

May 2012

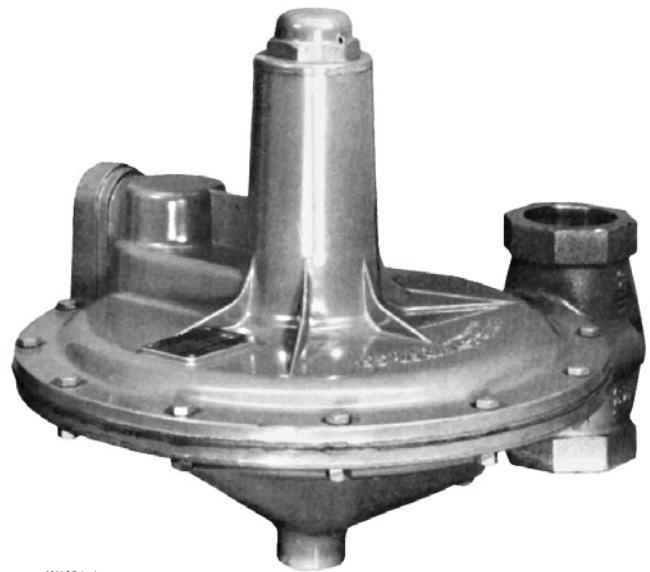
Y610A, Y611A, and Y612A Series Vacuum Service Equipment and Relief Valves

WARNING

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

Fisher® vacuum breakers or relief valves 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 a leak develops or if the outlet continually vents gas, service to the unit may be required. Failure to correct trouble could result in a hazardous condition. Only a qualified person must install or service the unit.



W1094_1

Figure 1. Type Y610A Vacuum Breaker

Introduction

Scope of the Manual

This manual describes and provides instructions and parts lists for Y610A, Y611A, and Y612A Series vacuum service equipment and relief valves. Instructions and parts lists for other equipment used with these regulators are found in separate manuals.

Product Description

The Y610A, Y611A, and Y612A Series devices are used in a wide variety of vacuum and relief service applications. The Y610A Series devices (Figure 1) are used as vacuum breakers, the Y611A Series devices are used as either vacuum breakers or relief valves, and the Y612A Series devices are used as vacuum regulators, and are described as follows:

Type Y610A—Direct-operated vacuum breaker with upward pointing 1 NPT vent connection, and internal registration requiring no downstream control line.

Type Y610AP—Same as Type Y610A except with blocked throat, diaphragm case assembly tapped 1/2 NPT for control line connection, and O-ring stem seal.

Type Y611A—Direct-operated relief valve with upward pointing 1 NPT vent connection, and internal registration requiring no downstream control line.

Type Y611AP—Direct-operated vacuum breaker with blocked throat, 1 NPT screened side vent, diaphragm case assembly tapped 1/2 NPT for control line connection, and O-ring stem seal.



Y610A, Y611A, and Y612A Series

Specifications

The Specifications section gives some general Y610A, Y611A, and Y612A Series ratings and other specifications. Individual regulator data as it comes from the factory is stamped either on the closing cap or on a nameplate (Figure 2).

Body Sizes (Inlet x Outlet) and End Connection Style⁽²⁾

Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP: 1-1/2 or 2 NPT, or NPS 2 / DN 50 CL125 FF or CL250 RF flanged

Pressure Information⁽¹⁾

Type Y610A or Y610AP Vacuum Breaker:

See Table 1

Type Y611A or Y611AP Relief Valve:

See Table 2

Type Y612A or Y612AP Vacuum Regulator:

See Table 3

Temperature Capabilities⁽¹⁾

-20 to 150°F / -29 to 66°C

Pressure Registration

Type Y610A, Y611A, or Y612A: Internal

Type Y610AP, Y611AP, or Y612AP: External

Approximate Weights

Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP

With 1-1/2 NPT Body:

25 pounds / 11 kg

With NPS 2 / DN 50 Body:

30 pounds / 14 kg

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

2. DIN (or other) end connections threaded to various national or international thread standards can usually be supplied; consult your local Sales Office.

Type Y612A—Direct-operated vacuum regulator with upward pointing 1 NPT vent connection, and internal registration requiring no downstream control line.

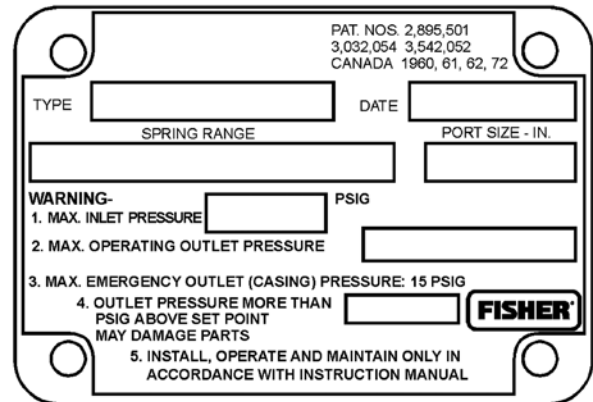
Type Y612AP—Same as Type Y612A except with blocked throat, diaphragm case assembly tapped 1/2 NPT for control line connection, and O-ring stem seal.

Installation



WARNING

Personal injury, property damage, equipment damage, or leakage due to escaping gas or bursting of pressure-containing parts may result if this equipment is overpressured or is installed where service conditions could exceed the limits given in Tables 1 through 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.



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Figure 2. Nameplate

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

Equipment operation within ratings does not preclude the possibility of damage from debris in the lines or from external sources. This equipment should be inspected for damage periodically and after any overpressure condition.

Y610A, Y611A, and Y612A Series

Table 1. Types Y610A and Y610AP Vacuum Breaker Pressure Information

| TYPES | MAXIMUM ALLOWABLE INLET (BODY) PRESSURE | | MAXIMUM EMERGENCY OUTLET (CASING) PRESSURE (POSITIVE) | | SET PRESSURE RANGE (VACUUM) | | MAXIMUM ALLOWABLE VACUUM | | CONTROL SPRING COLOR CODE, PART NUMBER | CHANGE IN OUTLET (CONTROLLED) PRESSURE REQUIRED TO FULLY OPEN VACUUM BREAKER | |
|------------------|---|------|---|-----|--------------------------------------|--------------------------------------|--------------------------|------|--|--|------|
| | psig | bar | psig | bar | With Spring Case Above Diaphragm | With Spring Case Below Diaphragm | psig | bar | | psig | mbar |
| Y610A and Y610AP | 13 | 0.90 | 15 | 1.0 | 1 to 3 inches w.c. / 2 to 7 mbar | 0 to 2 inches w.c. / 0 to 5 mbar | 5.1 | 0.35 | Brown Stripe, 1D892527022 | 0.043 | 3 |
| | | | | | 1.5 to 5 inches w.c. / 4 to 12 mbar | 0.50 to 4 inches w.c. / 1 to 10 mbar | 5.2 | 0.36 | Pink Stripe, 1D765427012 | 0.078 | 5 |
| | | | | | 3 to 8 inches w.c. / 7 to 20 mbar | 2 to 7 inches w.c. / 5 to 17 mbar | 5.3 | 0.37 | Purple Stripe, 0B019727052 | 0.143 | 1 |
| | | | | | 8 to 16 inches w.c. / 20 to 40 mbar | 7 to 15 inches w.c. / 17 to 37 mbar | 5.6 | 0.39 | Gray, 1B766627062 | 0.181 | 12 |
| | | | | | 16 to 32 inches w.c. / 40 to 80 mbar | 15 to 31 inches w.c. / 37 to 77 mbar | 6.1 | 0.42 | Unpainted, 1B883327022 | 0.378 | 26 |
| | | | | | 0.25 to 3 psig / 17 to 207 mbar | 0.25 to 3 psig / 17 to 207 mbar | 8.0 | 0.55 | Black, 1A630627022 | 1.944 | 134 |

Table 2. Types Y611A and Y611AP Relief Valve Pressure Information

| TYPES | MAXIMUM ALLOWABLE INLET (CASING) PRESSURE ⁽¹⁾ | | MAXIMUM OPERATING INLET (RELIEF) PRESSURE TO PREVENT PART DAMAGE ⁽¹⁾ | | INLET RELIEF SET PRESSURE RANGE, | | CONTROL SPRING COLOR CODE, PART NUMBER | BUILDUP OVER INLET PRESSURE REQUIRED TO FULLY OPEN RELIEF VALVE | |
|------------------|--|-----|---|------|--------------------------------------|--|--|---|------|
| | psig | bar | psig | bar | With Spring Case Above Diaphragm | With Spring Case Below Diaphragm | | psig | mbar |
| Y611A and Y611AP | 15 | 1.0 | 5.1 | 0.35 | 3 to 4 inches w.c. / 7 to 10 mbar | 2 to 3 inches w.c. / 5 to 7 mbar | Red, 1D892627022 | 0.089 | 6 |
| | | | 5.2 | 0.36 | 3.75 to 6 inches w.c. / 9 to 15 mbar | 2.75 to 5 inches w.c. / 6.9 to 12 mbar | Red, 1D892727012 | 0.100 | 7 |
| | | | 5.3 | 0.37 | 5 to 8 inches w.c. / 12 to 20 mbar | 4 to 7 inches w.c. / 10 to 17 mbar | Black, 1D892727012 | 0.124 | 9 |
| | | | 5.5 | 0.38 | 7 to 16 inches w.c. / 17 to 40 mbar | 6 to 15 inches w.c. / 15 to 37 mbar | White Stripe, 1D893227032 | 0.216 | 15 |
| | | | 6 | 0.41 | 10 to 30 inches w.c. / 25 to 75 mbar | 9 to 29 inches w.c. / 22 to 72 mbar | Green, 1D893327032 | 0.351 | 24 |
| | | | 6.5 | 0.45 | 0.75 to 1.5 psig / 52 to 103 mbar | 0.75 to 1.5 psig / 52 to 103 mbar | Blue, 1H975827032 | 0.648 | 45 |
| | | | 7.5 | 0.52 | 1 to 2.5 psig / 69 to 172 mbar | 1 to 2.5 psig / 69 to 172 mbar | Orange, 1H975927032 | 1.026 | 71 |

1. Including buildup.

Note

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

1. Only personnel qualified through training and experience should install, operate, and maintain this equipment. For Y610A, Y611A, or Y612A Series equipment that is shipped separately, make sure that there is no damage to or foreign material in it. Also ensure that all tubing and piping have been blown free.

2. This equipment 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. If continuous operation is required during inspection or maintenance, install a three-valve bypass around the equipment.



This equipment may vent some gas to the atmosphere. In hazardous or flammable gas service, vented gas may accumulate and cause personal

Y610A, Y611A, and Y612A Series

Table 3. Types Y612A and Y612AP Vacuum Regulator Pressure Information

| MAXIMUM ALLOWABLE INLET (CASING) PRESSURE | | MAXIMUM OPERATING INLET PRESSURE TO PREVENT PART DAMAGE | | SET PRESSURE RANGE (VACUUM) | | MAXIMUM ALLOWABLE VACUUM | | CONTROL SPRING COLOR CODE, PART NUMBER | CHANGE IN OUTLET (CONTROLLED) PRESSURE REQUIRED TO FULLY OPEN VACUUM REGULATOR | | | | | |
|---|------|---|------|--------------------------------------|--|--------------------------|------|--|--|------|------------------------------|------|-----------------------------------|------|
| | | | | | | | | | 5/8-inch / 16 mm Port Diameter | | 1-inch / 25 mm Port Diameter | | 1-3/16-inch / 30 mm Port Diameter | |
| psig | bar | psig | bar | With Spring Case Above Diaphragm | With Spring Case Below Diaphragm | psig | bar | | psig | mbar | psig | mbar | psig | mbar |
| 15 | 1.03 | 5.1 | 0.35 | 1 to 3 inches w.c. / 2.5 to 7 mbar | 0 to 2 inches w.c. / 0 to 5 mbar | 5.1 | 0.35 | Brown Stripe, 1D892527022 | 0.089 | 6.1 | 0.053 | 3.6 | 0.076 | 5.2 |
| | | 5.2 | 0.36 | 1.5 to 5 inches w.c. / 4 to 12 mbar | 0.50 to 4 inches w.c. / 1.2 to 10 mbar | 5.2 | 0.36 | Pink Stripe, 1D765427012 | 0.124 | 8.6 | 0.074 | 5.1 | 0.106 | 7.3 |
| | | 5.3 | 0.37 | 3 to 8 inches w.c. / 7 to 20 mbar | 2 to 7 inches w.c. / 5 to 17 mbar | 5.3 | 0.37 | Purple Stripe, 0B019727052 | 0.189 | 13 | 0.112 | 7.7 | 0.161 | 11 |
| | | 5.6 | 0.39 | 8 to 16 inches w.c. / 20 to 40 mbar | 7 to 15 inches w.c. / 17 to 37 mbar | 5.6 | 0.39 | Gray, 1B766627062 | 0.227 | 16 | 0.134 | 9.3 | 0.193 | 13 |
| | | 6.1 | 0.42 | 16 to 32 inches w.c. / 40 to 80 mbar | 15 to 31 inches w.c. / 37 to 77 mbar | 6.1 | 0.42 | Unpainted, 1B883327022 | 0.405 | 28 | 0.240 | 17 | 0.345 | 24 |
| | | 8.0 | 0.55 | 0.25 to 3 psig / 17 to 207 mbar | 0.25 to 3 psig / 17 to 207 mbar | 8.0 | 0.55 | Black, 1A630627022 | 1.944 | 134 | 1.152 | 79 | 1.656 | 114 |

injury, death, or property damage due to fire or explosion. Vent equipment 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.

- A Type Y610A or Y610AP vacuum breaker (Figure 3) is used in applications where an increase in vacuum must be limited. An increase in vacuum (decrease in absolute pressure) is transmitted to the lower side of the diaphragm, opening the disk assembly. This permits atmosphere, or an upstream vacuum that has higher absolute pressure than the downstream vacuum, to enter the system and restore the controlled vacuum to its original pressure setting. A Type Y610A direct-operated vacuum breaker is self-contained and requires no control line. A Type Y610AP vacuum breaker requires a control line from the 1/2 NPT tapping in the diaphragm case assembly (key 20, Figure 4) to a point downstream of the body (key 28, Figure 4).
- A Type Y611AP vacuum breaker (Figure 3) also is used in applications where an increase in vacuum must be limited. An increase in vacuum (decrease in absolute pressure) is transmitted to the upper side of the diaphragm, opening the disk assembly. This permits atmosphere, or an upstream vacuum that has higher absolute pressure than the downstream vacuum, to enter the system and restore the controlled vacuum to its original pressure setting. A Type Y611AP vacuum breaker requires a control line from the 1/2 NPT tapping in the spring case assembly (key 23, Figure 5) to a point downstream of the body (key 28, Figure 5).
- A Type Y611A relief valve (Figure 3) is used to maintain a constant inlet pressure with the outlet flowing to atmosphere or to any system whose pressure is lower than the pressure at the relief valve inlet. An increase in inlet pressure opens the disk assembly, relieving the excess pressure and restoring the inlet pressure to its original setting. A Type Y611A direct-operated relief valve is self-contained and requires no control line.
- A Type Y612A or Y612AP vacuum regulator is used to maintain a constant vacuum at the regulator inlet. A decrease in this vacuum (increase in absolute pressure) beyond this value registers underneath the diaphragm and opens the disk. This permits a downstream vacuum of lower absolute pressure than the upstream vacuum to restore the upstream vacuum to its original pressure setting. A Type Y612A (Figure 6) direct-operated vacuum regulator is self-contained and requires no control line. A Type Y612AP vacuum regulator requires a control line from the 1/2 NPT tapping in the diaphragm case assembly to a point upstream of the body.

Startup and Adjustment

All Y610A, Y611A, or Y612A Series equipment can be placed in operation by slowly introducing inlet vacuum or pressure. This equipment takes control when downstream vacuum or pressure is established.

This equipment is suitable for the pressure range stamped on the nameplate (key 48, Figure 4, 5, or 6), and listed in Tables 1 through 3. To adjust the pressure setting, remove the closing cap (key 3, Figure 4, 5, or 6), the adjusting screw clockwise to increase the pressure setting or counterclockwise to decrease the setting. Replace the cap after making this adjustment. If desired, the closing cap may be wired to the hole provided in the spring case to discourage tampering.

Shutdown

First close the nearest upstream shut-off valve and then close the nearest downstream shut-off valve to vent the equipment properly. Next, open the vent valve between the equipment and the downstream shut-off valve nearest to it. All pressure between these shut-off valves is released through the open vent valve.

Maintenance

Equipment parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement of parts depends on the severity of service conditions and upon applicable codes and government regulations.



WARNING

To avoid personal injury, property damage, or equipment damage caused by sudden release of pressure or explosion of accumulated gas, do not attempt any maintenance or disassembly without first isolating the regulator from system pressure and relieving all internal pressure from the equipment.

Body Area

These procedures are for gaining access to the disk assembly, seat ring, and body gasket or diaphragm case O-ring. All pressure must be released from the diaphragm case before the following steps can be performed.

Type Y610A or Y610AP Vacuum Breaker

Key numbers are referenced in Figure 4.

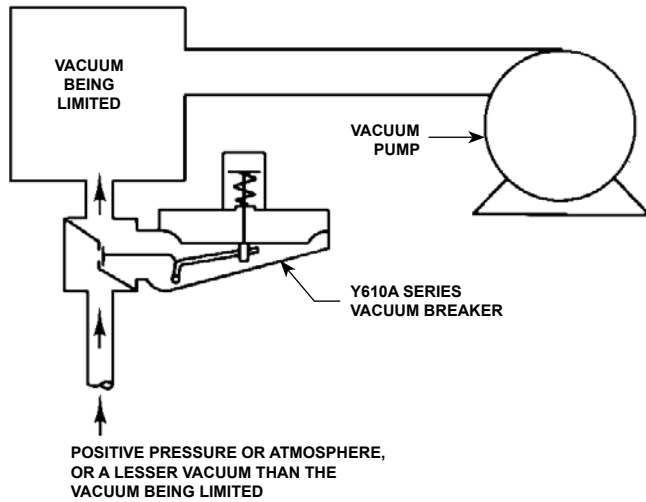
1. To inspect or replace the seat O-ring (key 39) or seat ring (key 27), loosen the diaphragm case cap screws (key 29), remove the union ring (key 20D), and separate the diaphragm case assembly (key 20) from the body (key 28).
2. Remove the diaphragm case O-ring (key 15) and inspect the body (key 28).
3. Inspect and replace the seat ring (key 27) if necessary. Lubricate the threads of the replacement seat ring with a good grade of pipe sealant and tighten using 29 to 37 foot-pounds / 39 to 50 N•m of torque.
4. If it is necessary to replace the seat O-ring (key 39), remove the disk assembly cap screw (key 44), seal washer (key 45), seat O-ring washer (key 32), and seat O-ring from the valve stem (key 13).
5. Install the seat O-ring (key 39), seat O-ring washer (key 32), and seal washer (key 45) onto the seat O-ring holder (key 31), and secure with the disk assembly cap screw (key 44).
6. If necessary, install a replacement diaphragm case O-ring (key 15) into the body (key 28).
7. Install the diaphragm case assembly (key 20) on the body (key 28) and secure with the union ring (key 20D) and diaphragm case cap screws (key 29).

Type Y611A or Y611AP Vacuum Breaker or Relief Valve or Type Y612A or Y612AP Vacuum Regulator

Types Y611A and Y611AP key numbers are referenced in Figure 5 and Types Y612A and Y612AP key numbers are referenced in Figure 6.

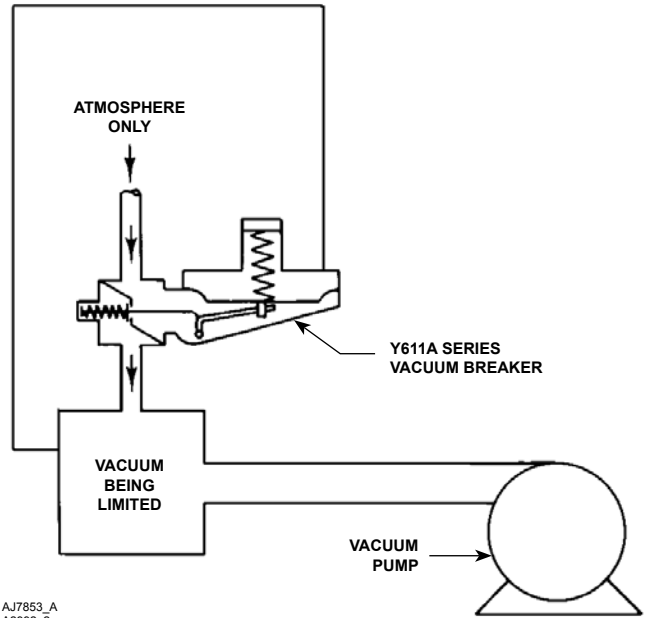
1. To inspect and replace the disk assembly (key 25), remove the body cap (key 38).
2. Unscrew the disk spacer (key 43) and remove the disk assembly (key 25), disk assembly gasket (key 26), and disk spring (key 41) from the valve stem (key 40).
3. To inspect and replace the seat ring (key 27), loosen the diaphragm case cap screws (key 29), remove the union ring (key 20D), and separate the diaphragm case assembly (key 20) from the body (key 28).
4. Remove the diaphragm case O-ring (key 15) and inspect the body (key 28).

Y610A, Y611A, and Y612A Series



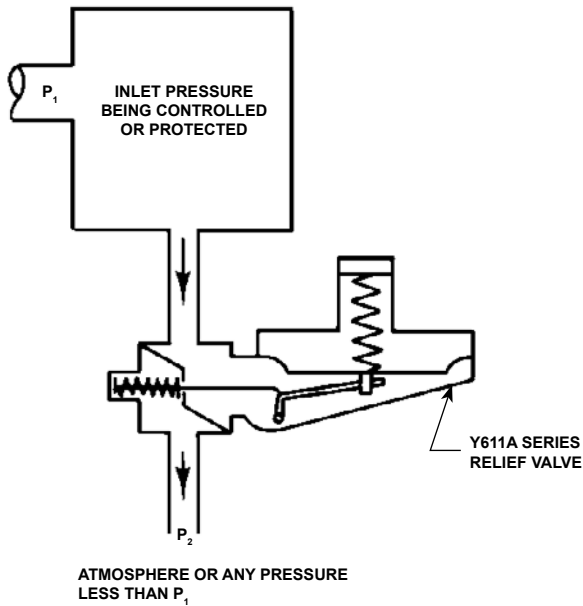
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Y610A SERIES VACUUM BREAKER



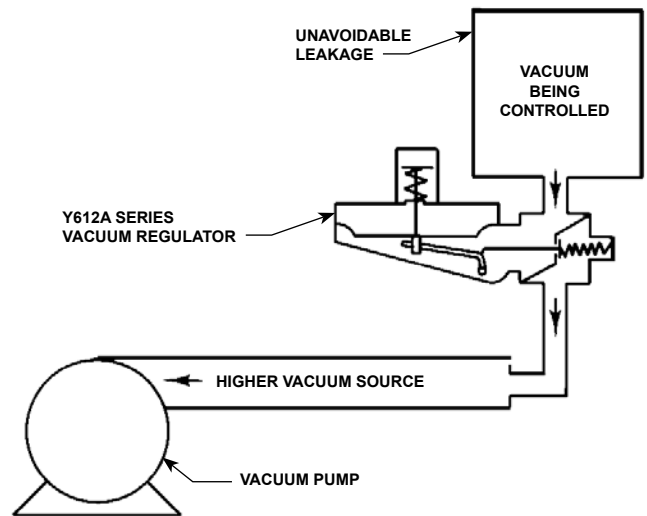
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Y611A SERIES VACUUM BREAKER



AJ7854_A
A2993_2

Y611A SERIES RELIEF VALVE



AJ7865_A
A2994_2

Y612A SERIES VACUUM REGULATOR

Figure 3. Installation Schematics

Y610A, Y611A, and Y612A Series

5. Inspect and replace the seat ring (key 27) if necessary. Lubricate the threads of the replacement seat ring with a good grade of pipe sealant and tighten using 29 to 37 foot-pounds / 39 to 50 N•m of torque.
6. If necessary, install a replacement diaphragm case O-ring (key 15) into the body (key 28).
7. Install the diaphragm case assembly (key 20) on the body (key 28) and secure with the union ring (key 20D) and diaphragm case cap screws (key 29).
8. Install the disk spring (key 41), disk assembly gasket (key 26), and disk assembly (key 25) on the disk stem (key 40) and attach using the disk spacer (key 43).
9. Use a good quality thread sealer when replacing the body cap (key 38) assembly.
6. Grease the replacement stem seal O-ring (key 46) with a good grade of elastomer lubricant and install on the valve stem (key 13). Install the valve stem by pushing it into the stem adaptor (key 60) and perform Type Y610A or Y610AP body area maintenance procedure steps 5 and 6 if necessary.
7. Install the lever assembly (key 9) into the valve stem (key 13) and secure the lever assembly (key 9) with the lever pin (key 10) and machine screws (key 11).
8. Install the small diaphragm plate gasket (key 7), diaphragm plate (key 24), and diaphragm (key 5) on the pusher post (key 8) and attach with the diaphragm nut (key 37). Tighten using 30 to 45 foot-pounds / 41 to 61 N•m of torque.
9. Install the pusher post (key 8) plus attached diaphragm parts onto the lever assembly (key 9).
10. Install the spring case assembly (key 23) and control spring (key 1) on the diaphragm case assembly (key 20) so that the vent assembly (key 65, not shown) is correctly oriented, and secure them with the spring case cap screws (key 21) and hex nuts (key 22) to finger tightness only.

Diaphragm and Spring Case Area

These procedures are for gaining access to the control spring, diaphragm assembly, valve stem, and stem O-ring. All pressure must be released from the diaphragm case before these steps can be performed.

Type Y610A or Y610AP Vacuum Breaker

Key numbers are referenced in Figure 4.

1. Remove the closing cap (key 3) and turn the adjusting nut (key 18) counterclockwise until all compression is removed from the control spring (key 1).
2. Remove the spring case cap screws (key 21) and hex nuts (key 22) and lift off the spring case assembly (key 23). If the only further maintenance is to change the control spring (key 1), skip to step 10.
3. Remove the diaphragm (key 5) and attached parts by tilting it so that the pusher post (key 8) slips off the lever assembly (key 9). To separate the diaphragm (key 5) from the attached parts, unscrew the diaphragm nut (key 37). If the only further maintenance is to replace the diaphragm parts or change the control spring (key 1), skip to step 8.
4. To replace the lever assembly (key 9), remove the machine screws (key 11) and lever pin (key 10).
5. To replace the valve stem (key 13) or stem seal O-ring (key 46) perform Type Y610A or Y610AP body area maintenance procedure step 4 and pull the valve stem out of the stem adaptor (key 60).
11. Turn the adjusting nut (key 18) clockwise until there is enough control spring (key 1) force to provide proper slack to the diaphragm (key 5) and attached parts. Using a crisscross pattern, finish tightening the spring case cap screws (key 21) and hex nuts (key 22) to 55 to 75 inch-pounds / 6.2 to 8.5 N•m of torque. Then finish turning the adjusting nut (key 18) to the desired set pressure setting.
12. Install a replacement closing cap gasket (key 35) if necessary, and then install the closing cap (key 3).

Type Y611A or Y611AP Vacuum Breaker or Relief Valve

Key numbers are referenced in Figure 5.

1. Remove the closing cap (key 3) and turn the adjusting screw (key 2) counterclockwise until all compression is removed from the control spring (key 1).
2. Remove the spring case cap screws (key 21) and hex nuts (key 22) and lift off the spring case assembly (key 23). If the only further maintenance is to change the control spring (key 1), skip to step 10.

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3. Remove the diaphragm (key 5) and attached parts by tilting it so that the pusher post (key 8) slips off the lever assembly (key 9). To separate the diaphragm (key 5) from the attached parts, unscrew the diaphragm plate cap screw (key 64). If the only further maintenance is to replace the diaphragm parts or change the control spring (key 1), skip to step 8.
4. To replace the lever assembly (key 9), remove the machine screws (key 11) and lever pin (key 10).
5. To replace the valve stem (key 13) or stem seal O-ring (key 46) pull the valve stem out of the stem adaptor (key 60).
6. Grease the replacement stem seal O-ring (key 46) with a good grade of elastomer lubricant and install on the valve stem (key 13). Install the valve stem by pushing it into the stem adaptor (key 60).
7. Install the lever assembly (key 9) into the valve stem (key 13) and secure the lever assembly (key 9) with the lever pin (key 10) and machine screws (key 11).
8. Install the small diaphragm plate gasket (key 7), diaphragm plate (key 24), and diaphragm (key 5) on the pusher post (key 8) and attach with the diaphragm plate cap screw (key 64). Tighten using 30 to 45 foot-pounds / 41 to 61 N•m of torque.
9. Install the pusher post (key 8) plus attached diaphragm parts onto the lever assembly (key 9).
10. Install the spring case assembly (key 23) and control spring (key 1) on the diaphragm case assembly (key 20) so that the vent assembly (key 65, not shown) is correctly oriented, and secure them with the spring case cap screws (key 21) and hex nuts (key 22) to finger tightness only.
11. Turn the adjusting screw (key 2) clockwise until there is enough control spring (key 1) force to provide proper slack to the diaphragm (key 5) and attached parts. Using a crisscross pattern, finish tightening the spring case cap screws (key 21) and hex nuts (key 22) to 55 to 75 inch-pounds / 6.2 to 8.5 N•m of torque. Then finish turning the adjusting screw (key 2) to the desired set pressure setting.
12. Install a replacement closing cap gasket (key 35) if necessary, and then install the closing cap (key 3).

Type Y612A or Y612AP Vacuum Regulator

Key numbers are referenced in Figure 6.

1. Remove the closing cap (key 3) and turn the adjusting nut (key 18) counterclockwise until all compression is removed from the control spring (key 1).
2. Remove the spring case cap screws (key 21) and hex nuts (key 22) and lift off the spring case assembly (key 23). If the only further maintenance is to change the control spring (key 1), skip to step 10.
3. Remove the diaphragm (key 5) and attached parts by tilting it so that the pusher post (key 8) slips off the lever assembly (key 9). To separate the diaphragm (key 5) from the attached parts, unscrew the diaphragm nut (key 37). If the only further maintenance is to replace the diaphragm parts or change the control spring (key 1), skip to step 8.
4. To replace the lever assembly (key 9), remove the machine screws (key 11) and lever pin (key 10).
5. To replace the valve stem (key 13) or stem seal O-ring (key 46) pull the valve stem out of the stem adaptor (key 60).
6. Grease the replacement stem seal O-ring (key 46) with a good grade of elastomer lubricant and install on the valve stem (key 13). Install the valve stem by pushing it into the stem adaptor (key 60).
7. Install the lever assembly (key 9) into the valve stem (key 13) and secure the lever assembly (key 9) with the lever pin (key 10) and machine screws (key 11).
8. Install the small diaphragm plate gasket (key 7), diaphragm plate (key 24), and diaphragm (key 5) on the pusher post (key 8) and attach with the diaphragm nut (key 37). Tighten using 30 to 45 foot-pounds / 41 to 61 N•m of torque.
9. Install the pusher post (key 8) plus attached diaphragm parts onto the lever assembly (key 9).
10. Install the spring case assembly (key 23) and control spring (key 1) on the diaphragm case assembly (key 20) so that the vent assembly (key 65, not shown) is correctly oriented, and secure them with the spring case cap screws (key 21) and hex nuts (key 22) to finger tightness only.

Y610A, Y611A, and Y612A Series

11. Turn the adjusting nut (key 18) clockwise until there is enough control spring (key 1) force to provide proper slack to the diaphragm (key 5) and attached parts. Using a crisscross pattern, finish tightening the spring case cap screws (key 21) and hex nuts (key 22) to 55 to 75 inch-pounds / 6.2 to 8.5 N•m of torque. Then finish turning the adjusting nut (key 18) to the desired set pressure setting.
12. Install a replacement closing cap gasket (key 35) if necessary, and then install the closing cap (key 3).

Parts Ordering

When corresponding with the local Sales Office about this regulator, include the type number and all other pertinent information stamped on the closing cap (key 3) or nameplate (key 48). Specify the eleven-character part number when ordering new parts from the following parts list.

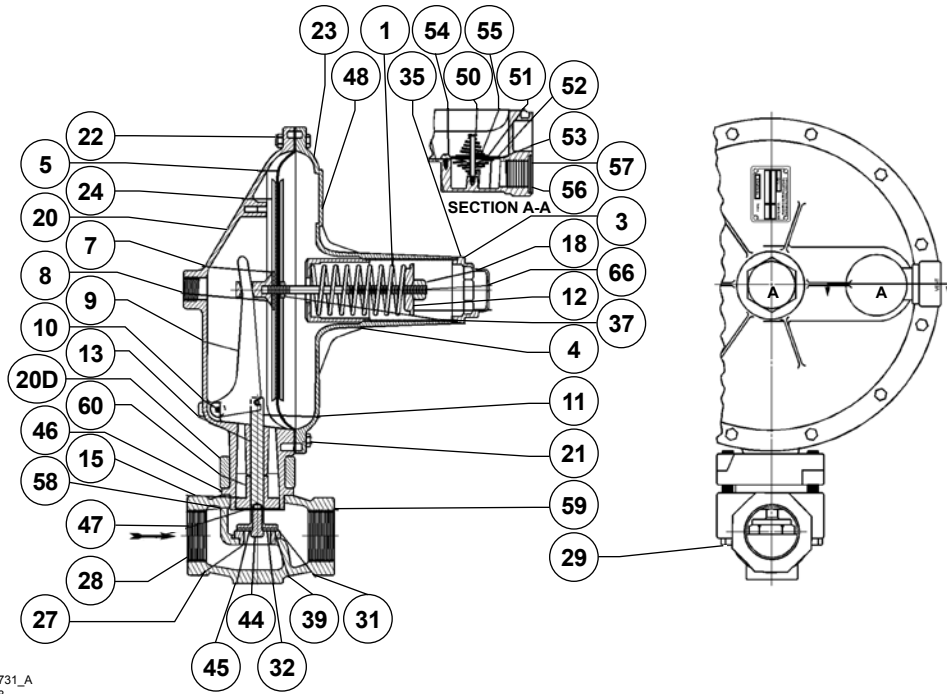
Parts List (Figures 4 through 6)

| Key | Description | Part Number |
|-----|---|---|
| 1 | Control Spring, Steel | See following table |
| 2 | Adjusting Screw Type Y611A or Y611AP, For aluminum | 1L928608012 |
| 3 | Closing Cap Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP, Aluminum | 1L928308012 |
| 4 | Control Spring Seat Type Y610A, Y610AP, Y612A, or Y612AP, Cast iron | 1U226019012 |
| 5* | Diaphragm, Aluminum Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1K649602052 |
| 7* | Small Diaphragm Plate Gasket Type Y610A, Y610AP, Y611A, or Y611AP, Aluminum | 1L143403022 |
| 8 | Pusher Post Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP, Aluminum | 1L143311992 |
| 9 | Lever Assembly, Plated steel Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP, Aluminum | 1H974028992 |
| 10 | Lever Pin Stainless steel | 1H972935032 |
| 11 | Machine Screw (2 required) Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP, Plated steel | 1B420428982 |
| 12 | Control Spring Seat Steel | See following table |
| 13 | Stem Assembly Type Y610A, Aluminum Type Y610AP, Aluminum Type Y611A, Y611AP, Y612A, or Y612AP, Aluminum | 1H9748000A2 1L1426000A2 1L2212000A2 |
| 15* | Diaphragm Case O-ring, Nitrile (NBR) | 1F358106992 |
| 18 | Adjusting Nut (for Type Y610A, Y610AP, Y612A, or Y612AP only), Brass | 1A201914012 |

| Key | Description | Part Number |
|-----|---|--|
| 20 | Diaphragm Case Assembly Type Y610A, Y611A, or Y612A, Aluminum Type Y610AP, Y611AP, or Y612AP, Aluminum | 1H9751X0012 1H9751X0022 |
| 21 | Spring Case Cap Screw, Plated steel Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP (12 required) | 1B136324052 |
| 22 | Hex Nut, Cadmium Plated steel Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP (12 required) | 1A309324122 |
| 23 | Spring Case Assembly Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP, Aluminum | 4L142308032 |
| 24 | Diaphragm Plate | See following table |
| 25* | Disk Assembly (not used with Type Y610A or Y610AP) Type Y611A, Y611AP, Y612A, or Y612AP, Aluminum disk holder and Nitrile (NBR) disk | 1H9739000A2 |
| 26* | Disk Assembly Gasket (for Type Y611A, Y611AP, Y612A, or Y612AP only), Composition | 1F826804022 |
| 27* | Seat Ring Type Y610A or Y610AP, Aluminum 3/4-inch / 19 mm, port diameter 1-3/8-inch / 30 mm, port diameter Type Y611A or Y611AP, Aluminum 1-3/8-inch / 30 mm, port diameter Type Y612A or Y612AP, Aluminum 5/8-inch / 16 mm, port diameter 1-inch / 25 mm, port diameter 1-3/8-inch / 30 mm, port diameter | 1H979509022 1L220809022 1H980809022 1H980509022 1H980709022 1H980809022 |
| 28 | Body Type Y610A or Y610AP Cast iron 1-1/2 NPT 2 NPT NPS 2 / DN 50, CL125 FF flanged Steel 1-1/2 NPT 2 NPT Type Y611A, Y611AP, Y612A, or Y612AP Cast iron 1-1/2 NPT 2 NPT NPS 2 / DN 50, CL125A FF flanged Steel 1-1/2 NPT 2 NPT | 1J190319012 1H974919012 2K184219012 1K787922012 1K791222012 1J190519012 1H974319012 1K184319012 1K788022012 1K792222012 |
| 29 | Diaphragm Case Cap Screw (for Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP only), Plated steel (2 required) | 1H974724052 |
| 31 | Seat O-ring Holder (for Type Y610A or Y610AP only), Aluminum | 1L154909012 |
| 32 | Seat O-ring Washer (for Type Y610A or Y610AP only), Aluminum | 1V5121X0012 |
| 35* | Closing Cap Gasket, Neoprene (CR) Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1N446206992 |
| 37 | Diaphragm Nut (for Type Y610A, Y610AP, Y612A, or Y612AP only), Aluminum | 1A499724122 |
| 38 | Body Cap Assembly Type Y611A, Y611AP, Y612A, or Y612AP, Aluminum | 1R236109022 |
| 39* | Seat O-ring (for Type Y610A or Y610AP only), Nitrile (NBR) | 1F269206992 |
| 40 | Valve Stem Type Y611A, Y611AP, Y612A, or Y612AP, Aluminum | 1H973509082 |
| 41 | Back Disk Spring Type Y611A, Y611AP, Y612A, or Y612AP | 1L303837022 |
| 43 | Disk Spacer Type Y611A, Y611AP, Y612A, or Y612AP, Aluminum | 1H973609012 |

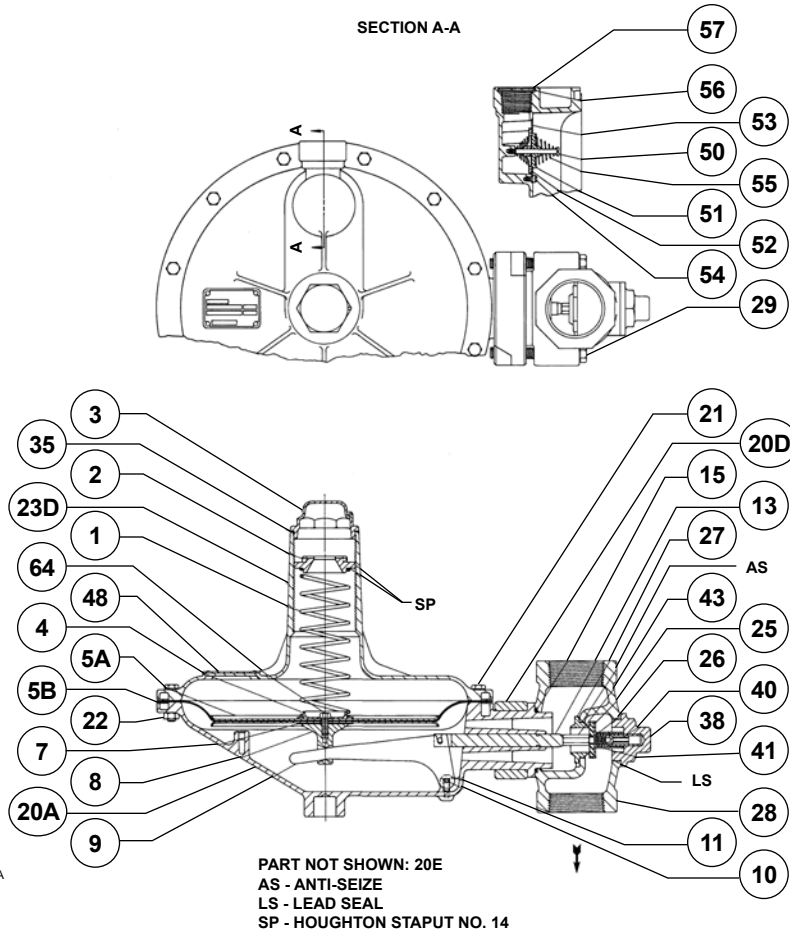
*Recommended Spare Part

Y610A, Y611A, and Y612A Series



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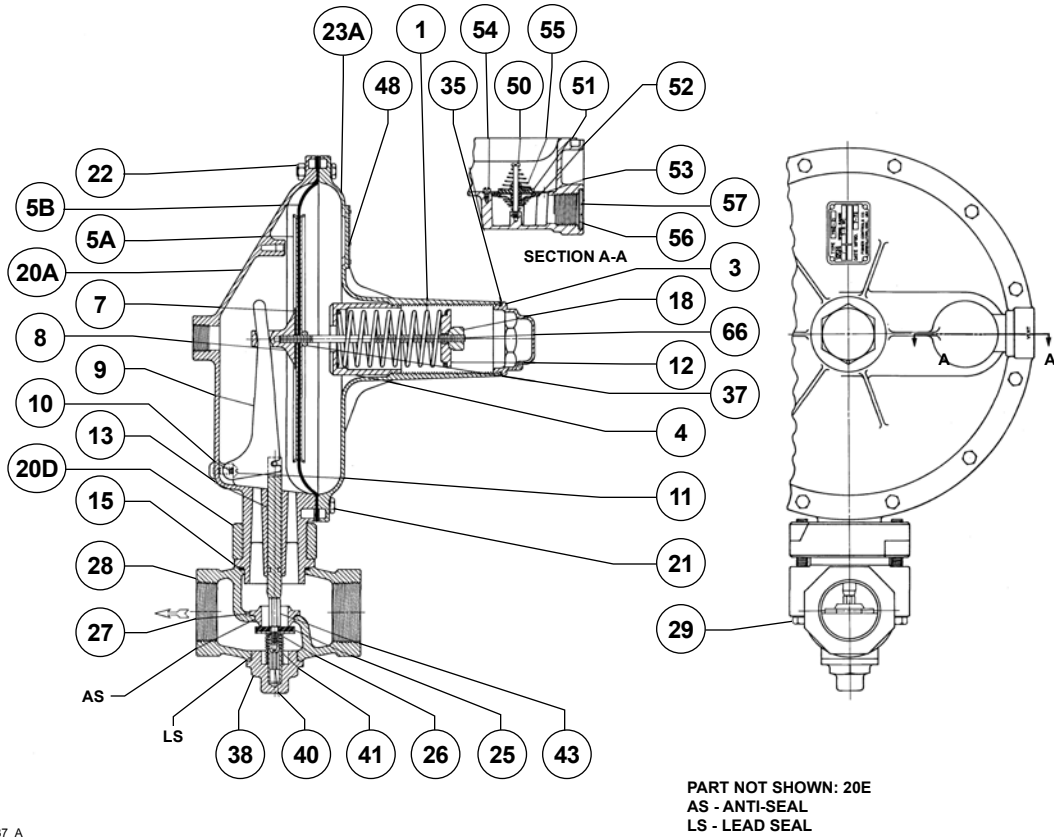
Figure 4. Type Y610AP Vacuum Breaker



51A1733_A

Figure 5. Type Y611A Relief Valve Assembly

Y610A, Y611A, and Y612A Series



51A1737_A

Figure 6. Type Y612A Vacuum Regulator

Key 1 Control Spring, Steel
 Key 12 Control Spring Seat, Steel
 Key 24 Diaphragm Plate, Steel
 Key 64 Diaphragm Plate Cap Screw, Plated steel

| TYPES | KEY 1 ⁽¹⁾ | | KEY 12 | KEY 24 | | KEY 64 |
|------------------|----------------------|-------------|-------------|-------------|-------------------|-------------|
| | Color Code | Part Number | Part Number | Part Number | Quantity Required | Part Number |
| Y610A and Y610AP | Brown Stripe | 1D892527022 | 1A869524092 | 0B006628982 | 2 | ----- |
| | Pink Stripe | 1D765427012 | 1A869524092 | 0B006628982 | 2 | ----- |
| | Purple Stripe | 0B019727052 | 1A869524092 | 0B006628982 | 2 | ----- |
| | Gray | 1B766627062 | 1A869524092 | 0B006628982 | 2 | ----- |
| | Unpainted | 1B883327022 | 1A626424092 | 0B006628982 | 2 | ----- |
| | Black | 1A630627022 | 1A626424092 | 1A347825022 | 2 | ----- |
| Y611A and Y611AP | Red | 1D892627022 | ----- | 0B006628982 | 2 | 1C473224052 |
| | Red | 1D892627022 | ----- | 0B006628982 | 2 | 1C473224052 |
| | Black Stripe | 1D892727012 | ----- | 0B006628982 | 2 | 1C473224052 |
| | White Stripe | 1D893227032 | ----- | 0B006628982 | 2 | 1C473224052 |
| | Green | 1D893327032 | ----- | 0B006628982 | 2 | 1C473224052 |
| | Blue | 1H975827032 | ----- | 1A347825022 | 2 | 1A667824052 |
| Y612A and Y612AP | Brown Stripe | 1D892527022 | 1A869524092 | 0B006628982 | 2 | ----- |
| | Pink Stripe | 1D765427012 | 1A869524092 | 0B006628982 | 2 | ----- |
| | Purple Stripe | 0B019727052 | 1A869524092 | 0B006628982 | 2 | ----- |
| | Gray | 1B766627062 | 1A869524092 | 0B006628982 | 2 | ----- |
| | Unpainted | 1B883327022 | 1A626424092 | 0B006628982 | 2 | ----- |
| | Black | 1A630627022 | 1A626424092 | 1A347825022 | 2 | ----- |

1. See Tables 1 through 3 for spring ranges.

Y610A, Y611A, and Y612A Series

Parts List (Figures 4 through 6) (continued)

| Key | Description | Part Number | Key | Description | Part Number |
|-----|--|-------------|-----|--|-----------------------------|
| 44 | Cap Screw (for Type Y610A or Y610AP only), Aluminum | 1E760324052 | 55 | Spring (2 required) Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1H976837022 |
| 45 | Dyna-Seal Washer (for Type Y610A or Y610AP only), Aluminum | 1F990428982 | 56 | Screen Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1E564843122 |
| 46* | Stem Seal O-ring (for Type Y610AP, Y611AP, or Y612AP only), Nitrile (NBR) | 1E216306992 | 57 | Snap Ring Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1E564937022 |
| 50 | Flapper Stem Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1H976335022 | 58 | Retaining Ring Type Y610AP, Y611AP, or Y612AP | 1L142838992 |
| 51 | Lower Flapper Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1H976406992 | 59 | O-Ring Type Y610AP, Y611AP, or Y612AP | 1L142906992 |
| 52 | Upper Flapper Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1H976506992 | 60 | Stem Adaptor Type Y610AP, Y611AP, or Y612AP | 1L143109012 |
| 53 | Flapper Seat (for Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP only), Stainless steel | T13609T0012 | 64 | Diaphragm Plate Cap Screw, Plated steel | See table on page 11 |
| 54 | Self Tapping Screw (3 required) Type Y610A, Y610AP, Y611A, Y611AP, Y612A, or Y612AP | 1H976728982 | 65 | Type Y602-1 Vent Assembly, Spring Case Up Spring Case Down | Type Y602-11 Type Y602-2 |
| | | | 66 | Stem Type Y610A, Y610AP, Y612A, or Y612AP | 1A626314012 |

*Recommended Spare Part

Industrial Regulators

Emerson Process Management Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75069-1872, USA
Tel: +1 800 558 5853
Outside U.S. +1 972 548 3574

Asia-Pacific
Shanghai 201206, China
Tel: +86 21 2892 9000

Europe
Bologna 40013, Italy
Tel: +39 051 419 0611

Middle East and Africa
Dubai, United Arab Emirates
Tel: +971 4811 8100

Natural Gas Technologies

Emerson Process Management Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75069-1872, USA
Tel: +1 800 558 5853
Outside U.S. +1 972 548 3574

Asia-Pacific
Singapore 128461, Singapore
Tel: +65 6770 8337

Europe
Bologna 40013, Italy
Tel: +39 051 419 0611
Chartres 28008, France
Tel: +33 2 37 33 47 00

TESCOM

Emerson Process Management Tescom Corporation

USA - Headquarters
Elk River, Minnesota 55330-2445, USA
Tels: +1 763 241 3238
+1 800 447 1250

Europe
Selmsdorf 23923, Germany
Tel: +49 38823 31 287

Asia-Pacific
Shanghai 201206, China
Tel: +86 21 2892 9499

For further information visit www.fisherregulators.com

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