Integra® Pneumatically Operated Diaphragm Valves

¼" Orifice 2-way, normally closed, normally opened, sampling designs

REPAIR INSTRUCTIONS

For models:

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

Normally open, 2-way:
202-73, 202-74, 202-76, 202-77, 202-73-01, 202-74-01, 202-76-01, 202-77-01

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

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

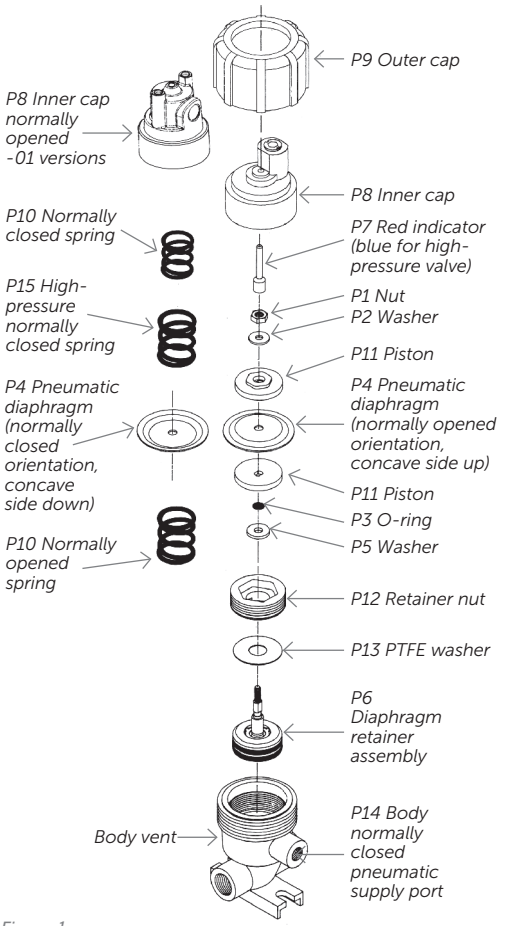

Figure 1

REPAIR PROCEDURE – DISASSEMBLY

1. Refer to Figure 1 and begin disassembly by first holding the inner cap (P8) on the flat sections of the pneumatic supply port with an adjustable wrench (S5,) while turning the outer cap (P9) in a counterclockwise direction with the outer cap wrench (T1).
2. On normally closed valves, remove the spring (P10) and discard.
3. While preventing the piston (P11) from rotating by holding the raised hex with an adjustable wrench (S5), remove the indica tor (P7) by turning it counterclockwise with a pliers (S3). 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) on normally closed valves by prying up between the body and the piston with two flat bladed screwdrivers (S4). On normally opened valves, remove the lower piston (P11) and the spring (P10). Discard spring P10.
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).

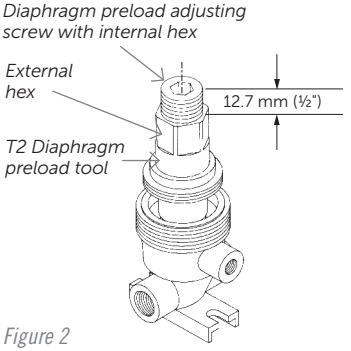

Figure 2

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) and 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) orings (see Figure 3).

P6 Diaphragm/
Retainer Assembly

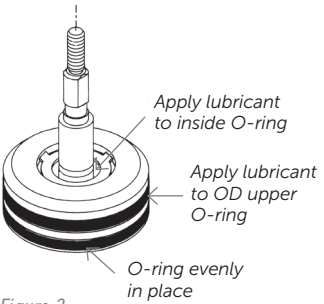

Figure 3

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. Put the PTFE washer (P13) in place 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) in place 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).

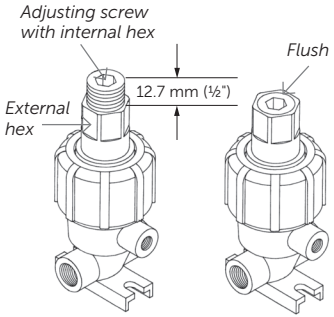

Figure 4

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).
9. Torque the external hex on the diaphragm preload tool (T2) to 2.82 N•m (25 in•lb) with a torque wrench (S2) and a ⅞" socket (S7).
10. While holding the external hex to keep 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 oring (P3) with lubricant (S1) and place on top of the washer (P5).
12. On normally opened valves, place the spring (P10) in place inside the retainer nut (P12).
13. Put lower piston (P11) in place. Orient the raised hexagonal surfaces facing away from the pneumatic diaphragm (see Figure 1).
14. On normally closed valves, place the pneumatic diaphragm (P4) onto the diaphragm stem with the concave side facing up (see Figure 1). On normally opened valves, place the pneumatic diaphragm (P4) onto the diaphragm stem with the concave side facing down (see Figure 1).
15. Put upper piston (P11) in place. Orient the raised hexagonal surfaces facing away from the pneumatic diaphragm (see Figure 1).
16. Place the washer (P2) onto the diaphragm stem.
17. 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 in•lb) with the torque wrench (S2) and the 5/16" socket (S9).
18. While preventing the piston (P11) from rotating by holding the raised hex with an adjustable wrench (S5), install the indicator (P7) by rotating it clockwise and tighten it with a pliers (S3) until it just contacts the nut (P1).
19. On normally closed valves, place the spring (P10) on the upper piston (P11). For high pressure valves, place the high-pressure valve spring (P15) over the spring (P10).
20. On normally closed valves, place the inner cap (P8) on the spring (P10). On normally opened valves, place the inner cap (P8) on the pneumatic diaphragm (P4). On 2-way valves, orient the inner cap vent (pneumatic supply port) over the inlet port. On sampling valves, orient inner cap vent over port 1.
21. Place the outer cap (P9) on the inner cap (P8).
22. 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 dia phragms, it is important to hold the inner cap (P8) from rotating. On normally open valves only, actuate pilot with 414 kpa (60 psi) while torquing outer cap.

23. Hold the inner cap (P8) so it does not rotate and torque the outer cap (P9) to 9.0 N•m (80 inch•lb) with the outer cap wrench (T1) and torque wrench (S2).
24. On normally closed valves, with the valve in the closed position, trim off the indica tor (P7) with a blade (S10) so it is flush with the top of the inner cap (P8). On normally opened valves, actuate the pilot and trim off the indicator (P7) with a blade (S10) so it is flush with the top of the inner cap (P8).
25. Assembly is now complete. See testing procedures.

TESTING

The valve must be tested in the following ways:

External Operator Leakage

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

Inlet to Outlet Leakage

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. On nor mally opened valves, apply 276 kPa (40 psi) pneumatic pressure to the pilot port and then apply 690 kPa (100 psi) pressure to the inlet. No leakage at the outlet should be seen at the outlet when the outlet port is submerged in water.

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 when port 3 is submerged in water.

External Media Leakage

Plug the inlet port with a taped plug or Flaretek fitting cap, then apply 690 kPa (100 psi) air pressure to the outlet. No leak age should be seen at the body vent port.

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

ORDERING INFORMATION

Repair Parts Kit
(part numbers listed below)

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

Repair Tool Kits
Part number 213-102

ITEM	DESCRIPTION
T1	Outer cap wrench
T2	Diaphragm preload tool

Customer Supplied Items

ITEM	DESCRIPTION
S1	Lubricant and brush for applying
S2	Torque wrench ½" drive, 6" extension, 11.3 N•m (100 in•lb)
S3	Pliers
S4	(2) Screwdrivers, flat blade style
S5	Adjustable wrench to 39 mm (1½") or larger
S6	Allen wrench (⅜")
S7	Socket (⅞"), ½" drive
S8	Isopropyl alcohol
S9	Socket (3⁄16"), ½" drive
S10	Blade for trimming

Repair Parts Kit
(part numbers listed below)

VALVE ORDERING NUMBER	REPAIR PARTS KIT ORDERING NUMBER	VALVE ORDERING NUMBER	REPAIR PARTS KIT ORDERING NUMBER	VALVE ORDERING NUMBER	REPAIR PARTS KIT ORDERING NUMBER
202-68	202-112	202-78	202-112	202-126	202-145
202-69	202-112	202-79	202-112	202-127	202-145
202-71	202-112	202-81	202-112	202-130	202-145
202-72	202-112	202-82	202-112	202-131	202-145
202-73	202-113	202-122	202-145	202-73-01	202-156
202-74	202-113	202-123	202-145	202-74-01	202-156
202-76	202-113	202-124	202-145	202-76-01	202-156
202-77	202-113	202-125	202-145	202-77-01	202-156

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