Fisher® Sliding-Stem Valve Selection Guide

W8861

GX

W7957-2

easy-e™

X0165

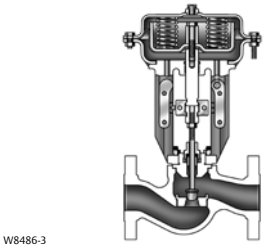
TBX STEAM CONDITIONING VALVE

Typical Fisher Sliding-Stem Control Valves

- A broad range of Fisher valves, sizes, and materials is offered—from NPS 1/2 for general service to NPS 20 and larger for demanding high-pressure steam, hydrocarbon, and noise services.
- FIELDVUE™ digital valve controllers offer digital control and remote diagnostics. The traditional proven line of Fisher transducers, positioners, controllers, transmitters, and switches is also available.
- ENVIRO-SEAL™ and HIGH-SEAL packing systems are available on many designs to assist in compliance with environmental emissions requirements.
- Whisper Trim™ and Cavitrol™ anti-noise and anti-cavitation trims are available for most designs.
- Fisher products deliver excellent dynamic performance to minimize process variability, providing opportunities to improve your plant's financial performance.
- Contact your Emerson Process Management sales office for details.

General-Service and Heavy-Duty Valves (GX, EZ, and ES)

Figure 1. General-Service and Heavy-Duty Valves (GX, EZ, and ES)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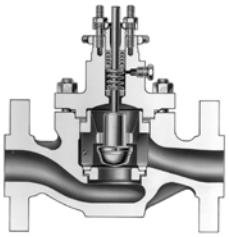
GX CONTROL VALVE AND ACTUATOR SYSTEM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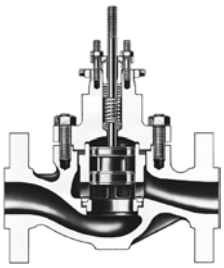
EZ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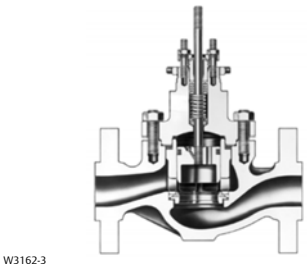
ES

Table 1. General Service and Heavy-Duty Valves (GX, EZ, and ES)

GX	EZ	ES
Applications		
Compact, state-of-the-art control valve and actuator system designed to control a wide range of process liquids, gases, and vapors. Capable of air supply pressures to 6.0 barg (87 psig), allowing valve shutoff at high pressure drops.	Heavy-duty general service for controlling liquids and gases, including viscous and other hard-to-handle fluids. UOP applications	Heavy-duty, general-service valve for clean liquids and gases. Positive shutoff at seat
Style		
Single port, flow up globe style valve Stem-guided or port-guided Balanced or unbalanced Screwed-in seat ring	Single-seated, post-guided globe or angle valve Unbalanced Seat ring retained by spacer Metal or soft seats	Cage-guided globe or angle valve Unbalanced Cage-retained seat
Sizes		
DN 15, 20, 25, 40, 50, 80, and 100 NPS 1/2, 3/4, 1, 1-1/2, 2, 3, and 4	DN 15, 20, 25, 40, 50, 80, and 100 NPS 1/2, 3/4, 1, 1-1/2, 2, 3, and 4	**ES:** DN 15 through 200 (NPS 1/2 through 8) **EWS:** DN 100 x 50 through 600 x 500 (NPS 4 x 2 through 24 x 20)
Ratings		
PN 10 to 40, CL150 and 300	PN 16, 25, 40, 63 and 100 and CL125, 150, 300, and 600	PN 10, 16, 25, 40, 63, or 100 and CL150, 300, or 600
End Connections		
Flanged raised-face per EN 1092-1 and ASME B16.5	Screwed NPT internal, flat- or raised-face flanged, ring-type joint, socket-weld, and buttwelding ends	Screwed NPT internal, flat- or raised-face flanged, ring-type joint, socket-weld and buttwelding ends
Valve Body Materials		
EN: 1.0619 steel, 1.4409 stainless steel, or CW2M ASME: SA216 WCC steel, SA351 CF3M stainless steel, or CW2M	Steel, alloy steel, stainless steel (to EN, ASME, or ASTM specifications)	Steel, alloy steel, stainless steel (to EN, ASME, or ASTM specifications)
Valve Plug and Seat Ring (Trim) Materials		
Stainless steel (316L) with optional alloy 6 hardfacing or PTFE soft seat	Stainless steel with or without alloy 6 on seat or seat and guide Soft seat is PTFE	Stainless steel with or without alloy 6 on seat or seat and guide Soft seat is PTFE
Flow Characteristics and Maximum Flow Coefficients		
Equal percentage or linear Maximum C_V from 0.0389 to 183.5	Quick opening, linear, or equal percentage Maximum C_V from 4.47 to 190	Quick opening, linear, or equal percentage Maximum C_V from 6.53 to 1110
Shutoff Class (IEC 60534-4 and ANSI/FCI 70-2)		
Class IV (standard with metal seats), Class V (optional with metal seats), or Class VI (optional with PTFE seats)	Class IV (standard with metal seats), Class V (optional with metal seats), or Class VI (optional with soft or metal seats)	Class IV (standard with metal seats), Class V (optional with metal seats), or Class VI (optional with soft or metal seats)
Available Actuators (see section on Sliding-Stem Valve Actuators)		
GX multi-spring, pneumatic diaphragm	657 or 667 spring and diaphragm; 585C piston	657 or 667 spring and diaphragm; 585C piston

Heavy-Duty and Severe-Service Valves (ED, ET, HP, and EH)

Figure 2. Heavy-Duty and Severe-Service Valves (ED, ET, HP, and EH)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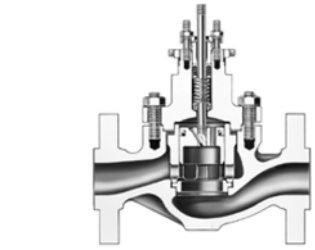
ED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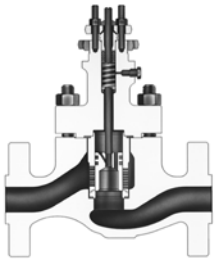
ET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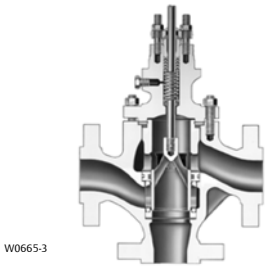
HP AND EH

Table 2. Heavy-Duty and Severe-Service Valves (ED, ET, HP, and EH)

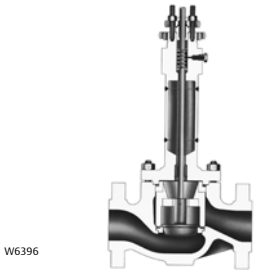
ED	ET	HP and EH
Applications		
easy-e heavy-duty, general- and severe- service valve for clean liquids and gases with higher pressure drops but where tight shutoff is not required	easy-e heavy-duty, general- and severe- service valve for tight shutoff with clean liquids and gases with higher pressure drops and temperatures to 232°C [450°F] (to 316°C [600°F] with optional seal materials)	For high-pressure and severe-service applications. Available with special trim to combat noise and cavitation. Often used in power generation applications
Style		
Cage-guided globe or angle valve Balanced trim Cage-retained seat	Cage-guided globe or angle valve Balanced trim Cage-retained seat	Cage-guided globe or angle valve Balanced or unbalanced trim
Sizes		
DN 25 through 200 and NPS 1 through 8 (ED) DN 100 x 50 through 600 x 500 and NPS 4 x 2 through 24 x 20 (EWD)	DN 25 through 200 and NPS 1 through 8 (ET) DN 100 x 50 through 600 x 500 and NPS 4 x 2 through 24 x 20 (EWT)	DN 25 through 500 and NPS 1 through 20
Ratings		
PN 10, 16, 25, 40, 63, or 100, and CL150, 300, or 600	PN 10, 16, 25, 40, 63, or 100, and CL150, 300, or 600	DIN PN 160, 250, 420 and CL900, 1500, 2500, or intermediate ASME ratings
End Connections		
Screwed NPT internal, flat- or raised-face flanged, ring-type joint, socket-weld and buttwelding ends	Screwed NPT internal, flat- or raised-face flanged, ring-type joint, socket-weld and buttwelding ends	Raised-face flanged, ring-type joint, socket-weld and buttwelding ends Expanded ends
Valve Body Materials		
Steel, alloy steel, stainless steel (to EN, ASME, or ASTM specifications)	Steel, alloy steel, stainless steel (to EN, ASME, or ASTM specifications)	Steel, alloy steel, stainless steel (to EN, ASME, or ASTM specifications)
Valve Plug and Seat Ring (Trim) Materials		
Stainless steel with or without alloy 6 on seat or seat and guide	Stainless steel with or without alloy 6 on seat or seat and guide. Soft seat is PTFE	Stainless steel with or without alloy 6 on seat or seat and guide
Flow Characteristics and Maximum Flow Coefficients		
Quick opening, linear, or equal percentage Maximum C_v from 17.2 to 6500	Quick opening, linear, or equal percentage Maximum C_v from 17.2 to 6500	Linear, equal percentage or characterized Maximum C_v from 0.354 to 2600
Shutoff Class (IEC 60534-4 and ANSI/FCI 70-2)		
Class II (standard) Class III or IV (optional depending on size)	Class IV (standard with metal seats), Class V (optional with soft or metal seats), or Class VI (optional with soft or metal seats)	Class II, III, IV or V (depending on size and construction)
Available Actuators (see section on Sliding-Stem Valve Actuators)		
657 or 667 spring and diaphragm; 585C piston	657 or 667 spring and diaphragm; 585C piston	657 or 667 spring and diaphragm; 585C piston

Three-Way Valves, Cryogenic, and Lined Valve (YD and YS, ET-C and EZ-C, and RSS)

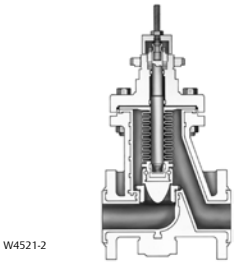
Figure 3. Three-Way, Cryogenic, and Lined Valves (YD and YS, ET-C and EZ-C, and RSS)



YD AND YS



ET-C & EZ-C



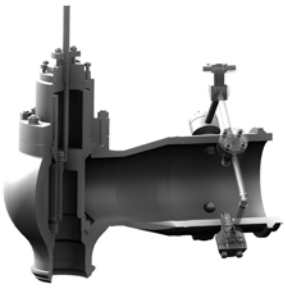
RSS

Table 3. Three-Way, Cryogenic, and Lined Valves (YD and YS, ET-C and EZ-C, and RSS)

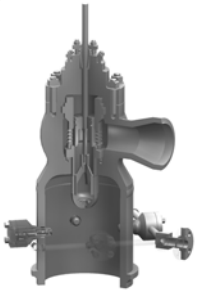
YD and YS	ET-C and EZ-C	RSS
Applications		
Three-way valves for flow-mixing or flow-splitting service. The YS unbalanced, and the YD is balanced.	easy-e stainless steel cryogenic valves for liquefied natural gas and other special chemical and hydrocarbon applications with temperatures to -198°C (-325°F)	Lined valve for severely corrosive or toxic process fluids. An economic alternative to alloy bodies. Limited in pressure and temperature
Style		
Cage-guided three-way globe valves Balanced or unbalanced trim	Single-seated post-guided (EZ-C) or cage-guided (ET-C) globe valve Unbalanced (EZ-C) or balanced (ET-C) Metal seats	Fully lined, single-seated, unbalanced globe valve Includes bellows stem seal
Sizes		
NPS 1/2 through 6	DN80 through 250 x 200 or NPS 3 through 10 x 8 (ET-C) DN 15 through 100 or NPS 1 through 4 (EZ-C)	NPS 1 through 4 (face-to-face dimensions to DIN or ANSI/ISA specifications)
Ratings		
CL125, 150, 250, 300, or 600	PN 10, 16, 25, 40, 63, 100 and CL150, 300, 600	CL150 or 300
End Connections		
Screwed NPT internal, flat- or raised-face flanged, ring-type joint, socket-weld and buttwelding ends	Raised-face flanges	Raised-face flanges
Valve Body Materials		
Cast iron, steel, alloy steel, stainless steel (to ASME or ASTM specifications)	Stainless steel (to ASME or ASTM specifications)	Ductile iron with PFA liner
Valve Plug and Seat Ring (Trim) Materials		
Stainless steel	Stainless steel with or without alloy 6 hardfacing on seat	Valve Plug and Seat Ring: Pure modified (reinforced) PTFE Bellows: Heavy-duty PTFE (TFM1705) with 304L SST support rings [Bellows is PTFE for NPS 1/2 and 3/4 valves]
Flow Characteristics and Maximum Flow Coefficients		
Linear Maximum C_V 8.42 to 567	Quick opening, linear, or equal percentage Maximum C_V from 13.2 to 924	Equal percentage Maximum C_V from 0.212 to 145
Shutoff Class (IEC 60534-4 and ANSI/FCI 70-2)		
Class II or IV (YD) Class IV or V (YS)	Class IV (standard) 0.05 mL/min/psid/inch of port diameter (optional for ET-C) or Class V (optional for EZ-C)	Class VI (soft seat)
Available Actuators (see section on Sliding-Stem Valve Actuators)		
657 or 667 spring and diaphragm; 585C piston	657 or 667 spring and diaphragm; 585C piston	657 or 667 spring and diaphragm; 585C piston

Steam Conditioning Valves (TBX Flow Up, TBX Flow Down, and CVX)

Figure 4. Steam Conditioning Valves (TBX Flow Up, TBX Flow Down, and CVX)



TBX (FLOW UP)



TBX (FLOW DOWN)

CVX

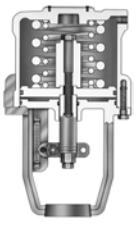
Table 4. Steam Conditioning Valves (TBX Flow Up, TBX Flow Down, and CVX)

TBX Flow Up	TBX Flow Down	CVX
Applications		
HP, HRH, IP, LP Turbine Bypass Process steam Steam Let Down		
Style		
Flow up design, hung trim configuration to thermally compensate rapid changes in temperature, incorporates a spraywater manifold of variable geometry AF nozzles that produce an optimized spray pattern over a wide operating range.	Flow down design, hung trim configuration to thermally compensate rapid changes in temperature, incorporates a spraywater manifold of variable geometry AF nozzles that produce an optimized spray pattern over a wide operating range.	Flow down design, hung trim configuration to thermally compensate rapid changes in temperature, incorporates a spraywater manifold of variable geometry AF nozzles that produce an optimized spray pattern over a wide operating range.
Sizes		
Inlet Sizes: NPS 4 - 24 Outlet Sizes: NPS 8 - 36		
Orifice Type		
Welded or Bolted	Bolted	Welded or Bolted
End Connections		
ASME Buttweld or ASME Raised Face Flange		
Flow Characteristics		
Whisper Trim III: Linear or WhisperFlo™: Linear	Whisper Trim III: Linear	Standard Drill Hole: Linear
Shutoff Class (IEC 60534-4 and ANSI/FCI 70-2)		
Class V: Standard Class IV: Optional		
Valve Body and Bonnet Material and Construction		
SA105 (Carbon Steel), SA182 Grade F22 (2.25Cr-1Mo), SA182 Grade F91 (9Cr-1Mo-V)		
Available Actuators		
See Section on Sliding-Stem Valve Actuators		

Sliding-Stem Valve Actuators (657, 667, 585C, and 585CLS [Long-Stroke])

Figure 5. Sliding-Stem Valve Actuators (657, 667, 585C, and 585CLS)

657 and 667



585C

585CLS

Table 5. Sliding-Stem Valve Actuators (657, 667, 585C, and 585CLS)

657 and 667	585C and 585CLS
Features	
Heavy-duty actuators	**585C:** Heavy-duty actuators **585CLS:** Heavy-duty actuators for large valves and valves with long travel
Style	
Spring-return pneumatic diaphragm	**585C:** Double-acting piston or spring-bias piston **585CLS:** Double-acting piston
Typical Maximum Thrust, Lbf (Varies with Operating Pressure, Spring, and Construction)	
45,000	**585C:** 5890 @ 125 psig operating pressure **585CLS:** 25,000 @ 125 psig operating pressure
Accessories	
Pneumatic or electro-pneumatic valve positioners, FIELDVUE digital valve controller, limit switches, position transmitters, handwheels, travel stops, and supply pressure filter-regulator	**585C:** I/P transducers, pneumatic or electro-pneumatic valve positioners, FIELDVUE digital valve controller, limit switches, position transmitters, handwheels, travel stops, and 67CFR supply pressure filter-regulator **585CLS:** I/P transducers, pneumatic valve positioners, limit switches, position transmitters, handwheels, travel stops, and supply pressure filter-regulator

Sliding-Stem Valve Actuators (655 and 1008)

Figure 6. Sliding-Stem Valve Actuators (655 and 1008)

655

1008

Table 6. Sliding-Stem Valve Actuators (655 and 1008)

655	1008
Features	
Actuators for pressure regulation applications	Manual handwheel for applications that require a throttling type of control valve that can be manually operated and set
Style	
Pressure-actuated, spring-and-diaphragm	Manual handwheel actuator
Typical Maximum Thrust, Lbf (Varies with Operating Pressure, Spring, and Construction)	
	17,000
Accessories	
Travel indicator, top-mounted handwheel/adjustable travel stop, stem seal and drain tapping for leakoff	Handwheel lock, Tejax valve stem position indicator

Other actuators available are...

- Full range of self-operated control valves, 1B, 643, 644, 645

Alloy Valve Guidelines

- Emerson Process Management expertise has combined its knowledge of metals and foundry techniques with valve user experience in creating high alloy valves that fight corrosion successfully.
- Guidelines have been developed to help the valve user specify alloy valves correctly. Techniques have also been implemented that verify a foundry's ability to cast alloy valves properly and has established stringent specifications that guide the foundry in providing quality results.
- Valve user guidelines include—*Avoid the use of alloy tradenames, Don't specify wrought for cast, Forego non-destructive testing*
- Steps used to qualify a foundry include—*Weldability tests to gauge the foundry's ability to pour alloy materials, Dedicating casting patterns solely to high-alloy service*
- Stringent specifications developed by Emerson Process Management include—*Raw Material Composition and Quality, Heat Qualification, Visual Inspection, Weld Repair, Heat Treatment, and Nondestructive Testing*

Figure 7. Typical Fisher Products

W7957-2

FIELDVUE DIGITAL VALVE CONTROLLER MOUNTED ON 667 ACTUATOR AND easy-e VALVE

W8861

GX CONTROL VALVE AND ACTUATOR SYSTEM

W6307-1

846 ELECTRO-PNEUMATIC TRANSDUCER MOUNTED ON A 667 ACTUATOR

- A complete line of actuators and accessories for Fisher sliding-stem valves are offered that meet your price/performance expectations
- FIELDVUE digital valve controllers are communicating, microprocessor-based controllers that utilize HART™ and FOUNDATION™ fieldbus protocols. Through digital communications, the controllers give easy access to actuator, valve, and instrument information that is critical to process operation.
- AMS ValveLink™ Software and AMS Suite: Intelligent Device Manager allow you to care for and maintain equipment assets—such as valves, transmitters, analyzers, motors, pumps, etc. and plant unit equipment such as pipes, vessels, tanks, columns, reactors, digesters, etc.—to improve yields and minimize downtime of industrial manufacturing processes.
- Contact your Emerson Process Management sales office for details