ensures a permanent connection between the lining surface and the base. Anti-blow-out stem design for maximum safety.

**For more information** see document number KMEEBR3221



## CLEANFLOW™ - 191000

Specifically designed for applications in the food and beverage industry as well as biotechnology, pharmaceutical, and other similar facilities where optimal cleanliness and sterile valves are required.

### FEATURES

- Meets USDA and 3A requirements and can be supplied for Clean In Place (CIP) and Steam In Place (SIP)
- One body with different bonnet and numerous end connection options for various applications

### SPECIFICATIONS

**Valve Type:** Sanitary / Aseptic  
**Size:** DN 10 to 100; 0.38" to 4"  
**Pressure:** PN 10 to PN 25; Class 150  
**Materials:** Stainless Steel  
**Temperature:** -25 °C to 130 °C;  
-13 °F to 266 °F

### SOLUTIONS

Various end connection and bonnet options make this one of the most modular control valves – from beverage filling units to pharmaceutical production plants, and more. All module options meet current regulations and cleaning procedures.

**For more information** see document number KMEEBR9123



## SMALLFLOW™ - 385000 & 080000

Tight precise control for ultra-low flow ranges. These products are widely used for applications in laboratories and industrial research departments, as well as industrial processes requiring high degrees of control accuracy.

### FEATURES

- Compact microflow control valves with Cv values from 0.000063 to 4.7
- Optional microflow control valves Cv values from 0.000012 to 0.01
- Special end connections available

### SPECIFICATIONS

**Valve Type:** Low Flow / Micro Flow

**Size:** DN 6 to DN 25; ¼" to 1"

**Pressure:** PN 40 to PN 400;  
Class 150 to 2500

**Materials:** Stainless Steel; Carbon Steel;  
Special Alloys

**Temperature:** -200 °C to 400 °C;  
-328 °F to 752 °F

### SOLUTIONS

Microflow is a special area for control valves. They typically contain small gaps and flow passages. Calculating laminar flow conditions requires significant expertise. Kämmer has calculated and manufactured low flow control valves and reproducible accurate trims for more than 40 years.

**For more information** see document number KMEEBR8020



## DRAINFLOW™ - 051000

The result of years of experience in developing special control valve features and application dedicated products. This valve meets exacting requirements for both on/off and control-on-tank drain applications.

### FEATURES

- Various designs and materials with extending or retracting plug designs
- High-pressure options available with or without bellows, steam jackets, and other options

### SPECIFICATIONS

**Valve Type:** Tank Outlet

**Size:** DN 15 to DN 150; ½" to 6"

**Pressure:** PN 10 to PN 40;  
Class 150 to 300

**Materials:** Stainless Steel; Special Alloys

**Temperature:** -30 °C to 250 °C;  
-22 °F to 482 °F

### SOLUTIONS

Tank valves are typically specific to the vessel. The dynamic features of this valve allow it to be designed to exacting specifications to ensure a perfect fit and finish. Even special designs, such as a built-in temperature sensor or variant plug design in a mixing system vessel, are easily achieved.

**For more information** see document number KMENBR5120



## SURVIVOR

Reliable solutions designed for use in the harshest conditions – erosion, corrosion, slurry, high velocity, and flashing applications.

### FEATURES

- Sweep angle design allows the process fluid to flow cleanly, without sharp turns or stagnant points
- Directs the energy of flashing process fluids away from critical equipment
- Valves are specifically targeted to each application; custom contours and materials are available
- Prevents particles suspended in fluids from entering the bonnet; reduces damage to guides and surfaces; minimizes packing wear and stem seizure

### SPECIFICATIONS

**Valve Type:** Linear Globe

**Size:** DN 25 to DN 350; 1" to 14"

**Pressure:** PN 40 to PN 160;  
Class 300 to 2500

**Material:** Carbon Steel; Stainless Steel;  
Special Alloys

**Temperature:** -10 °C to 400 °C;  
14 °F to 752 °F

### SOLUTIONS

Suitable for erosive applications, including abrasive slurry. Optional ceramic trim helps maximum product life cycle. Available in a wide range of materials, from stainless steel to titanium, for corrosive applications.

**For more information** see document number VLENTB0036



# POSITIONERS

Flowserve's portfolio of ultra-high precision positioners supports a range of communication protocols and hazardous area classifications to help facilitate dramatic improvements in process uptime, reliability, and yield.

Flowserve provides a comprehensive suite of ultra-high precision digital, analog, and pneumatic valve position controllers that accommodate a broad spectrum of communication protocols and prevailing hazardous area classifications and safety standards.

All models offer industry-leading embedded measurement, data reduction, and diagnostic functionality, while control system-independent user interfaces facilitate performance configuration, operation, and diagnosis with a single view. Flowserve positioners use advanced prognostic and diagnostic solutions to quickly diagnose field problems and expedite corrective actions that significantly reduce return-to-operation times.

Standardized platform architectures and software interfaces dramatically improve process uptime, reliability, and reduce costs.

## POSITIONERS QUICK REFERENCE

Operating Pressure	Temperature Range	Input Signal	Product Type
150 psi	-52° C to 85° C -61° F to 180° F	4-20 mA, HART communications versions 5 & 6 and Foundation™ Fieldbus	<b>Logix 3200MD/3400MD</b> Page 30
Single Acting 90 psi Double Acting 150 psi	-52° C to 85° C -61° F to 180° F	4-20 mA, HART communications versions 5, 6, & 7	<b>Logix 500MD+</b> Page 30
150 psi	-20° C to 75° C -4° F to 167° F	Modbus	<b>StarPac</b> Page 31
145 psi max	-29° C to 80° C -40° C option available -20° F to 176° F	3-15 psi, 6-30 psi, 4-20 mA	<b>XL/NT3000</b> Page 31

## Successful Flow Control Solutions

Flowserve puts fluids in motion. Recent successes include helping to restore the Florida Everglades, irrigating 13 million acres of farmland in Bangkok, Thailand, assisting with flood control in the Netherlands and ensuring that Las Vegas, Nevada has more than enough water to support their explosive population growth.



### LOGIX 3200MD/3400MD

Easiest calibration and configuration of any positioner available. Single push-button calibration, and DIP switch configuration allows the user to fully commission the positioner in a matter of minutes. 24/7 diagnostics with ValveSight Software DTM.

#### FEATURES

- Best-in-class accuracy with dual stage piezo technology and inner loop control
- Explosion-proof aluminum or stainless steel housings work in virtually any hazardous location worldwide
- Balanced spool design provides flexibility to convert from 3-way to 4-way operation in the field
- Multiple mounting options are suitable for use with most linear and rotary actuators

#### SPECIFICATIONS

**Operating Pressure:** 150 psi  
**Temperature Range:** -52°C to 85°C;  
-61 °F to 180 °F  
**Certifications:** FM/CSA/IECEX/ATEX, KOSHA, InMetro, GOST R explosion-proof, Non-incendive, Intrinsically Safe  
**Input Signal:** 4-20 mA, HART communications versions 5 and 6, and FOUNDATION™ Fieldbus

#### SOLUTIONS

Suitable for most applications that require precise, accurate control of valve packages. For use in hazardous locations worldwide. Linear and rotary applications for use in chemical, refining, food and beverage, and power industries.

**For more information** see document number LGENIM0059, LGENIM3404



### LOGIX 500MD+

The newest digital positioner from Flowserve. Increased flow rates, and added LCD display make it flexible enough for most applications. Performs basic configurations using available DIP switches, and more complex configurations using the LCD menu system. 24/7 diagnostics are available with ValveSight Software DTM.

#### FEATURES

- Exceptional control with dual-stage piezo technology
- Multiple mounting options are suitable for use with both linear and rotary actuators
- Increased Cv allow quicker response without the need for flow boosters
- Single push-button calibration allows commissioning in a matter of minutes

#### SPECIFICATIONS

**Operating Pressure:** Single Acting 90 psi, Double Acting 150 psi  
**Temperature Range:** -52°C to 85°C;  
-61 °F to 180 °F  
**Certifications:** FM/CSA/IECEX/ATEX Non-incendive, Intrinsically Safe  
**Input Signal:** 4-20 mA, HART communications versions 5, 6, and 7

#### SOLUTIONS

Suitable for most applications that require precise, accurate control of valve packages. Designed for use in non-incendive and intrinsically safe markets. Linear and rotary applications for chemical, refining, food and beverage, and power industries.

**For more information** see document number LGENIM0105





## STARPAC

Simplified process measurement and control that fits in the space of a standard globe valve. Fully compensated pressure and temperature sensors on the valve provide accurate and reliable process readings.

### FEATURES

- Integrated pressure, flow, and temperature measurements
- Simplified installation – meter runs are not required through 4-inch globe valves
- Fast update, integrated PID controller
- High rangeability flow measurements
- Applications for both gas and liquid measurements

### SPECIFICATIONS

#### StarPac 3 Unit

**Operating Pressure:** 150 psi

**Temperature range:** -20 °C to 75 °C;  
-4 °F to 167 °F

**Certifications:** FM/CSA Explosion-proof and Non-incendive

**Input Signal:** Modbus and / or 4-20mA

#### Process Measurement

**Repeatability:** Flow =  $\pm 0.25\%$  Full Scale,  
Pressure =  $\pm 0.1\%$  Full Scale, 0-6000 psi  
Temperature  $\pm 1$  °C, -195C to 537C

### SOLUTIONS

Suitable for steam flow, industrial gasses, gas injection wells, and skid packages or any non-instrumented processes.

**For more information** see document number VLENBR0066



## XL/NT3000

The most sensitive and accurate analog positioner available. Modular design allows easy mounting on linear and rotary actuators. Available in 3-15 psi and 4-20 mA versions.

### FEATURES

- Dual-stage design allows 0.1% response to input signal
- Modular design allows customization for specific applications
- Additional end-of-travel switches or 4 mA to 20 mA feedback can be added in existing housing
- Linear and rotary VDI/VDE 3845 mounting options

### SPECIFICATIONS

**Operating Pressure:** 145 psi max

**Temperature Range:** -29 °C to 80 °C,  
with -40 °C option available;  
-20 °F to 176 °F

**Certifications:** FM/CSA/IECEX/ATEX/  
InMetro/ANZEx Explosion-proof and  
Intrinsically Safe

**Input Signal:** 3-15 psi, 6-30 psi,  
and 4-20 mA

### SOLUTIONS

Accurate, high-precision control for chemical, refining, and power industries. Global certifications allow use in most hazardous locations worldwide.

**For more information** see document number VLAIM0047



## VALVESIGHT

Standalone or portable software and positioner system offers an integrated package to monitor valve package performance 24/7 with DCS or asset management tools that support FDT/DTM technology. Monitors and evaluates the condition of four key health indicators on any integrated control valve for enhanced user confidence when performing critical control valve operations. Degradations are displayed in simple, intuitive formats that draw attention and spark immediate actions.

### FEATURES

- Displays real-time evaluation of valve, actuator and positioner performance
- Deviations can be recognized and evaluated immediately to eliminate costly downtime
- Help screens offer probable causes and solutions to active alarm conditions
- Maximizes production uptime

### SPECIFICATIONS

Certified DTM  
Compatible with Yokogawa, Honeywell,  
DeltaV, Rockwell, Invensys  
FDT 1.2 certified

### SOLUTIONS

Runs on any DCS system with certified FDT frame. Suitable for chemical, food and beverage, refining, power, and mining industries.

**For more information** see document number VSENSF0003

## SALES & SERVICE

### FLOWSERVE: AROUND THE CLOCK, AROUND THE WORLD

Flowserve manufactures, sells, and services precision-quality pumps, control valves, seals, and automation equipment to a diverse range of industries worldwide.

We maintain strict quality control at all stages of manufacturing, assembly and testing. In-process inspections are routine, and all manufactured parts and valve assemblies are fully inspected and warranted prior to delivery.



### UNPARALLELED SERVICE

Flowserve Quick Response Centers (QRC) are equipped with thousands of commonly required parts, including OEM and Flowserve custom-built products. And each has the manpower and equipment to expedite time-sensitive repairs – large or small – including plant shutdowns.

Our service technicians can restore all types of control, manual-operated, or pressure relief valves to original quality.

Should any valve – standard or nonstandard – prove unrepairable, Flowserve can usually replace the broken valve with a new valve, within the same time frame.



To locate a Flowserve representative near you visit [www.flowserve.com](http://www.flowserve.com)

### **SERVICE WHEN AND WHERE YOU NEED IT MOST**

Flowserve Quick Response Centers (QRC) are strategically located around the world to ensure rapid response to your time-critical repair needs, routine maintenance, and product upgrades.

### **SINGLE POINT OF CONTACT**

Our QRCs serve as a local, single point of contact for the full inventory of Flowserve products and services, including the machinery to manufacture custom-built units. We offer better than 95% on-time performance for all repairs and can turnaround new and custom-built units within 72 hours.

### **TIME-CRITICAL REPAIRS**

To meet your time-critical repair needs, Flowserve offers 24-hour emergency repair, free pick-up and delivery within QRC service areas, mobile, and on-site repair.

When a service technician is needed on-site, we can have one there within 24 hours anywhere in North America, and 48 hours outside of North America.