

November 2023

# 627B Series Pressure Reducing Regulators



## WARNING

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

Fisher™ regulators must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations, and Emerson Process Management Regulator Technologies, Inc. instructions.

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

Call a gas service person to service the unit. Only a qualified person must install or service the regulator.



W4793

Figure 1. Typical 627B Direct-Operated Pressure Reducing Regulator

## Introduction

### Scope of the Manual

This manual provides instructions for the installation, adjustment, maintenance and parts ordering information for the 627B Series Regulators. These regulators are usually shipped separately for line installation, although sometimes they are shipped installed on other equipment. Refer to the Instruction Manual of the other equipment for installation and operating instructions.

### Description

The 627B Series Direct-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.



## WARNING

Personal injury, property damage, equipment damage or leakage due to 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 the Specifications section, Tables 1 and 2 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.

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.

# 627B Series

## Specifications

The Specifications section gives some general specifications for the 627B Series Regulators. The nameplates give detailed information for a particular regulator as it comes from the factory.

### Available Constructions

**Type 627BM:** Direct-operated, balanced port pressure reducing regulator with a stem seal between the body outlet pressure and diaphragm case. Pressure is measured under the diaphragm through the 1/4 NPT downstream control line connection. (Figure 6)

**Type 627BMR:** Type 627BM with token internal relief. (Figure 7)

**Type 627BHM:** Type 627BM with a diaphragm limiter to deliver a higher outlet pressure. (Figure 8)

### Body Sizes and End Connection Styles

| BODY SIZE |    | END CONNECTION STYLE                 | CONSTRUCTION AVAILABLE |
|-----------|----|--------------------------------------|------------------------|
| NPS       | DN |                                      |                        |
| 1         | 25 | NPT, CL150 RF, CL300 RF and CL600 RF | All                    |
| 2         | 50 | NPT, CL150 RF, CL300 RF and CL600 RF |                        |

### Maximum Inlet Pressure<sup>(1)</sup> (Body Rating)

**Flanged Stainless steel:** 1440 psig / 99.3 bar

**NPT Stainless steel:** 2000 psig / 138 bar

**Flanged steel:** 1500 psig / 103 bar

**NPT steel:** 2000 psig / 138 bar

**Ductile iron:** 1000 psig / 69.0 bar

### Maximum Valve Disk Inlet Pressure Rating<sup>(1)</sup>

**Nylon (PA) Disk:** 1500 psig / 103 bar

### Maximum Operating Inlet Pressure, Pressure Differential and Outlet Pressure Ranges<sup>(1)</sup>

See Table 1 for pressures by orifice size and spring range

### Maximum Spring and Diaphragm Casing Pressure<sup>(1)</sup>

See Table 2

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

**Types 627BM, 627BMR and 627BHM only**

*NPT steel:* 2000 psig / 138 bar

*Flanged steel:* 1500 psig / 103 bar

*Ductile iron:* 1000 psig / 69.0 bar

### Orifice Size

9/16 in. / 14.3 mm

### Options

- Up to 25% Hydrogen Blend (By Volume) Construction
- 100% Hydrogen Construction

### Internal Relief Performance

**Type 627BMR:** Limited by field-installed control line piping

### Elastomer Temperature Capabilities<sup>(1)(2)</sup>

| MATERIAL                           | DISK/<br>DIAPHRAGM | TEMPERATURE |           |
|------------------------------------|--------------------|-------------|-----------|
|                                    |                    | °F          | °C        |
| Nitrile (NBR)                      | Diaphragm          | -40 to 180  | -40 to 82 |
|                                    | O-ring             |             |           |
| Fluorocarbon (FKM)                 | Diaphragm          | 0 to 180    | -18 to 82 |
| Nylon (PA)                         | Disk               | -40 to 180  | -40 to 82 |
| Neoprene (CR) for Type 627BHM only | Diaphragm          | -40 to 180  | -40 to 82 |

### Flow Coefficients

See Table 3

### Pressure Registration

**Type 627BM, 627BMR or 627BHM:** External through 1/4 NPT control line connection in the diaphragm casing

### Relief Indicator

For Type 627BMR (see Figure 7)

### Spring Case Vent Connection

3/4 NPT with removable screened vent assembly

### Approximate Weights

#### 627B Series

*Ductile iron, Steel or Stainless steel Casings:*

10 lbs / 5 kg

*Aluminum Casing:* 6.3 lbs / 3 kg

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

2. Stainless steel body is rated to -40°F / -40°C. Steel and Ductile iron bodies are rated to -20°F / -29°C.

## Product Description

**Type 627B Direct-Operated Pressure Reducing Regulator**—The Type 627B Regulator provides economical pressure reducing control for a variety of residential, commercial and industrial applications. The regulator pitot tube located in a high velocity stream provides dynamic boost that compensates for outlet pressure drop.

**Downstream Control Line for Type 627BM, 627BMR or 627BHM Regulator**—A Type 627BM, 627BMR or 627BHM Regulator has a blocking throat stem seal with O-rings and a 1/4 NPT control line connection in the diaphragm case. A regulator with a downstream control line is used for monitoring applications or other applications where other equipment is installed between the regulator and the pressure control point. The stem seal separates the body outlet pressure from the diaphragm case.

## Principle of Operation

Refer to Figure 2. When downstream demand decreases, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by a spring). Through the action of the pusher post assembly, lever and valve stem, the valve disk moves closer to the orifice and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward and the valve disk moves away from the orifice.

## Installation

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 this section are shown in Figures 6 through 8. Ensure that the operating temperature capabilities listed in Specifications section are not exceeded.

### 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.



## WARNING

**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.

Perform steps 7 through 9 for Types 627BM, 627BMR and 627BHM Regulators only:

7. A Type 627BM or 627BMR 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 in. / 9.5 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.

## Remote Vent Line Installation

All 627B Series Regulators have a vent assembly installed in the 3/4 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. It should be as short as possible with 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.

## Overpressure Protection

The 627B 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 627BM and 627BHM Regulators if the inlet pressure can exceed the outlet pressure rating, since these regulators do not have internal relief.

Type 627BMR Regulator provides overpressure relief via a small capacity or token relief that relieves minor overpressure caused by thermal expansion or minor nicks in the orifice or disk. Capacity of the token relief is limited by field-installed control line piping.

# 627B Series

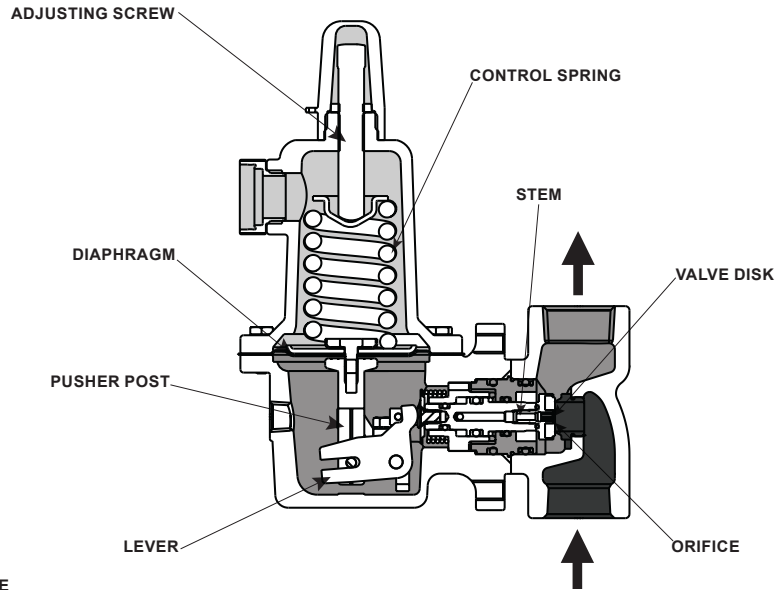


Figure 2. Type 627BM Operational Schematic

Table 1. Maximum Inlet Pressures and Outlet Pressure Ranges

| TYPE             | OUTLET PRESSURE RANGE  |              | SPRING PART NUMBER | COLOR CODE | ORIFICE SIZE        |      | MAXIMUM INLET PRESSURE <sup>(1)</sup> |     |
|------------------|------------------------|--------------|--------------------|------------|---------------------|------|---------------------------------------|-----|
|                  | psig                   | bar          |                    |            | In.                 | mm   | Nylon (PA) Disk                       |     |
|                  |                        |              |                    |            |                     |      | psig                                  | bar |
| 627BM and 627BMR | 5 <sup>(2)</sup> to 20 | 0.34 to 1.4  | 10B3076X012        | Yellow     | 9/16 <sup>(3)</sup> | 14.3 | 1500                                  | 103 |
|                  | 15 to 40               | 1.0 to 2.8   | 10B3077X012        | Green      |                     |      |                                       |     |
|                  | 35 to 80               | 2.4 to 5.5   | 10B3078X012        | Blue       |                     |      |                                       |     |
|                  | 70 to 150              | 4.8 to 10.3  | 10B3079X012        | Red        |                     |      |                                       |     |
| 627BHM           | 140 to 250             | 9.7 to 17.2  | 10B3078X012        | Blue       |                     |      |                                       |     |
|                  | 240 to 500             | 16.5 to 34.5 | 10B3079X012        | Red        |                     |      |                                       |     |

1. For inlet pressure in excess of 1000 psig / 69.0 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. Only available with 9/16 in. / 14.3 mm orifice. If a smaller orifice is installed the unit will not achieve published capacities.

Table 2. Maximum Spring and Diaphragm Casing Pressure<sup>(1)</sup>

| MAXIMUM PRESSURE DESCRIPTION  | DIAPHRAGM CASING MATERIAL | TYPE 627BM |      | TYPE 627BMR   |      | TYPE 627BHM   |      |
|---|---------------------------|------------|------|---------------|------|---------------|------|
|   |                           | psig       | bar  | psig          | bar  | psig          | bar  |
| Maximum pressure to spring and diaphragm casings to prevent leak to atmosphere other than relief action (internal parts damage may occur)                       | Ductile iron              | 250        | 17.2 | Not Available |      | Not Available |      |
|   | Steel or Stainless steel  |            |      | 250           | 17.2 | 800           | 55.2 |
| Maximum pressure to spring and diaphragm casings to prevent burst of casings during abnormal operation (leak to atmosphere and internal parts damage may occur) | Ductile iron              | 465        | 32.1 | 465           | 32.1 | Not Available |      |
|   | Steel or Stainless steel  | 1500       | 103  | 1500          | 103  | 1500          | 103  |
| Maximum diaphragm casing overpressure (above setpoint) to prevent damage to internal parts  | All materials             | 60         | 4.1  | 120           | 8.3  | 120           | 8.3  |

1. If the spring case is pressurized, a metal adjusting screw cap is required. Contact your local Sales Office for details.

**Table 3. Flow Coefficients**

| ORIFICE |      | NPS 1 / DN 25 BODY                         |  |       | NPS 2 / DN 50 BODY                         |  |       |
|---------|------|--|--|-------|--|--|-------|
| In.     | mm   | Wide-Open $C_v$ for External Relief Sizing | Wide-Open $C_v$ for External Relief Sizing | $C_1$ | Wide-Open $C_v$ for External Relief Sizing | Wide-Open $C_v$ for External Relief Sizing | $C_1$ |
| 9/16    | 14.3 | 211.6                                      | 5.6  | 37.8  | 219.3                                      | 6.0  | 36.0  |

**Table 4. Maximum Torque Values**

| KEY NUMBER <sup>(1)</sup> | COMPONENT                 | CONSTRUCTION                          | MAXIMUM TORQUE  |              |
|---------------------------|---------------------------|---------------------------------------|-----------------|--------------|
|                           |                           |                                       | Ft-lbs          | N•m          |
| 2                         | Orifice                   | All                                   | 25 to 35        | 33.9 to 47.5 |
| 3                         | Cap screw, Body           | Aluminum lower casing                 | 10 to 20        | 13.6 to 27.1 |
|                           |                           | Ductile iron or Steel lower casing    | 22 to 30        | 29.8 to 40.7 |
| 9                         | Disk holder assembly      | All                                   | 20 to 24 in-lbs | 2.3 to 2.7   |
| 18                        | Cap screw, Lever          | All                                   | 7 to 10         | 9.5 to 13.6  |
| 22                        | Nut, Diaphragm Connector  | 627BMR                                | 15 to 20        | 20.3 to 27.1 |
| 26                        | Guide Retainer            | 627BMR                                | 2.5 to 4        | 3.4 to 5.4   |
| 37                        | Cap screw, Spring case    | Ductile iron or Aluminum lower casing | 7 to 10         | 9.5 to 13.6  |
|                           |                           | Steel lower casing                    | 36 to 40        | 48.8 to 54.2 |
| 46                        | Cap screw, Diaphragm head | 627BM                                 | 7 to 10         | 9.5 to 13.6  |
|                           |                           | 627BHM                                | 12 to 16        | 16.3 to 21.7 |
| 78                        | Spring seat retainer      | All                                   | 55 to 60 in-lbs | 6.2 to 6.8   |

1. Refer to Figures 6 through 8 for key number locations.

## 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 damage, pressure gauges should always be used to monitor pressures during startup.**

1. Slowly open the upstream shut-off valve.
2. Slowly open the downstream shut-off valve.
3. Check all connections for leaks.
4. Make final control spring adjustments according to the adjustment procedures.

### Adjustment

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

Before increasing the setting, refer to Table 1 or 2. 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.

#### Note

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

Refer to Figures 6 through 8 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.
4. When the desired pressure is obtained, hold the adjusting screw (key 35) in place and tighten the locknut (key 34).

## Shutdown



### WARNING

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.

1. Close the nearest upstream shut-off valve.
2. Close the nearest downstream shut-off valve.
3. Open the vent valve between the regulator and the downstream shut-off valve nearest to it.
4. A Type 627BM, 627BHM or 627BMR Regulator requires venting the control line and downstream pressure from the regulator before maintenance. The pressure between these shut-off 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 orifice 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 orifice and disk assembly is accelerated with high pressure drops and with large amounts of impurities in the flow stream. Instructions are given below for replacing the disk assembly orifice, diaphragm and O-rings. These procedures may also be used for disassembly required for inspection and replacement of other parts.

## Problem Indication for Type 627BM Regulator



### 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 7). 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 orifice.

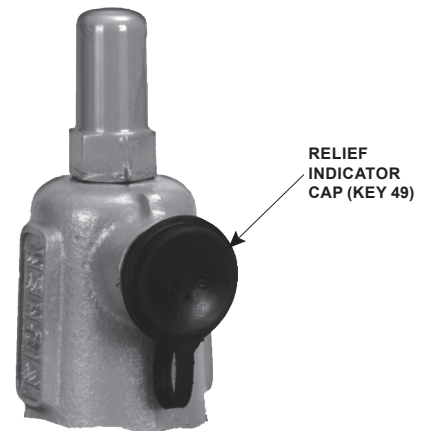


Figure 3. Relief Indicator

If the disk assembly and orifice are not damaged, refer to the Diaphragm and Spring Case Area Maintenance Procedures in this section.

The disk assembly and orifice 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 orifice, 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 6 through 8 for key number locations.

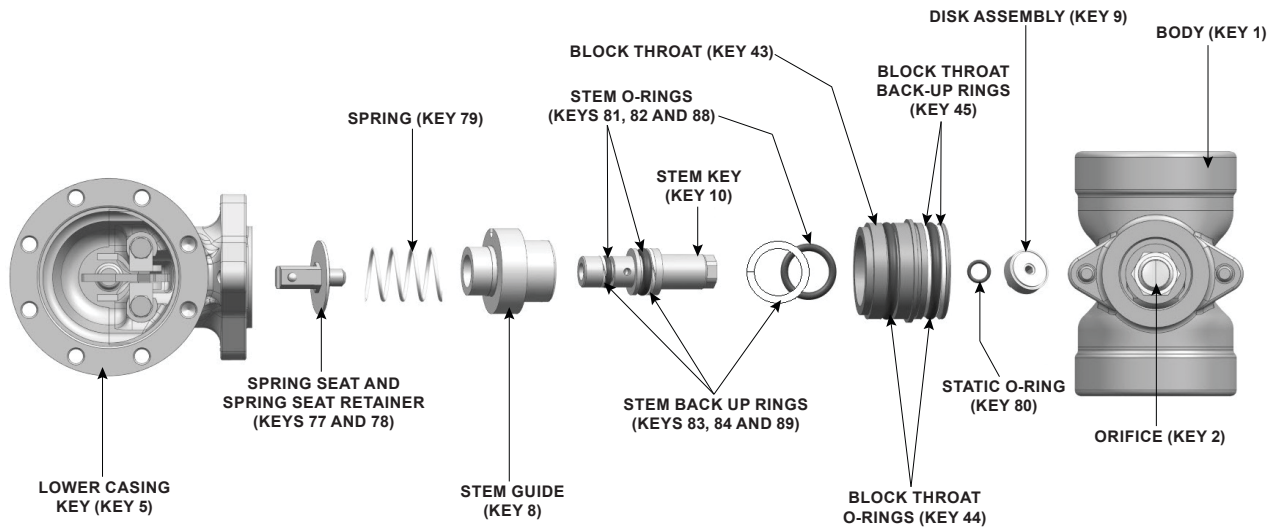
### Replacing the Disk Assembly and Orifice

1. To inspect and replace the disk assembly (key 9) or orifice (key 2), remove the cap screws (key 36) and separate the diaphragm casing (key 5) from the body (key 1).
2. Inspect and, if necessary, remove the orifice (key 2). If removed, coat the threads of the replacement orifice with lubricant and torque to values shown in Table 4.

#### Note

**Only install a 9/16 in. / 14.3 mm orifice on Types 627BM, 627BMR and 627BHM**

3. Inspect the disk assembly (key 9) and if necessary to replace, skip to steps 7 through 12 to remove the stem assembly from the lower casing. The disk assembly cannot be replaced without removing the trim from the lower casing.



**Figure 4. Stem Assemblies**

4. To remove the disk assembly (key 9) once the stem assembly has been removed from the lower casing, hold the stem (key 10) in place by securing a wrench on the spring seat retainer (key 78) and loosen the disk assembly with a 5/32 in. / 3.97 mm allen wrench inserted into the center of the disk. Inspect and, if necessary, replace the static O-ring (key 80) if the disk assembly is removed.
  5. Verify that the passageway through the center of the disk assembly (key 9) is clear of any blockages.
  6. Once disk maintenance is complete, slide stem assembly into diaphragm casing (key 5), skip to Diaphragm and Spring Case Area Maintenance Procedure section to build the actuator.
- Stem Assembly Maintenance**
7. Use steps 8 through 22 to remove and replace the stem assembly.
  8. Remove the adjusting screw cap (key 36), loosen the lock nut (key 34) and turn the adjusting screw (key 35) counterclockwise until all compression is removed from the control spring (key 32).
  9. Remove the spring case cap screws (key 37) and lift off the spring case (key 29).
  10. Remove the diaphragm limiter O-ring and diaphragm limiter (keys 51 and 50, on Type 627BHM only). Remove the diaphragm assembly by tilting it so that the pusher post (key 19) slips off the lever (key 15).
  11. Unhook the lever (key 15) from the spring retainer (key 78) to free the stem assembly.
  12. To remove stem assembly, insert a screw driver blade into the groove provided in the blocked throat (key 43) and pry it out of the diaphragm casing (key 5). Inspect and replace parts as necessary.
  13. To disassemble stem assembly, hold spring seat retainer (key 78) while loosening the disk assembly with a 5/32 in. / 3.97 mm allen key inserted into the center of the disk assembly (key 9). Slide blocked throat (key 43) off of stem.
  14. While holding stem (key 10) from where the disk assembly attaches, unscrew spring seat retainer (key 78) which will loosen the spring (key 79) and allow the stem to slide out of the stem guide (key 8).
  15. Inspect and if necessary, replace blocked throat O-rings (key 44) and back-up rings (key 45).
  16. Apply lubricant to replacement blocked throat O-rings (key 44) and back-up rings (key 45).
  17. Apply lubricant to the replacement stem O-rings (keys 81, 82 and 88) and stem back-up rings (keys 83, 84 and 89) and install on the stem (key 10).
  18. To assemble stem assembly, insert stem (key 10) into stem guide (key 8).
  19. Apply a small amount of thread lock to the spring seat retainer (key 78). Compress spring (key 79) with spring seat (key 77) and torque spring seat retainer (key 78) to torque values shown in Table 4 while holding stem. Excess thread lock can interfere with the operation of the regulator and potentially create unsafe conditions.
  20. Insert stem assembly into blocked throat (key 43).
  21. Place disk assembly O-ring (key 80) on disk assembly (key 9). Install disk assembly on stem (key 10) and torque to torque values shown in Table 4 while holding spring seat retainer (key 78).
  22. Slide stem assembly into diaphragm casing (key 5).
  23. Continue to Diaphragm and Spring Case Area Maintenance Procedures.

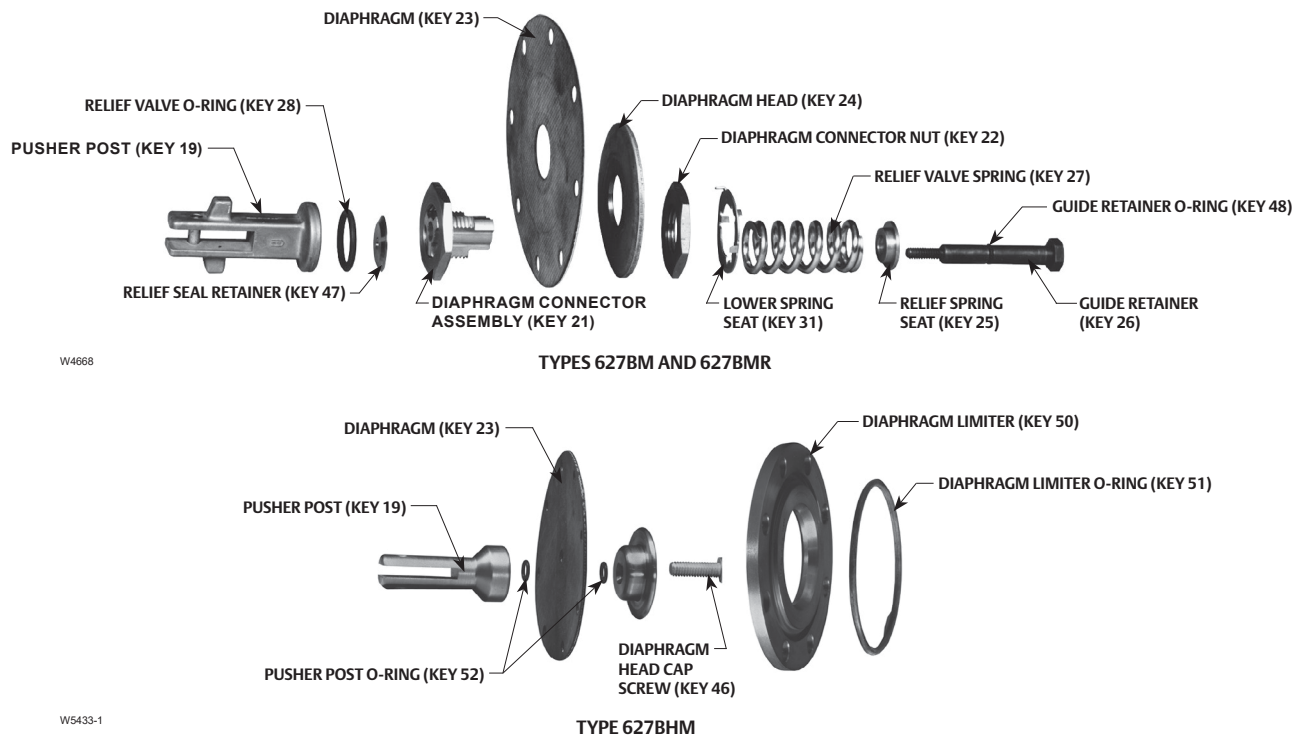


Figure 5. Diaphragm Assemblies

## Diaphragm and Spring Case Area Maintenance Procedures

These procedures are for gaining access to the control spring, diaphragm assembly and lever assembly. All spring pressure must be released from the diaphragm casing before these steps can be performed.

While using the following procedures, refer to Figures 6 through 8 for key number locations.

1. Remove the adjusting screw cap (key 36), loosen the lock nut (key 34) and turn the adjusting screw (key 35) counterclockwise until all compression is removed from the control spring (key 32).
2. Remove the spring case cap screws (key 37), the nameplates and lift off the spring case (key 29). If changing the control spring (key 32) or repositioning the spring case (key 29) is the only maintenance required, install the replacement control spring or rotate the spring case so it is correct for the application. Skip to step 21. For diaphragm area maintenance, continue with step 3.
3. Remove the diaphragm limiter O-ring and diaphragm limiter (keys 51 and 50, on the Type 627BHM only). Remove the diaphragm assembly by tilting it so that the pusher post (key 19) slips off the lever (key 15).
4. If it is necessary to replace the lever assembly, remove the lever cap screws (key 18).
5. Install the replacement lever (key 15) into the lever retainer (key 16) by inserting the lever pin (key 17). Secure the lever assembly into the diaphragm casing with the cap screws (key 18) and torque the cap screws to torque values shown in Table 4.

## Perform steps 6 through 11 for Types 627BM and 627BHM Variations Regulators only:

6. For Types 627BM and 627BHM Regulators (Figures 6 and 8), use steps 7 through 11 to disassemble and reassemble the diaphragm assembly.
7. Remove the diaphragm head cap screw (key 46), lower spring seat (key 31, Type 627BM) and diaphragm head (key 24). On the Type 627BHM, remove the pusher post O-rings (key 52). Separate the diaphragm (key 23) from the pusher post (key 19).
8. Install the diaphragm (key 23), in reverse order in step 7, on the pusher post (key 19), insert and finger tighten the diaphragm head cap screw (key 46).
9. Hook the pusher post on the lever (key 15), then turn the diaphragm (key 23) to match the holes in the diaphragm with the holes in the spring casing.
10. Unhook the pusher post from the lever (key 15) and torque the diaphragm head cap screw (key 46) to torque values shown in Table 4.
11. Hook the pusher post on the lever (key 15) and check the hole alignment. If necessary, loosen the cap screw (key 46) and reposition the diaphragm (key 23) on the pusher post (key 19). Retorque the screw (see step 10). Skip to step 20.

## Perform steps 12 through 19 for Type 627BMR Variation Regulator only:

12. For Type 627BMR Regulator (Figure 7), use steps 13 through 19 to disassemble and reassemble the diaphragm assembly.



13. Remove the guide retainer (key 26) and separate the diaphragm parts. Refer to Figure 7 for the sequence of parts.
14. To remove the diaphragm (key 23), remove the diaphragm connector nut (key 22) and lift off the diaphragm head (key 24) and diaphragm (key 23) from the connector assembly (key 21). Do not attempt to disassemble the connector assembly (key 21).
15. Position the replacement diaphragm (key 23) on the connector assembly (key 21), install the diaphragm head (key 24) and connector nut (key 22), then torque to torque values shown in Table 4.
16. If necessary, replace the guide retainer O-ring (key 48) and, set the guide retainer (key 26) aside, ready for assembly.
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 torque values shown in Table 4.
18. Hook the pusher post (key 19) (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 over the screw holes, insert the spring case cap screws (key 37) and finger tighten.
23. Screw in the adjusting screw (key 35) to put slack into the diaphragm (key 23).
24. Using a crisscross pattern, finish tightening the spring case cap screws (key 37) to torque values shown in Table 4.
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 local Sales Office about this equipment, always reference the equipment serial number or FS number that can be found on the nameplate.

When ordering replacement parts, reference the key number of each needed part as found in the following parts list. Separate kits containing all recommended spare parts are available.

\*Recommended spare part.

1. Bodies can be used for both standard and NACE constructions.

## Parts List

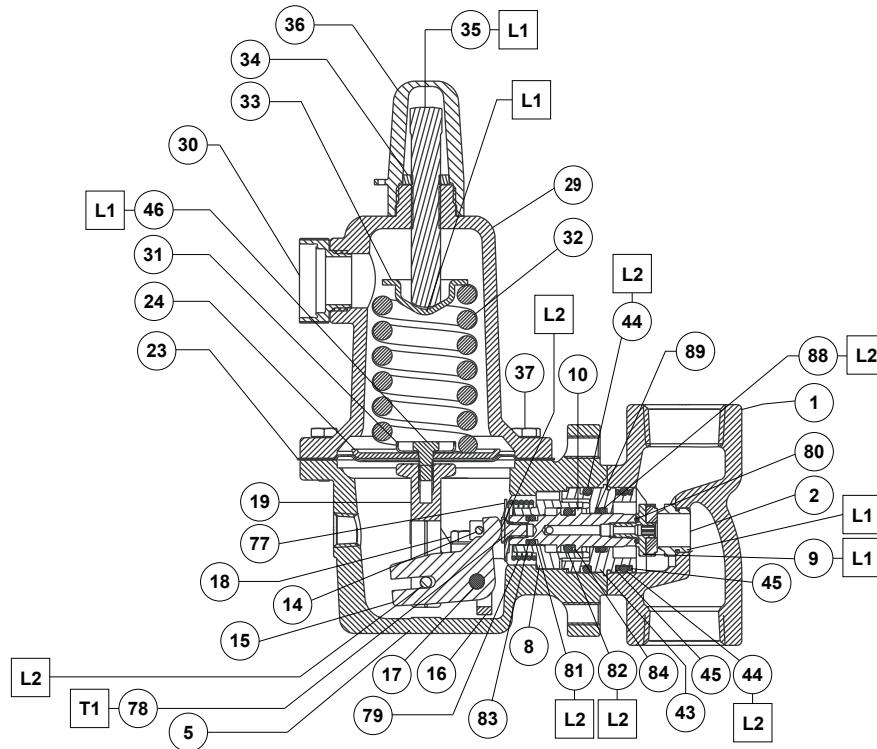
|     |   | Note   |
|-----|---|--|
|     |   | <b>In this parts list, parts marked NACE are intended for corrosion-resistant service as detailed in the NACE International Standard MR0175.</b> |
| Key | Description   | Part Number  |
|     | Type 627BM Part Kit with SST/Nylon (PA) trim (includes keys 9, 23, 44 and 45)   | R627BMX0P02  |
|     | Type 627BHM Parts Kit with SST/Nylon (PA) trim (includes keys 9, 23, 44 and 45) | R627BHM0X12  |
| 1   | Body <sup>(1)</sup>   |  |
|     | Ductile iron  |  |
|     | 1000 psig / 69.0 bar maximum inlet pressure                                     |  |
|     | 1 NPT   | 30B3048X012  |
|     | 2 NPT   | 30B3096X012  |
|     | Steel   |  |
|     | 2000 psig / 138 bar maximum inlet pressure                                      |  |
|     | 1 NPT   | 30B3051X012  |
|     | 2 NPT   | 30B7452X012  |
|     | Steel, CL600 RF flanged   |  |
|     | 1500 psig / 103 bar maximum inlet pressure                                      |  |
|     | NPS 1 / DN 25   | 40B6754X012  |
|     | NPS 2 / DN 50   | 40B6756X012  |
|     | Steel, CL300 RF flanged   |  |
|     | 750 psig / 51.7 bar maximum inlet pressure                                      |  |
|     | NPS 1 / DN 25   | 41B8978X012  |
|     | NPS 2 / DN 50   | 41B8080X012  |
|     | Steel, CL150 RF flanged   |  |
|     | 290 psig / 20.0 bar maximum inlet pressure                                      |  |
|     | NPS 1 / DN 25   | 43B8656X022  |
|     | NPS 2 / DN 50   | 44B0666X012  |
|     | Steel, BWE  |  |
|     | 1000 psig / 69.0 bar maximum inlet pressure                                     |  |
|     | NPS 1 / DN 25   | 33B6723X012  |
|     | NPS 2 / DN 50   | 38B1688X012  |
|     | Steel, PN 16/25/40 RF   |  |
|     | 580 psig / 40.0 bar maximum inlet pressure                                      |  |
|     | NPS 1 / DN 25   | 44B0386X012  |
|     | NPS 2 / DN 50   | 44B3342X012  |
| 2*  | Orifice   |  |
|     | 9/16 in. / 14.3 mm  |  |
|     | Aluminum  | 1C4252X0012  |
|     | 303 SST   | 1C425235032  |
|     | 316 SST   | 1C4252X0022  |
| 3   | Cap Screw (not shown), (2 required)   |  |
|     | Steel   | 1A560724052  |
|     | Stainless steel   | 1A5607X0052  |
| 5   | Diaphragm Case  |  |
|     | For Types 627BM, 627BMR, 627BHM   |  |
|     | Ductile iron (not for Type 627BHM)  | ERAA50626A0  |
|     | Steel   | ERAA50625A0  |
| 8   | Stem Guide  |  |
|     | Stainless steel   | ERAA51322A0  |
| 9*  | Disk Assembly   |  |
|     | 316 Stainless steel holder and Nylon (PA) disk                                  | ERAA49120A1  |
| 10  | Stem, 316 Stainless steel (NACE)  | ERAA51314A0  |
| 14  | Drive Pin, Stainless steel  | ERAA49515A0  |
| 15  | Lever, Carbon steel   | 20B3063X012  |
| 16  | Lever Retainer, Plated steel  | 30B3097X012  |
| 17  | Lever Pin   |  |
|     | Stainless steel   | 10B3083X012  |
|     | 316 Stainless steel (NACE)  | 10B3083X022  |
| 18  | Lever Cap Screw (2 required)  |  |
|     | Plated steel  | 10B7454X012  |
|     | 316 Stainless steel (NACE)  | 1B2905X0012  |

# 627B Series

| KEY NUMBER | PART DESCRIPTION  | ADJUSTMENT TOOL                         | PART NUMBER |
|------------|---|---|-------------|
| 2          | Orifice   | 7/8 in. / 22.2 mm Socket                | 1C4252      |
| 3          | Cap Screw/Ductile iron, Steel or Stainless steel Casing | 3/8 in. / 9.53 mm Hex/Allen Wrench      | 1A5607      |
| 9          | Disk Holder Assembly                                    | 5/32 in. / 3.97 mm Hex/Allen Wrench     | ERAA49120   |
| 10         | Stem  | 1/2 in. / 12.7 mm Socket                | ERAA51314   |
| 35         | Adjusting Screw   | 1/2 in. / 12.7 mm Adjustable End Wrench | 10B3081     |
| 37         | Cap Screw/Aluminum or Ductile iron Casing               | 1/4 in. / 6.35 mm Socket                | 1A3917      |
|            | Cap Screw/Steel or Stainless steel Casing               | 3/8 in. / 9.53 mm Socket                | 1A36832     |
| 78         | Spring Seat Retainer                                    | 3/8 in. / 9.53 mm Socket                | ERAA50115   |

| Key | Description                                    | Part Number | Key | Description                                  | Part Number |
|-----|--|-------------|-----|--|-------------|
| 19  | Pusher Post<br>For Type 627BM, Aluminum        | 10B3098X012 | 33  | Upper Spring Seat, Plated steel              | 1D667125072 |
|     | For Type 627BMR, 316 Stainless steel           | ERAA51240A0 | 34  | Locknut, Plated steel                        | 1D667728982 |
|     | For Type 627BHM                                |             | 35  | Adjusting Screw, Plated steel                |             |
|     | 316 Stainless steel                            | ERAA51241A1 |     | For Types 627BM or 627BHM                    | 10B3081X012 |
|     | NACE   | ERAA51241A0 |     | For Type 627BMR                              | 10B3080X012 |
| 21  | Diaphragm Connector (for Type 627BMR only)     |             | 36  | Adjusting Screw Cap, Plastic                 | 20B3082X012 |
|     | Stainless steel                                | 28B8832X012 | 37  | Spring Case Cap Screw, Plated steel          |             |
| 22  | Diaphragm Connector nut (for Type 627BMR only) |             |     | (8 required)                                 |             |
|     | Stainless steel                                | 10B7449X012 |     | For Aluminum or Ductile iron diaphragm case  | 1A391724052 |
| 23* | Diaphragm                                      |             |     | For Steel diaphragm case                     | 1A368324052 |
|     | Nitrile (NBR)                                  |             |     | For Stainless steel case and body            | 1A3683X0062 |
|     | For Type 627BM with Aluminum                   |             |     | For Aluminum case and SST body               | 1A3917X0062 |
|     | or Ductile iron diaphragm case                 | 10B3069X012 |     | For Type 627BHM, Steel diaphragm case        | 1A346424052 |
|     | For Type 627BM with Steel diaphragm case       | 10B8735X012 | 43  | Blocked Throat, Stainless steel              | ERAA51294A0 |
|     | For Type 627BMR with Aluminum                  |             | 44* | Blocked Throat O-ring                        |             |
|     | or Ductile iron diaphragm case                 | 10B3068X012 |     | (For Types 627BM, 627BHM or 627BMR only),    |             |
|     | For Type 627BMR with Steel diaphragm case      | 10B8736X012 |     | Nitrile (NBR) (2 required)                   | ERAA19159A0 |
|     | For Type 627BHM with Steel diaphragm case      |             | 45* | Blocked Throat Back-up Ring                  |             |
|     | (diaphragm is Neoprene (CR) with               |             |     | For Types 627BM, 627BHM or 627BMR only),     |             |
|     | Nylon (PA) fabric)                             | 12B0178X012 |     | Polytetrafluoroethylene (PTFE) (2 required)  | 10B3106X012 |
| 24  | Diaphragm Head                                 |             | 46  | Diaphragm Head Cap Screw, Steel              |             |
|     | For Type 627BM, Plated steel                   | 1D666428982 |     | For Type 627BM                               | 1B290524052 |
|     | For Type 627BMR, Plated steel                  | 10B3071X012 |     | For Type 627BHM                              | 1C379124052 |
|     | For Type 627BHM, 416 Stainless steel           | 12B0175X012 | 47  | Relief Seal Retainer (For Type 627BMR only)  |             |
| 25  | Relief Spring Seat (For Type 627BMR only)      |             |     | Stainless steel                              | 10B7445X012 |
|     | Steel  | 10B7446X012 | 48* | Guide Retainer O-ring (For Type 627BMR only) |             |
| 26  | Guide Retainer (For Type 627BMR only)          |             |     | Nitrile (NBR)                                | 1D682506992 |
|     | Stainless steel                                | 10B7450X012 | 49  | Relief Indicator (For Type 627BR or          |             |
| 27  | Relief Spring (For Type 627BMR only)           |             |     | 627BMR only), Rubber (not shown)             | 30B3100X012 |
|     | Plated steel                                   | 10B6757X012 | 50  | Diaphragm Limiter                            |             |
| 28* | Relief Seal O-Ring (For Type 627BMR only)      | ERAA19157A0 |     | (For Type 627BHM only)                       | 22B0176X012 |
| 29  | Spring Case                                    |             | 51* | Diaphragm Limiter O-ring                     |             |
|     | For Type 627BM or 627BMR                       |             |     | (For Type 627BHM only)                       | ERAA19160A5 |
|     | Ductile iron                                   | 30B3055X012 | 52* | Pusher Post O-ring (2 required)              |             |
|     | Steel  | 30B3102X012 |     | (For Type 627BHM only)                       | 1C853806992 |
|     | For Type 627BHM                                |             | 58  | Pipe Plug, Zinc                              | 1D8293T0022 |
|     | Steel  | 30B3102X012 | 67  | Drive Screw, 18-8 Stainless steel            | 1A368228982 |
| 30  | Screened Vent Assembly, Plastic                | 10B3093X012 | 72  | Pipe Plug, Zinc-plated steel                 | 1A767524662 |
| 31  | Lower Spring Seat, Plated steel                |             | 77  | Spring Seat, Stainless steel                 | ERAA50118A0 |
|     | For Type 627BM                                 | 1D666625072 | 78  | Spring Seat Retainer, Stainless steel        | ERAA50115A0 |
|     | For Type 627BMR                                | 20B3073X012 | 79  | Spring                                       |             |
| 32  | Control Spring, Plated steel                   |             |     | Stainless steel                              | ERAA50082A0 |
|     | 5 to 20 psig / 0.34 to 1.4 bar, Yellow         | 10B3076X012 |     | NACE   | ERAA50061A0 |
|     | 15 to 40 psig / 1.0 to 2.8 bar, Green          | 10B3077X012 | 80* | O-ring (Disk Holder)                         | ERAA49442A0 |
|     | 35 to 80 psig / 2.4 to 5.5 bar, Blue           | 10B3078X012 | 81* | O-ring (Stem - Small)                        | ERAA49363A0 |
|     | 70 to 150 psig / 4.8 to 10.3 bar, Red          | 10B3079X012 | 82* | O-ring (Stem - Large)                        | ERAA49364A0 |
|     | 140 to 250 psig range / 9.7 to 17.2 bar, Blue, |             | 83* | Back-up Ring (Small)                         | ERAA49365A0 |
|     | used for Type 627BHM                           | 10B3078X012 | 84* | Back-up Ring (Large)                         | ERAA49366A0 |
|     | 240 to 500 psig range / 16.5 to 34.5 bar, Red, |             | 88* | O-Ring (Blocked Throat)                      | 1D541506992 |
|     | used for Type 627BHM                           | 10B3079X012 | 89* | Back-up Ring (Blocked Throat)                | ERAA51338A0 |

\*Recommended spare part.

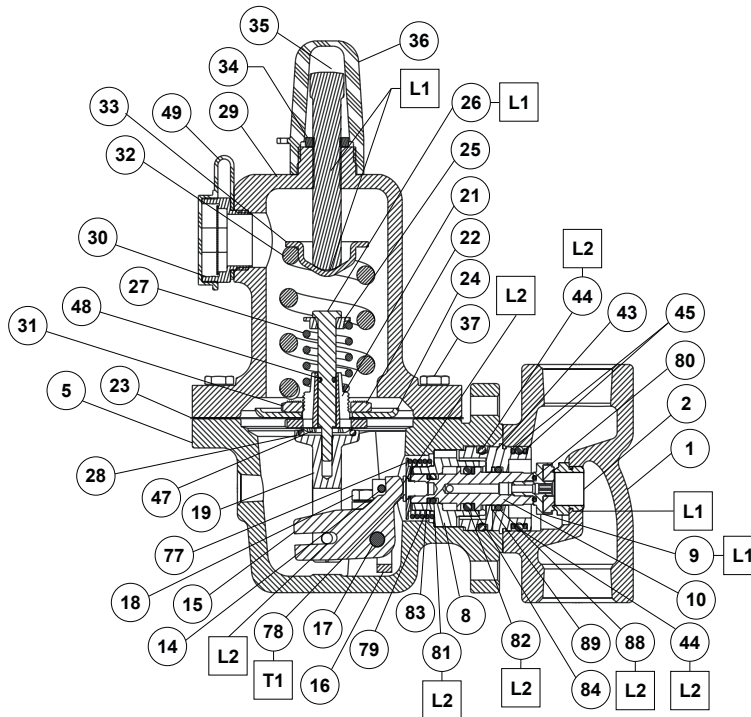


ERAA49923\_AB

- APPLY LUBRICANT<sup>(1)</sup>
- L1 = MULTI-PURPOSE LITHIUM POLYMER TYPE GREASE
- L2 = EXTREME LOW-TEMPERATURE BEARING GREASE
- T1 = APPLY THREADLOCK

1. Lubricants must be selected such that they meet the temperature requirements.

**Figure 6. Type 627BM Regulator Assembly**



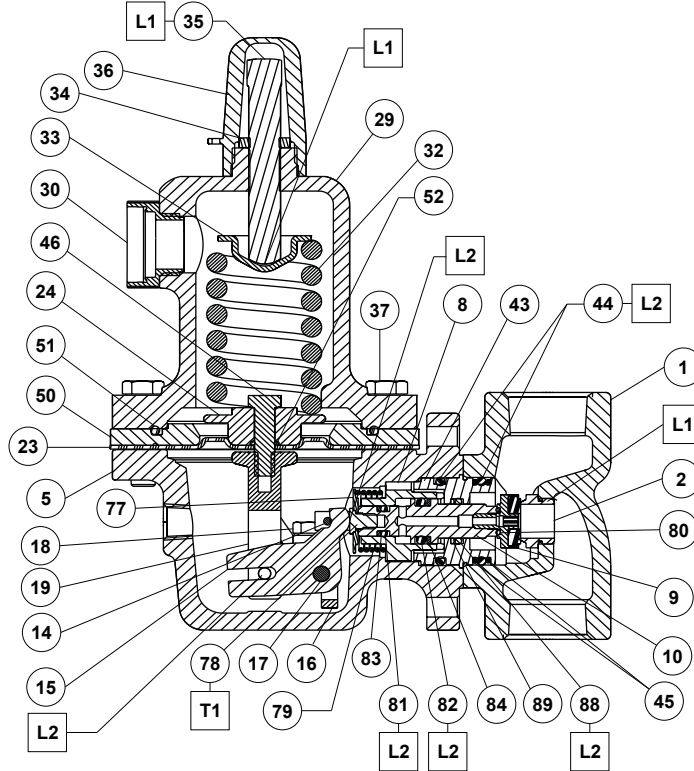
ERAA50665\_AB

- APPLY LUBRICANT<sup>(1)</sup>
- L1 = MULTI-PURPOSE LITHIUM POLYMER TYPE GREASE
- L2 = EXTREME LOW-TEMPERATURE BEARING GREASE
- T1 = APPLY THREADLOCK

1. Lubricants must be selected such that they meet the temperature requirements.

**Figure 7. Type 627BMR Regulator Assembly**

# 627B Series



ERAA49929\_AB

- **APPLY LUBRICANT<sup>(1)</sup>**
- L1 = MULTI-PURPOSE LITHIUM POLYMER TYPE GREASE
- L2 = EXTREME LOW-TEMPERATURE BEARING GREASE
- T1 = APPLY THREADLOCK

1. Lubricants must be selected such that they meet the temperature requirements.

**Figure 8. Type 627BHM Regulator Assembly**

- ✉ Webadmin.Regulators@emerson.com
- 📘 Facebook.com/EmersonAutomationSolutions
- 🔍 Fisher.com
- 🌐 LinkedIn.com/company/emerson-automation-solutions
- 🐦 Twitter.com/emr\_automation

**Emerson**

**Americas**  
 McKinney, Texas 75070 USA  
 T +1 800 558 5853  
 +1 972 548 3574

**Europe**  
 Bologna 40013, Italy  
 T +39 051 419 0611

**Asia Pacific**  
 Singapore 128461, Singapore  
 T +65 6777 8211

**Middle East and Africa**  
 Dubai, United Arab Emirates  
 T +971 4 811 8100

D104602X012 © 2021, 2023 Emerson Process Management Regulator Technologies, Inc. All rights reserved. 11/23.  
 The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their prospective owners.  
 Fisher™ is a mark owned by Fisher Controls International LLC, a business of Emerson Automation Solutions.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

Emerson Process Management Regulator Technologies, Inc does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any Emerson Process Management Regulator Technologies, Inc. product remains solely with the purchaser.

