

627 Series Pressure Reducing Regulators

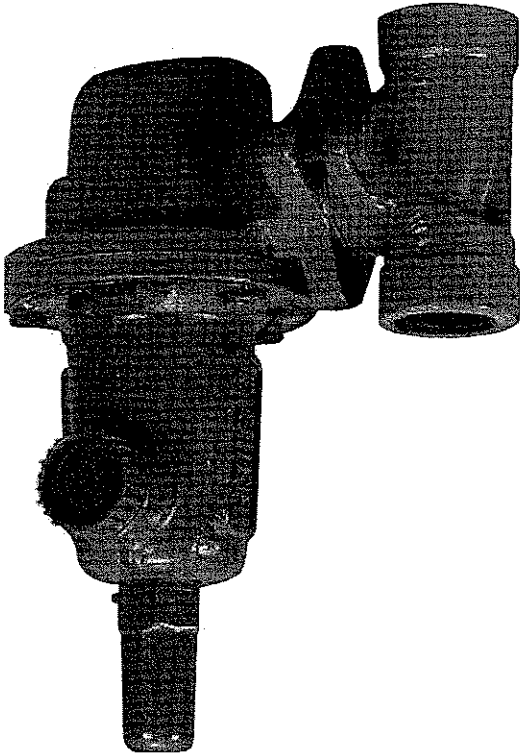


Figure 1. Typical 627 Series Self-Operated Pressure Reducing Regulator

Introduction

Scope of Manual

This manual provides instructions for the installation, Adjustment, Maintenance, and Parts Ordering for the 627 Series regulators. These regulators usually are shipped separate for line installation, although sometimes they are shipped installed on other equipment. Refer to the instruction manual for the other equipment for installation and operating instructions.

Specifications

The Specifications section gives some general nameplates (Figure 2) give detailed information for a particular regulator as it comes from the factory.

Description

The 627 Series self-operated pressure reducing regulators (Figure 1) are for high and low pressure systems. These regulators can be used with natural gas, air, or a variety of other gases. Performance characteristics vary according to construction.

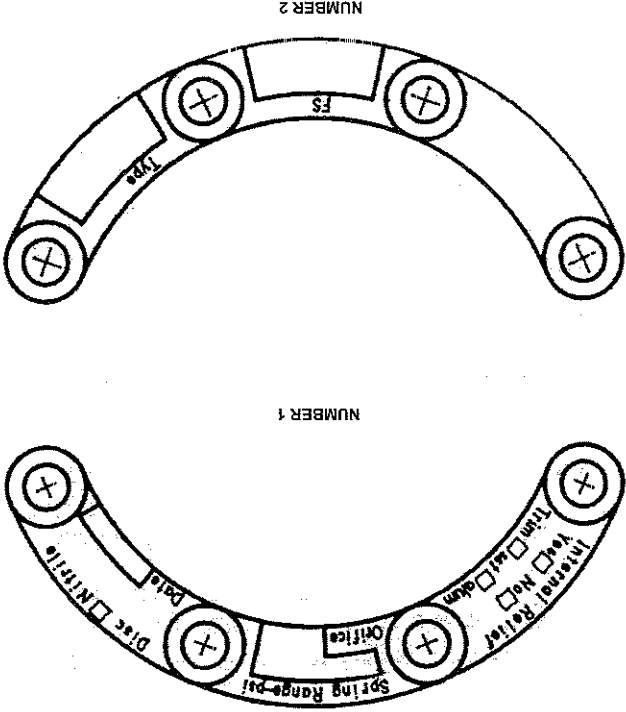


Figure 2. Nameplates



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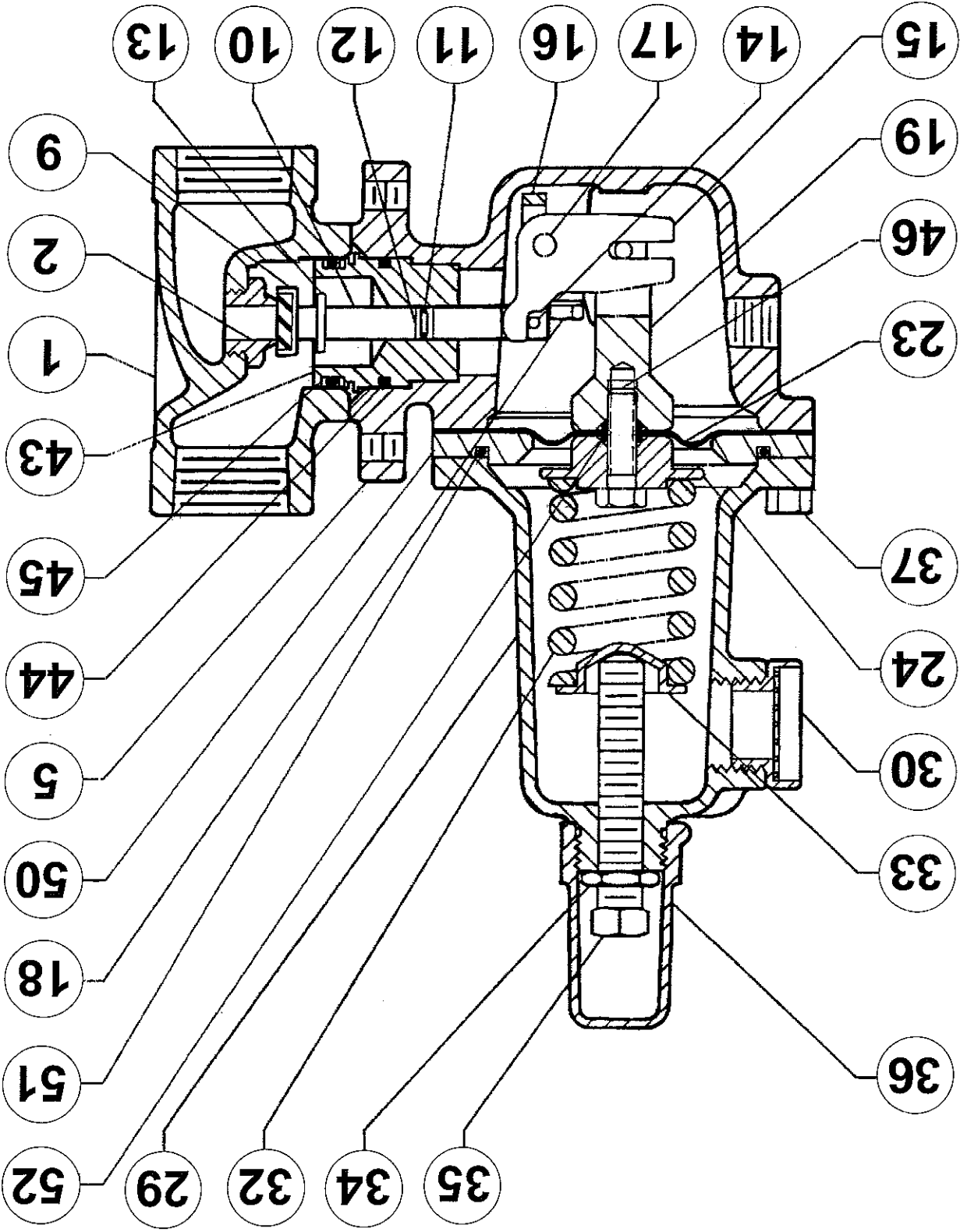
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Specifications

Available Constructions	
Type 627: Self-operated pressure reducing regulator equipped with a pilot tube for greater regulated capacities (Figure 7)	
Type 627R: Type 627 with internal relief and with an open throat (Figure 8)	
Type 627M: Type 627 with a stem seal between the body outlet pressure and diaphragm case. Pressure is measured under the diaphragm through the 1/4-inch NPT downstream control line connection (Figure 9).	
Type 627MR: Type 627M with internal relief (Figure 10).	
Type 627H: Type 627 with a diaphragm limiter to deliver a higher outlet pressure (Figure 11).	
Type 627HM: Type 627H with a stem seal between the body outlet pressure and diaphragm case. Pressure is measured under the diaphragm through two 1/4-inch NPT downstream control line connections (Figure 12).	
Body Sizes	
3/4, 1, or 2-inch body sizes: NPT	
1 or 2-inch (DN 25 or 50) body sizes: ANSI Class 300 or 600 RF flanged	
Maximum Inlet Pressure ⁽¹⁾ (Body Rating)	
2000 psig (138 bar) for NPT steel, 1480 psig (102 bar) for RF flanged steel, or 1000 psig (69 bar) for ductile iron	
Maximum Valve Disk Inlet Pressure Rating ⁽¹⁾	
2000 psig (138 bar) for nylon disk or 1000 psig (69 bar) for nitrile disk	
Maximum Operating Inlet Pressure, Pressure Differential, and Outlet Pressure Ranges ⁽¹⁾	
See Table 1 for pressures by port and spring range	
Internal Relief Performance	
Type 627R: See Table 3	
Type 627MR: Limited by field-installed control line piping	
Temperature Capabilities ⁽¹⁾	
Type 627, 627H or 627R: Internal	
Type 627M, 627HM or 627MR: External through 1/4-inch NPT control line connection in the diaphragm casing	
De-Icer System	
See Figure 3 and Type 627M Regulator De-Icer System Application section	
Relief Indicator	
For Types 627R and 627MR (see Figures 8 and 10)	
Spring Case Vent Connection	
3/4-inch NPT female with removable screened vent assembly	
Control Line Connection (Type 627M, 627HM or 627MR Only)	
1/4-inch NPT female	
Approximate Weight	
Ductile Iron or Steel Casings: 10 pounds (4.54 kg)	
Aluminum Casings: 6.3 pounds (2.86 kg)	

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



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Figure 12. Type 627HM Regulator Components

Table 1. Maximum Inlet Pressures, Differential Pressures, and Outlet Pressure Ranges

TYPE	OUTLET PRESSURE RANGE, SPRING PART NUMBER, AND COLOR	ORIFICE SIZE, INCHES (mm)	MAXIMUM INLET PRESSURE, PSIG (bar)	MAXIMUM DIFFERENTIAL PRESSURE, PSID (bar d)
627 and 627M ^(a)	Yellow 10B3076X012 5 ^(a) to 20 psig (0.34 to 1.38 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 500 (34.5) 300 (20.7) 250 (17.2)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 500 (34.5) 300 (20.7) 250 (17.2)
	Green 10B3077X012 15 to 40 psig (1.03 to 2.76 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7)	2000 (138) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7)
	Blue 10B3078X012 35 to 80 psig (2.41 to 5.52 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7) 200 (13.8)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7) 200 (13.8)
	Red 10B3079X012 70 to 150 psig (4.83 to 10.3 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7) 200 (13.8)	2000 (138) ^(a) 2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7) 200 (13.8)
627R and 627MR	Yellow 10B3076X012 5 ^(a) to 20 psig (0.34 to 1.38 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 500 (34.5) 300 (20.7) 200 (13.8)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 500 (34.5) 300 (20.7) 200 (13.8)
	Green 10B3077X012 15 to 40 psig (1.03 to 2.76 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7)	2000 (138) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7)
	Blue 10B3078X012 35 to 80 psig (2.41 to 5.52 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7) 200 (13.8)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7) 200 (13.8)
	Red 10B3079X012 70 to 150 psig (4.83 to 10.3 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7) 200 (13.8)	2000 (138) ^(a) 2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7) 500 (34.5) 300 (20.7) 200 (13.8)
627H and 627MH ^(a)	Blue 10B3078X012 140 to 250 psig (9.65 to 17.2 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7)
	Red 10B3079X012 240 to 500 psig (16.5 to 34.5 bar)	3/32 (2.38) 1/8 (3.18) 3/16 (4.76) 1/4 (6.35) 3/8 (9.53) 1/2 (12.7)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7)	2000 (138) ^(a) 2000 (138) ^(a) 1750 (121) ^(a) 1500 (103) ^(a) 1000 (69) ^(a) 750 (51.7)

1 For inlet pressure in excess of 1000 psig (69 bar), refer to the maximum body and disk pressure ratings in the Specifications section.
2 For pressure settings under 10 psig (0.69 bar), inlet pressure should be limited to approximately 100 psig (6.9 bar) so the setpoint adjustment can be obtained.
3 The unbalance forces change from the wide-open monitor mode to an active regulator mode such that the Type 627M or 627MH should have a 3/8-inch (9.53 mm) or larger orifice when used as a wide-open monitor.

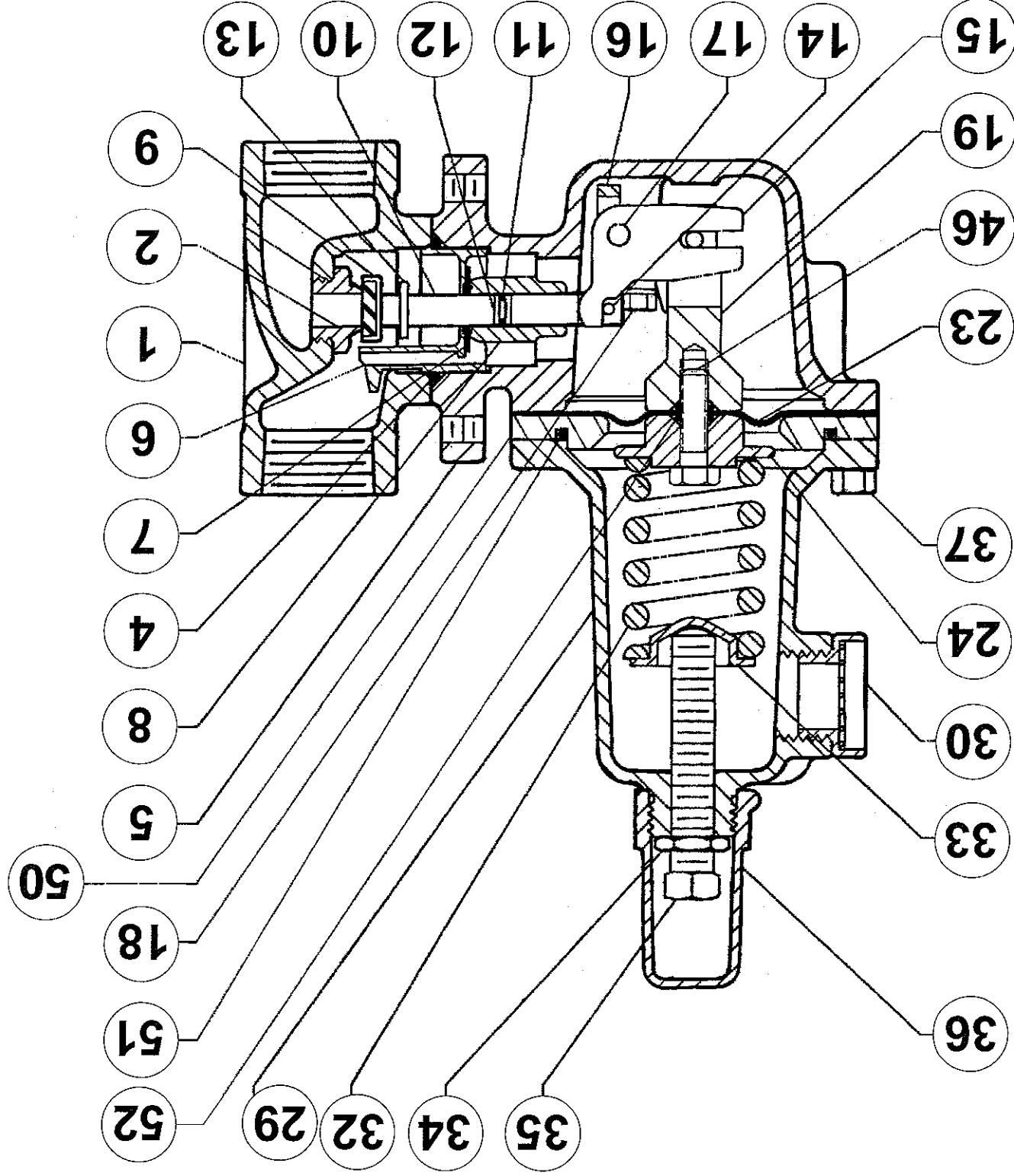


Figure 11. Type 627H Regulator Components

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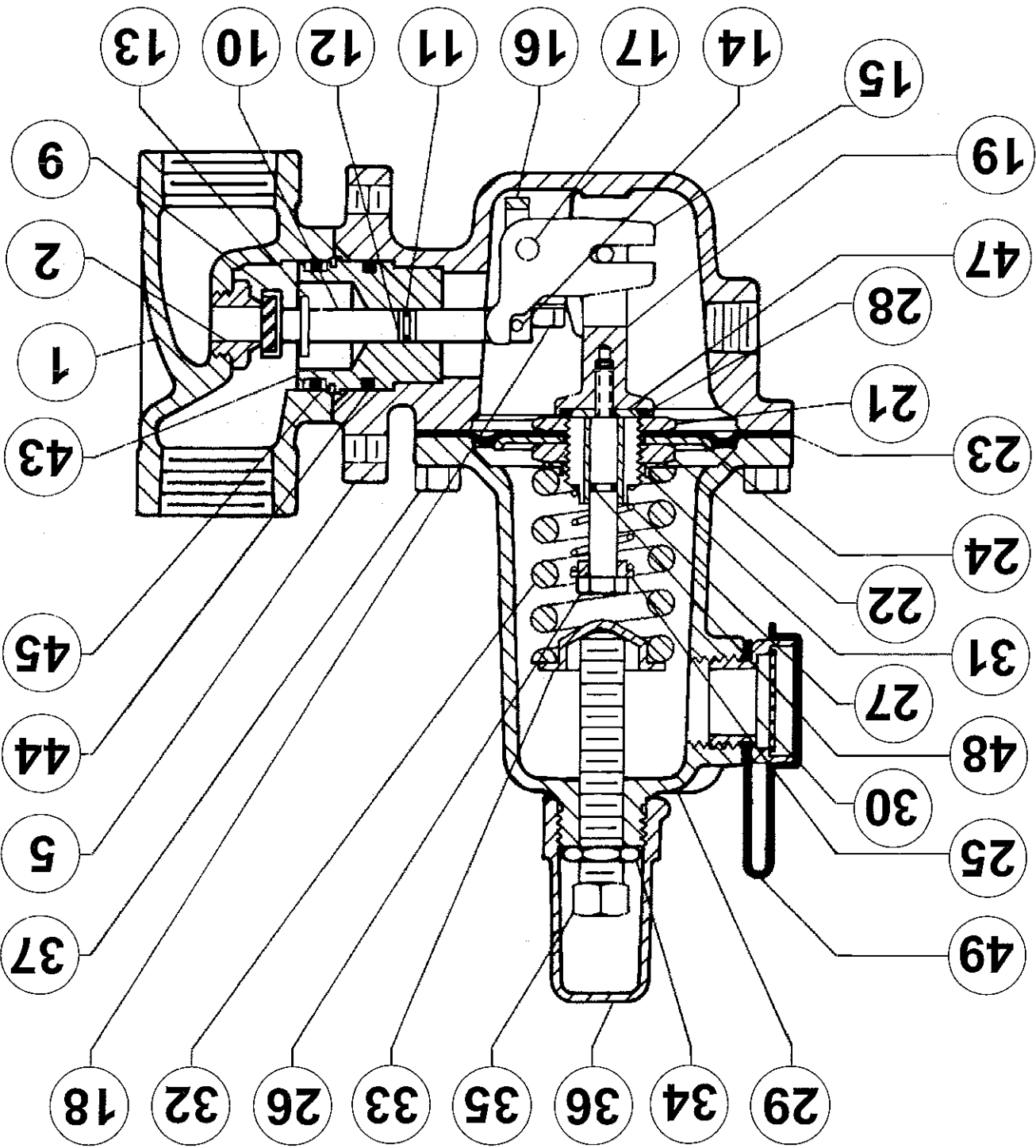


Figure 10. Type 627MR Regulator Components

Table 2. Maximum Spring and Diaphragm Casing Pressure⁽¹⁾

MAXIMUM PRESSURE DESCRIPTION	Maximum pressure to spring and diaphragm casings to prevent leak to atmosphere other than relief action (internal parts damage may occur)		Maximum pressure to spring and diaphragm casings to prevent burst of casings during abnormal operation (leak to atmosphere and internal parts damage may occur)		Maximum diaphragm casing overpressure (above setpoint) to prevent damage to internal parts	
	Die cast aluminum	Steel	Die cast aluminum	Ductile iron	Steel	All styles
SPRING AND DIAPHRAGM CASING STYLE	250 (17.2)	250 (17.2)	250 (17.2)	465 (32.1)	1500 (103)	60 (4.14)
TYPE 627, PSIG (bar)	250 (17.2)	250 (17.2)	375 (25.9)	465 (32.1)	1500 (103)	120 (8.27)
TYPE 627R, PSIG (bar)	250 (17.2)	250 (17.2)	375 (25.9)	465 (32.1)	1500 (103)	60 (4.14)
TYPE 627M, PSIG (bar)	250 (17.2)	250 (17.2)	Not Available	465 (32.1)	1500 (103)	120 (8.27)
TYPE 627MR, PSIG (bar)	Not Available	Not Available	Not Available	465 (32.1)	1500 (103)	120 (8.27)
TYPE 627H, PSIG (bar)	Not Available	Not Available	Not Available	465 (32.1)	1500 (103)	120 (8.27)

1. If the spring case is pressurized, a metal adjusting screw cap is required. Contact your Sales Representative.

this section are shown in Figures 7 through 12. Ensure that the operating temperature capabilities listed in Specifications section are not exceeded.

Like most regulators, 627 Series regulators have outlet pressure ratings that are lower than their inlet pressure ratings. A pressure-relieving or pressure-limiting device must be provided by the user for the Types 627, 627H, 627M, and 627HM regulators if the inlet pressure can exceed the outlet pressure rating, since these regulators do not have internal relief.

Type 627R regulators provide internal relief which limits the total outlet pressure buildup over setpoint. Use Table 3 to determine the total outlet pressure. This internal relief may be adequate for the application, if not, provide additional pressure relief or a pressure-limiting device downstream.

Note

If the regulator is shipped mounted on another unit, install that unit according to the appropriate instruction manual.

Perform steps 1 through 6 for all types of regulators:

1. Only personnel qualified through training and experience should install, operate, or maintain this regulator.
2. For a regulator that is shipped separately, make sure that there is no damage to, or foreign material in, the regulator.
3. Ensure that all tubing and piping have been blown free of foreign debris.
4. The regulator may be installed in any position as long as the flow through the body is in the direction indicated by the arrow cast on the body.
5. If continuous operation is required during inspection or maintenance, install a three-valve bypass around the regulator.

Personal injury, property damage, escaping gas or bursting of pressure-containing parts may result if this regulator is overpressured or is installed where service conditions could exceed the limits given in Specifications section, Tables 1, 2, and 3, or where conditions exceed any ratings of the adjacent piping or piping connections.

To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices (as required by the appropriate code, regulation, or standard) to prevent service conditions from exceeding those limits. The Type 627R or 627MR regulator with internal relief will provide downstream overpressure protection within the limits given in Specifications section, Tables 1, 2 and 3. If these limits are exceeded additional downstream overpressure protection must be provided by the user.

Additionally, physical damage to the regulator could cause personal injury or property damage due to escaping gas. To avoid such injury or damage, install the regulator in a safe location.

Regulator operation within ratings does not preclude the possibility of damage from debris in the lines or from external sources. A regulator should be inspected for damage periodically and after any overpressure condition. Key numbers referenced in

Installation

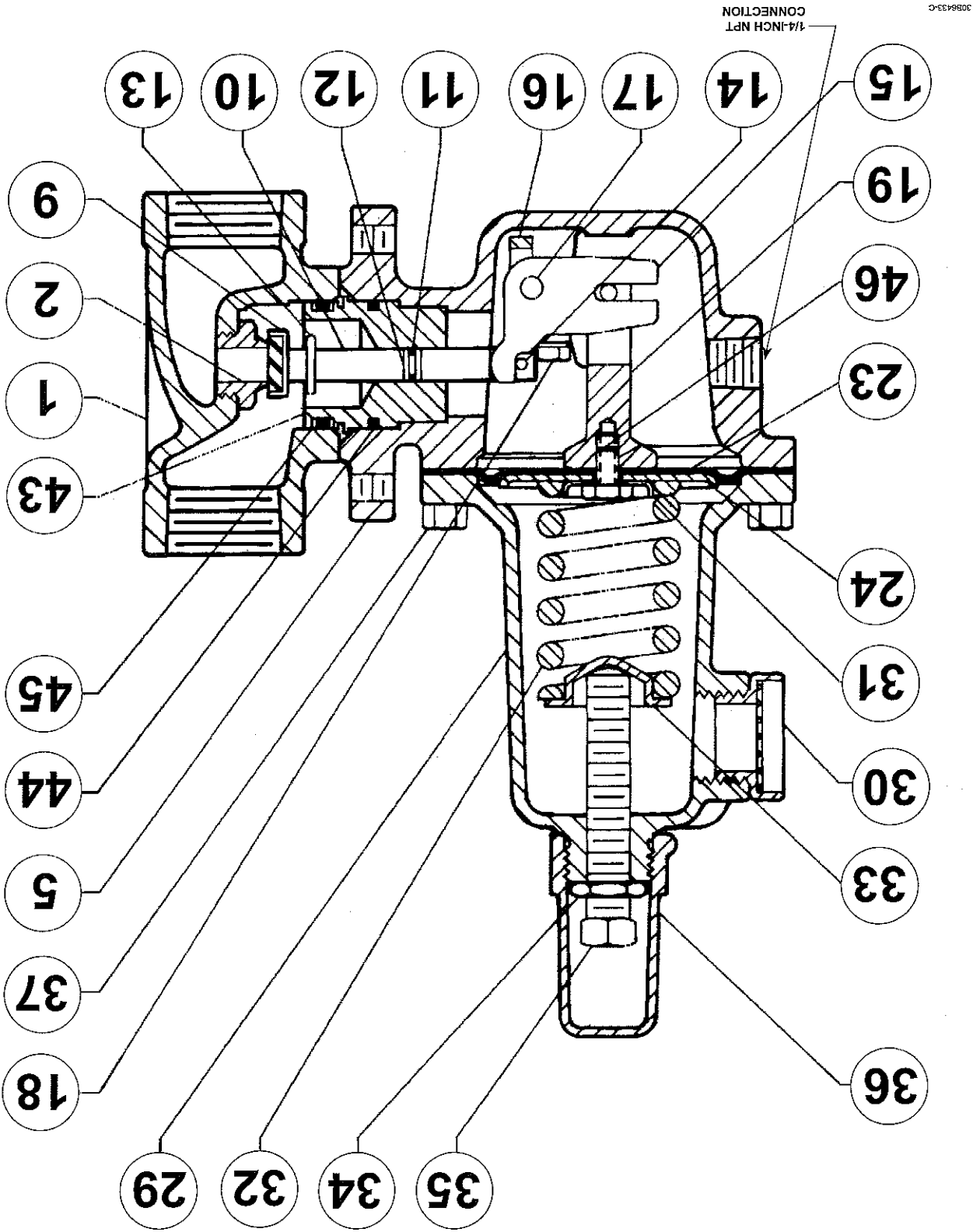


Figure 9. Type 627M Regulator Components

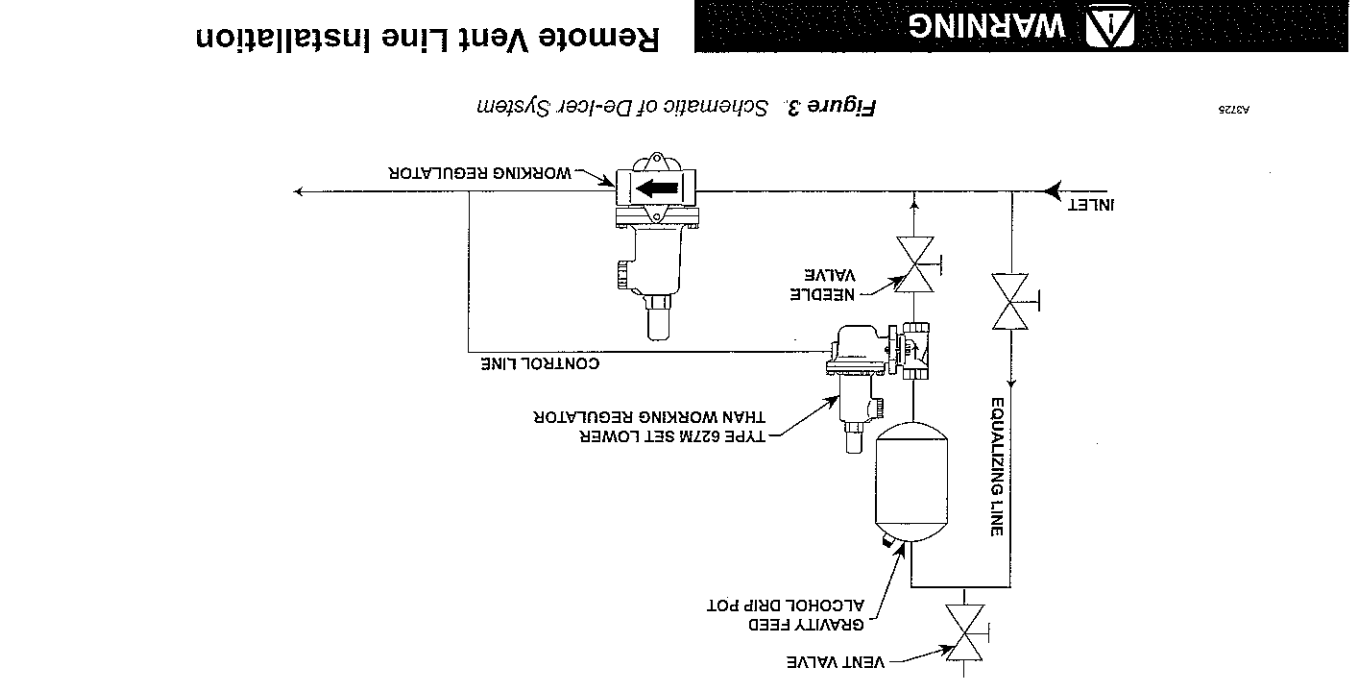


Figure 3. Schematic of De-Icer System

All 627 Series regulators have a vent assembly installed in the 3/4-inch threaded NPT spring case vent opening. The vent assembly can be removed to install a remote vent line if necessary. Remote vent lines must have the largest practical diameter. The vent line should be as short as possible with a minimum number of bends or elbows.

Protect the remote vent opening against entrance of rain, snow, or any other foreign material that may plug the vent or vent line and prevent proper operation of the regulator. Periodically check the vent opening to be sure it is not plugged with foreign debris.

Type 627M or 627HM Regulator De-Icer System Application

For the Type 627M or 627HM regulator de-icer system, refer to the application shown in Figure 3. With a large pressure drop across the working regulator, ice can form within this regulator. The formation of ice decreases the size of the port opening, so the regulator is unable to supply enough flow to satisfy the downstream demand.

- A regulator may vent some gas to the atmosphere. In hazardous or flammable gas service, vented gas may accumulate and cause personal injury, death, or property damage due to fire or explosion. Vent a regulator in hazardous gas service to a remote, safe location away from air intakes or any hazardous area. The vent line or stack opening must be protected against condensation or clogging.**
6. Position the body (key 1) and/or diaphragm spring case (key 29) so it will not collect moisture or debris into the screened vent. If the regulator requires repositioning, refer to the Body Area Maintenance Procedures and/or the Diaphragm and Spring Case Area Maintenance Procedures in the Maintenance section to reposition the screened vent for the application.
 7. A Type 627M, 627HM, or 627MR regulator requires a downstream control line. Install the control line before putting the regulator into operation.
 8. Ensure that the downstream control line piping is at least 3/8-inch (9.53 mm) or larger outside diameter tubing and connected to a straight section of outlet piping 10 diameters downstream of the regulator.
 9. A hand valve should be installed in the control line. This hand valve can be used to throttle down and dampen outlet pulsations in control pressure which may cause instability or cycling of the regulator.

When the downstream pressure falls below the outlet pressure setting of the Type 627M or 627HM regulator, the disk assembly of the Type 627M or 627HM regulator moves off its seat ring, permitting alcohol to flow into the main gas line. The alcohol carried to the main regulator by the flowstream prevents additional ice from forming on the seat ring. When normal flow resumes, and as pressure in the downstream system is restored, the Type 627M or 627HM regulator shuts off.

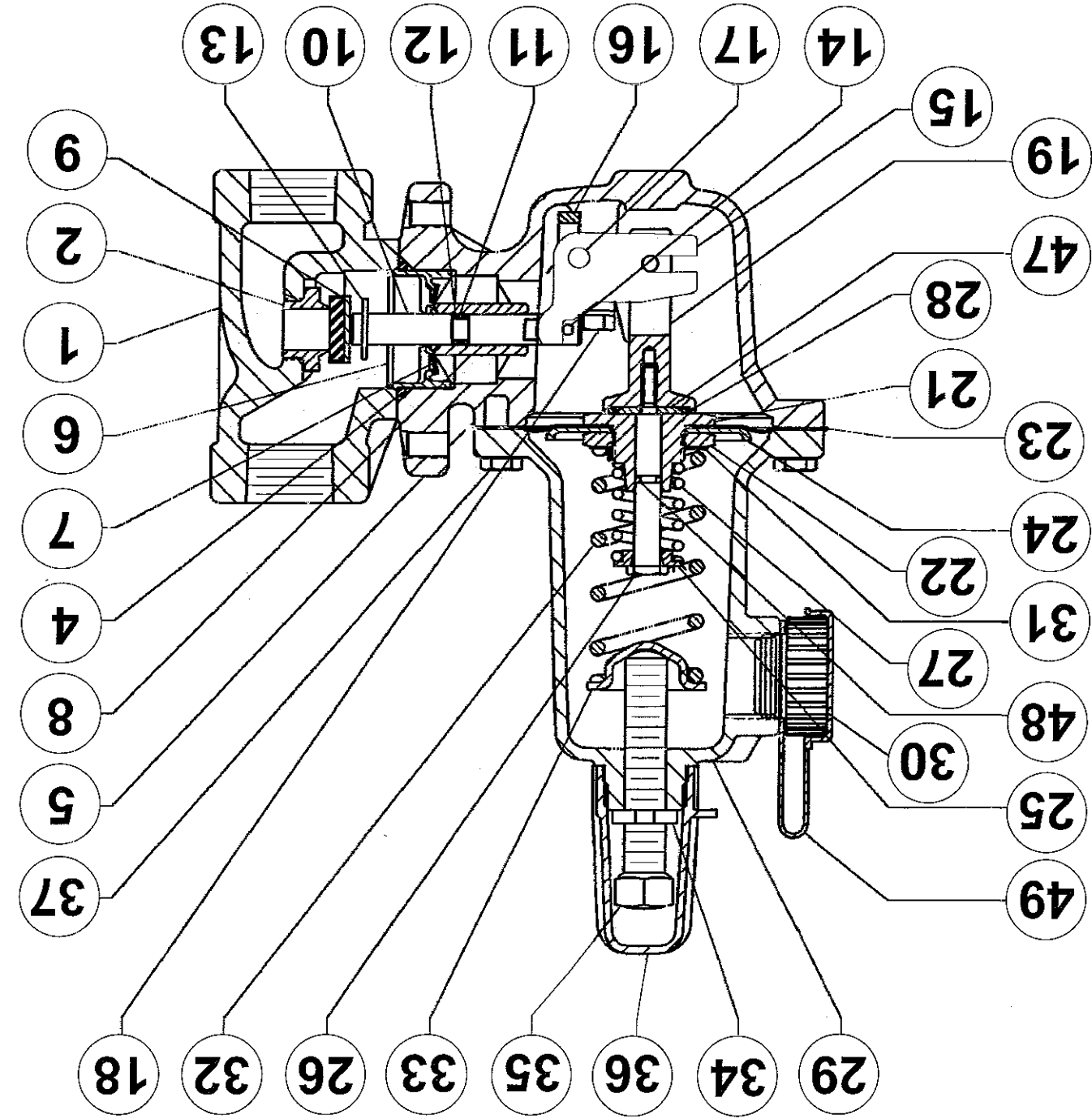


Figure 8. Type 627R Regulator Components

Table 3. Type 627R Internal Relief Performance^(a)

OUTLET PRESSURE RANGE, SPRING PART NUMBER, AND COLOR	OUTLET PRESSURE SETTING, PSIG (bar)	MAXIMUM ALLOWABLE PRESSURE, PSIG (bar)	MAXIMUM INLET PRESSURE TO KEEP MAXIMUM ALLOWABLE DOWNSTREAM SYSTEM PRESSURE FROM BEING EXCEEDED, PSIG (bar) ^(a)		Orifice Size, Inches (mm)	
			3/32 (2.38)	1/8 (3.18)	3/16 (4.76)	1/2 (12.7)
5 ^(b) to 20 psig (0.3 to 1.4 bar) Yellow	10 (0.7)	1250 (86.2)	740 (51.0)	320 (22.1)	190 (13.1)	95 (6.55)
		1000 (69.0)	620 (42.7)	260 (17.9)	170 (11.7)	90 (6.21)
		100 (6.9)	1400 (96.5)	610 (42.1)	370 (25.5)	170 (11.7)
		125 (8.6)	1900 (131)	830 (57.2)	480 (33.1)	220 (15.2)
	15 (1.0)	2000 (138)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		175 (12.1)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		200 (13.8)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		250 (17.2)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
	20 (1.4)	850 (58.6)	490 (33.8)	210 (14.5)	130 (8.96)	80 (5.52)
		2000 (138)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		1800 (124)	1800 (124)	1800 (124)	1800 (124)	1800 (124)
		2000 (138)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
15 to 40 psig (1.0 to 2.8 bar) Green	20 (1.4)	100 (6.9)	1200 (82.7)	550 (37.9)	330 (22.8)	160 (11.0)
		125 (8.6)	1700 (117)	760 (52.4)	450 (31.1)	210 (14.5)
		175 (12.1)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		200 (13.8)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
	30 (2.1)	250 (17.2)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		200 (13.8)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		175 (12.1)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		200 (13.8)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
	40 (2.8)	250 (17.2)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		200 (13.8)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		175 (12.1)	2000 (138)	2000 (138)	2000 (138)	2000 (138)
		200 (13.8)	2000 (138)	2000 (138)	2000 (138)	2000 (138)

- continued -

Startup and Adjustment

Startup



WARNING

To avoid personal injury or property damage due to explosion or damage to regulator or downstream components during startup, release downstream pressure to prevent an overpressure condition on the diaphragm of the regulator.

In order to avoid an overpressure condition and possible equipment

The range of allowable pressure settings is marked on the nameplate (Figure 2). If a pressure setting beyond this range is necessary, substitute the appropriate regulator control spring. Change the nameplate to indicate the new pressure range.

Adjustment

1. Slowly open the upstream shutoff valve during startup. damage, pressure gauges should always be used to monitor pressures
2. Slowly open the downstream shutoff valve.
3. Check all connections for leaks.
4. Make final control spring adjustments according to the adjustment procedures.

Table 3. Type 627R Internal Relief Performance⁽¹⁾ (continued)

OUTLET PRESSURE RANGE, SPRING PART NUMBER, AND COLOR	OUTLET PRESSURE SETTING, PSIG (bar)	MAXIMUM ALLOWABLE SYSTEM PRESSURE, PSIG (bar)	Office Size, inches (mm)		
			1/2 (12.7)	3/8 (9.53)	
			1/4 (6.35)	3/16 (4.76)	
35 to 80 psig (2.4 to 5.5 bar)	40 (2.8)	125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
60 (4.1)	40 (2.8)	125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
70 (4.8)	40 (2.8)	125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
80 (5.5)	40 (2.8)	125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
70 to 150 psig (4.8 to 10.3 bar) <td>40 (2.8)</td> <td>125 (8.6)</td> <td>150 (10.3)</td> <td>170 (11.7)</td> <td>140 (9.65)</td>	40 (2.8)	125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
100B3079X012 Red	40 (2.8)	125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
		125 (8.6)	150 (10.3)	170 (11.7)	140 (9.65)
1 The internal relief performance values are obtained by removing the disk assembly.					
2 For inlet pressures in excess of 1000 psig (69.0 bar), refer to the maximum body and disk pressure ratings in the Specifications section.					
3 For pressure settings under 10 psig (0.69 bar), inlet pressure should be limited to approximately 100 psig (6.9 bar) so the setpoint adjustment can be obtained.					
Shaded areas indicate maximum inlet pressures allowed during system malfunction only. Table 1 gives the maximum inlet pressure for normal regulator operation.					

- Before increasing the setting, refer to Table 1, 2, or 3. Review the pressure limits for the control spring range being used and be certain that the new pressure setting will not result in an overpressure condition.
4. When the desired pressure is obtained, hold the adjusting screw (key 35) in place and tighten the locknut (key 34).

Note

Always use a pressure gauge to monitor pressure when making adjustments.

Refer to Figures 7 through 12 for key number locations.

1. Remove the adjusting screw cap (key 36).
2. Loosen the locknut (key 34).
3. Increase the outlet pressure setting by turning the adjusting screw (key 35) clockwise. Decrease the outlet pressure setting by turning the adjusting screw counterclockwise.

To avoid personal injury or property damage due to explosion or damage to regulator or downstream components during shutdown, release downstream pressure to prevent an overpressure condition on the diaphragm of the regulator.



WARNING

Shutdown

Figure 7. Type 627 Regulator Components

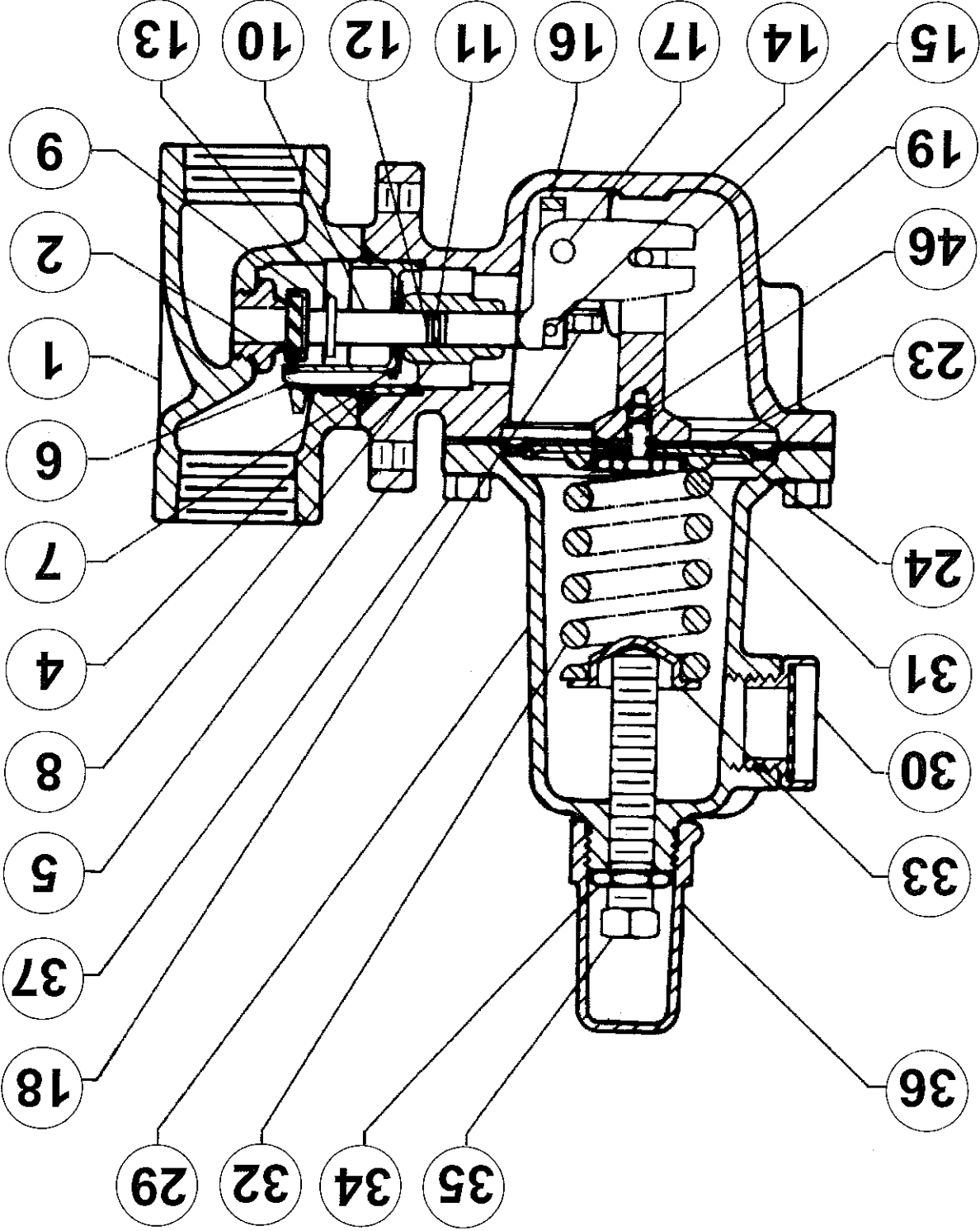


Table 4. Maximum Torque Values

KEY NUMBER ^(a)	DESCRIPTION	MAXIMUM TORQUE, FOOT-POUNDS (N·m)
2	Seat ring	25 (34)
3	Cap screw (with aluminum diaphragm casing)	16 (22)
18	Lever cap screw	7 (9)
22	Diaphragm connector nut	17 (23)
26	Guide retainer (for Types 627R and 627MR only)	3 (4)
37	Spring case cap screw (with aluminum or ductile iron diaphragm casing)	7 (9)
46	Diaphragm cap screw (with Type 627H or 627MH)	14 (19)
1. Refer to Figures 7 through 12 for key number locations.		

1. Close the nearest upstream shutoff valve.

2. Close the nearest downstream shutoff valve.

3. Open the vent valve between the regulator and the downstream shutoff valve nearest to it.

4. For a Type 627, 627H, or 627R regulator, the regulator will open to release pressure between the upstream shutoff valve and the regulator.

5. A Type 627M, 627HM, or 627MR regulator requires venting the control line and downstream pressure from the regulator before maintenance. The pressure between these shutoff valves is released through the open regulator because the disk assembly remains open in response to the decrease in control line pressure.

Maintenance

Unless otherwise specified, the following maintenance procedures apply to all types of regulators. For a summary of maximum torque values required for all types of regulators, refer to Table 4.

Due to normal wear, damage from external sources, or debris in the air or gas line, regulator parts such as the disk assembly, seat ring, and diaphragm must be inspected periodically and replaced as necessary to ensure correct performance. The frequency of inspection and replacement depends upon the severity of conditions and the requirements of state and federal laws. Normal wear of the seat ring and disk assembly is accelerated with high pressure drops and with large amounts of impurities in the flowstream. Instructions are given below for replacing the disk assembly, seat ring, diaphragm, and O-rings. These procedures may also be used for disassembly required for inspection and replacement of other parts.

Problem Indication for Types 627R and 627MR Regulators



WARNING

Isolate the regulator from all pressure to avoid personal injury and equipment damage due to explosion or sudden release of process pressure. Cautiously release pressure from the regulator before attempting disassembly.

The vent assembly is equipped with a relief indicator (key 49, Figure 4). The cap for the relief indicator snaps over the vent assembly opening. If the relief valve opens wide, exhaust gas pops the cap off the screen vent assembly opening indicating a problem with the regulator. If the cap pops off, refer to the shutdown and to the Body Area Maintenance Procedures to inspect the disk assembly and seat ring. If the disk assembly and seat ring are not damaged, refer to the Diaphragm and Spring Case Area Maintenance Procedures in this section.

The disk assembly and seat ring can be inspected, removed, and replaced without removing the regulator body from the line connections. Refer to the Body Area Maintenance Procedures.

Body Area Maintenance Procedures

These procedures are for gaining access to the disk assembly, seat ring, diaphragm casing O-ring and stem assembly. All pressure must be released from the diaphragm casing before performing these steps.

While using the following procedures, refer to

Figures 7 through 12 for key number locations.

Part Number Key Description

10B7450X012	26	Guide Retainer (for Type 627R or 627MR only), Stainless steel
10B6757X012	27	Relief Spring (for Type 627R or 627MR only), Plated steel
10B8757X012	28*	Relief Seal O-Ring (for Type 627R or 627MR only), Nitrile
11J08506992	29	Spring Case (for Type 627 or 627R)
40B3086X012		Aluminum
30B3056X012		Ductile iron
30B3102X012		Steel
30B3055X012		For Type 627M or 627MR
30B3102X012		Steel
30B3102X012		For Type 627H or 627HM
30B3102X012	30	Screened Vent Assembly, Plastic
10B3093X012		Steel
1D666265072	31	Lower Spring Seat, Plated steel
10B3076X012		For Type 627 or 627MR
20B3073X012	32	Control Spring, Plated steel
10B3076X012		5 to 20 psig (0.34 to 1.38 bar), yellow
10B3077X012		15 to 40 psig (1.03 to 2.76 bar), green
10B3078X012		35 to 80 psig (2.41 to 5.52 bar), blue
10B3079X012		70 to 150 psig (4.83 to 10.3 bar), red
10B3079X012		140 to 250 psig range (9.65 to 17.2 bar)
10B3079X012		240 to 500 psig range (16.5 to 34.5 bar)
10B3079X012	33	Upper Spring Seat, Plated steel
1D667125072	34	Locknut, Plated steel
1D667728982	35	Adjusting Screw, Plated steel
10B3081X012		For Type 627 or 627M
10B3081X012		For Type 627H or 627HM
10B3081X012		For Type 627R or 627MR
10B3080X012	36	Adjusting Screw Cap, Plastic
20B3082X012	37	Spring Case Cap Screw, Plated steel (8 required)
1A391724052		For aluminum or ductile iron diaphragm case
10B8737X012		For steel diaphragm case
1A346424052	39	Nameplate
10B3085X012	43	Blocked Throat (for Type 627M 627HM or 627MR only), Stainless steel
1E264306992	44	Blocked Throat O-Ring (for Type 627M, 627HM, or 627MR only), Nitrile (2 required)
10B3106X012	45	Blocked Throat Backup Ring (for Type 627M 627HM, or 627MR only), TFE (2 required)
1K920724052	46	Diaphragm Head Cap Screw, Steel
1C379124052	47	Relief Seal Retainer (for Type 627R or 627MR only), Stainless steel
10B7445X012	48*	Guide Retainer O-Ring (for Type 627R or 627MR only), Nitrile
1D682506992	49	Relief Indicator (for Type 627R or 627MR only), Rubber (not shown)
30B3100X012	50	Diaphragm Limiter
1K877606992	51*	Diaphragm Limiter O-Ring
1C853806992	52*	Pusher Post O-Ring (2 required)

^aRecommended spare part.
2 Delrin™ is a mark owned by E. I. du Pont de Nemours Co.

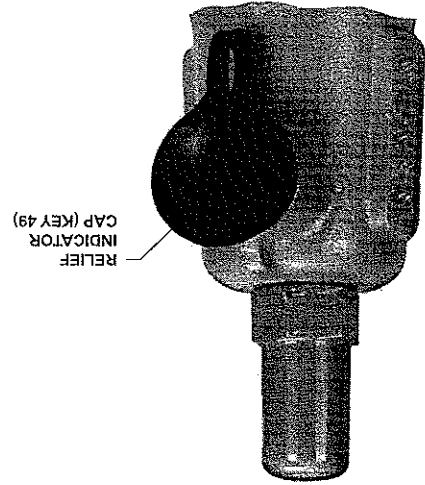


Figure 4. Relief Indicator

Replacing the Disk Assembly or Seat Ring

- 1. To inspect and replace the disk assembly (key 9) or seat ring (key 2), remove the cap screws casing (key 3, Figure 5), and separate the diaphragm ring (key 2). If removed, coat the threads of the replacement seat ring with lubricant and torque to 25 foot-pounds (34 N•m).
- 3. Inspect the disk assembly and, if necessary, remove the hair pin clip (key 13) that holds the disk assembly in place. If replacing the disk assembly is the only maintenance required, skip to step 16.

Replacing the Stem Assembly

If it is necessary to perform maintenance on the stem through 19 for Types 627M, 627H, and 627MR regulators, continue with steps 4 through 8 and 15 assembly, through 19 for Types 627, 627H, and 627MR regulators, or steps 9 through 19 for Types 627M, 627HM, and 627MR regulators.

Perform steps 4 through 8 for Types 627, 627H, and 627R Regulators only:

- 4. Types 627, 627H, and 627R regulators (Figure 5), use steps 5 through 8 to remove and replace the stem assembly.
- 5. Remove the boost body (key 6), stabilizer (key 7), and stem guide (key 8) from the diaphragm casing (key 5). Unhook and remove the stem (key 10) from the diaphragm casing (key 5).
- 6. Remove and inspect the diaphragm casing O-ring (key 4, Figure 7, 8, or 11) and replace it if necessary.
- 7. Apply lubricant to a replacement diaphragm casing O-ring (key 4, Figure 7, 8, or 11) and install it onto the boost body (key 6). Skip to step 14.
- 8. For the Type 627 or 627H regulators, be sure to insert the pilot tube (tab) into the outlet side of the body (see Figure 7 or 11). Skip to step 14.

Perform steps 9 through 19 for Types 627M, 627HM, and 627MR Regulators only:

- 9. Types 627M, 627HM, and 627MR regulators (Figure 5), use steps 10 through 14 to remove and replace the stem assembly.
- 10. To remove the blocked throat (key 43), insert a screw driver blade into the groove provided in the throat and pry it out of the diaphragm casing (key 5). Inspect and replace parts as necessary.

- 11. Inspect and, if necessary, replace the blocked throat O-rings (key 44, Figure 5) and backup rings (key 45, Figure 5).
- 12. Apply lubricant to replacement blocked throat O-rings (key 44) and backup rings (key 45).
- 13. Apply lubricant to the replacement stem O-ring (key 11) and stem backup rings (key 12) and install them on the stem (key 10).
- 14. For assembly, insert the stem (key 10) into the diaphragm casing (key 5) and hook it on the lever (key 15).
- 15. Insert parts into the diaphragm casing (key 5) that were removed in steps 5 and 6 or step 10 (see Figure 5).
- 16. Install the disk assembly (key 9), line up the hole in the disk assembly and stem (key 10) and insert the hair pin clip (key 13).
- 17. Position the diaphragm casing plus attached parts in relation to the body (key 1) so that they are correct for the application.
- 18. Secure the diaphragm casing to the body with the cap screws (key 3, Figure 5). For an aluminum diaphragm casing (key 5), torque the cap screws (key 3) to 16 foot-pounds (22 N•m). For ductile iron or steel diaphragm casings, torque the cap screws (key 3) to 25 foot-pounds (34 N•m).
- 19. It may be necessary to reposition the diaphragm spring case to prevent rain, ice, and foreign debris from entering the spring case. Refer to the Diaphragm and Spring Case Area Maintenance Procedures, steps 1, 2, and 21 through 25.

Parts List

Part Number	Description	Key
R627X000A12	Type 627 Parts Kit with Aluminum/Nitrile trim (includes keys 4, 9, 11, 12, and 23)	1
R627X000S12	Type 627R Parts Kit with Aluminum/Nitrile trim (includes keys 4, 9, 11, 12, and 23)	
R627RX00A12	Type 627R Parts Kit with Stainless steel/Nitrile trim (includes keys 4, 9, 11, 12, 23, 28, and 48)	
R627RX00S12	(includes keys 4, 9, 11, 12, 23, 28 and 48)	
Body	Ductile iron	
1000 psig (69.0 bar) maximum inlet pressure	3/4-inch NPT size	
Steel	1-inch NPT size	
2000 psig (138 bar) maximum inlet pressure	2-inch NPT size	
30B3050X012	3/4-inch NPT size	
30B3051X012	1-inch NPT size	
30B7452X012	2-inch NPT size	
40B6754X012	1-inch NPT size	
40B6756X012	2-inch NPT size	
Aluminum	3/32-inch (2.38 mm) port diameter	
OR044109022	1/8-inch (3.18 mm) port diameter	
1A936709012	3/16-inch (4.76 mm) port diameter	
0B042009012	1/4-inch (6.35 mm) port diameter	
0B042209012	3/8-inch (9.53 mm) port diameter	
1A928809012	1/2-inch (12.7 mm) port diameter	
0R044135032	303 Stainless steel	
1A936735032	1/8-inch (3.18 mm) port diameter	
00991235032	3/16-inch (4.76 mm) port diameter	
0B042035032	1/4-inch (6.35 mm) port diameter	
0B042235032	3/8-inch (9.53 mm) port diameter	
-----	1/2-inch (12.7 mm) port diameter	
OR0441X0012	3/16 Stainless steel, NACE™ construction only	
1A9367X0022	1/8-inch (3.18 mm) port diameter	
009912X0012	3/16-inch (4.76 mm) port diameter	
0B0420X0012	1/4-inch (6.35 mm) port diameter	
0B0422X0012	3/8-inch (9.53 mm) port diameter	
1A9288X0012	1/2-inch (12.7 mm) port diameter	
18A1087X012	All Types with Ductile Iron diaphragm case, Plated steel	
1C403824052	diaphragm case, Plated steel	
1C403024052	or steel diaphragm case, Plated steel	
17A2325X022	Diaphragm Case O-Ring (Type 627, 627H, or 627R only), Nitrile	4*
	Diaphragm Case	5
	For Type 627 or 627R	
	Aluminum without 1/8-inch (3.18 mm) gauge tap	
40B3084X012	Aluminum with 1/8-inch (3.18 mm) gauge tap	
11B5380X012	for Type 627 only	
30B3053X012	Ductile iron without 1/8-inch (3.18 mm) gauge tap	
31B0641X012	for Type 627 only	
30B3104X012	Steel	
39A5967X012	Ductile Iron	
30B8734X012	Steel	
30B3104X012	For Type 627H, Steel	
30B8734X012	For Type 627HM, Steel	

- 17. On the pusher post (key 19) install the relief seal O-ring (key 28) and apply lubricant. Also, install the relief seal retainer (key 47), diaphragm connector assembly (key 21, with attached parts) relief spring (key 27), upper relief spring seat (key 33), and guide retainer (key 26). Torque the guide retainer (key 26) to 3 foot-pounds (4 N•m).
- 18. Hook the pusher post (with attached parts) on the lever (key 15) to check the alignment of the holes in the diaphragm with the holes in the spring casing. If the holes do not line up, unhook the pusher post from the lever, hold the pusher post, and rotate the diaphragm to the correct position.
- 19. Install the lower spring seat (key 31) over the relief spring so it rests flat on the connector nut (key 22).
- 20. Insert the diaphragm assembly into the diaphragm casing (key 5) and hook the pusher post on the lever (key 15).
- 21. Install the control spring (key 32) and upper spring seat (key 33), and apply lubricant to the upper spring seat (key 33).
- 22. Install the spring case (key 29) so that the screened vent assembly (key 30) is in the correct position for the application. Place the nameplates (key 39) over the screw holes, insert the spring case cap screws (key 37), and finger tighten.
- 23. Screw in the adjustment screw to put slack into the diaphragm (key 23).
- 24. Using a crisscross pattern, finish tightening the spring case cap screws (key 37) to 7 foot-pounds (9 N•m) of torque.
- 25. If necessary, refer to the installation and/or the Startup and Adjustment procedures.
- 26. Install the adjusting locknut (key 34) after regulator adjustment.

Parts Ordering

When corresponding with your Fisher sales office or sales representative about this regulator, always reference the type number which is found on the nameplate (key 39, Figures 7 through 12). When ordering replacement parts, reference the key number of each needed part as found in the following parts list.

*Recommended spare part.
1 National Association of Corrosion Engineers

