Integra® Pneumatically Operated Diaphragm Valves with Position Indication Option

¼" orifice, 2-way, normally closed, sampling designs

REPAIR INSTRUCTIONS

For models:

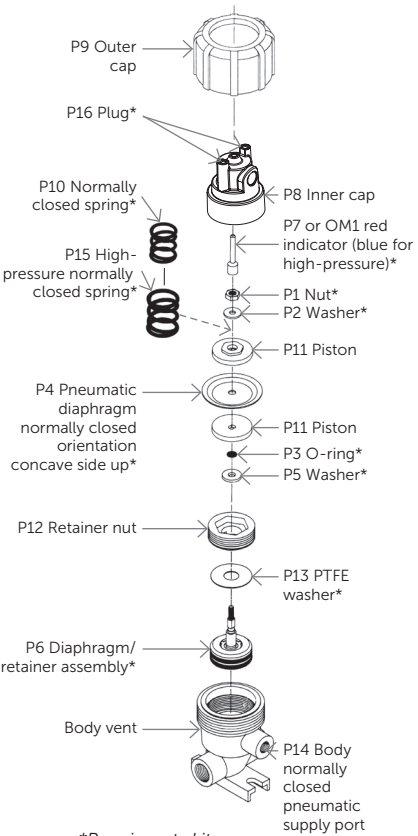
Normally closed 2-way:
202-68-01, 202-69-01, 202-71-01, 202-72-01

Sampling:
202-78-01, 202-79-01, 202-81-01, 202-82-01

High-pressure:
202-122-01, 202-123-01, 202-124-01, 202-125-01, 202-126-01, 202-127-01, 202-130-01, 202-131-01

REPAIR PROCEDURE – DISASSEMBLY

1. Refer to Figure 1 and begin disassembly by first holding the inner cap (P8) with an adjustable wrench (S5) on the flat sections of the pneumatic supply port while turning the outer cap (P9) counterclockwise with the outer cap wrench (T1).
2. Remove the spring (P10) and discard (save for assembly if only installing the Omron® sensor bracket kit).



**Repair parts kit*

Figure 1.

3. While preventing the piston (P11) from rotating by holding the raised hex with an adjustable wrench (S5), remove the indicator (P7) by turning it counter-clockwise with a pliers (S3). For Omron kit only, skip to step 17 of Assembly repair procedure. For other valves, while still holding the piston (P11), remove the nut (P1) with the 5/16" socket (S9). Discard the nut (P1) and indicator (P7).
4. Remove and discard the washer (P2) and then remove the top piston (P11) by pulling up on it.
5. Remove the pneumatic diaphragm (P4) and discard.
6. Remove the lower piston (P11) by prying up between the body and the piston with two flatbladed screwdrivers (S4).
7. Remove the o-ring (P3) and the washer (P5) and discard both.
8. Use the 3/8" allen wrench (S6) to turn the adjusting screw on the diaphragm preload tool (T2) out 12.7 mm (½"). (See Figure 2.) Now, place the diaphragm preload tool (T2) onto the retainer nut (P12). (See Figure 2.)

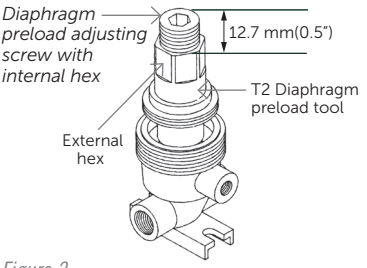


Figure 2.

9. With the 7/8" socket (S7) and torque wrench (S2) turn the external hex on the diaphragm preload tool (T2) counterclockwise to remove the retainer nut (P12).
10. Remove the PTFE washer (P13) and discard.
11. Hold the stainless steel diaphragm stem with a pliers (S3), pull out the diaphragm/ retainer assembly (P6) and discard.

REPAIR PROCEDURE – ASSEMBLY

1. Before beginning assembly, clean the internal body surfaces (P14) and the parts not supplied in the kit with isopropyl alcohol (S8).
2. Begin assembly by applying lubricant (S1) on the diaphragm/retainer assembly (P6) o-rings. (See Figure 3.)

P6 Diaphragm/Retainer Assembly

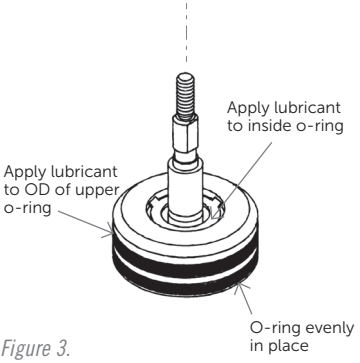


Figure 3.

3. Make sure the o-ring between the diaphragm and retainer is evenly in place (see Figure 3) and then install the diaphragm/retainer assembly (P6) in the valve body (P14) and push the retainer all the way down.
4. Place the PTFE washer (P13) on top of the diaphragm/retainer assembly (P6).
5. Thread the retainer nut (P12) by hand into the valve body (P14) until it contacts the PTFE washer (P13).
6. Place the washer (P5) on the diaphragm stem.

7. Make sure the diaphragm preload tool (T2) adjusting screw is out 12.7 mm (½") before placing the diaphragm preload tool (T2) onto the retainer nut (P12) and securing it in place with the outer cap (P9). (See Figure 4.)

8. While holding the diaphragm preload tool (T2) external hex from turning with an adjustable wrench (S5), turn the internal hex on top of the diaphragm preload tool (T2) with the ⅜" allen wrench (S6) clockwise until it is flush with the top surface of the diaphragm preload tool (T2). (See Figure 4.)

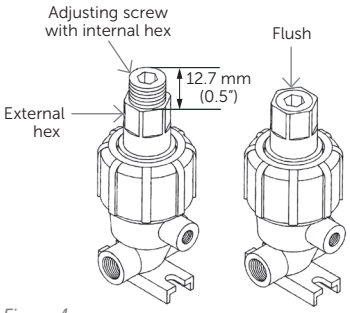


Figure 4.

9. Torque the external hex on the diaphragm preload tool (T2) to 2.82 N•m (25 inch•lbs) with a torque wrench (S2) and a ⅞" socket (S7).

10. While holding the external hex to keep it from turning, turn the internal hex on top of the diaphragm preload tool (T2) counterclockwise until it is 12.7 mm (½") above the top surface of the diaphragm preload tool (T2). Remove the outer cap (P9) and then the diaphragm preload tool (T2).

11. Lubricate the o-ring (P3) with lubricant (S1) and place on top of the washer (P5).

12. Put lower piston (P11) in place. Orient the raised hexagonal surfaces facing away from the pneumatic diaphragm. (See Figure 1.)

13. Place the pneumatic diaphragm (P4) onto the diaphragm stem with the concave side facing up. (See Figure 1.)

14. Put upper piston (P11) in place. Orient the raised hexagonal surfaces facing away from the pneumatic diaphragm. (See Figure 1.)

15. Place the washer (P2) onto the diaphragm stem.

16. While preventing the piston (P11) from rotating by holding the raised hex with an adjustable wrench (S5), install the nut (P1) by rotating it clockwise and torquing it to 0.85 N•m (7.5 inch•lbs) with the torque wrench (S2) and the 5/16" socket (S9).

17. While preventing the piston (P11) from rotating by holding the raised hex with an adjustable wrench (S5), install the indicator (P7 or OM1) by rotating it clockwise and tighten it with a pliers (S3) until it just contacts the nut (P1).

18. Place the spring (P10) on the upper piston (P11). For high-pressure valves, place the high-pressure valve spring (P15) over the spring (P10).

19. Place the inner cap (P8) on the spring (P10).

20. Place the outer cap (P9) on the inner cap (P8).

21. Push down on the inner cap (P8) and prevent it from rotating while threading the outer cap (P9) onto the body (P14). To prevent damage to the valve diaphragms, it is important to prevent the inner cap (P8) from rotating.

22. Hold the inner cap (P8) so it does not rotate and torque the outer cap (P9) to 9.0 N•m (80 inch•lbs) with the outer cap wrench (T1) and torque wrench (S2).

23. Do not trim the indicator until testing is complete.

24. For Omron kit only, install mounting bracket (OM3) using #8-32 screws (OM4). (See Figure 6.)

25. Assembly is now complete. See testing procedures.

TESTING

The valve must be tested in the following ways:

External Operator Leakage

1. Apply 483 kPa (70 psi) air pressure to the pneumatic supply port. No air leakage should be seen from the body vent hole or from the top of the operator when the valve is submerged in water.

Inlet to Outlet Leakage

2. For normally closed valves, apply 690 kPa (100 psi) air pressure to the inlet. No leakage should be seen at the outlet when the outlet port is submerged in water.
3. For high-pressure valves, apply 690 kPa (100 psi) pneumatic pressure to the outlet port. No leakage should be seen at the inlet when the outlet port is submerged in water.
4. For sampling valves, plug port 1 with a taped plug or Flaretek® fitting cap, then apply 690 kPa (100 psi) air pressure to port 2. No leakage should be seen at port 3 when it is submerged in water.

External Media Leakage

5. For normally closed valves, plug the inlet port with a taped plug or Flaretek fitting cap, then apply 690 kPa (100 psi) air pressure to the outlet. No leakage should be seen at the body vent port.
6. For sampling valves, plug ports 1 and 2 with taped plugs or Flaretek fitting caps, then apply 690 kPa (100 psi) air pressure to port 3. No leakage should be seen at the body vent port.

Testing is now complete. Remove two plugs (P16) and continue to the Indicator Stem Trim Procedure.

INDICATOR STEM TRIM PROCEDURE

1. For Omron kit only, place smaller hole of the trim fixture (OM2) around the indicator as shown in Figure 6, and use a blade (S10) to trim the indicator flush with the thinner portion of the trim fixture.

   IMPORTANT: Make sure to use the smaller hole on the thinner section of the trim fixture to ensure the indicator gets trimmed to the proper height.

2. For all other valves, refer to Figure 5. Attach the indicator stem trim fixture (T3) to the inner cap (P8) using the two 8-32 screws provided. The trim fixture must be firmly attached, but take special care not to overtighten the screws and strip the plastic threads.
3. Apply 483 kPa (70 psi) to the pneumatic supply port. With the valve in the actuated, opened position, cut off the indicator stem flush with the top of the trim fixture (T3).
4. Remove the trim fixture. If the valve does not have Espy position sensing, install the two plugs (P16) in the inner cap.

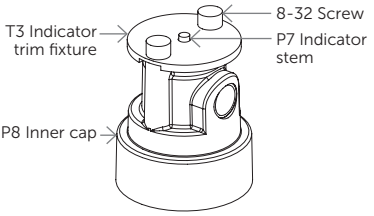


Figure 5.

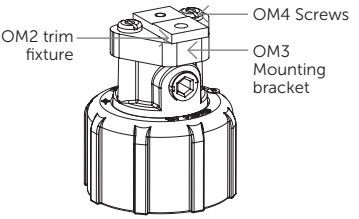


Figure 6.

POSITION SENSING

1. If the valve is equipped with Espy position sensing, refer to installation instructions 1030-205.

ORDERING INFORMATION

Repair parts kit
(See part numbers listed in next table.)

ITEM	DESCRIPTION	QUANTITY
P1	Nut	1
P2	Washer	1
P3	O-ring (piston)	1
P4	Pneumatic diaphragm	1
P5	Washer	1
P6	Diaphragm/ retainer assembly	1
P7	Red indicator (Blue for high-pressure valve)	1
P10	Spring	1
P13	PTFE washer	1
P15	Spring (high-pressure valve)	1
P16	Plug	2

Repair parts kit part numbers

VALVE PART NUMBER	REPAIR PARTS KIT PART NUMBER
202-68-01	202-155
202-69-01	202-155
202-71-01	202-155
202-72-01	202-155
202-78-01	202-155
202-79-01	202-155
202-81-01	202-155
202-82-01	202-155
202-122-01	202-157
202-123-01	202-157
202-124-01	202-157
202-125-01	202-157
202-126-01	202-157
202-127-01	202-157
202-130-01	202-157
202-131-01	202-157

Repair tool kit part number 213-102-01

ITEM	DESCRIPTION	QUANTITY
T1	Outer cap wrench	1
T2	Diaphragm pre-load tool	1
T3	¼" Valve indicator stem trim fixture	1

Omron sensor bracket kit part number 202-4-OMRON-RKIT

ITEM	DESCRIPTION	QUANTITY
OM1	Red indicator (Blue for high-pressure valve)	1
OM2	Indicator trim fixture	1
OM3	Sensor bracket	1
OM4	#8-32 screws	2

Customer supplied items

ITEM	DESCRIPTION	QUANTITY
S1	Lubricant and brush for applying	1
S2	Torque wrench, ½" drive, 6" extension, 11.3 N•m (100 inch•lbs) scale	1
S3	Pliers	1
S4	(2) Screwdrivers, flat blade style	1
S5	Adjustable wrench to 39 mm (1½") or larger	1
S6	Allen wrench (⅜")	1
S7	Socket (⅞") ½" drive	1
S8	Isopropyl alcohol	1
S9	Socket (5⁄16") ½" drive	1
S10	Blade for trimming	1

FOR MORE INFORMATION

Please call your Regional Customer Service Center today to learn what Entegris can do for you. Visit **entegris.com** and select the Contact Us link to find the customer service center nearest you.

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