

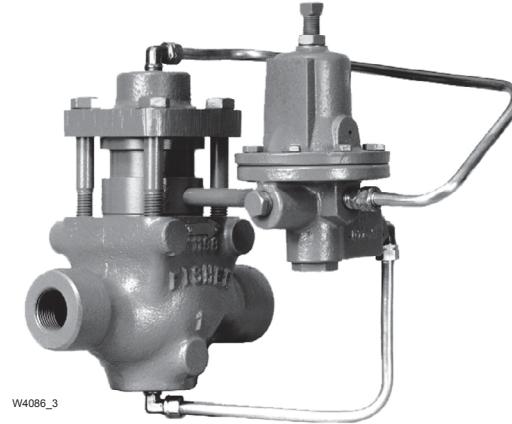
Type 92S Pilot-Operated Steam Regulator

Introduction

The Type 92S steam regulator is piston actuated for high cycle steam service which includes a Type 6492L, 6492H or 6492HT pilot (see Figure 1). These pilots have bellows sealed stems to eliminate stem guide friction. The valve and pilot use lapped seating surfaces that have been proven to minimize seat leakage.

Features

- Good Shutoff for Low Downstream Build-up—** Type 92S main valve and Types 6492H, 6492L and 6492HT pilots are machine-lapped seating surfaces that have been time-proven to minimize seat leakage when the downstream demand is zero and the regulator is shutoff.
- Resistance to Piping Stresses—** Steel constructions are available to help resist the piping stresses commonly encountered in steam applications.
- Ease of Installation—** Compact construction reduces installation space requirements. Supply of pressure to the pilot is supplied from the inlet side of the main valve through factory piped tubing; with a standard pilot, this means no separate pilot supply pressure is required.
- Increased Sensitivity to Downstream Pressure Changes—** Friction-reducing bellows seal on the pilot stem and large pilot diaphragm areas yield good sensitivity.
- Ease of Pilot Maintenance—** Pilot valve plug and seat can be removed for inspection of maintenance without disassembling piping connections and without removing the diaphragm. Pilot inlet screen (Figure 2) is easily removed with the seating parts for inspection and cleaning. Diaphragm can be removed without disturbing the seating parts.
- Noise Reduction Capability Without Decrease in Capacity—** A noise attenuation trim is available for use with NPS 2 / DN 50 and larger main valve sizes to provide an economical yet full-flow means



1 NPT STEEL
MAIN VALVE WITH TYPE 6492H OR 6492HT PILOT



NPS 3 / DN 80 FLANGED CAST IRON
MAIN VALVE WITH TYPE 6492L PILOT

Figure 1. Type 92S Pilot-Operated Steam Regulator

for the reduction of noise from high velocity steam flow. Further noise reduction of the system can be achieved by the use of a heavier piping schedule and/or thermal insulation of the attached piping.

Type 92S

Specifications

This section lists the specifications for the Type 92S regulator. Factory specifications are stamped on the nameplate fastened on the regulator at the factory.

Main Valve Body Sizes and End Connection Styles

| BODY SIZES | END CONNECTION STYLES AND RATINGS | |
|---|-----------------------------------|---|
| | Cast Iron Body | Steel or Stainless Steel Body |
| 1, 1-1/2 and 2 | NPT | NPT or PN 16/25/40 |
| NPS 1, 1-1/2, 2, 2-1/2, 3 and 4 / DN 25, 40, 50, 65, 80 and 100 | CL125 FF or CL250 RF | CL150 RF, CL300 RF, CL600 RF or PN 16/25/40 |
| NPS 6 x 4 / DN 150 x 100 ⁽²⁾ | Not available | CL300 RF, CL600 RF or PN 16/25-40/64/100 |

Maximum Inlet and Pilot Supply Pressure⁽¹⁾

Cast Iron Main Valve and Pilot: 250 psig / 17.2 bar or body rating limit, whichever is lower
Steel Main Valve and Pilot: 300 psig / 20.7 bar or body rating limit, whichever is lower

Minimum and Maximum Differential Pressures⁽¹⁾

| BODY SIZES, NPS / DN | MINIMUM DIFFERENTIAL PRESSURE | MAXIMUM DIFFERENTIAL PRESSURE |
|--|-------------------------------|---|
| 1, 1-1/2 and 2 / 25, 40 and 50 | 15 psi / 1.0 bar | 200 psi / 13.8 bar or body rating limit, whichever is lower |
| 2-1/2, 3, 4 and 6 x 4 / 65, 80, 100 and 150 x 100 ⁽²⁾ | 20 psi / 1.4 bar | 175 psi / 12.1 bar or body rating limit, whichever is lower |

Outlet (Control) Pressure Ranges

See Table 1

Maximum Outlet Pressures⁽¹⁾

See Table 2

Maximum Allowable Loading Pressure for Pilot with Tapped Spring Case

Combination of pilot control spring setting and spring case loading pressure cannot exceed 150 psig / 10.3 bar for Type 6492H pilot or 25 psig / 1.7 bar for Type 6492L pilot and 250 psig / 17.2 bar for Type 6492HT

Droop

See Table 5 and Figure 8

Typical Regulating Capacities

See Table 5 and Capacity Information section

Main Valve Orifice Sizes and Flow Coefficients

See Table 3

Noise Information

See Table 6 and Noise Abatement Information section

Construction Materials

Main Valve

Body and Body Flange: Cast iron (NPS 1 through 4 / DN 25 through 100 sizes only), Steel or CF8M
Stainless steel (all sizes)

Valve Plug: Heat-treated 17-4PH Stainless steel

Cage: Cast iron or Stainless steel

Spiral Wound Gasket: 316L Stainless steel and graphite

Spring, Lower Stem, Retaining Ring, Bolting and Cylinder Spacer: Steel or Plated steel

Body and Cylinder Gaskets: Copper

Pistons, Seat Ring and Cylinders: Heat-treated 416 Stainless steel

Piston Ring(s): Polytetrafluoroethylene (PTFE)

Piston Ring Retainer(s): 302 Stainless steel

Noise Attenuation Trim (If Used): Stainless steel

Stem Seal: PTFE/glass

Pilot

Body and Spring Case: Cast iron, Steel and Stainless steel

Seat Ring and Stem: Heat-treated 416 Stainless steel

Bellows and Bellows Retainer: Brass

Plug, Plug Guide, Plug Spring, Diaphragms, Bleed Restriction and Inlet Screen: Stainless steel

Diaphragm Gasket: Composition or Flexible Graphite

Control Spring, Upper Spring Seat, Adjusting Screw, Bolting, Pipe Plug, Reducing Bushing and (If Used) Diaphragm Plate: Steel

Fittings: Brass

Tubing: Copper

Pipe Nipple: Steel

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitations, must not be exceeded.

2. The two-number designation indicates line size by trim size.

Specifications (continued)

Maximum Temperature Capabilities⁽¹⁾

Cast Iron Main Valve and Pilot: 406°F / 208°C

Steel Main Valve and Pilot: 500°F / 260°C

High Temperature Optional Steel and Stainless steel Main Valve and Pilot: 650°F / 343°C

Downstream Control Line Connection

NPS 1, 1-1/2 and 2 / DN 25, 40 and 50

Main Valve Sizes: 1/4 NPT in main valve cylinder spacer

NPS 2-1/2, 3, 4 and 6 x 4 / DN 65, 80, 100 and

150 x 100⁽²⁾ Main Valve Sizes: 1/4 NPT

in pilot body

Pilot Spring Case Vent

Standard: 1/8 in. / 3.18 mm drilled hole

Optional: 1/4 NPT tapping for pressure loading or on-off service

Pressure Registration

External through downstream control line

Approximate Weights

| BODY SIZE | | END CONNECTION STYLE | APPROXIMATE WEIGHTS | |
|----------------------|--------------------------|----------------------------------|---------------------|----------------|
| NPS | DN | | lbs | kg |
| 1 1-1/2 | 25 40 | NPT or flanged NPT or flanged | 32 44 | 15 20 |
| 2 | 50 | NPT Flanged | 55 67 | 25 30 |
| 2-1/2 3 4 | 65 80 100 | Flanged Flanged Flanged | 90 115 165 | 41 52 75 |
| 6 x 4 ⁽²⁾ | 150 x 100 ⁽²⁾ | Flanged | CL300 CL600 | 335 435 |
| | | | | 152 197 |

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitations, must not be exceeded.

2. The two-number designation indicates line size by trim size.

Table 1. Outlet (Control) Pressure Ranges

| PILOT TYPE | OUTLET PRESSURE RANGES | | PART NUMBER | COLOR CODE | SPRING WIRE DIAMETER | | SPRING FREE LENGTH | |
|------------|------------------------|--------------|-------------|------------|----------------------|------|--------------------|------|
| | psig | bar | | | In. | mm | In. | mm |
| 6492L | 2 to 6 | 0.14 to 0.41 | 1E395627022 | Yellow | 0.207 | 5.26 | 2.50 | 63.5 |
| | 5 to 15 | 0.35 to 1.0 | 1D7455T0012 | Green | 0.234 | 5.94 | 2.62 | 66.6 |
| | 13 to 25 | 0.90 to 1.7 | 1E395727192 | Red | 0.283 | 7.19 | 2.44 | 62.0 |
| 6492H | 10 to 30 | 0.69 to 2.1 | 1E395627022 | Yellow | 0.207 | 5.26 | 2.50 | 63.5 |
| | 25 to 75 | 1.7 to 5.2 | 1D7455T0012 | Green | 0.234 | 5.94 | 2.62 | 66.6 |
| | 70 to 150 | 4.8 to 10.3 | 1E395727192 | Red | 0.283 | 7.19 | 2.44 | 62.0 |
| 6492HT | 15 to 100 | 1.0 to 6.9 | 14B9943X012 | Unpainted | 0.282 | 7.16 | 2.50 | 63.5 |
| | 80 to 250 | 5.5 to 17.2 | 14B9942X012 | | 0.375 | 9.53 | 2.50 | 63.5 |

Table 2. Maximum Inlet and Outlet Pressures

| CONSTRUCTION | MAXIMUM ALLOWABLE INLET PRESSURE | | | | MAXIMUM OPERATING OUTLET PRESSURE | | MAXIMUM EMERGENCY OUTLET PRESSURE | | | |
|------------------------|----------------------------------|------|---------------------------|------|-----------------------------------|------|---|--|--|--|
| | Cast Iron | | Steel and Stainless Steel | | | | Cast Iron Main Valve and Pilot Body | Steel or Stainless Steel Main Valve and Pilot Body | | |
| | psig | bar | psig | bar | psig | bar | psig | bar | | |
| With Type 6492HT pilot | ---- | | 300 | 20.7 | 250 | 17.2 | ---- | | | |
| With Type 6492H pilot | 250 | 17.2 | | | 150 | 10.3 | 250 psig / 17.2 bar or main valve body rating limit, whichever is lower | | | |
| With Type 6492L pilot | | | | | 25 | 1.7 | 100 psig / 6.9 bar | 100 psig / 6.9 bar | | |

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Table 3. Flow and Sizing Coefficients⁽¹⁾

| BODY SIZE | | ORIFICE SIZE | | REGULATING C _s | WIDE-OPEN C _s FOR RELIEF SIZING | C ₁ | K _m | IEC SIZE COEFFICIENTS | | |
|--|-----------|--------------|----|---------------------------|--|----------------|----------------|-----------------------|----------------|----------------|
| NPS | DN | In. | mm | | | | | X _T | F _D | F _L |
| 1 | 25 | 7/8 | 22 | 16 | 17.5 | 34 | 0.62 | 0.51 | 0.79 | |
| 1-1/2 | 40 | 1-1/8 | 29 | 30 | 33 | | | | | |
| 2 | 50 | 1-29/64 | 37 | 48 | 52 | | | | | |
| 2-1/2 | 65 | 1-5/8 | 41 | 74 | 78 | | 0.73 | 0.47 | 0.84 | |
| 3 | 80 | 2-1/16 | 52 | 100 | 110 | | | 0.48 | | |
| 4 | 100 | 2-3/8 | 60 | 140 | 145 | | 0.71 | 0.47 | | |
| 6 x 4 | 150 x 100 | 2-3/8 | 60 | 150 | 155 | | | 0.46 | | |
| 1. C _v = C _s x 20 ÷ C ₁ | | | | | | | | | | |

- **Lapped Seats for Tight Shutoff**—The valve and pilot use lapped seating surfaces that have been proven to minimize seat leakage.
- **Application Flexibility**—Pilot with optional tapped spring case is available for use either with an air loading regulator for remote adjustment of outlet pressure setting or, when all compression is removed from the pilot control spring, with a solenoid or switching valve for on-off service.

Principle of Operation

Pilot supply pressure is piped from the main valve inlet (Figure 2) to the pilot inlet connection. Downstream pressure registers on the main valve pistons through the downstream control line and then on the pilot diaphragm.

When increased downstream demand lowers the downstream pressure to a value below the setting of the pilot control spring, this forces the pilot valve plug to open increasing the loading pressure on the main valve pistons. At the same time, the increased demand lowers the downstream pressure on the main valve piston(s). This opens the main valve plug, increasing flow to the downstream system to satisfy the increased demand and to restore downstream pressure to the setting of the pilot control spring.

Decreased downstream demand increases the downstream pressure registered on the pilot diaphragm. The increased pressure overcomes the force of the pilot control spring and allows the pilot valve plug spring to close the valve plug. As the pilot valve plug closes, excess loading pressure bleeds to the downstream system through the pilot bleed restriction. At the same time, decreased downstream demand increases the downstream pressure registered on the main valve piston(s). This allows

the main valve spring to close the main valve plug, reducing flow to the downstream system in response to the decreased demand.

With a pilot for pressure-loaded service (Figure 7), the operation is the same as for a standard pilot except that the pilot control spring force on the pilot valve plug is aided by pneumatic pressure from the loading device. With a pilot for on-off service, the only force acting on top of the pilot diaphragm is pneumatic pressure provided by the solenoid or switching valve.

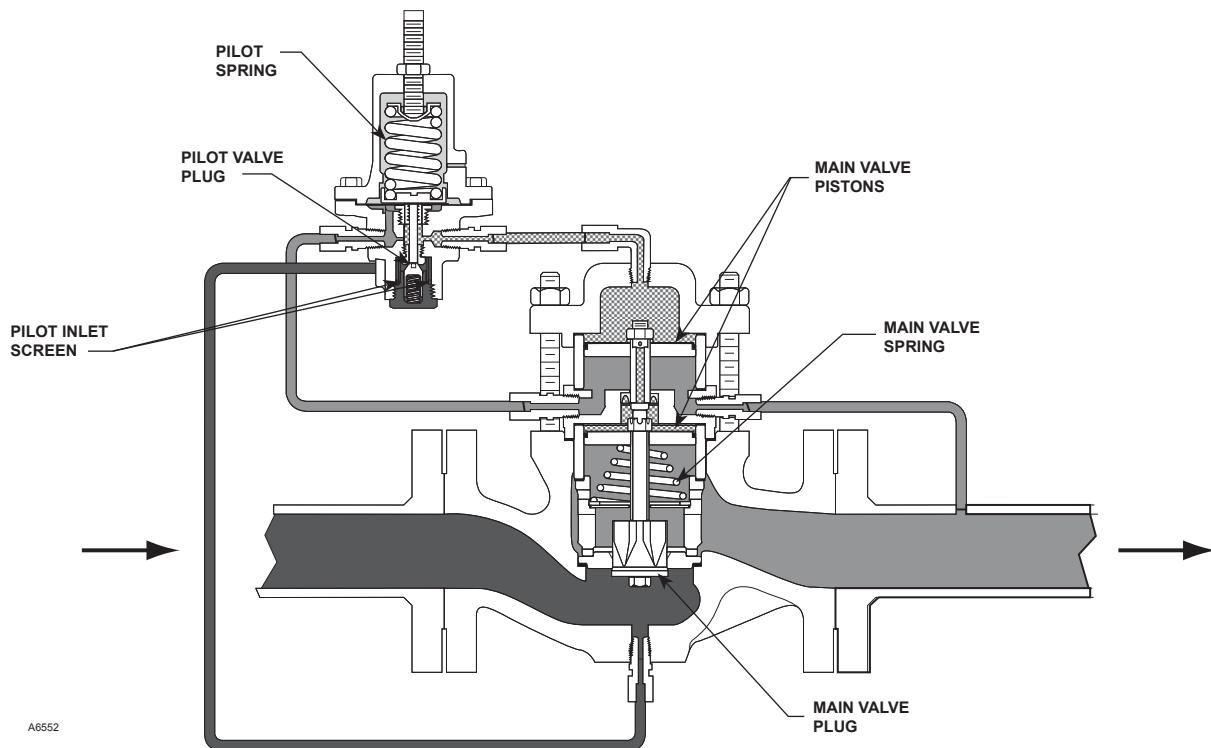
Installation

The Type 92S regulator should be installed and used in accordance with governmental codes and regulations. Although this regulator minimizes leakage under shutoff conditions, downstream overpressure protection must be provided by the user. The pressure and temperature limitations in the Specifications section must be observed and the downstream equipment protected.

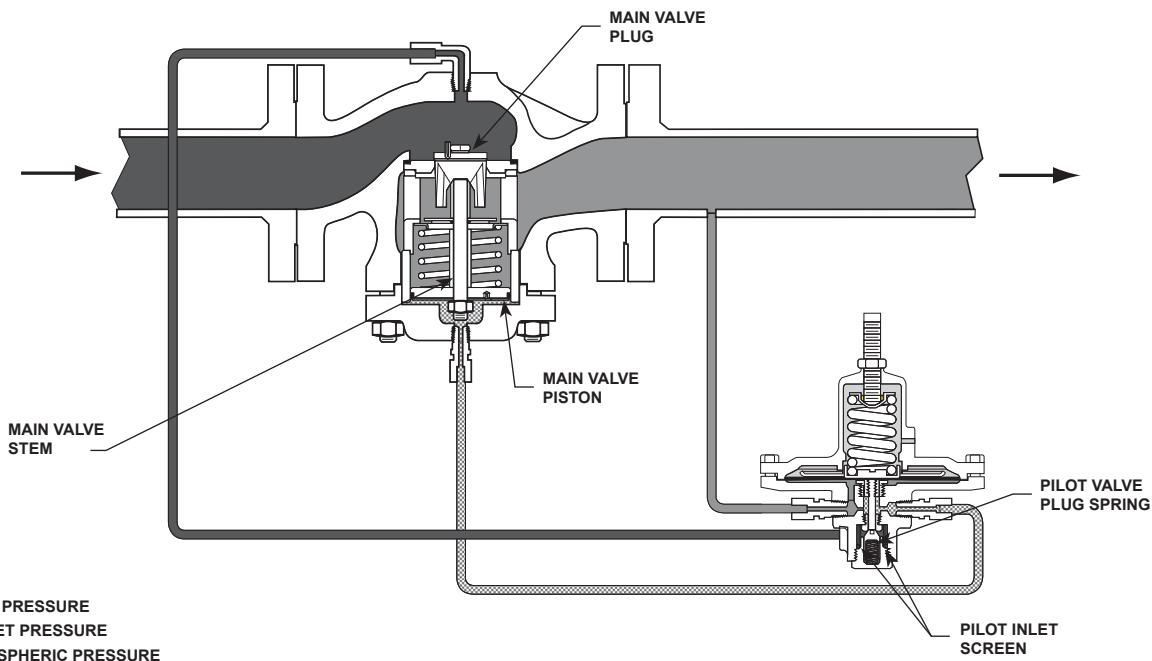
A Type 92S regulator may be installed in any orientation, but should not be installed in a tall vertical pipeline where condensate could collect and create a pressure head affecting regulator performance. To obtain maximum flow capacities in some instances, outlet piping will have to be swaged up above the given body size.

A downstream control line is required but is not furnished with the Type 92S regulator. Additionally, an adjustable loading pressure regulator and loading pressure piping are required for pressure-loading pilot regulators, while an on-off or solenoid valve is required for on-off pilot regulators.

Dimensions are shown in Figure 9.



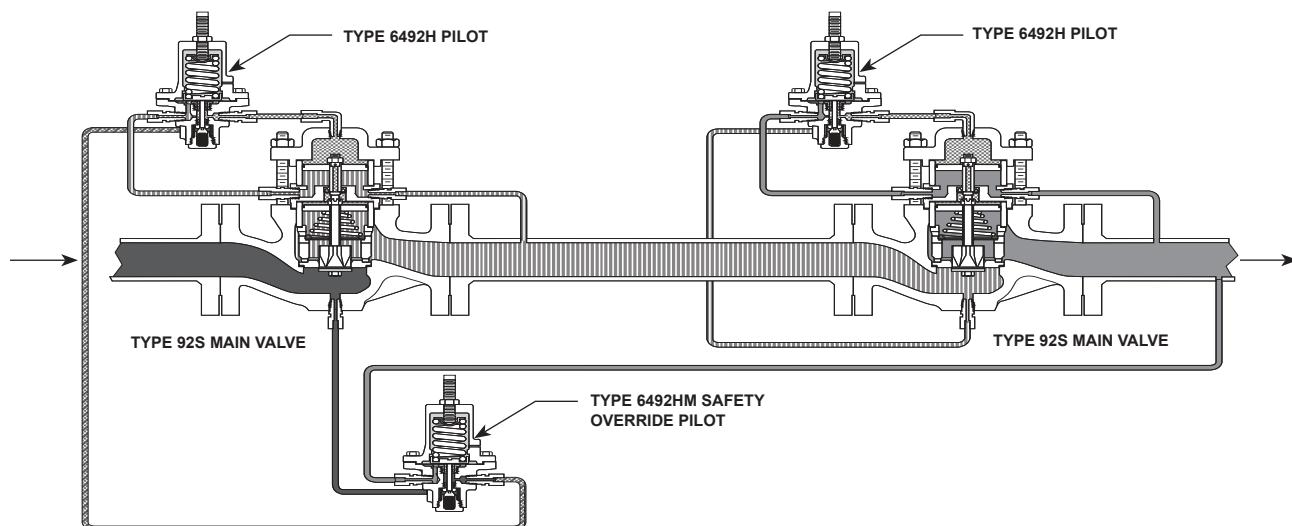
NPS 1, 1-1/2 OR 2 / DN 25, 40 OR 50
MAIN VALVE BODY AND TYPE 6492H OR 6492HT PILOT



NPS 2-1/2, 3, 4 OR 6 x 4 / DN 65, 80, 100 OR 150 x 100
MAIN VALVE BODY AND TYPE 6492L PILOT

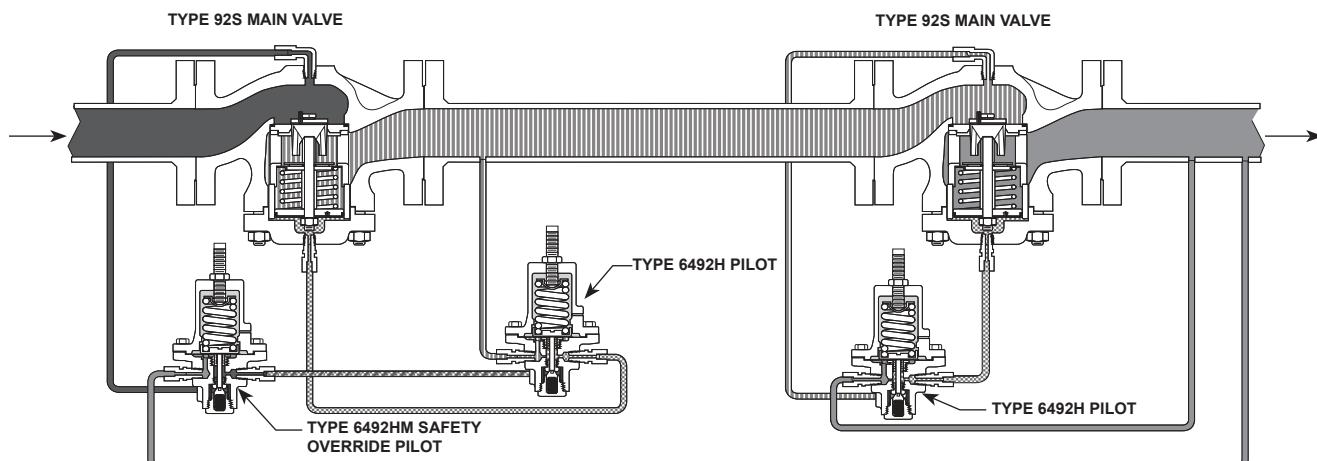
Figure 2. Type 92S Pressure Reducing Regulator Operational Schematics

Type 92S



E0402

Figure 3. NPS 1, 1-1/2 and 2 / DN 25, 40 and 50 Type 92S Pilot-Operated Pressure Reducing Regulator with Safety Override Pilot Operational Schematic



E0403

- INLET PRESSURE
- OUTLET PRESSURE
- ATMOSPHERIC PRESSURE
- LOADING PRESSURE
- INTERMEDIATE PRESSURE

Figure 4. NPS 2-1/2, 3 and 4 / DN 65, 80 and 100 Type 92S Pilot-Operated Pressure Reducing Valve with Safety Override Pilot Operational Schematic

Table 4. Safety Pilot Outlet (Control) Pressure Ranges

| TYPE | SPRING RANGE | | SPRING COLOR | PART NUMBER | MINIMUM PRESSURE AT WHICH MONITORING PILOT CAN BE SET |
|---------|--------------|-------------|--------------|-------------|---|
| | psig | bar | | | |
| 6492HM | 10 to 30 | 0.69 to 2.1 | Yellow | 1E395627022 | 5 psig / 0.35 bar over normal distribution pressure |
| | 25 to 75 | 1.7 to 5.2 | Green | 1D7455T0012 | |
| | 70 to 150 | 4.8 to 10.3 | Black | 1E395727192 | |
| 6492HTM | 15 to 100 | 1.0 to 6.9 | Unpainted | 14B9943X012 | 10 psig / 0.69 bar over normal distribution pressure |
| | 80 to 250 | 5.5 to 17.2 | | 14B9942X012 | |

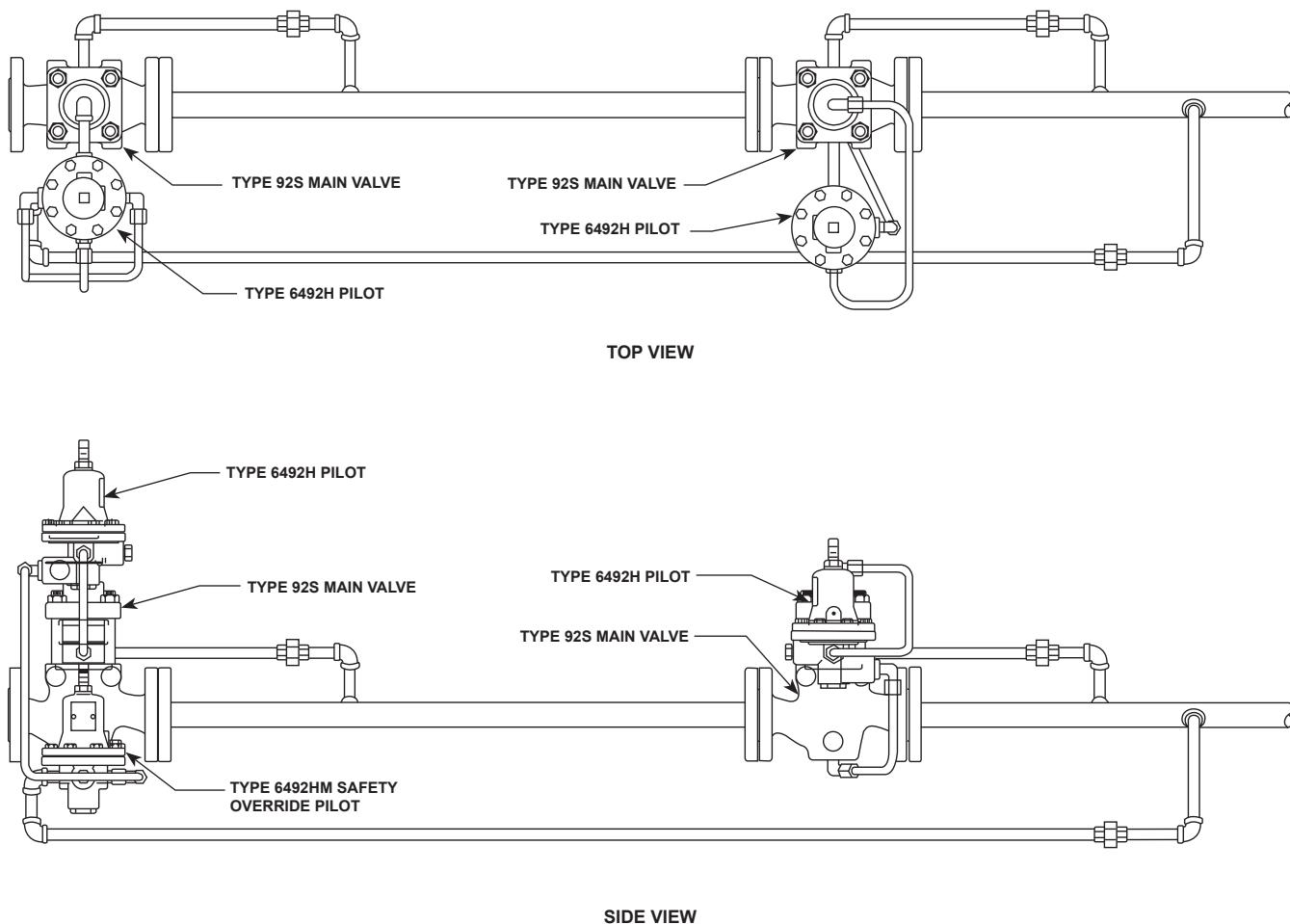


Figure 5. NPS 1, 1-1/2 and 2 / DN 25, 40 and 50 Piping Schematics

Type 92S

Type 92S Pilot-Operated Pressure Reducing Regulator with Safety Override Pilot

A Type 6492HM or 6492HTM safety override pilot is available for the Type 92S. The Type 6492H pilot is used in a series installation with the Type 6492HM or 6492HTM safety override pilot installed on the upstream regulator. The Type 6492HM or 6492HTM safety override pilot senses pressure downstream of the second valve and prevents pressure from rising above safe operating pressure in the event the downstream valve fails. This system is approved by ASME B31.1-1989, 122.14.2.A and can replace an ASME safety valve when vent piping is not practical and Type 92S Pilot-Operated, Pressure Reducing Regulator with Safety Override Pilot upstream steam pressure does not exceed 400 psig / 27.6 bar. Local codes and standards may require approval by an appropriate authority prior to installation.

Operation

Once placed in operation, the upstream Type 6492H pilot senses the intermediate pressure between both valves and the Type 6492HM or 6492HTM pilot senses downstream pressure of the second valve. As demand for flow increases, intermediate pressure will fall causing the Type 6492H pilot to open. As the Type 6492H pilot valve opens, loading pressure to the main valve increases, opening the main valve.

The Type 6492HM or 6492HTM safety override pilot remains open because its setpoint is above the setpoint of the downstream valve. In the unlikely event that the downstream valve fails open, downstream pressure will rise above the downstream valve's setpoint. This pressure is sensed by the Type 6492HM or 6492HTM safety override pilot. As downstream pressure increases the safety override pilot closes, reducing loading pressure to the main valve, which positions the main valve to maintain downstream pressure as specified per ASME Boiler and Pressure Vessel Code, Section VIII.

In the event that the upstream valve fails, the downstream regulator will prevent downstream pressure from rising above safe operating levels. It is recommended to install some type of warning system, such as a sentinel relief valve, to warn the operator that a valve has failed in the system. This will prevent prolonged operation with one valve, which could cause valve trim wear and noise associated with operation at high differential pressures.

When operating in most steam systems, valve setpoints should be in strict accordance to ASME Boiler and Pressure Vessel Code, Section VIII. The Type 6492HM or 6492HTM safety override pilot should be set at 10 psig / 0.69 bar or 10% above maximum downstream operating pressure of the second valve, whichever pressure is greater. For example, most HVAC systems operate at 15 psig / 1.0 bar, so the safety override pilot should be set no higher than 25 psig / 1.7 bar.

Capacity Information

Table 5 gives typical regulating capacities in lbs/h / kg/h of saturated steam. Capacities for regulators with noise attenuation trim are the same as for regulators without noise attenuation trim. Figure 8 shows a typical performance curve.

To determine regulating capacities at pressure settings not given in Table 5 or to determine wide-open capacities for relief sizing at any inlet pressure, use the following procedure 1 or 2 as appropriate.

1. If the steam is saturated and the pressure drop across the regulator is critical (absolute outlet pressure is equal to approximately one-half or less than one-half of the absolute inlet pressure), use the equation:

$$Q = (P_{1\text{abs}}) (C_s)$$

where,

Q = Flow capacity in pounds of saturated steam per hour

$P_{1\text{abs}}$ = Absolute inlet pressure in psia ($P_{1\text{gauge}} + 14.7$)

C_s = Regulating or wide-open steam sizing coefficient (see Table 3)

2. If the steam is superheated or if the pressure drop across the regulator is lower than critical (absolute outlet pressure is greater than approximately one-half the absolute inlet pressure), use the valve sizing slide rule or the sizing nomographs in Catalog 10.

Noise Abatement Information

A noise attenuation trim is available for use with NPS 2 / DN 50 and larger Type 92S steam regulators to provide an economical means for the reduction of noise from high-velocity steam flow. Capacities for a regulator equipped with a noise attenuation trim are the same as for a regulator without noise attenuation trim and are given in Table 5.

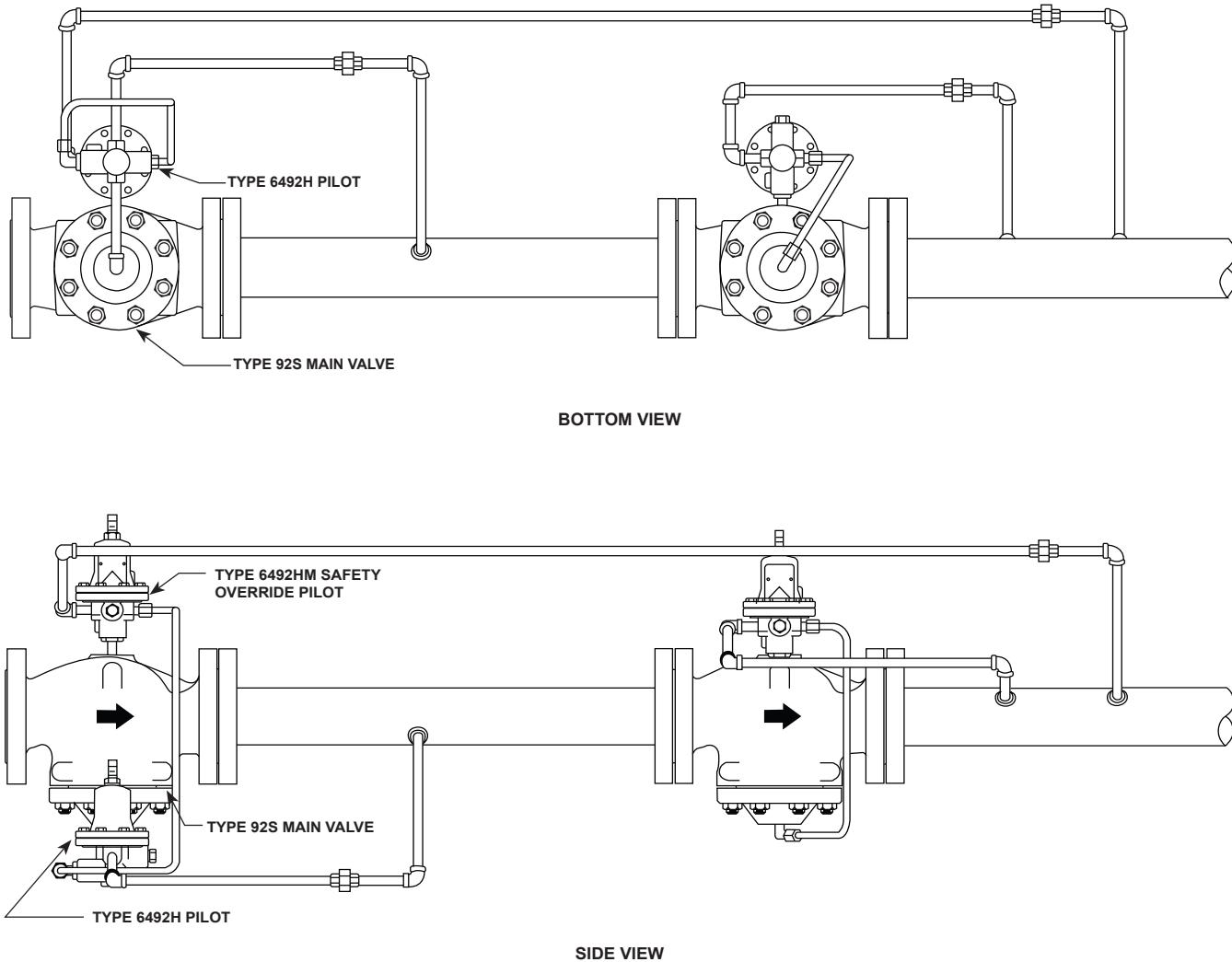


Figure 6. NPS 2-1/2, 3 and 4 / DN 65, 80 and 100 Piping Schematics

Noise level values for a regulator equipped either with or without a noise attenuation trim are presented in Table 6. These noise levels are determined at a point 39 in. / 991 mm downstream of the regulator outlet and 39 in. / 991 mm from the piping surface.

For example, consider full-capacity flow of steam through a NPS 2 / DN 50 Type 92S steam regulator connected with uninsulated 2 in. / 51 mm Schedule 40 downstream piping (see Table 6). For an inlet pressure of 250 psig / 17.2 bar and an outlet pressure of 100 psig / 6.9 bar, P/P_{1abs} is 0.6. Under the specified service conditions, the noise level for steam flow through a Type 92S steam regulator without a noise

attenuation trim will be 98 decibels, while the same regulator equipped with a noise attenuation trim will have a noise level reduced to 92 decibels.

Noise levels for steam flow through a Type 92S steam regulator can be reduced further with the use of either a heavier schedule of pipe or thermal insulation of the downstream piping. By using thermal insulation, as much as 15 decibels of noise can be additionally reduced from the system. Consult the insulation manufacturer's specifications for the attenuating capability and application procedures of the specific insulation required by your system.

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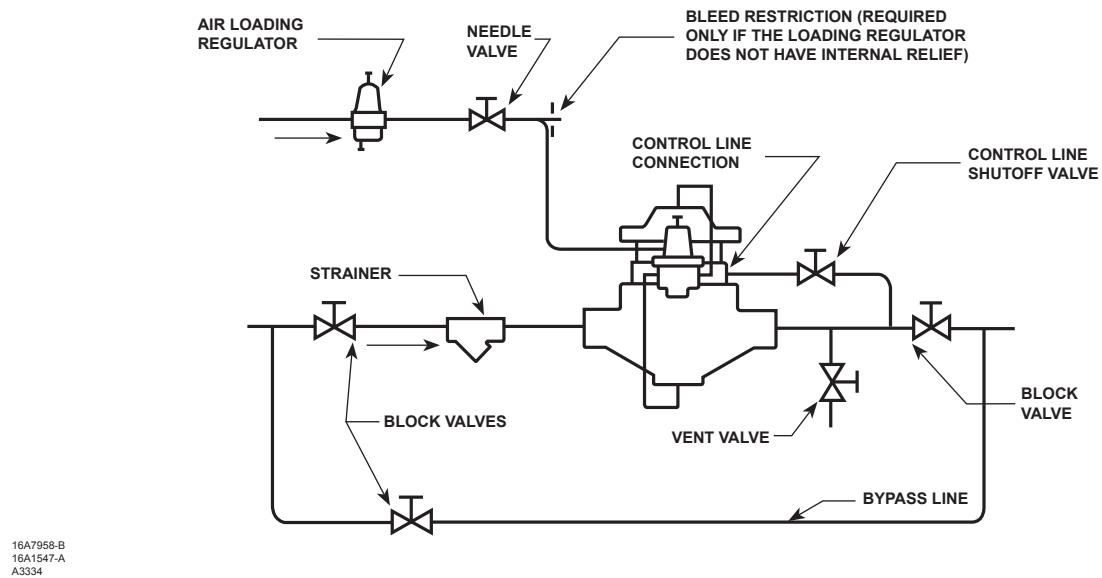


Figure 7. Typical Pressure-Loaded Pilot Installation

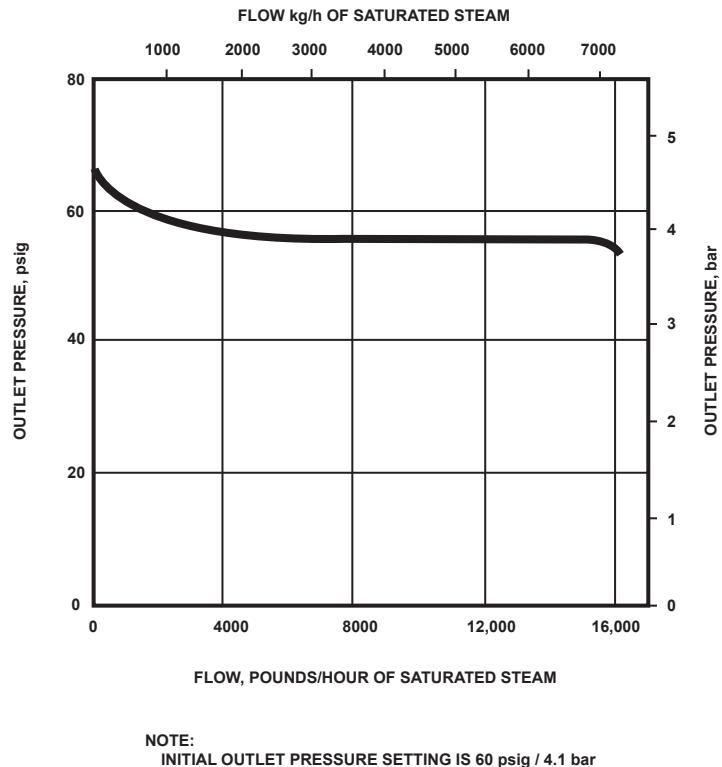


Figure 8. Typical Performance Curve for NPS 2-1/2 / DN 65 Type 92S Pressure Reducing Regulator with Type 6492H Pilot

Table 5. Flow Capacities in Pounds per Hour / kg/h of Saturated Steam

| OUTLET PRESSURE SETTING ⁽¹⁾ | | PILOT TYPE NUMBER | INLET PRESSURE | | MAIN VALVE BODY SIZE, NPS / DN | | | | | | | | | | | | DROOP | |
|--|------|------------------------------|-------------------|-------|--------------------------------|-------|------------|-------|--------|-------|------------|-------|--------|--------|---------|--------|--------|--------|
| | | | | | 1 / 25 | | 1-1/2 / 40 | | 2 / 50 | | 2-1/2 / 65 | | 3 / 80 | | 4 / 100 | | | |
| psig | bar | psig | bar | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | |
| 5 | 0.35 | 6492L | 25 | 1.7 | 575 | 261 | 950 | 431 | 1750 | 794 | 1000 | 454 | 1225 | 556 | 2510 | 1139 | 2600 | 1179 |
| | | | 30 | 2.1 | 700 | 318 | 1150 | 522 | 1880 | 853 | 1500 | 680 | 2200 | 998 | 4000 | 1814 | 4100 | 1860 |
| | | | 50 | 3.5 | 950 | 431 | 1800 | 816 | 2950 | 1338 | 4180 | 1896 | 6550 | 2971 | 8500 | 3856 | 8600 | 3901 |
| | | | 75 | 5.2 | 1350 | 612 | 2375 | 1077 | 4100 | 1860 | 6000 | 2722 | 8400 | 3810 | 12,600 | 5715 | 12,900 | 5851 |
| | | | 100 | 6.9 | 1725 | 782 | 3050 | 1383 | 5600 | 2540 | 8500 | 3856 | 10,300 | 4672 | 14,300 | 6486 | 15,100 | 6849 |
| | 0.69 | 6492H or 6492L | 150 | 10.3 | 1800 | 816 | 4050 | 1837 | 6150 | 2790 | 11,900 | 5398 | 16,900 | 7666 | 23,000 | 10433 | 23,600 | 10,705 |
| | | | 30 | 2.1 | 700 | 318 | 1200 | 544 | 2050 | 930 | 3050 | 1383 | 4300 | 1950 | 5800 | 2631 | 5800 | 2631 |
| | | | 50 | 3.5 | 1040 | 472 | 1800 | 816 | 3100 | 1406 | 4700 | 2132 | 6250 | 2835 | 8920 | 4046 | 9200 | 4173 |
| | | | 75 | 5.2 | 1440 | 653 | 2600 | 1179 | 4400 | 1996 | 6000 | 2722 | 9000 | 4082 | 11,000 | 4990 | 11,500 | 5216 |
| | | | 100 | 6.9 | 1800 | 816 | 3300 | 1497 | 5600 | 2540 | 8600 | 3901 | 10,700 | 4854 | 16,300 | 7394 | 17,100 | 7757 |
| 10 | 1.0 | 6492L, 6492H or 6492HT | 150 | 10.3 | 2350 | 1066 | 4500 | 2041 | 8000 | 3629 | 12,000 | 5443 | 17,000 | 7711 | 19,600 | 8891 | 20,200 | 9163 |
| | | | 200 | 13.8 | 2150 | 975 | 5100 | 2313 | 9200 | 4173 | | | | | | | | |
| | | | 35 | 2.4 | 710 | 322 | 1300 | 590 | 2100 | 953 | 2300 | 1043 | 3200 | 1452 | 4600 | 2087 | 4600 | 2087 |
| | | | 50 | 3.5 | 1040 | 472 | 1800 | 816 | 2950 | 1338 | 4550 | 2064 | 6200 | 2812 | 7700 | 3493 | 8100 | 3674 |
| | | | 75 | 5.2 | 1440 | 653 | 2650 | 1202 | 4300 | 1950 | 6300 | 2858 | 8900 | 4037 | 11,900 | 5398 | 12,200 | 5534 |
| | 1.4 | 6492L, 6492H or 6492HT | 100 | 6.9 | 1820 | 826 | 3400 | 1542 | 5450 | 2472 | 8100 | 3674 | 11,800 | 5352 | 16,100 | 7303 | 16,800 | 7620 |
| | | | 150 | 10.3 | 2600 | 1179 | 4800 | 2177 | 7800 | 3538 | 12,100 | 5489 | 16,900 | 7666 | 23,100 | 10,478 | 23,800 | 10,796 |
| | | | 200 | 13.8 | 3400 | 1542 | 6200 | 2812 | 10,200 | 4627 | | | | | | | | |
| | | | 50 | 3.5 | 1040 | 472 | 1800 | 816 | 2950 | 1338 | 4590 | 2082 | 6250 | 2835 | 7570 | 3434 | 7700 | 3493 |
| | | | 75 | 5.2 | 1440 | 653 | 2700 | 1225 | 4300 | 1950 | 6450 | 2926 | 9100 | 4128 | 11,000 | 4990 | 11,800 | 5352 |
| 20 | 2.1 | 6492H, 6492HT | 100 | 6.9 | 1820 | 826 | 3450 | 1565 | 5450 | 2472 | 8650 | 3924 | 11,900 | 5398 | 16,200 | 7348 | 16,900 | 7666 |
| | | | 150 | 10.3 | 2650 | 1202 | 4900 | 2223 | 7950 | 3606 | 12,300 | 5579 | 17,150 | 7779 | 23,500 | 10,660 | 24,100 | 10,932 |
| | | | 200 | 13.8 | 3450 | 1565 | 6400 | 2903 | 10,300 | 4672 | | | | | | | | |
| | | | 50 | 3.5 | 900 | 408 | 1650 | 748 | 2700 | 1225 | 4040 | 1833 | 5350 | 2427 | 7770 | 3524 | 8100 | 3674 |
| | | | 75 | 5.2 | 1440 | 653 | 2700 | 1225 | 4300 | 1950 | 6580 | 2985 | 8800 | 3992 | 12,000 | 5443 | 12,500 | 5670 |
| | 2.8 | 6492H, 6492HT | 100 | 6.9 | 1820 | 826 | 3450 | 1565 | 5450 | 2472 | 8400 | 3810 | 11,800 | 5352 | 19,000 | 8618 | 19,600 | 8891 |
| | | | 150 | 10.3 | 2650 | 1202 | 4900 | 2223 | 7950 | 3606 | 12,000 | 5443 | 17,000 | 7711 | 23,100 | 10,478 | 23,800 | 10,796 |
| | | | 200 | 13.8 | 3450 | 1565 | 6500 | 2948 | 10,300 | 4672 | 16,700 | 7575 | 22,650 | 10,274 | 30,600 | 13,653 | 30,600 | 13,880 |
| | | | 75 | 5.2 | 1250 | 567 | 2250 | 1021 | 3750 | 1701 | 4950 | 2245 | 7950 | 3606 | 10,800 | 4899 | 11,500 | 5216 |
| | | | 100 | 6.9 | 1820 | 826 | 3200 | 1452 | 5450 | 2472 | 8400 | 3810 | 11,800 | 5352 | 16,100 | 7303 | 17,000 | 7711 |
| 50 | 3.5 | 6492H, 6492HT | 150 | 10.3 | 2650 | 1202 | 4900 | 2223 | 7950 | 3606 | 12,200 | 5534 | 17,000 | 7711 | 23,100 | 10,478 | 24,000 | 10,886 |
| | | | 200 | 13.8 | 3450 | 1565 | 6500 | 2948 | 10,300 | 4672 | 15,695 | 7119 | 22,100 | 10,025 | 30,100 | 13,653 | 31,000 | 14,062 |
| | | | 250 | 17.2 | 4300 | 1950 | 8000 | 3629 | 12,900 | 5851 | | | | | | | | |
| | | | 80 | 5.5 | 1365 | 619 | 2300 | 1043 | 4080 | 1851 | 5500 | 2495 | 7700 | 3493 | 10,500 | 4763 | 11,000 | 4990 |
| | | | 100 | 6.9 | 1780 | 807 | 3100 | 1406 | 5300 | 2404 | 7880 | 3574 | 10,600 | 4808 | 14,200 | 5126 | 11,900 | 5398 |
| | 4.1 | 6492H, 6492HT | 150 | 10.3 | 2650 | 1202 | 4900 | 2223 | 7950 | 3606 | 12,300 | 5579 | 16,750 | 7598 | 22,700 | 10,297 | 23,000 | 10,433 |
| | | | 200 | 13.8 | 3450 | 1565 | 6500 | 2948 | 10,300 | 4672 | 16,400 | 7439 | 22,450 | 10,183 | 30,200 | 13,699 | 31,000 | 14,062 |
| | | | 250 | 17.2 | 4300 | 1950 | 8000 | 3629 | 12,900 | 5851 | | | | | | | | |
| | | | 100 | 6.9 | 1450 | 658 | 2600 | 1179 | 4350 | 1973 | 6270 | 2844 | 9250 | 4196 | 11,900 | 5398 | 12,300 | 5579 |
| | | | 150 | 10.3 | 2600 | 1179 | 4650 | 2109 | 7800 | 3538 | 11,700 | 5307 | 15,850 | 7190 | 21,400 | 9707 | 22,000 | 9979 |
| 80 | 5.5 | 6492H, 6492HT | 200 | 13.8 | 3450 | 1565 | 6500 | 2948 | 10,300 | 4672 | 15,600 | 7076 | 21,750 | 9866 | 29,600 | 13,427 | 30,200 | 13,699 |
| | | | 250 | 17.2 | 4300 | 1950 | 8000 | 3629 | 12,900 | 5851 | 19,300 | 8754 | 27,750 | 12,587 | 38,000 | 17,237 | 39,000 | 17,690 |
| | | | 300 | 20.7 | 5050 | 2291 | 9400 | 4264 | 15,100 | 6849 | | | | | | | | |
| | | | 125 | 8.6 | 1900 | 862 | 3300 | 1497 | 5700 | 2586 | 8470 | 3842 | 11,400 | 5171 | 14,400 | 6532 | 15,200 | 6895 |
| | | | 150 | 10.3 | 2490 | 1129 | 4350 | 1973 | 7450 | 3379 | 11,000 | 4990 | 14,900 | 6759 | 19,900 | 9027 | 20,500 | 9299 |
| | 6.9 | 6492H, 6492HT | 200 | 13.8 | 3450 | 1565 | 6250 | 2835 | 10,300 | 4672 | 15,700 | 7122 | 21,350 | 9684 | 28,700 | 13,018 | 29,100 | 13,200 |
| | | | 250 | 17.2 | 4300 | 1950 | 8000 | 3629 | 12,900 | 5851 | 20,100 | 9117 | 26,800 | 12,156 | 35,700 | 16,194 | 36,500 | 16,556 |
| | | | 300 | 20.7 | 5050 | 2291 | 9400 | 4264 | 15,100 | 6849 | | | | | | | | |

- Shaded areas show where maximum differential pressure is exceeded.

1. Standard pilot or combination of setting plus loading pressure or optional pilot.

- continued -

Type 92S

Table 5. Flow Capacities in Pounds per Hour / kg/h of Saturated Steam (continued)

| OUTLET PRESSURE SETTING ⁽¹⁾ | | PILOT TYPE NUMBER | INLET PRESSURE | | MAIN VALVE BODY SIZE, NPS / DN | | | | | | | | | | | | DROOP | | |
|--|------|-------------------------|-------------------|-------|--------------------------------|-------|------------|-------|--------|-------|------------|--------|--------|--------|---------|--------|--------|--------|--------|
| | | | | | 1 / 25 | | 1-1/2 / 40 | | 2 / 50 | | 2-1/2 / 65 | | 3 / 80 | | 4 / 100 | | | | |
| psig | bar | psig | bar | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | lbs/h | kg/h | | |
| 125 | 8.6 | 6492H, 6492HT | 140 | 9.7 | 1600 | 726 | 3100 | 1406 | 4800 | 2177 | 2586 | 9200 | 4173 | 13,100 | 5942 | 16,400 | 7439 | 16,900 | 7666 |
| | | | 150 | 10.3 | 1900 | 862 | 3650 | 1656 | 5700 | 2586 | 4287 | 14,600 | 6623 | 19,950 | 9049 | 27,000 | 12,247 | 28,000 | 12,701 |
| | | | 200 | 13.8 | 3150 | 1429 | 5750 | 2608 | 9450 | 4287 | 5851 | 19,500 | 8845 | 27,000 | 12,247 | 37,500 | 17,010 | 38,300 | 17,373 |
| | | | 250 | 17.2 | 4300 | 1950 | 8000 | 3629 | 12,900 | 5851 | 6849 | 23,800 | 10,796 | 32,500 | 14,742 | 44,300 | 20,094 | 45,100 | 20,457 |
| | | | 300 | 20.7 | 5050 | 2291 | 9400 | 4264 | 15,100 | 6849 | | | | | | | | | |
| 150 | 10.3 | 6492H, 6492HT | 175 | 12.1 | 2450 | 1111 | 4000 | 1814 | 7300 | 3311 | 10,000 | 4536 | 14,000 | 6350 | 19,100 | 8664 | 20,100 | 9117 | |
| | | | 200 | 13.8 | 3050 | 1383 | 5250 | 2381 | 9100 | 4128 | 13,400 | 6078 | 18,200 | 8256 | 30,800 | 13,971 | 31,000 | 14,062 | |
| | | | 250 | 17.2 | 4150 | 1882 | 7400 | 3357 | 12,400 | 5625 | 18,600 | 8437 | 25,750 | 11,680 | 34,100 | 15,468 | 35,200 | 15,967 | |
| | | | 300 | 20.7 | 5050 | 2291 | 9400 | 4264 | 15,100 | 6849 | 23,400 | 10,614 | 31,900 | 14,470 | 42,900 | 19,459 | 43,300 | 19,641 | |

- Shaded areas indicate where minimum differential pressure is not attained.

1. Standard pilot or combination of setting plus loading pressure or optional pilot.

Table 6. Noise Level Data in Decibels with Schedule 40 Downstream Piping and No Insulation⁽¹⁾

| P ₁ | | $\frac{\Delta P}{P_{1abs}}$ | PERCENTAGE OF MAXIMUM REGULATOR FLOW RATE | NOISE LEVEL, dBA | | | | | | | |
|----------------|-----|-----------------------------|--|---|--------------------|--|--------------------|--|--------------------|---|--------------------|
| | | | | NPS 2 / DN 50 Main Valve Body with 2 in. / 51 mm Downstream Piping | | NPS 2-1/2 / DN 65 Main Valve Body with 4 in. / 102 mm Downstream Piping | | NPS 3 / DN 80 Main Valve Body with 4 in. / 102 mm Downstream Piping | | NPS 4 / DN 100 Main Valve Body with 8 in. / 203 mm Downstream Piping | |
| psig | bar | | | Without Attenuator | With Attenuator | Without Attenuator | With Attenuator | Without Attenuator | With Attenuator | Without Attenuator | With Attenuator |
| 50 | 3.5 | 0.2 | 100 30 | 73 62 | 72 61 | 66 59 | 64 56 | 72 63 | 68 60 | 78 71 | 76 68 |
| | | 0.3 | 100 30 | 79 68 | 77 66 | 72 61 | 68 57 | 78 65 | 72 61 | 83 73 | 78 70 |
| | | 0.4 | 100 30 | 82 71 | 79 68 | 76 65 | 69 61 | 80 69 | 74 65 | 86 76 | 81 73 |
| | | 0.5 | 100 30 | 84 73 | 80 69 | 78 67 | 72 63 | 82 73 | 76 67 | 88 79 | 83 75 |
| | | 0.6 | 100 30 | 87 76 | 80 70 | 81 70 | 75 65 | 82 74 | 79 68 | 90 80 | 84 76 |
| | | 0.7 | 100 30 | 88 78 | 82 71 | 84 73 | 79 69 | 88 80 | 83 71 | 92 83 | 87 79 |
| 100 | 6.9 | 0.2 | 100 30 | 78 67 | 77 66 | 71 64 | 69 61 | 77 68 | 73 65 | 83 76 | 81 73 |
| | | 0.3 | 100 30 | 84 73 | 82 71 | 77 66 | 73 62 | 83 70 | 77 66 | 88 78 | 83 75 |
| | | 0.4 | 100 30 | 86 76 | 84 72 | 81 70 | 74 66 | 85 74 | 79 70 | 91 80 | 86 78 |
| | | 0.5 | 100 30 | 89 78 | 85 74 | 83 72 | 77 68 | 87 78 | 81 72 | 93 84 | 88 80 |
| | | 0.6 | 100 30 | 92 81 | 86 75 | 86 75 | 80 70 | 87 79 | 84 73 | 95 85 | 89 81 |
| | | 0.7 | 100 30 | 82 93 | 75 86 | 78 89 | 74 84 | 85 93 | 76 88 | 88 97 | 84 92 |

1. Overall noise levels determined at a point 39 in. / 991 mm downstream of the regulator outlet and 39 in. / 991 mm from piping surface.

- continued -

Table 6. Noise Level Data in Decibels with Schedule 40 Downstream Piping and No Insulation⁽¹⁾(continued)

| P ₁ | | $\frac{\Delta P}{P_{1abs}}$ | PERCENTAGE OF MAXIMUM REGULATOR FLOW RATE | NOISE LEVEL, dBA | | | | | | | |
|----------------|------|-----------------------------|---|--|-----------------|---|-----------------|---|-----------------|--|-----------------|
| | | | | NPS 2 / DN 50 Main Valve Body with 2 in. / 51 mm Downstream Piping | | NPS 2-1/2 / DN 65 Main Valve Body with 4 in. / 102 mm Downstream Piping | | NPS 3 / DN 80 Main Valve Body with 4 in. / 102 mm Downstream Piping | | NPS 4 / DN 100 Main Valve Body with 8 in. / 203 mm Downstream Piping | |
| psig | bar | Without Attenuator | With Attenuator | Without Attenuator | With Attenuator | Without Attenuator | With Attenuator | Without Attenuator | With Attenuator | Without Attenuator | With Attenuator |
| 250 | 17.2 | 0.2 | 100 30 | 84 73 | 81 71 | 78 71 | 76 68 | 84 75 | 80 72 | 90 83 | 88 80 |
| | | 0.3 | 100 30 | 90 80 | 85 77 | 84 73 | 80 69 | 90 77 | 84 73 | 95 85 | 90 82 |
| | | 0.4 | 100 30 | 93 82 | 88 78 | 88 77 | 81 73 | 92 81 | 86 77 | 98 88 | 93 85 |
| | | 0.5 | 100 30 | 95 85 | 91 80 | 90 79 | 84 75 | 94 85 | 88 79 | 100 91 | 95 87 |
| | | 0.6 | 100 30 | 98 88 | 92 82 | 93 82 | 87 77 | 94 86 | 91 80 | 102 92 | 96 88 |
| | | 0.7 | 100 30 | 101 89 | 94 83 | 96 85 | 91 81 | 100 92 | 95 83 | 104 95 | 99 91 |

1. Overall noise levels determined at a point 39 in. / 991 mm downstream of the regulator outlet and 39 in. / 991 mm from piping surface.

Ordering Information

When ordering, specify:

Application

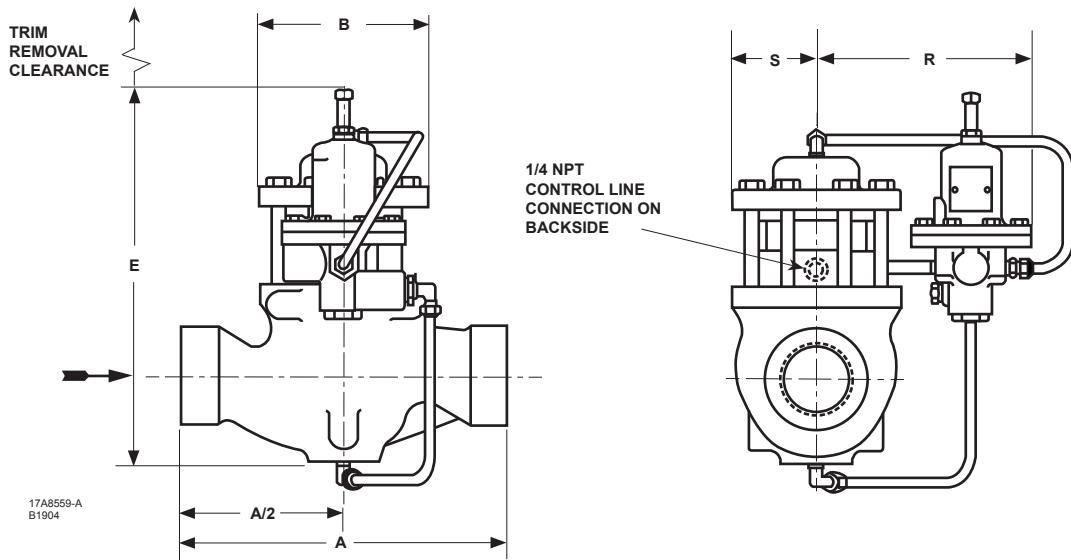
- Range of temperatures
- Range of inlet pressures (maximum, normal, minimum)
- Outlet pressure setting
- Range of flow rates (maximum, normal, minimum, controlled)
- Body size

Construction

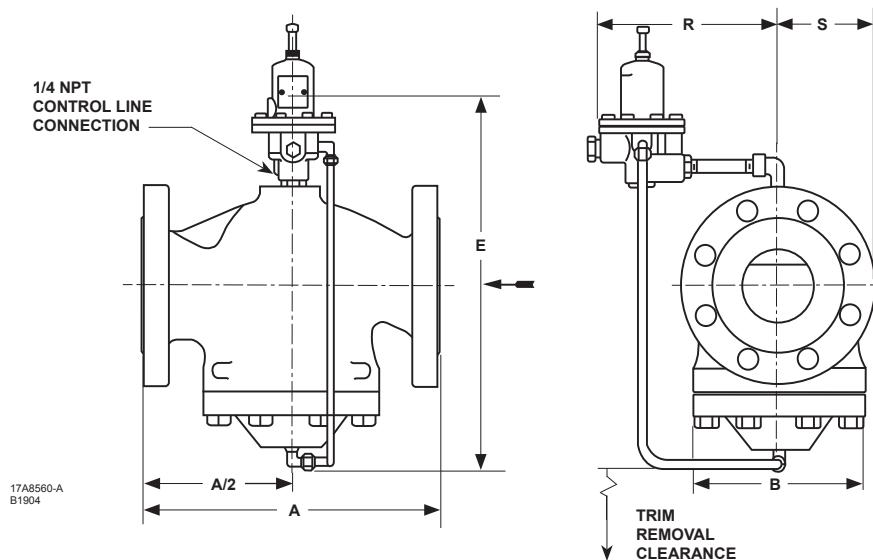
Refer to the Specifications section on page 2. Review the descriptions to the right of each specification and specify the desired choice wherever there is a selection to be made. If not otherwise specified, the pilot control spring is factory-set at the approximate mid-range.

Be sure to specify the type of regulator desired (standard pilot or pilot with optional tapped spring case). Refer to separate bulletins for information on loading regulators for use with pressure loaded pilots.

Type 92S



NPS 1, 1-1/2 OR 2 / DN 25, 40 OR 50 MAIN VALVE BODY



NPS 2-1/2, 3, 4 OR 6 x 4 / DN 65, 80, 100 OR 150 x 100 MAIN VALVE BODY

Figure 9. Dimensions

Table 7. Dimensions

| MAIN VALVE BODY SIZE | | DIMENSION | | | | | | | | | | | | | | | | | |
|----------------------|-----------|-----------|-------|------------------------------|-----|------------------------------|-----|-------|-----|-------------|-----|------------------------------|-----|------------------|-----|-------|-----|------------------------|-----|
| | | NPT | | A | | | | B | | E (Maximum) | | R | | | | S | | Trim Removal Clearance | |
| | | | | CL125 FF or CL150 RF Flanged | | CL250 RF or CL300 RF Flanged | | | | | | Types 6492H and 6492HT Pilot | | Type 6492L Pilot | | | | | |
| NPS | DN | In. | mm | In. | mm | In. | mm | In. | mm | In. | mm | In. | mm | In. | mm | In. | mm | In. | mm |
| 1 | 25 | 8.25 | 210 | 7.25 | 184 | 7.75 | 197 | 8.25 | 210 | 3.88 | 99 | 11.69 | 297 | 8.50 | 216 | 9.88 | 251 | 1.94 | 49 |
| 1/2 | 40 | 9.88 | 251 | 8.75 | 222 | 9.25 | 235 | 9.88 | 251 | 5.38 | 137 | 12.19 | 310 | 8.81 | 224 | 10.19 | 259 | 2.69 | 68 |
| 2 | 50 | 11.25 | 286 | 10.00 | 254 | 10.50 | 267 | 11.25 | 286 | 5.88 | 149 | 13.00 | 330 | 9.06 | 230 | 10.44 | 265 | 2.94 | 75 |
| 2-1/2 | 65 | ----- | ----- | 10.88 | 276 | 11.50 | 292 | 12.25 | 311 | 6.56 | 167 | 17.19 | 437 | 8.75 | 222 | 10.12 | 257 | 3.28 | 83 |
| 3 | 80 | ----- | ----- | 11.75 | 298 | 12.50 | 318 | 13.25 | 337 | 7.38 | 187 | 18.25 | 464 | 8.75 | 222 | 10.12 | 257 | 3.69 | 94 |
| 4 | 100 | ----- | ----- | 13.88 | 353 | 14.50 | 368 | 15.50 | 394 | 8.62 | 219 | 20.44 | 519 | 10.38 | 264 | 11.75 | 298 | 4.31 | 109 |
| 6 x 4 | 150 x 100 | ----- | ----- | 18.62 | 473 | 20.00 | 508 | 8.62 | 219 | 22.06 | 560 | 11.50 | 292 | 12.88 | 327 | 4.31 | 109 | 7.00 | 178 |

Ordering Guide

Body Size (Select One)

- NPS 1 / DN 25**
- NPS 1-1/2 / DN 40**
- NPS 2 / DN 50***
- NPS 2-1/2 / DN 65*
- NPS 3 / DN 80**
- NPS 4 / DN 100**
- NPS 6 x 4 / DN 150 x 100
(WCC Steel or Stainless steel with CL300 RF and CL600 RF only)*

Body and Body Flange Material and End Connection Style (Select One)

Cast Iron

- NPT***
- CL125 FF**
- CL250 RF**

WCC Steel

- NPT***
- CL150 RF**
- CL300 RF**
- CL600 RF**
- PN 16/25/40**

CF8M Stainless Steel

- NPT**
- CL150 RF*
- CL300 RF*
- CL600 RF*
- PN 16/25/40*

Tubing and Fittings (Select One)

- Copper tubing with brass fittings***
- Stainless steel tubing and fittings**

Pilot Bellows (Select One)

- Brass (standard)***
- 321 Stainless steel**

Regulators Quick Order Guide

| | |
|-----|--|
| *** | Readily Available for Shipment |
| ** | Allow Additional Time for Shipment |
| * | Special Order, Constructed from Non-Stocked Parts. Consult Your local Sales Office for Availability. |

Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.

Outlet Pressure Range (Select One)

Type 6492L Pilot

- 2 to 6 psig / 0.14 to 0.41 bar, Yellow***
- 5 to 15 psig / 0.35 to 1.0 bar, Green***
- 13 to 25 psig / 0.90 to 1.7 bar, Red***

Type 6492H Pilot

- 10 to 30 psig / 0.69 to 2.1 bar, Yellow***
- 25 to 75 psig / 1.7 to 5.2 bar, Green***
- 70 to 150 psig / 4.8 to 10.3 bar, Red***

Type 6492HT Pilot

- 15 to 100 psig / 1.0 to 6.9 bar, Unpainted***
- 80 to 250 psig / 5.5 to 17.2 bar, Unpainted***

Noise Attenuation Trim (Optional)

- Yes**

Replacement Pilot (Optional)

- Yes, send one replacement pilot to match this order.

Main Valve Replacement Parts Kit (Optional)

- Yes, send one main valve replacement parts kit to match this order.

Pilot Replacement Parts Kit (Optional)

- Yes, send one pilot replacement parts kit to match this order.

Steam Specification Worksheet

Application:

Tag Number: _____

Valve Type: Direct-Operated Pilot-Operated
 Pressure Loaded Differential

Body Material: Steel Iron Stainless Steel

Inlet/Outlet End Connection Style:

- CL150 RF Flange NPT
- CL300 RF Flange CL250 RF Flange
- PN 16/25/40 CL600 RF Flange

Inlet/Outlet Pipe Size: _____ In. / mm

Steam Conditions:

Inlet Pressure (psig/bar)

Inlet Temperature (°F/°C)

Outlet Pressure (psig/bar)

Flow (lbs/h or kg/hr)

| Maximum | Normal | Minimum |
|---------|--------|---------|
| | | |
| | | |
| | | |
| | | |

Performance Required:

Accuracy Requirements: ≤10% ≤20%
 ≤30% ≤40%

Type 92S

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 Fisher.com

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 LinkedIn.com/company/emerson-automation-solutions

 Twitter.com/emr_automation

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