



Control and Shut-Off Valves | Variety of Trim Designs in Different Materials | Electric and Pneumatic Actuators as Standard

## General Stem-Guided Control Valves

Sizes ½" - 12" (15mm - 300mm)

ANSI Class 150 - 900 (PN16 - 160)



Spence Engineering

# REflex Product Information

---

## BROADEST RANGE IN THE INDUSTRY

The REflex line of two and three way valves offers more possibilities than any other valve family in the Industry. It is an all-purpose stem guided control valve, suitable for use in a wide range of Industries. Using a modular design, and with numerous trim styles and materials available, there is a valve for nearly every application. **All valves are available either as ANSI or DIN, ensuring that direct replacement is always possible.**

## TRIM OPTIONS

Interchangeable plugs and seats offer maximum versatility in flow control applications.

Plug variations include:

- **On/Off Plug** – Provides maximum flow with minimum pressure drop.
- **Parabolic Plug** – Covers all Cv ranges and is especially suitable for low differential pressures.
- **V Port Plug** – Shorter stroke allows smaller actuators to be used.
- **Perforated Plug** – Reduces noise and offers protection against cavitation.
- All of the above trims are available with Soft Seat option, increasing the shut off from standard Class IV to Class VI.

## TRIM MATERIALS

Standard valve trim consists of series 400 stainless steel plugs with 316 stainless steel seats. In addition, 316 stainless steel plugs are available offering superior corrosion resistance. Seating surfaces (both plug and seat ring) can be armored with a nickel/cobalt overlay (Stellite®) which provides significantly longer service life. Complete trims (plug and seat) are also available in Ferro-Titanium offering a trim for the most demanding applications.

## WIDE VARIETY OF STEM PACKINGS

Including: Maintenance free self-adjusting multilayer PTFE packing, pure graphite packing, Bellows Seal and Chlorophrene packing (for refrigeration). The REFLEX can be delivered with a stem packing for the given application. On top of the wide selection of different packings available, all valve stems are roller burnished preventing burrs that can damage the packing, thus extending the service life of the packing.

## HIGH FLOW CAPACITIES

Widest Cv range in the industry, coupled with optimized flow geometry, reduces body velocities and pressure losses, maximizing valve body life.

## PNEUMATIC AND ELECTRIC ACTUATORS AVAILABLE

Large range of standard pneumatic and electric actuators. Other Industry typical electric, pneumatic and hydraulic actuators can easily be mounted on the REFLEX giving greater flexibility to tailor to the requirements of each plant.



# REflex Product Information

## PNEUMATIC ACTUATORS

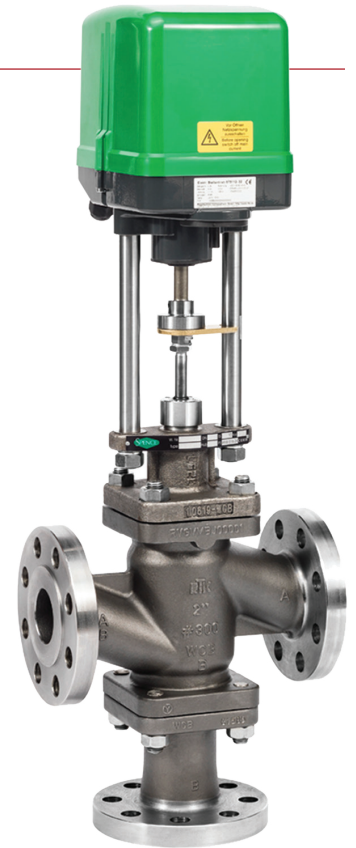
A full range of compact and robust multi-spring actuators available from 15 – 155 sq. in. All actuators are powder coated as standard for long service life and are also available in stainless steel for use in demanding environments. All actuators can be easily reversed between direct and reverse-acting function and the simple design allows easy mounting of all Industry standard positioners and other typical accessories.

## ELECTRIC ACTUATORS

The robust modular design covers a wide range of actuating forces from 675 – 3370 lbs. force. A wide range of actuating speeds and all standard voltages are available, giving the customer an actuator to suit their needs. Many options and accessories are available, including two extra limit switches (for the customer) as standard. These actuators are also available with a certified hydraulic fail close function and come with a hand wheel for manual operation as standard.

## OPTIONS

Hydraulic Emergency Closing Unit. This unit gives valves with electric actuators a proven and reliable fail close option. The unit closes smoothly even at large differential pressures. The closing time can be adjusted to meet the system requirements. Automatic return to closed loop control is possible without any external components or wiring. This ensures that the valve resumes normal duties as soon as the plant returns to normal operations.



**REflex**

# REflex Specifications

### Body Assembly:

Style: Single seated, top entry bolted bonnet, globe style body, stem guided unbalanced plug

### Size, Ratings:

#### Two Way\*

|      |          |      |         |
|------|----------|------|---------|
| 150# | ½" – 12" | 600# | ½" – 4" |
| 300# | ½" – 12" | 900# | 1" – 4" |

\*2½" only available in 150# & 300#

#### Three Way

|      |          |      |          |
|------|----------|------|----------|
| 150# | 1" – 12" | 300# | 1" – 12" |
|------|----------|------|----------|

### Body Materials:

Carbon Steel, ASTM A216 WCB  
(Class 150 – 900)

Stainless Steel, ASTM A351 CF8M  
(Class 150 – 900)

Chrome Moly, ASTM A217 WC9  
(Class 600 & 900)

### Bonnet:

Bolted Bonnet  
Bonnet with cooling fins for high temperatures  
Extended bonnet for valves with bellows seal

### End Connections:

Flanges according to ANSI  
B16.5 RF (Raised Face)  
Butt Weld Ends according to ASME  
B16.25 - 2007  
Threaded NPT Connections (up to 2")

Dimensions (face-to-face) per  
ANSI/ISA-S75.03 (DIN EN 558-1)

### Stem Packing:

PTFE/Graphite: -76°F to 482°F (-60°C to 250°C)  
Pure Graphite: -76°F to 986°F (-60°C to 530°C)  
Bellows Seal: -76°F to 662°F (-60°C to 350°C)  
Chloroprene: -40°F to 212°F (-40°C to 100°C)

### Plug Types & Flow Characteristics:

On/Off Plug (Quick Opening)  
Parabolic Plug (Equal Percentage or Linear)  
V Port Plug (Linear)  
Perforated Plug (Equal Percentage or Linear)  
Mixing Plug (Linear)  
Diverting Plug (Linear)

### Trim Materials:

Plug 1.4122 (Martensitic)  
Stem and Seat AISI 316 Ti

#### Optional:

Plug AISI 316 Ti  
Parabolic Plug stellited or hardened  
Perforated Plug hardened

### Shutoff Class (ANSI/FCI 70-2):

Standard Trim Class IV (<0.01% Cv) metal seat  
Standard Trim Class IV - S2 (<0.005% Cv) metal seat, lapped in  
Soft Seat Class VI (tight closing) with PTFE max +392°F  
Diverting Plug port B Class III (<0.1% Cv)

### Actuators:

**Standard:** Pneumatic Spring & Diaphragm and Electric

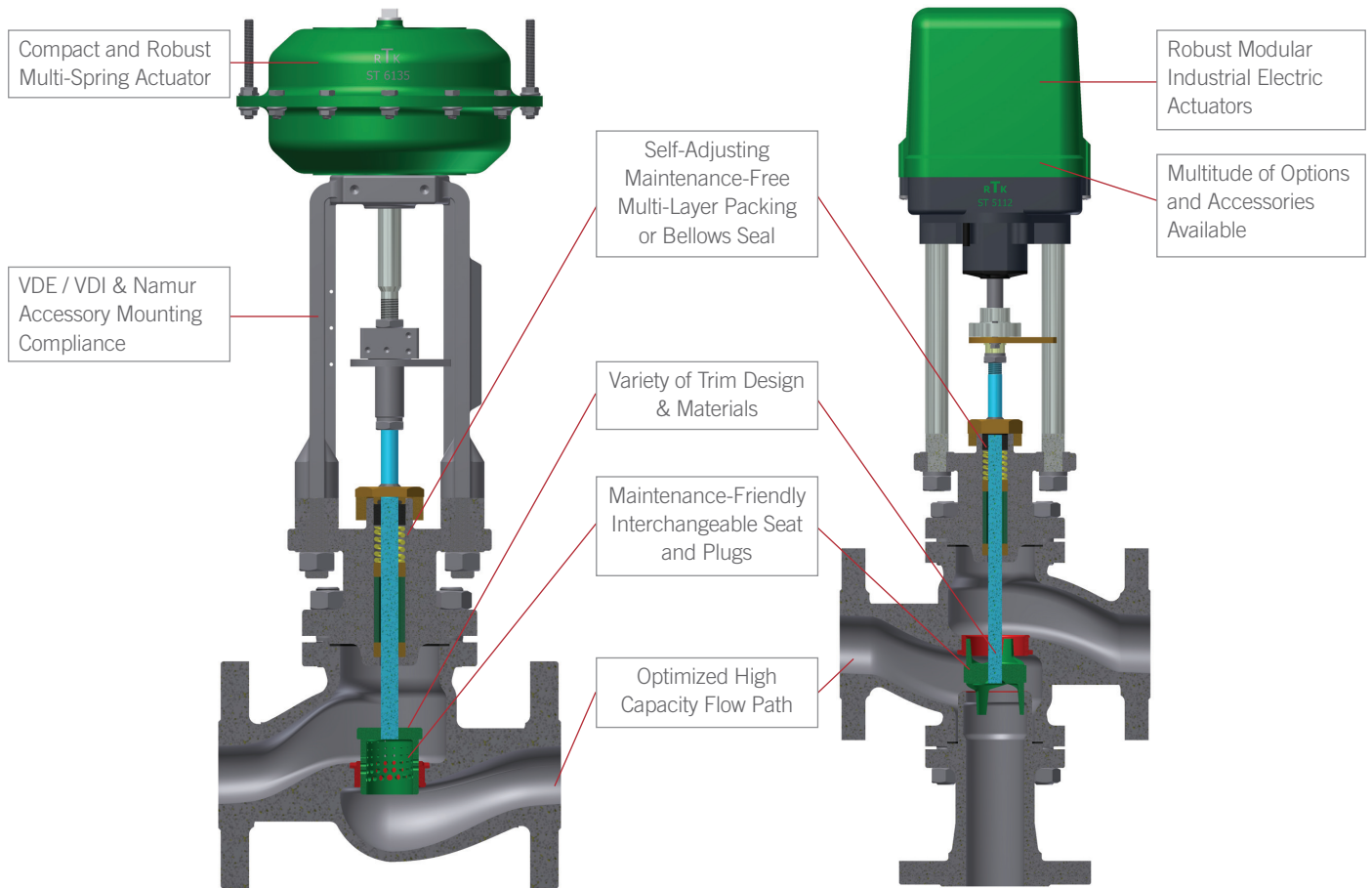
**Optional:** Customer specified actuators (Electric, Pneumatic and Hydraulic)



Spence Engineering

# REflex Features & Benefits

## Full range of ANSI and DIN Valves Available as Standard



| Feature  | Advantage  | Benefit  |
|--|--|--|
| Full Range of ANSI & DIN Valves Available                            | Interchangeability With Control Valves From Other Manufacturers                | Application Accessibility                                    |
| Variety of Trim Designs and Materials                                | Longer Life and Greater Flexibility  | Reduced Operating and Maintenance Costs, Longer Service Life |
| Self-Adjusting, Maintenance-Free Multi-Layer Packing or Bellows Seal | Reduced Leakage Lower Fugitive Emissions                                       | Improved Environmental Compliance<br>No Adjustment Necessary |
| Interchangeable, Top-Entry Trim                                      | Application Flexibility & Ease of Access                                       | Reduces Spare Inventory Costs                                |
| Optimized High Capacity Flow Path                                    | Per Size Cv Higher Than Most Valves In Its Class                               | Lower Initial Costs  |
| Compact Multi-Spring Actuator  | Reduced Height & Weight  | Lower Installation Costs                                     |
| Industry Standard Accessory Mounting                                 | Accommodates Most Valve Automation Products                                    | Lower Automation Costs                                       |
| Modular Industrial Designed Electric Actuator                        | Covers Wide Array of Application Capabilities                                  | Lower Inventory Costs  |
| Multitude of Options and Accessories Available for Electric Actuator | Provides Product Modification Agility Necessary to Satisfy Market Requirements | Application Rangeability                                     |

# REflex Trim Designs



## Two-Way On/Off

Characteristic: On/Off (Quick Opening)  
 Flow direction: To open or to close  
 This plug provides maximum flow with minimum pressure drop and is ideal when large flows are required just after opening.



## Two-Way Parabolic

Characteristic: Linear or Equal Percentage  
 Flow direction: To open  
 This plug covers all Cv ranges and is especially suitable for low differential pressures. The equal percentage flow characteristic provides excellent low flow control.



## Two-Way V-Port

Characteristic: Linear  
 Flow direction: To open or to close  
 This plug is ideally suited when actuator selection is critical, and the shorter stroke means smaller actuators can often be used.



## Two-Way Perforated

Characteristic: Linear or Equal Percentage  
 Flow direction: To open or to close  
 The perforated plug is suitable for use where high differential pressures are present. It can also be used where noise is an issue, typically reducing the noise level by 10 dBA. The hardened version improves life expectancy in cavitation and/or flashing conditions.



## Three-Way Mixing

Characteristic: Linear  
 Flow direction:  $A + B > AB$



## Three-Way Diverting

Characteristic: Linear  
 Flow direction:  $AB > A, B$

**All Plugs Available with Soft Seat, Offering Class VI Shut Off (Not Diverting)**

REflex C<sub>v</sub> Table

| Valve Size (in) | DN  | On/Off Plug |      | Parabolic Plug |      | V-Port Plug |      | Perforated Plug |      | Mixing Plug | Diverting Plug |
|-----------------|-----|-------------|------|----------------|------|-------------|------|-----------------|------|-------------|----------------|
|                 |     | Min         | Max  | Min            | Max  | Min         | Max  | Min             | Max  |             |                |
| ½               | 15  | 2           | 3.8  | 0.58           | 3.8  |             |      | 1.9             | 3    |             |                |
| ¾               | 20  | 2           | 7    | 0.58           | 7    |             | 7    | 2               | 5.3  |             |                |
| 1               | 25  | 2           | 10.7 | 0.58           | 10.7 | 8.7         | 10.7 | 2               | 8.4  | 10.7        | 8.7            |
| 1½              | 40  | 7.9         | 28   | 0.58           | 28   | 13          | 28   | 2               | 22   | 28          | 22             |
| 2               | 50  | 14          | 43   | 1.2            | 43   | 21          | 43   | 2               | 34   | 43          | 35             |
| 2½              | 65  | 22          | 73   | 2              | 73   | 22          | 73   | 5.6             | 57   | 73          | 55             |
| 3               | 80  | 36          | 110  | 7.9            | 110  | 36          | 110  | 8.8             | 86   | 110         | 92             |
| 4               | 100 | 56          | 172  | 14             | 172  | 56          | 172  | 8.8             | 135  | 172         | 140            |
| 6               | 150 | 147         | 386  | 56             | 386  | 147         | 386  | 23              | 303  | 386         | 339            |
| 8               | 200 | 225         | 687  | 87             | 687  | 225         | 687  | 35              | 540  | 687         | 487            |
| 10              | 250 | 350         | 1074 | 147            | 1074 | 350         | 1074 | 60              | 842  | 1074        | 867            |
| 12              | 300 | 540         | 1546 | 225            | 1546 | 540         | 1546 | 91              | 1223 | 1546        | 1306           |



Spence Engineering

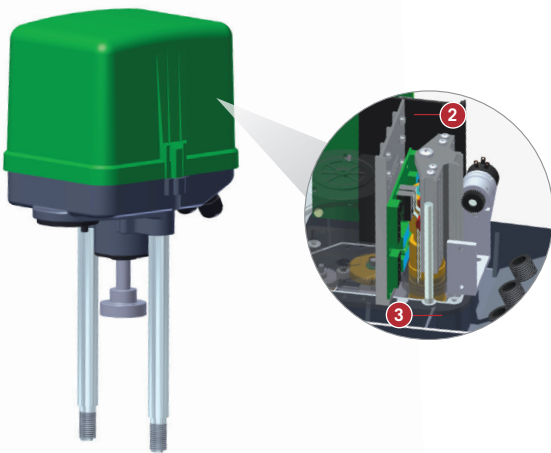
# Standard Actuator Offerings



## Spring & Diaphragm Actuator

The REflex is available with a multi-spring diaphragm actuator which delivers excellent control performance in a compact package. This actuator design is based on decades-proven and highly reliable diaphragm technology. The spring and diaphragm actuator provides for inherent fail safe operation and can be easily converted between direct and reverse acting functions. Standard positioners and a variety of accessories cleanly mount on this actuator.

- 1 Compact multi-spring actuator is field reversible. Can install anywhere from 2 to 7 springs depending on thrust requirements.



## Electric Actuator

All valves are available with an electrically-operated actuator. These actuators provide higher actuating forces than comparable pneumatic actuators. A wide range of operating voltages and actuating speeds are available for each actuator version, ensuring the actuator is tailor made for each application. Due to the inherent stiffness of the gear wheels and motors these actuators effectively buffer high fluid dynamic forces experienced in extreme flow conditions. A variety of accessories, including feed-back potentiometers, positioners and an emergency closing unit are available for these actuators, providing the best range in industry.

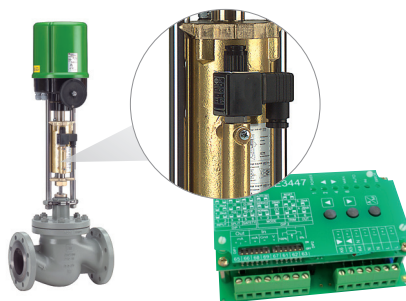
- 2 Robust modular industrial design covering a wide range of actuating forces and speeds.
- 3 Wide range of options available including feedback potentiometer, positioner and two extra limit switches as standard.

# Standard REflex Accessories



## Pneumatic Actuators

- > Siemens PS2
- > ABB TZIDC
- > Electropneumatic Eckardt SRI 990 & SRI 986
- > Pneumatic Eckardt SRP 981
- > Air Filter/Regulator
- > Solenoid Valves
- > Limit/Proximity Switches
- > Manual Override Handwheels



## Electric Actuators

- > Feedback Potentiometer
- > Feedback Transducer
- > Digital Valve Positioner
- > CANopen/Profibus Systems
- > Hydraulic Emergency Closing Units



## Noise Reduction Devices

- > Integrated Silencer on Valve Outlet
- > Silencing Orifice

# Specialty Valves



## Feedwater Valve with Recirculation

Specially designed to Protect Feedwater Pumps against cavitation by combining boiler feedwater valve and By-pass valve in one. Adjustable recirculation rate up to 10% of Cv value. Hardened recirculation plug and seat for low wear operation.



## Steam Converting Valve

Combined Pressure Reducing and Desuperheating in one valve. Optimized control characteristics with specially adapted Trim for Low Wear operation.



## Continuous Blowdown Valve

Parabolic Plug with linear characteristic for precise control of blowdown rate. Hardened trim for low wear operation. Available with or without manual sample valve.



## Bottom Blowdown Valve

Available in either pneumatic or manual design. Hardened trim for low wear operation. Protection of stem packing by back sealing when the valve is opened.



## Valve with Silencer

Used to Reduce Noise for steam and gases. Also used to suppress cavitation and reduce noise for liquids. Available with two to four throttle plates included in pipe expansion.

# Applications

- > Automotive Industry
- > Boiler Feedwater Control
- > Bottom Blowdown
- > Chemical Industry
- > Continuous Blowdown
- > District Heating
- > Flow Control
- > Food & Beverage Industry
- > Gases
- > Industrial Boilers
- > Industrial Refrigeration
- > Level Control
- > Liquids
- > Marine
- > Mining
- > Oil & Gas Industry
- > Power Industry
- > Pressure Reducing Desuperheating System (PRDS)
- > Pressure Control
- > Steam
- > Steel Industry
- > Temperature Control
- > Textile Industry
- > Thermal Oil
- > Water
- > Water Treatment
- > Wood Industry



Spence Engineering



CIRCOR Energy is a global manufacturer of highly engineered valves, fittings, pipeline and associated products for general, critical and severe service applications in the Oil & Gas, Power Generation and Process Industry markets. CIRCOR Energy continuously develops precision technologies to improve our customers' ability to control the flow of the world's natural resources.

Continuously Improving Flow Control. Worldwide.

Asia | Europe | Middle East | North America | South America



Spence Engineering

800.398.2493  
sales@spenceengineering.com

[www.circorenergy.com](http://www.circorenergy.com)

©2014 CIRCOR Energy. All rights reserved.