

# Steam and fluid control solutions for HVAC, commercial and institutional applications



## Steam and Fluid Control

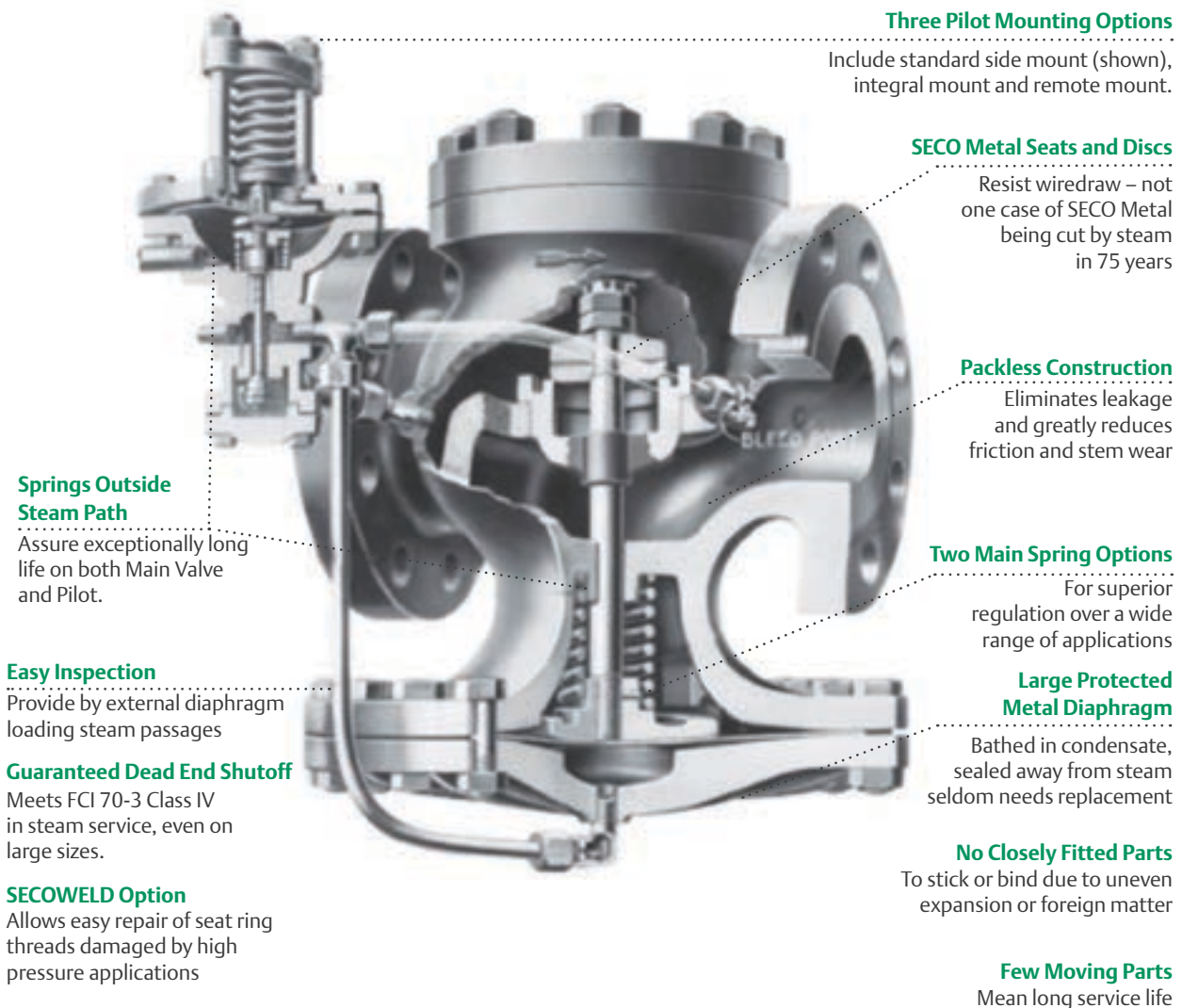
Regulators | Pilots and Combinations | Control Valves | Direct Operated Valves |  
Noise Suppression Insulation | Desuperheaters | Piping Specialties



# Pressure Regulator

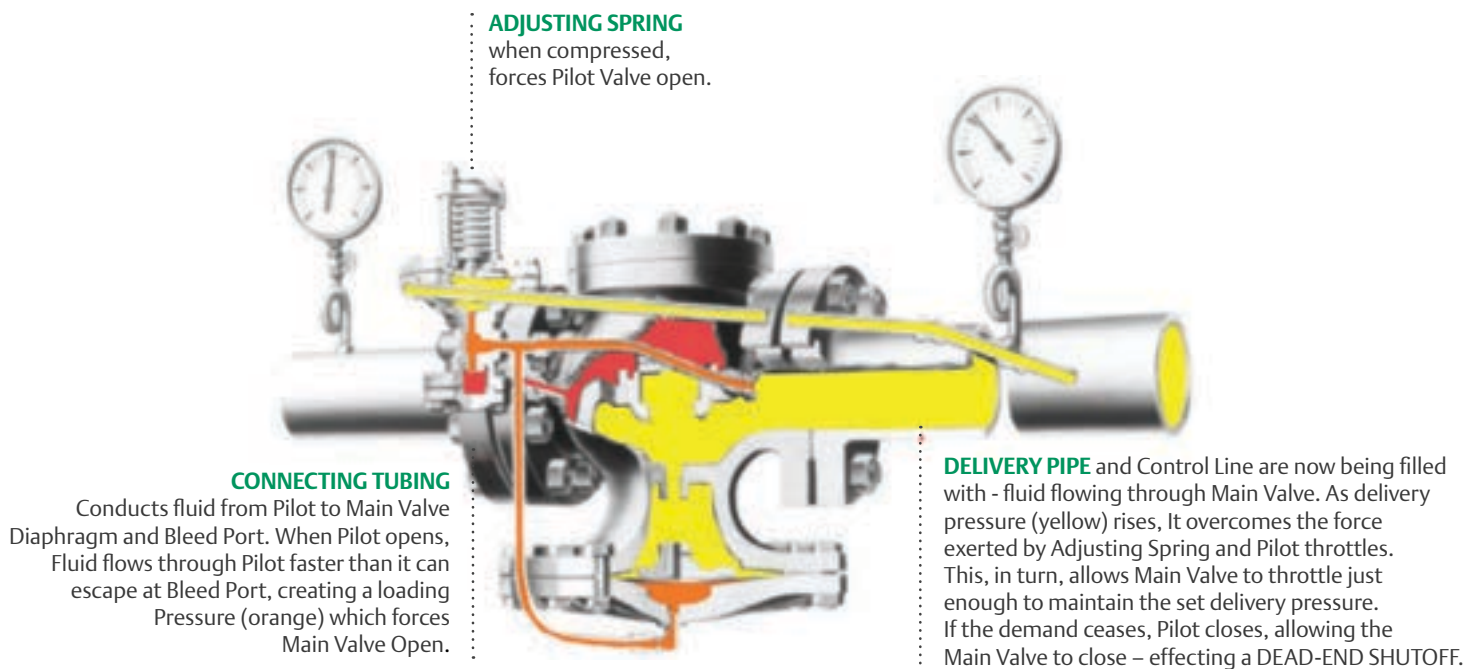
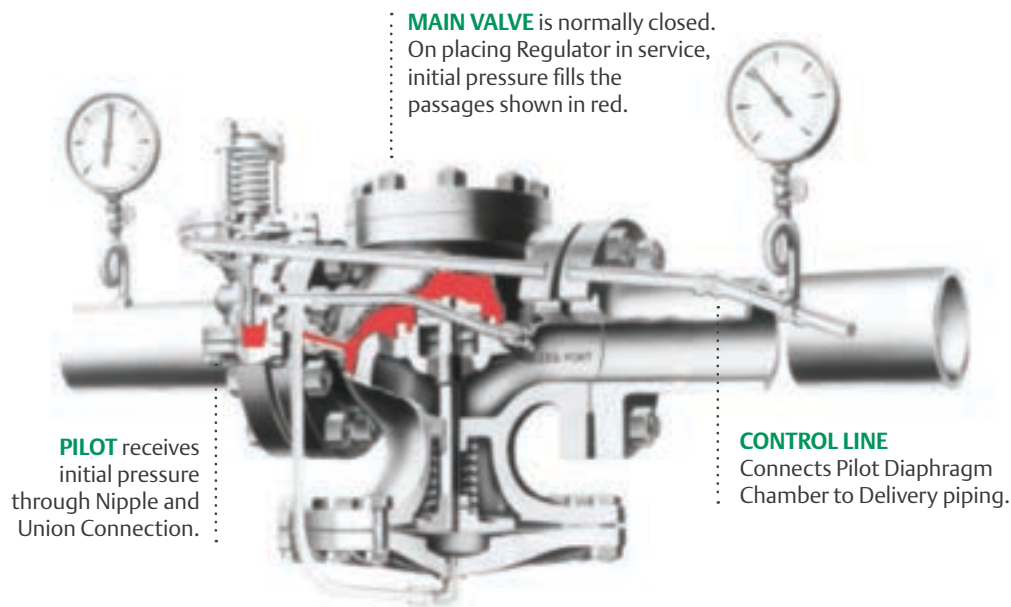
## APPLICATIONS

- Pressure Regulation for Steam Distribution • Single Point or Multiple Use Applications
- Pressure Control for Steam Plants • District Heating Systems • Single Stage Reduction Stations
- Two Stage Reduction Stations • Parallel Reduction Stations



# The Operating Cycle of a Spence™ Pressure Regulator

The basic Type ED has been selected to illustrate the operation of a Spence™ Pilot Operated Pressure Regulator. This presentation describes the successive steps in the mechanical cycle of the Regulator.



KEY      ● HIGH PRESSURE      ● MEDIUM PRESSURE      ● LOW PRESSURE

# Pilot-Operated Regulators for Commercial and Institutional Applications

The Spence™ Pilot Operated Regulator has been the trouble-free standard for Commercial/HVAC applications for nearly a century. If you are controlling a temperature, pressure, back pressure or differential pressure with a control valve and are plagued with erratic control, poor or slow response, leaky valves and/or complicated support systems, a Spence Pilot Operated Regulator is often the solution.

## Main Valves

- Fluid, gas, vapor applications
- Precise control
  - Flexible diaphragm
  - Choice of main spring to suit wide range of differential pressures
  - Wide variety of Pilots target specific requirements
- Low maintenance, long service life
  - Few moving parts and no fine tolerances
  - Packless construction for virtually frictionless, leak free operation
- Main spring isolated from steam
- ANSI/FCI 70-3 Class IV to Class VI shutoff
- Minimum operating pressure to 3 PSI
- Cast Iron - ANSI 250 Threaded 3/8" to 2"; ANSI 125/250 Flanged 1" to 12"
- For Type E, Cast Steel – ANSI 300 threaded 3/8" to 2"; ANSI 150/300/600 flanged 1/2" to 12"

## Type E

- Stainless steel multiple sheet diaphragm for durability
- Normally closed
- Single seat regulator
- Easy in line maintenance



## Type E2

- Nitrile diaphragm for maximum flexibility
- Low pressure and low differential applications



## Type E5

- For low differential pressures in higher pressure and/or high capacity applications
- Condensation chamber and long, finned base cool nitrile diaphragm for long service life



## Main Valve Options

- Balanced Construction for finer adjustments and smoother operation
- Stellited seat and disc option
- Condensation Chamber for high temperatures
- LP Main Spring for differential pressures below 30 PSI
- Composition Disc for ANSI/FCI 70-3 Class VI shutoff
- Parabolic Discs and Seat Rings for special flow requirements
- Dashpot to prevent water hammer for liquid service on single seat valves
- Integrally mounted pilot
- Insulcap Jacket to limit energy loss and reduce noise transmission

# Pilot-Operated Regulators – Pressure Pilots

## Type D Pressure Reducing

- The right choice in over 85% of pressure reduction applications
- Self contained
- Spring operated

- Normally closed
- Can be used in conjunction with other pilots i.e. T14
- Spring pressure ranges from 30 inches vacuum to 300 PSI



## Type N Differential Pressure

- Controls system pressure above or below another process variable
- Accurate within  $\pm 1$  PSI

- Three pilots with four spring pressure ranges from 3 to 150 PSI



## Type A Air Adjusted Pressure Reducing

- Pneumatic remote adjustment

- Multiple pilots from 30 inches vacuum to 150 PSI



## Type VH210 Electronic Actuator Pilot

- Modulates a process variable in relation to a proportional electronic control input signal
- Returns actuator to a closed position on power loss in 3 seconds or less.

- Accepts 4-20 or 0-10 VDC input signals, 24 VAC 50-60 Hz power supply, 17VA/12W power consumption



## Type P125 Trip Stop

- Quickly shuts off flow when overpressure condition exists

- Four spring pressure ranges from 5 to 175 PSI



## Type Q Back Pressure

- Maintains constant adjustable initial pressure and responds rapidly to sudden load changes, preventing overpressure
- Spring control or pneumatic adjustment

- 5 spring pressure ranges from 3 to 300 PSI



## Type SP/P Pressure Safety

- Emergency control when low pressure valve fails in two stage pressure reducing station where a safety relief valve is not an option
- Typically used with Type D or A Pilot

- Five spring pressure ranges from 5 to 175 PSI



## Pilot-Operated Regulators – Temperature Pilots

### Type T124/134 Temperature & Pressure

- For wide ranging, fast changing loads on instantaneous heaters and difficult process applications
- Cascade control varies pressure relative to temperature
- Reduced pressure ranges from 0 to 125 PSI
- Eleven temperature ranges from 20° to 500°F



### Type T14 Vapor Tension

- Maintains constant outlet temperature to a storage heat exchanger
- Add Type D or A Pilot to limit maximum pressure
- Eleven temperature ranges from 20° to 500°F



### Type T61 Pneumatic Temperature Controller

- Remote adjustment for wide ranging, fast changing loads on instantaneous heaters and difficult process applications
- Manually adjusted proportional controller with two temperature ranges from 50° to 250°F
- Output range up to 0-30 PSI permits more accurate control than typical 3-15 output



## Pilot-Operated Regulators – Solenoid Pilot

### M Solenoid Control

- Remote electrical actuation for on/off control with minimal pressure drop
- Typically used with Type D Pilot



# Direct-Operated Valves

## Series 2000 Temperature

- For steam, gases, water and other liquids
- Simple, low cost solution for gradually changing continuous loads

- Direct or reverse acting for heating or cooling; Three way for mixing
- Cast Bronze - ANSI 250 Threaded 1/2" to 2"
- Temperatures -15° to 400°F



## Type D/D2 Pressure Reducing

- For steam, gases, water and other liquids
- Four spring pressure ranges for pressures from

3 to 300 PSI



## Type D50A Pressure Reducing

- For steam, gases and water
- Cast Iron - Threaded 1/4" to 2"

- Reduced pressure ranges from 2 to 150 PSI



## Type N6 Differential Pressure

- Maintain pump discharge pressures at a constant differential above a separate source of pressure
- Bypass and constant differential valve on boiler feed water systems

- Cast Iron & Cast Steel - ANSI 250 Threaded 3/4" to 2"; ANSI 250 Flanged 2 1/2"
- Three spring pressure ranges for differential pressures from 5 to 200 PSI



## Type D34 Water Pressure Reducing Valve

- Self-contained
- Closes tight on dead-end shutoff
- Fast acting for rapid changes in flow

- Sediment settles away from control port when installed horizontally
- ANSI/FCI 70-2 Class VI shutoff



# Noise Attenuation

## Muffling Orifice Plate

- Reduces noise by 6 dBA to 12 dBA
- Engineered for each application; reduction estimates available

- Designed to fit between ANSI or DIN flanges



## Insulcap Insulating Jacket

- Average sound reduction of 6 dBA
- Provides insulation to limit heat energy losses
- Durable surface membrane barrier over woven glass reinforcement

- Fits Spence™ Type E and C Main Valves through 12"
- Also Available for pumps & traps



## Noise Suppressor

- Reduces noise up to 26 dBA
- Straight through design minimizes pressure drop, permitting normal valve sizing
- Effective over a broad frequency band (up to 12,000 Hz)

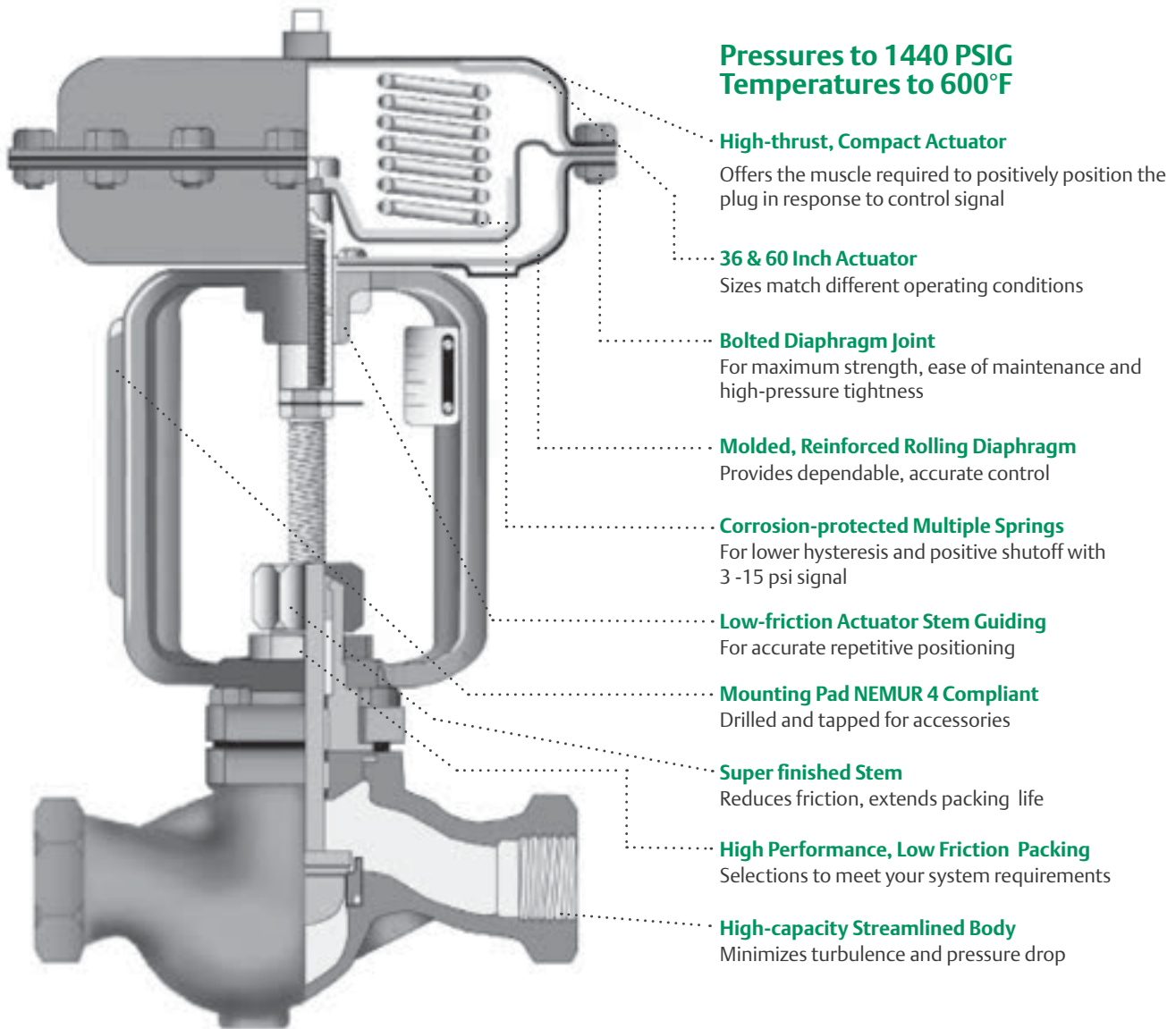
- Engineered for each application; reduction estimates available
- Standard sizes 3/8" to 8". Consult factory for additional sizes



# Control Valve

## APPLICATIONS

- Process control systems for food, pulp and paper, chemical, petrochemical & other industries
- HVAC systems
- Feed water and fuel system controls in boiler rooms
- Packaged systems (OEM) such as heat exchangers, water purification systems & vaporizer, metal cleaning and plating





# Control Valves

## Series K

- Globe style for steam, water and other liquids
- Pneumatic or electric actuator
- Two way or three way
- Shuts off to 400 PSI without positioner
- Cast Iron - ANSI 250 Flanged 2 1/2" to 4"
- Cast Bronze - ANSI 125/250 Union End 1/2" to 2"



## Type J

- Globe style for steam, water and other liquids
- Pneumatic actuator
- Compact, high capacity streamlined body
- Metal seat meets ANSI/ISA 70-2 Class IV shutoff; Teflon® seat meets ANSI/ISA 70-2 Class VI shutoff
- Cast Iron - ANSI 250 Threaded 1/2" to 2"
- Stainless Steel - ANSI 600 Threaded or Flanged 1/2" to 2"



# Control Valve Accessories

## EPC Electropneumatic Controller

- Simplified installation eliminates need for positioner, I/P, external power supply and instrument quality air
- No air consumption at steady state
- Output range 0-100 PSI permits more accurate control than typical 3-15 output



## Additional Products

- Positioners—Pneumatic, Electropneumatic, PS-2 & Smart Pos.
- IP Transducer
- RTD Resistance Probe Thermometer
- Electronic Pressure Transmitter
- Biasing Relay

# Desuperheaters

## Steam atomizing desuperheater

- Reduces the temperature of superheated steam by controlled direct injection of cooling water
- Mechanical atomizing 2.5:1 turndown
- Steam atomizing 20:1 turndown
- Line sizes 3" to 24" (larger sizes available upon request)
- Velocities to 8000 feet per minute
- Air operated only



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## Eliminator Steam Separator

- Extracts nearly all moisture and solids above 10 microns
- No moving parts
- Capacities to 35,000 lbs/hr
- Pressures to 900 PSIG
- Temperatures to 650°F
- NPT, socket weld or flanged 1/2" to 6"





## Notes

# Spence™ steam products and solutions for HVAC, commercial and institutional applications



## Emerson Automation Solutions

### Americas

McKinney, Texas 75070 USA  
T +1 972 548 3574

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

### Europe

T +39 051 419 0611

### Asia Pacific

T +65 6777 8211

### Middle East / Africa

T +971 4811 8100



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