

March 2022

Spence D Series Pressure Reducing Valve



WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire and/or chemical contamination causing property damage and personal injury or death.

Emerson Pressure Reducing Valve must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations and Emerson Process Management Regulator Technologies, Inc. (Emerson) instructions.

If the valve vents gas or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.

Installation, operation and maintenance procedures performed by unqualified personnel may result in improper adjustment and unsafe operation. Either condition may result in equipment damage or personal injury. Only a qualified person shall install or service the D Series pressure reducing valve.

Introduction

Scope of the Manual

This manual provides instructions for the installation, start-up, maintenance, disassembly, troubleshooting and parts ordering for D Series pressure reducing valve.



Figure 1. D Series Pressure Reducing Valve

Product Description

D Series pressure reducing valves are designed for air and steam services. They are direct-acting and are used on small delivery systems where pilot-operated regulators are not practical to use.

The valve is single-seated, normally open, springloaded and diaphragm-operated. Delivery pressure is transmitted to the diaphragm through an internal control port connecting the outlet side of the valve body with the diaphragm chamber.

D Series Valve

Specifications

This section lists the specifications for D Series pressure reducing valve. Factory specification are stamped on the nameplate fastened on the valve at the factory.

Available Types

Type D: ± 1 psi / 0.07 bar control of delivery pressure from 3 to 150 psi / 0.21 to 10.3 bar
Type D2: ± 2 psi / 0.14 bar control of delivery pressure from 100 to 300 psi / 6.89 to 20.7 bar

Valve Sizes

NPS 1/4 and 1/2 / DN 8 and 15

End Connection Styles

NPT, CL125 and CL250

Maximum Temperature⁽¹⁾

750°F / 400°C

Spring Pressure Rating⁽¹⁾

Cast Iron: 250 psig / 17.2 bar at 400°F / 204°C
Cast Steel: 600 psig / 41.4 bar at 750°F / 400°C

Spring Pressure Ranges⁽¹⁾

Type D
5 to 50 psig / 0.34 to 3.45 bar
10 to 100 psig / 0.69 to 6.89 bar
20 to 150 psig / 1.38 to 10.3 bar
Type D2
100 to 300 psig / 6.89 to 20.7 bar

Construction Materials

Body: Cast Steel or Cast Iron
Stem, Seat, Disc and Diaphragm: Stainless steel
Spring: Inconel®
Gasket: Grafoil

Options

Enclosed Spring Chamber
Composition Disc
Wall Bracket
Adjusting Handwheel
Locking Device

Application

Pressure Regulating for Steam Distribution
Regulating for Fluid, Gas and Vapor
Process Control
Processes with Small, Relatively Steady
Flow Rates

Approximate Weight

Type D: 7.3 lbs / 3.3 kg
Type D2: 10.6 lbs / 4.8 kg

1. The pressure/temperature limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.

Principle of Operation

When steam is turned on, the valve is in the wide open position. Steam flowing to the system creates a rising delivery pressure which feeds back through the control port to the underside of the diaphragm. As pressure on diaphragm approaches a balance with the force exerted by the adjusting spring, the disc is throttled to a position where just enough steam flows to maintain the set delivery pressure.

Installation



WARNING

Personal injury or system damage may result if this pressure reducing valve is installed, without appropriate

overpressure protection, where service conditions could exceed the limits given in the Specifications section and/or pressure reducing valve nameplate.

Additionally, physical damage to the pressure reducing valve may result in personal injury or property damage due to escaping of accumulated gas. To avoid such injury and damage, install the pressure reducing valve in a safe location.

All pressure equipment should be installed in a non-seismic area; should not be exposed to fire; and should be protected from thunderbolt (lightning) strikes.

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- Carefully clear inlet piping system of foreign matter and mount regulator with the flow arrow pointing in the direction of flow.
- Preferred position for D Series valve is in a horizontal line with spring down. When so mounted, the tendency of sediment to settle in the control ports is practically eliminated.

Start-up

On starting up, follow these steps:

1. Open the inlet stop valve gradually until the reducing valve takes control as indicated by the delivery pressure gauge.
2. Turn adjusting screw clockwise to increase the set pressure, counterclockwise to lower it.

Maintenance



WARNING

To avoid personal injury, property damage or equipment damage caused by sudden release of pressure or explosion of accumulated gas, do not attempt any maintenance or disassembly without first isolating the pressure reducing valve from system pressure and relieving all internal pressure from the pressure reducing valve.

Pressure reducing valves that have been disassembled for repair must be tested for proper operation before being returned to service. Only parts manufactured by Emerson should be used for repairing this pressure reducing valve.

Due to normal wear or damage that may occur from external sources, this pressure reducing valve should be inspected and maintained periodically. The frequency of inspection and replacement of parts depends upon the severity of service conditions or the requirement of local, state and federal rules and regulations.

Disassembly

To change or inspect disc and stem:

1. Remove compression on adjusting spring.
2. Remove adjusting spring.
3. Remove diaphragm bolts; take off cowl and diaphragm.
4. Hold pusher plate with socket wrench or pliers and turn off stem nuts.

Troubleshooting

Inadequate Flow or Delivery Pressure

Check initial pressure to see if full intended line pressure is applied at valve inlet.

Reduced Pressure Builds Up

1. Foreign matter may be lodged between seat and disc. Remove blind flange to inspect.
2. Diaphragm may be ruptured as evidenced by steam discharging in the area of the adjusting spring.

Erratic Operation

1. Disassemble the valve.
2. Check for clogged control port connecting body outlet with diaphragm chamber.
3. Check for deposits causing sticking of stem.

D Series Valve

Parts Ordering

When corresponding with your local Sales Office about this equipment, always reference the equipment valve size, service and serial number.

 SpenceValve.com

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