

# Type 630 Big Joe<sup>®</sup> High-Pressure Regulator

The Type 630 Big Joe<sup>®</sup> regulators are direct-operated, spring-loaded, pressure reducing regulators. They are available in 1 or 2-inch (DN 25 or 50) body sizes, and they are designed for maximum inlet pressures to 1500 psig (103 bar) and outlet pressures from 3 to 500 psig (0,21 to 34,5 bar). The Type 630 can be used with natural gas, air, or a variety of other gases for such applications as first-stage farm-tap regulators or high-pressure industrial regulators. The Type 630 can be converted in the field to a relief valve or is available as the Type 630R relief valve/backpressure regulator; refer to the separate Type 630R Bulletin (71.4:630R) for information.

## Features

- **High-Pressure Capabilities**—Inlet pressures up to 1500 psig (103 bar) and control pressures up to 500 psig (34,5 bar).
- **Rugged Construction**—Compact, sturdy design and solid metal construction provide a strong, reliable, long-lasting regulator.
- **Better Low-Pressure Control**—The Type 630 is available in both high-pressure and low-pressure constructions; the low-pressure units have a larger diaphragm area to provide more accurate control of low-pressure settings.
- **Sour Gas Service Capability**—Optional materials are available for applications handling sour gases. These constructions comply with the recommendations of the National Association of Corrosive Engineers (NACE) MR0175.

The manufacturing processes and materials used by Fisher Controls assure that all products specified for sour gas service comply with the chemical and physical requirements of NACE standard MR0175.

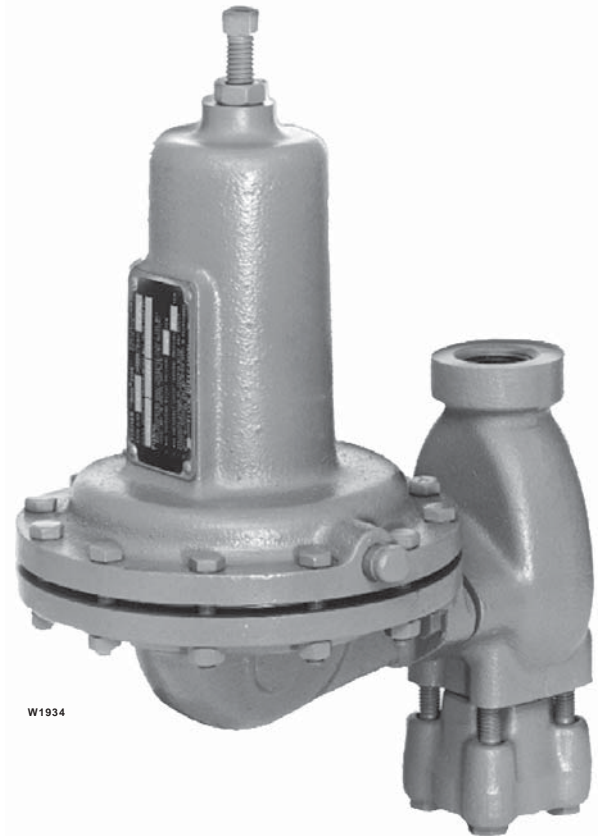


Figure 1. Type 630 Big Joe<sup>®</sup> High-Pressure Regulator

## Installation

These regulators may be installed in any position. Some installations may require a remote vent line. Protect all vent openings against the entrance of rain, snow, debris, or any other foreign material that may plug the opening.

Direction of flow through the regulator body must be in the direction indicated by the flow direction arrow found on the regulator body.

## Specifications

### Body Sizes

- 1-inch (DN 25) and ■ 2-inch (DN 50)

### End Connection Styles

- NPT Screwed, ■ ANSI Class 150, ■ 300, or ■ 600 raised-face flanges

### Maximum Inlet Pressure and Pressure Drop<sup>(1)</sup>

Up to 1500 psig (103 bar), See table 1

### Maximum Outlet Pressure<sup>(1)</sup>

Up to 500 psig (34,5 bar), See table 2

### Outlet Pressure Ranges

See table 3

### Pressure Registration

Internal

### Flow Capacities

See tables 4 and 5

### Orifice Sizes and Wide-Open Flow Coefficients for Relief Valve Sizing:

| ORIFICE SIZE       | $C_g$ | $C_v$ | $C_1$ |
|--------------------|-------|-------|-------|
| 1/8-inch (3,2 mm)  | 13.9  | 0.49  | 28.4  |
| 3/16-inch (4,8 mm) | 31.3  | 1.11  | 28.2  |
| 1/4-inch (6,4 mm)  | 55.1  | 2.03  | 27.2  |
| 3/8-inch (9,5 mm)  | 122.5 | 4.61  | 26.6  |
| 1/2-inch (12,7 mm) | 216.0 | 8.18  | 26.4  |

### Temperature Capabilities<sup>(1)</sup>

**Nitrile (NBR), Nylon (PA), and Neoprene (CR):**

-20° to 180°F (-29° to 82°C)

**Fluoroelastomer (FKM) and Teflon (TFE):**

0° to 300°F (-18° to 149°C)

### Construction Materials

**Body:** ■ Cast iron, or ■ steel

**Spring Case and Diaphragm Adaptor:** ■ Cast iron or ■ steel

**Orifice:** ■ Brass or ■ stainless steel

**Valve Disk:** ■ Nitrile (NBR), ■ nylon (PA), ■ teflon (TFE), or ■ fluoroelastomer (FKM)

**Valve Disk Holder:** ■ Brass or ■ stainless steel

**Valve Carrier:** ■ Zinc-plated brass or ■ stainless steel

**Diaphragm:** ■ Neoprene (CR) or ■ fluoroelastomer (FKM)

**Inlet Body Gaskets:** ■ Copper with brass trim or ■ stainless steel with stainless steel trim

**All Other Gaskets:** Composition

**Lever:** Zinc-plated steel

**Diaphragm Connector:** ■ Aluminum with brass trim or ■ stainless steel with stainless steel trim

**Pitot Tube:** Stainless steel

**Regulator Spring:** Plated steel

**Adjusting Screw:** Steel

**Diaphragm Plate:** Zinc-plated steel

**Upper Spring Seat:** Zinc

**Lower Spring Seat:** Zinc-plated steel (low-pressure) or ■ Zinc (high-pressure)

**Vent:** Y602-9

### Spring Case Vent

1/4-inch NPT screwed

### Options

- TFE diaphragm protector, ■ wire-seal adjusting screw, and ■ NACE

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

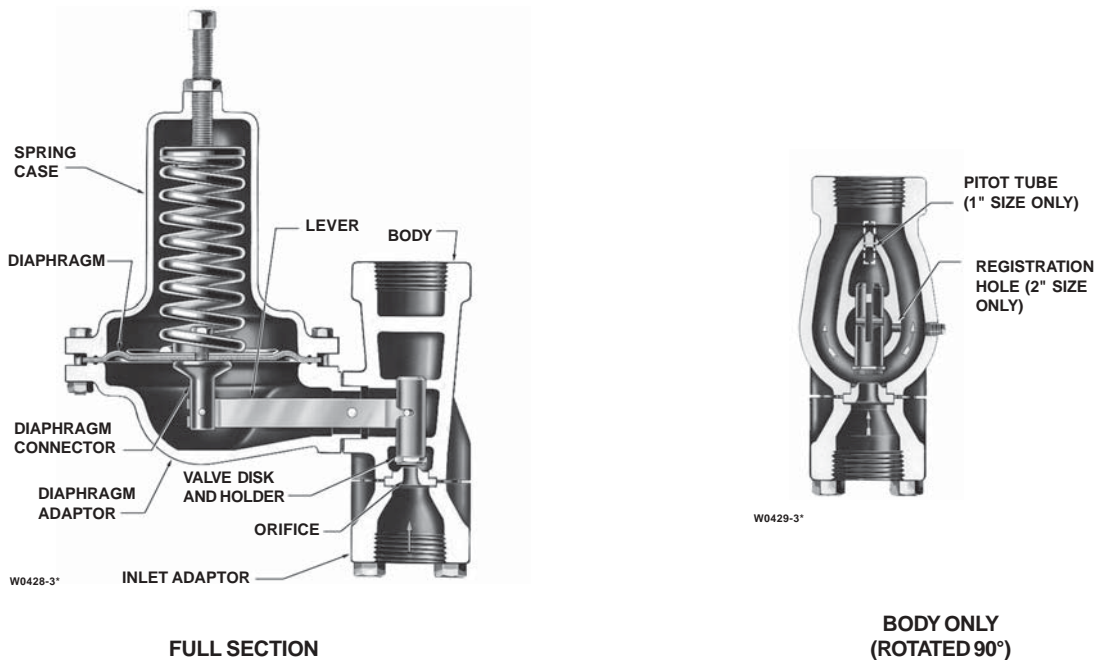


Figure 2. Type 630 Sectional Views

**Table 1. Maximum Pressure Drops. Maximum inlet pressure not to exceed 1500 psig (103 bar).**

| DISK MATERIAL               | ORIFICE SIZE, INCHES (mm) |            |            |            |
|-----------------------------|---------------------------|------------|------------|------------|
|                             | 1/8 & 3/16 (3,2 & 4,8)    | 1/4 (6,4)  | 3/8 (9,5)  | 1/2 (12,7) |
| Nylon (PA) and Teflon (TFE) | 1500 (103)                | 1000 (69)  | 500 (34,5) | 250 (17,2) |
| Nitrile (NBR)               | 600 (41,4)                | 600 (41,4) | 500 (34,5) | 250 (17,2) |
| Fluoroelastomer (FKM)       | 200 (13,8)                | 200 (13,8) | 200 (13,8) | 200 (13,8) |

**Table 2. Maximum Outlet Pressures**

| REGULATOR CONSTRUCTION | OUTLET PRESSURE RANGE, PSIG (bar) | SPRING PART NUMBER | MAXIMUM OPERATING OUTLET PRESSURE, PSIG (BAR) | MAXIMUM OUTLET PRESSURE OVER SETPOINT <sup>(1)</sup> , PSIG (bar) | MAXIMUM EMERGENCY OUTLET (CASING) PRESSURE, PSIG (bar) |
|------------------------|-----------------------------------|--------------------|---|---|--|
| Low-Pressure           | 3 to 10 (0,21 to 0,69)            | 0W019227022        | 10 (0,69)                                     | 20 (1,4)  | 66 (4,6)   |
|                        | 8 to 20 (0,55 to 1,4)             | 0W019127022        | 20 (1,4)                                      |   |  |
|                        | 17 to 30 (1,2 to 2,1)             | 0W019027022        | 30 (2,1)                                      |   |  |
|                        | 27 to 40 (1,9 to 2,8)             | 0Y0664000A2        | 40 (2,8)                                      |   |  |
| High-Pressure          | 27 to 50 (1,9 to 3,5)             | 0W019227022        | 50 (3,5)                                      | 200 (13,8)  | 550 (37,9)   |
|                        | 46 to 95 (3,2 to 6,6)             | 0W019127022        | 95 (6,6)                                      |   |  |
|                        | 90 to 150 (6,2 to 10,3)           | 0W019027022        | 150 (10,3)                                    |   |  |
|                        | 150 to 200 (10,3 to 13,8)         | 0Y0664000A2        | 200 (13,8)                                    |   |  |
|                        | 200 to 275 (13,8 to 19)           | 1J146927142        | 275 (19)                                      |   |  |
|                        | 275 to 500 (19 to 34,5)           | 1K370927082        | 500 (34,5)                                    | 200 <sup>(2)</sup> (13,8) <sup>(2)</sup>                          |  |

1. Damage to internal parts of the regulator may occur if outlet pressure exceeds the actual pressure setting by amounts greater than those shown in this column.  
 2. For outlet pressure settings to 350 psig (24,2 bar) only. For pressure settings over 350 psig (24,2 bar), outlet pressure is limited by maximum emergency outlet pressure of 550 psig (37,9 bar).

**Table 3. Outlet Pressure Ranges**

| REGULATOR CONSTRUCTION | OUTLET PRESSURE RANGE, PSIG (bar) | SPRING INFORMATION |               |                            |                          |
|------------------------|-----------------------------------|--------------------|---------------|----------------------------|--------------------------|
|                        |                                   | Part Number        | Color         | Wire Diameter, Inches (cm) | Free Length, Inches (cm) |
| Low-Pressure           | 3 to 10 (0,21 to 0,69)            | 0W019227022        | Red Stripe    | 0.23 (0,57)                | 6.0 (15,2)               |
|                        | 8 to 20 (0,55 to 1,4)             | 0W019127022        | Olive Drab    | 0.28 (0,71)                | 6.0 (15,2)               |
|                        | 17 to 30 (1,2 to 2,1)             | 0W019027022        | Unpainted     | 0.34 (0,86)                | 6.0 (15,2)               |
|                        | 27 to 40 (1,9 to 2,8)             | 0Y0664000A2        | Green Stripe  | 0.36 (0,92)                | 6.0 (15,2)               |
| High-Pressure          | 27 to 50 (1,9 to 3,5)             | 0W019227022        | Red Stripe    | 0.23 (0,57)                | 6.0 (15,2)               |
|                        | 46 to 95 (3,2 to 6,6)             | 0W019127022        | Olive Drab    | 0.28 (0,71)                | 6.0 (15,2)               |
|                        | 90 to 15 (6,2 to 10,3)            | 0W019027022        | Unpainted     | 0.34 (0,86)                | 6.0 (15,2)               |
|                        | 150 to 200 (10,3 to 13,8)         | 0Y0664000A2        | Green Stripe  | 0.36 (0,92)                | 6.0 (15,2)               |
|                        | 200 to 275 (13,8 to 19)           | 1J146927142        | Blue Stripe   | 0.38 (0,95)                | 6.1 (15,4)               |
|                        | 275 to 500 (19 to 34,5)           | 1K370927082        | Yellow Stripe | 0.44 (1,1)                 | 6.2 (15,7)               |

## Overpressure Protection

As is the case with most regulators, these regulators have an outlet pressure rating that is lower than the inlet pressure rating. Overpressure protection is needed if the actual inlet pressure can exceed the outlet pressure rating.

Regulator operation below the limits specified in tables 1 and 2 does not preclude the possibility of damage from external sources or from debris in the pipeline. The regulator should be inspected for damage after any overpressure condition.

## Capacity Data

Flow capacities are given in tables 4 and 5 in standard cubic feet per hour (scfh) and normal cubic meters per hour (m<sup>3</sup>/h(n)) of 0.6 specific gravity natural gas. To determine the equivalent flow rate for

other gases, multiply the table value by the appropriate factor: air—0.775; butane—0.548; nitrogen—0.789; propane—0.628.

To determine the wide-open capacity for relief sizing with the flow coefficients (C<sub>g</sub>), use the appropriate procedure below.

1. If flow is critical (absolute outlet pressure is equal to or less than one-half the absolute inlet pressure), use the equation:

$$\text{Flow} = (\text{Absolute Inlet Pressure}) (C_g) (1.29)$$

The flow determined will be in scfh of 0.6 specific gravity natural gas. To convert scfh to m<sup>3</sup>/h(n) multiply the scfh result by 0,0268.

2. If flow is less than critical (absolute outlet pressure is greater than one-half the absolute inlet pressure), use Fisher's computerized sizing program or contact your Fisher Sales Representative.