

Types 634 and 634M High-Pressure Shutoff Valves



W4128
TYPE 634M SHUTOFF VALVE WITH STANDARD PIPE PLUGS
IN BODY SIDE TAPPINGS



W4156-1
TYPE 634 SHUTOFF VALVE WITH OPTIONAL BLEED VALVE IN
UPSTREAM BODY SIDE TAPPING

Figure 1. Typical Constructions

Introduction

Types 634 and 634M high-pressure shutoff valves (Figure 1) serve to provide overpressure protection by containment. The Type 634 shutoff valve with internal registration is installed between a pressure-reducing regulator and a downstream system or equipment (Figure 2). The Type 634M shutoff valve with external registration requires a control line and is installed upstream of a pressure-reducing regulator (Figure 3).

Regulator outlet pressure registers on the side of the diaphragm opposite the fracture disk. An excessive rise in outlet pressure provides enough force on the diaphragm to drive the stem through the fracture disk. This lets the plug close, and stay closed until upstream and downstream pressure are relieved and a new fracture disk is installed.

Features

- **Overpressure Protection without Discharge of Gas or Liquid**—Under overpressure conditions, Types 634 and 634M shutoff valves stop the flow of gas or liquid rather than letting it vent to atmosphere.

- **Positive Shutoff**—After closing, shutoff valve stays closed until system is shutdown and fracture disk is replaced. Tight shutoff of elastomeric seat in plug assembly provides effective isolation.
- **Application Versatility**—Five different fracture disks are available to provide a choice of shatter pressure ranges.
- **Easy Maintenance**—Fracture disk, diaphragm, and plug assembly can be replaced without removing body from line or disconnecting control line. Optional bleed valves permit easy bleeding of trapped upstream and downstream pressure prior to disassembly.

Fracture Disk Information

The downstream pressure at which the fracture disk shatters depends on the unbalance between inlet and downstream pressure and can be determined from Figure 4. This shatter pressure is non-adjustable and can only be changed if the disk is changed (Type 634 shutoff valve), or if either the disk or inlet pressure is changed (Type 634M shutoff valve). Fracture disks are color coded to indicate their shatter pressure.

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Specifications

The Specifications section on this page provides the ratings and other specifications for the Types 634 and 634M. Factory specifications such as type, maximum inlet pressure, maximum temperature, maximum outlet pressure, spring range, and orifice size are stamped on the nameplate fastened on the regulator at the factory. The manufacture date and original fracture disk range are printed on the disk retainer.

Body Size and End Connection Style

3/4 or 1 NPT

Maximum Inlet Pressure⁽¹⁾

1500 psig / 103 bar

Maximum Body Outlet Pressure⁽¹⁾

Type 634: 150 psig / 10.3 bar

Type 634M: 1500 psig / 103 bar

Maximum Diaphragm Pressure⁽¹⁾

Operating: 150 psig / 10.3 bar

Emergency⁽²⁾: 225 psig / 15.5 bar

Outlet Pressure at which Fracture Disk Shatters

See Figure 4 and Table 1

Typical Capacities

See Table 2 and Capacity Information section

Wide-Open Flow Coefficients to Determine Capacities

NPS 3/4: C_g : 268, C_v : 7.37, C_f : 36.4

NPS 1: C_g : 319, C_v : 8.32, C_f : 38.3

Temperature Capabilities⁽¹⁾

-20⁽³⁾ to 180°F / -29⁽³⁾ to 82°C

Vent Connection

1/4 NPT with removable Type Y602-12 vent assembly

Downstream Pressure Registration Connection

Type 634: Internal

Type 634M: External through 1/4 NPT control line connection in the diaphragm case

Available Options

- One bleed valve in side tapping in upstream half of body or;
- Two bleed valves in side tappings in both upstream and downstream halves of body

Construction Materials

Body: WCC Steel

Casing and Fracture Disk: Cast Iron

Disk Retainer: Aluminum

Diaphragm: Neoprene (CR) and Nylon (PA) fabric

Plug Assembly: Aluminum and Nitrile (NBR)

O-rings: Nitrile (NBR)

Other Metal Parts: Steel and stainless steel

Approximate Weight

13 pounds / 6.0 kg

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

2. A pressure exceeding this value can cause failure of, or leakage from, pressure-containing components.

3. Low temperatures may stiffen elastomers and prevent normal shutoff.

The Type 634 shutoff valve has negligible unbalance because the downstream pressure is essentially the same as the inlet pressure during normal operation. Simply select the fracture disk of the appropriate color from Figure 4 according to the desired shatter pressure.

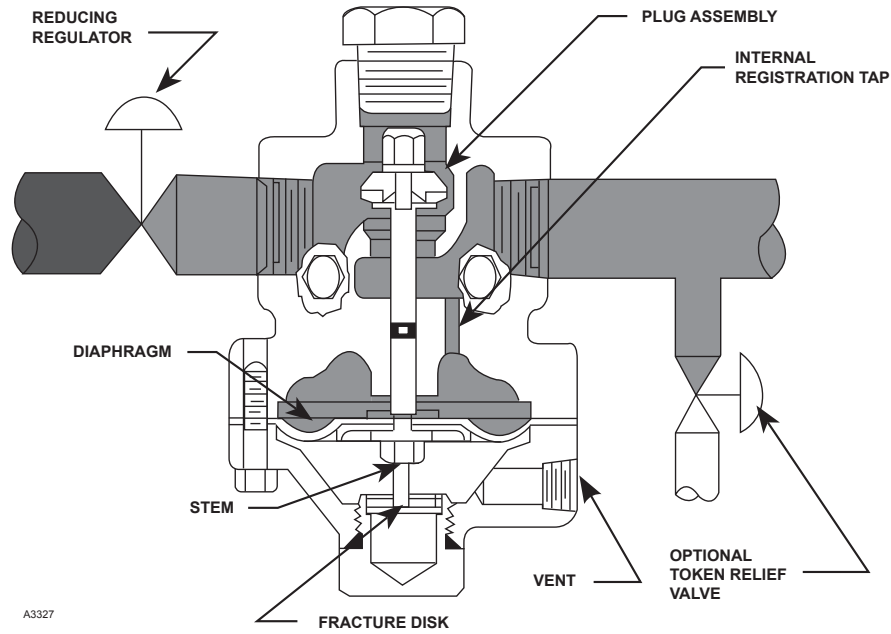
The Type 634M shutoff valve can have considerable unbalance, thus causing the shatter pressure to vary approximately 2 psig / 0.14 bar per every 100 psig / 6.9 bar of inlet pressure change. Select the fracture disk of the appropriate color from Figure 4 according to the desired shatter pressure in combination with the inlet pressure.

The lowest pressure of the fracture disk chosen must be higher than all normal operating pressures of the regulator and system being protected. Regulator pressure characteristics such as lockup, boost, and proportional band must be considered as part of normal operating pressures.

Installation

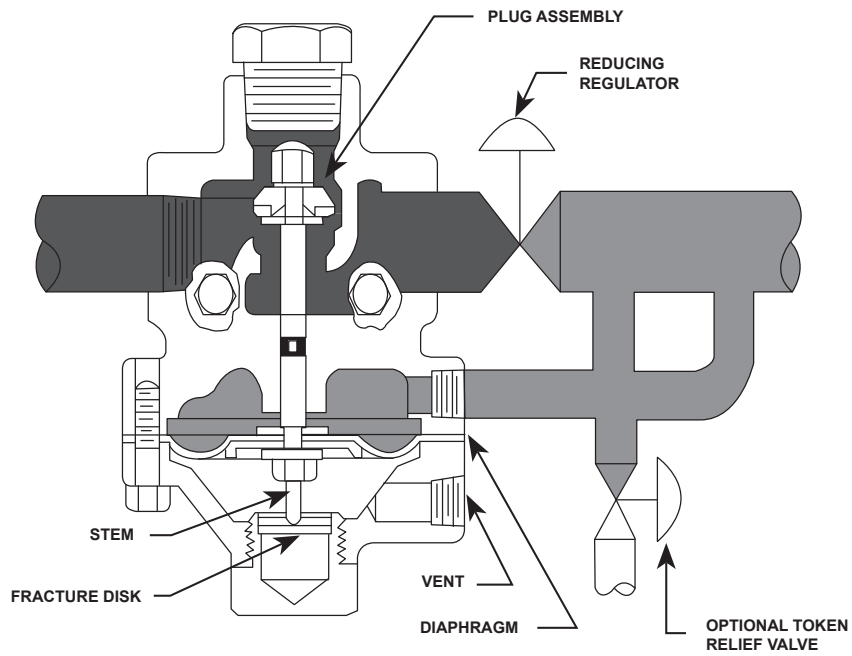
The Type 634 shutoff valve installation (Figure 2) does not shutoff inlet pressure to the upstream reducing regulator and thus does not provide overpressure protection to that regulator. Therefore, inlet pressure to the upstream reducing regulator must not exceed the maximum emergency outlet pressure rating of that regulator or 1500 psig / 103 bar, whichever is less.

The Type 634M shutoff valve installation (Figure 3) will shutoff flow to the downstream reducing regulator. Thus, inlet pressure to that regulator is limited by its maximum allowable inlet pressure rating or by the Type 634M maximum inlet pressure of 1500 psig / 103 bar, whichever is less.



INLET PRESSURE
 OUTLET PRESSURE

Figure 2. Type 634 Shutoff Valve Installation



INLET PRESSURE
 OUTLET PRESSURE

Figure 3. Type 634M Shutoff Valve Installation

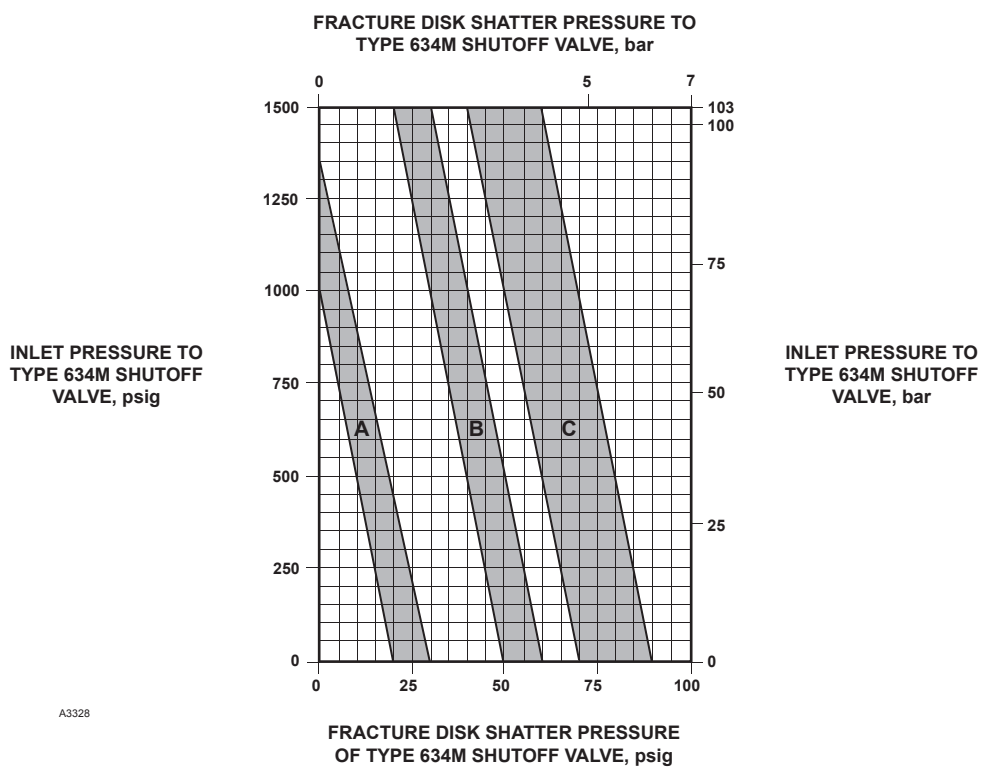


Figure 4. Fracture Disk Selection

Table 1. Fracture Disk Selection

SHATTER PRESSURE		FRACTURE DISK	
Type 634 Shutoff Valve	Type 634M Shutoff Valve	Color Code	Part Number
20 to 28 psig / 1.4 to 1.9 bar	20 to 28 psig / 1.4 to 1.9 bar at 0 psig / 0 bar inlet pressure; see curve A for other inlet pressures	Red	29A1936X012
50 to 60 psig / 3.4 to 4.1 bar	50 to 60 psig / 3.4 to 4.1 bar at 0 psig / 0 bar inlet pressure; see curve B for other inlet pressures	Yellow	29A1936X022
72 to 88 psig / 5.0 to 6.1 bar	72 to 88 psig / 4.9 to 6.1 bar at 0 psig / 0 bar inlet pressure; see curve C for other inlet pressures	White	29A1936X032

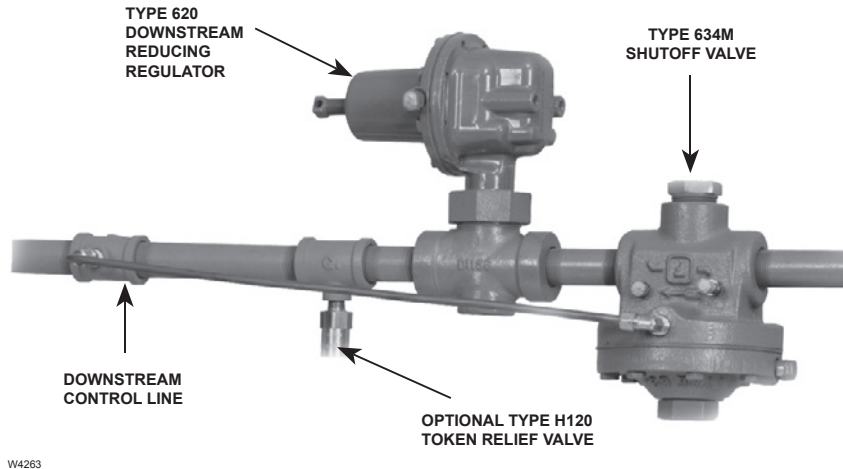


Figure 5. Typical Installation Showing Token Relief Valve

Table 2. Typical Capacities

INLET PRESSURE TO SHUTOFF VALVE		WIDE-OPEN PRESSURE DROP THROUGH SHUTOFF VALVE		FLOW IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS			
				3/4 NPT Body Size		1 NPT Body Size	
psig	bar	psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h
100	69.0	1	0.07	6000	161	7000	188
		5	0.34	13,000	348	15,000	402
		10	0.69	18,000	482	21,000	563
500	34.5	1	0.07	13,000	348	15,000	402
		5	0.34	29,000	777	34,000	911
		10	0.69	40,000	1072	46,000	1233
1000	69.0	1	0.07	18,000	482	21,000	563
		5	0.34	40,000	1072	46,000	1233
		10	0.69	56,000	1501	65,000	1742

Both types can be used along with a token relief valve (Figure 5) to minimize unnecessary shutoff. The relief valve is set to open before the Type 634 or 634M shutoff valve activates. This arrangement allows the relief valve to handle minor overpressure problems such as gas thermal expansion or seat leakage due to dirt moving through the system which may move out of the regulator during the next operating cycle. The shutoff valve does activate if the regulator has a major malfunction with excessive gas flow that exceeds the token relief capacity.

Dimensions are shown in Figure 6.

Capacity Information

Table 2 gives flow capacities at selected pressure drops across a wide-open Type 634 or 634M shutoff valve. Capacities are in SCFH (60°F and 14.7 psia) of 0.6 specific gravity natural gas at 60°F. To determine equivalent capacities for air, propane, butane, or nitrogen, multiply the listed capacity by the following appropriate conversion factor: 0.775 for air, 0.628 for propane, 0.548 for butane, or 0.789 for nitrogen. For gases of other specific gravities, multiply the given capacity by 0.775, and divide by the square root of the appropriate specific gravity. If the capacity is desired in normal cubic meters per hour (Nm³/h) at 0°C and 1.01325 bar, multiply SCFH by 0.0268.

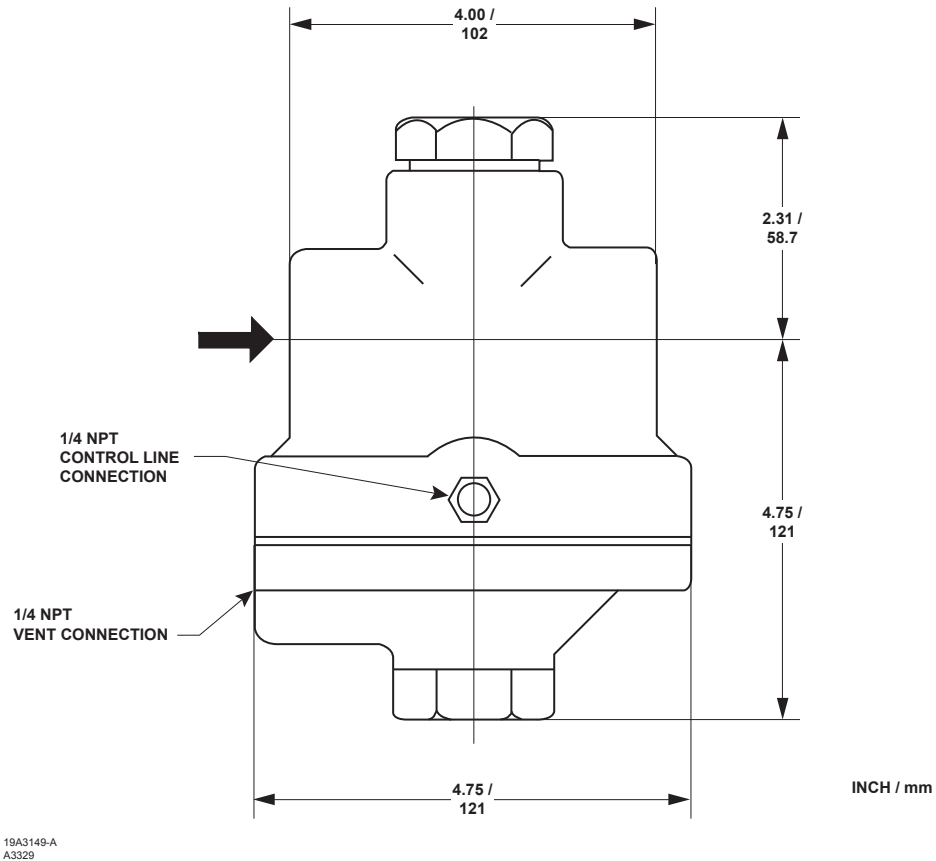


Figure 6. Outline Dimensions

Ordering Information

When ordering, complete the ordering guide on this page. Refer to the Specifications section on page 2. Review the description to the right of each specification and the information in each referenced table or figure. When ordering specify:

Application

- Controlled fluid
 - Composition (include chemical analysis, if available)
 - Temperature (normal, maximum anticipated, and minimum anticipated)
- Maximum inlet pressure
- Maximum flow rate required

Construction

Refer to the Specifications section on page 2. Review the description to the right of each specification and in the referenced table and figure. Specify the desired choice whenever there is a selection to be made. Always be sure to specify whether a Type 634 or 634M shutoff valve is desired.

Ordering Information (continued)

Ordering Guide

Body Size (Select One)

- 3/4 NPT
- 1 NPT

Type (Select One)

- 634
- 634M

Shatter Pressure (Select One)

- 20 to 28 psig / 1.4 to 1.9 bar, Red
- 50 to 60 psig / 3.4 to 4.1 bar, Yellow
- 72 to 88 psig / 4.9 to 6.1 bar, White

Bleed Valves (Optional)

- Inlet
- Inlet and Outlet

Regulators Quick Order Guide	
***	Standard - Readily Available for Shipment
**	Non-Standard - 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.	

Specification Worksheet

Application:
 Specific Use _____
 Line Size _____
 Gas Type and Specific Gravity _____
 Gas Temperature _____

Relief Valve Size:
 Brand of upstream regulator? _____
 Orifice size of the upstream regulator? _____
 Wide-open coefficient of the upstream regulator? _____

Pressure:
 Maximum Inlet Pressure (P_{1max}) _____
 Minimum Inlet Pressure (P_{1min}) _____
 Downstream Pressure Setting(s) (P_2) _____
 Maximum Flow (Q_{max}) _____

Performance Required:
 Accuracy Requirements? _____
 Need for Extremely Fast Response? _____

Other Requirements: _____

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