

## 1. Technical data

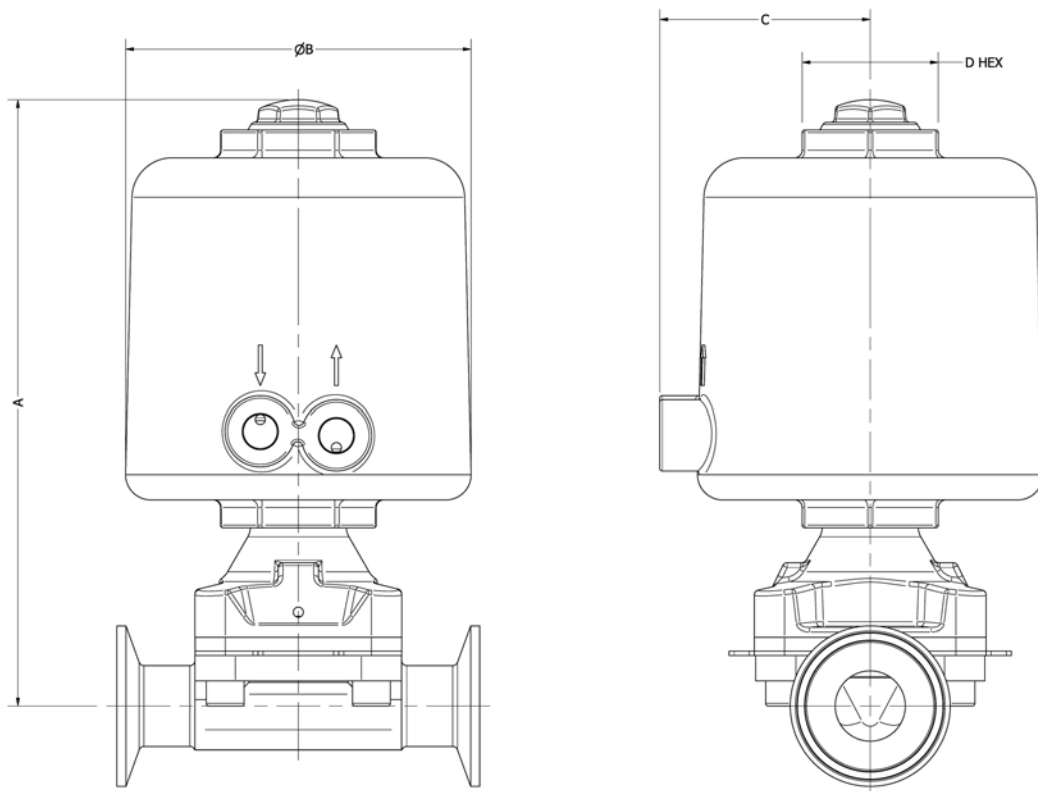
- Maximum air supply: 116 PSIG (8 Bar)
- Operating air supply range: 80 – 100 PSIG (5.5 Bar – 7 Bar)
- Air supply connection: ¼ FNPT
- Maximum ambient temperature: 120°F (49°C)

### 1.1 Working pressure and temperature

	Head	Maximum Working Pressure		Maximum Working Temperature
		MPTFE faced	Elastomer Only	
½"	E090	150 PSIG AT 180 °F	150 PSIG AT 180 °F	300 °F AT 50 PSIG
¾"	E110	150 PSIG AT 180 °F	150 PSIG AT 180 °F	
1"	E110	110 PSIG AT 225 °F	150 PSIG AT 180 °F	
1 ½"	E155	150 PSIG AT 160 °F	150 PSIG AT 160 °F	
2"	E155	110 PSIG AT 190 °F	150 PSIG AT 160 °F	

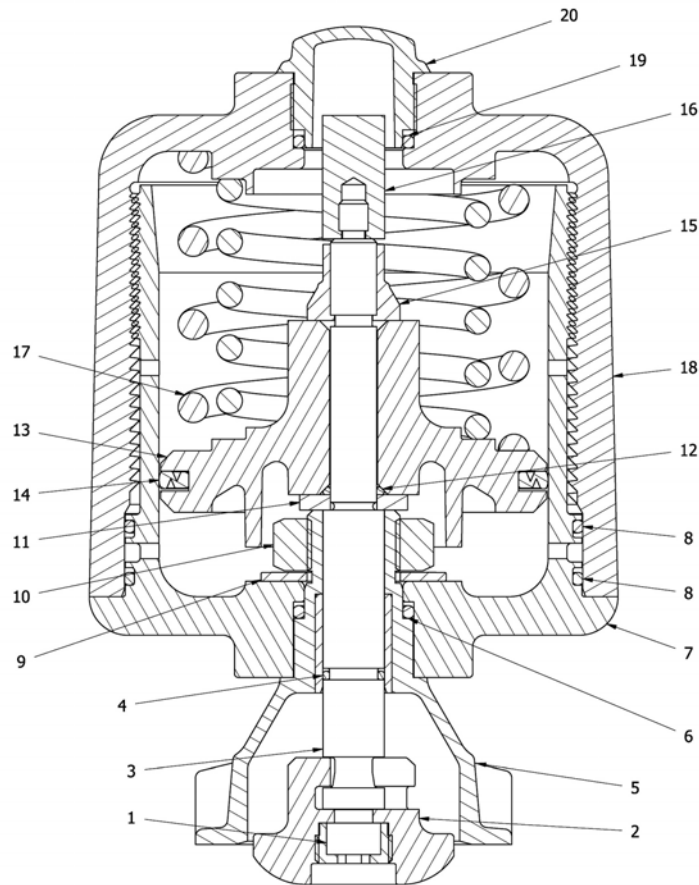
Linear interpolation between may be used between the maximum working pressure temperature and maximum working temperature points.

### 1.2 Envelope dimensions



Valve Size	A	B	C	D
½"	6.24 IN	3.50 IN	2.24 IN	1.38 IN
¾"	7.20 IN	4.28 IN	2.61 IN	1.69 IN
1"	7.49 IN	4.28 IN	2.61 IN	1.69 IN
1 ½"	10.05 IN	6.13 IN	3.68 IN	2.56 IN
2"	10.39 IN	6.13 IN	3.68 IN	2.56 IN

### 1.3 Materials of construction



No.	Qty	ITEM	MATERIAL
1	1	COMPRESSOR INSERT	BRASS
2	1	COMPRESSOR	STAINLESS STEEL
3	1	STEM	STAINLESS STEEL
4	1	STEM O-RING	NITRILE
5	1	BONNET	STAINLESS STEEL
6	1	BONNET O-RING	NITRILE
7	1	HOUSING	REINFORCED POLYAMIDE
8	2	HOUSING O-RING	NITRILE
9	1	SPRING WASHER	CHROME-VANADIUM STEEL
10	1	NUT	ZINC PLATED STEEL
11	1	PISTON WASHER	STAINLESS STEEL
12	1	PISTON WASHER O-RING	NITRILE
13	1	PISTON	REINFORCED POLYAMIDE
14	1	PISTON SEAL	NITRILE
15	1	LOCKNUT	STAINLESS STEEL
16	1	YELLOW INDICATOR	PE
17	1	SPRING SET	CHROME-SILICON STEEL
18	1	CAP	GLASS REINFORCED PA
19	1	SIGHT GLASS O-RING	NITRILE
20	1	SIGHT GLASS	POLYCARBONATE

## 2. Storage

It is recommended that the actuator be kept in a clean and dry location with supplied plugs in ports.

## 3. Installation

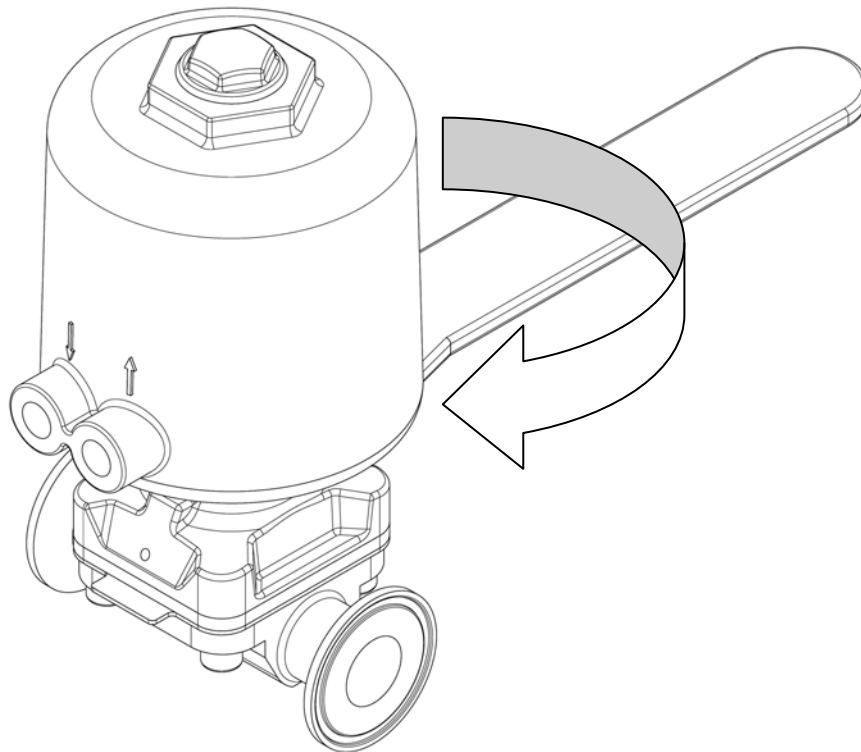
### 3.1 Typical

- Mount valve per drain angle
- Connect airline to the connection on the Cap (18). The arrow indicates the direction in which the piston moves when actuated.
- Use clean dry filtered air.
- Use the torque values shown below to tight the bolts.

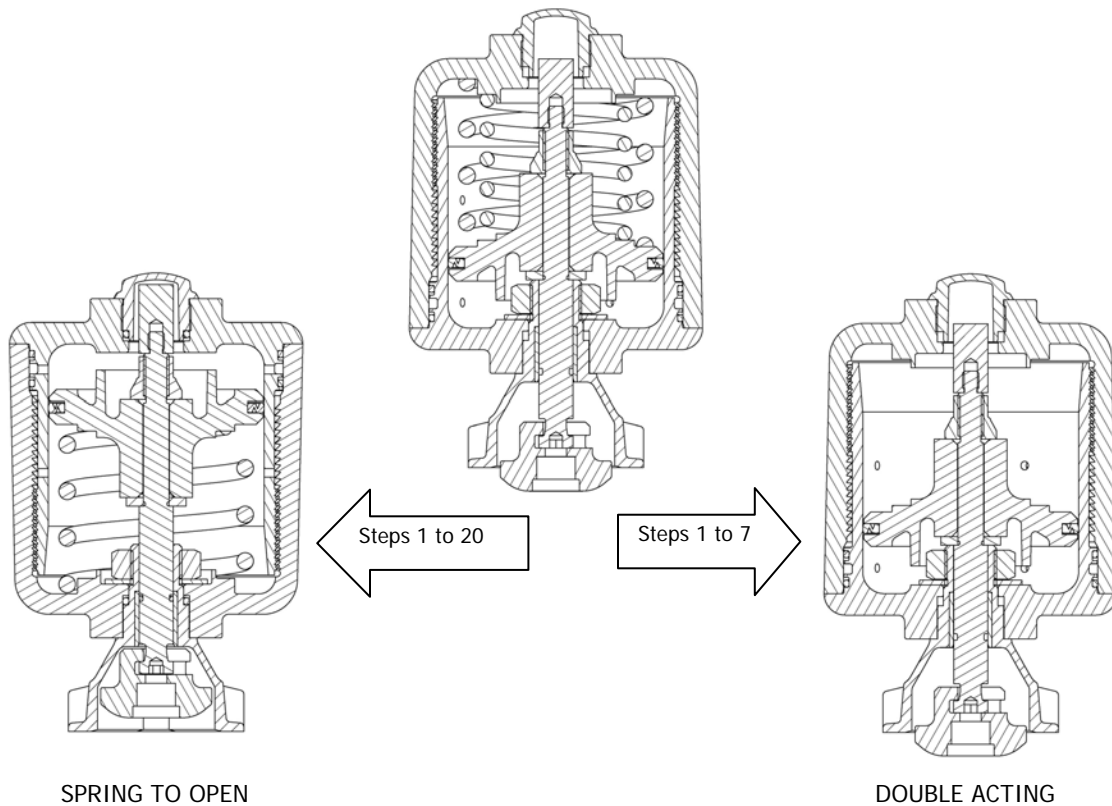
Body/bonnet torque values		
Valve Size	Elastomer Diaphragm	MPTFE Faced Diaphragm
½"	30 in/lbs	55 in/lbs.
¾"	35 in/lbs.	65 in/lbs.
1"	45 in/lbs.	90 in/lbs.
1 ½"	60 in/lbs.	130 in/lbs.
2"	150 in/lbs.	190 in/lbs.

### 3.2 Adjusting port orientation

The actuator is supplied with port as shown below. The port can be adjusted to ease air line installation by rotating the head using either the Cap (18) or Housing (7) hexagon near the bonnet in a clockwise fashion.



### 3.3 Changing the configuration from spring to close



The actuator supplied as spring to close configuration can be modified to either spring to open or double acting using the following procedure.

1. Ensure valve is in open position (for spring to close, air will need to be applied to the appropriate port)
2. Remove actuator from valve by unfastening the four bolts.
3. Remove diaphragm and Compressor Insert (1) if the diaphragm is of the screw type.
4. Place Bonnet (5) in a vise and hold Housing (7) with the assembly key on the hexagon.
5. Unscrew the Cap (18) completely.
6. Take out the Spring Set (17).
7. For double acting conversion, just screw back the Cap. For the spring to open conversion, remove Sight Glass (20) with the O-Ring (19) on and continue to step 7.
8. Unscrew Indicator (16) and Locknut (15) by preventing the Stem (3) from turning using an Allen key.
9. Pull out the Piston (13), Piston Washer (11) and O-Ring (12).
10. Unscrew the Nut (10) and take out Spring Washer (9).
11. Remove Housing (7), ensure the O-Ring (6) remains on the Bonnet (5).
12. Place the Cap (18) on the Bonnet (5).
13. Place the Spring Washer (9) and Nut (10). Add a drop of Loctite 274 on the internal thread of the Nut and tighten to the value shown at the end of this section.
14. Place Piston Washer (11) on the Stem (3) shoulder and place O-Ring (12) on the Piston Washer.
15. Install the spring to open from the Spring Set (17) in the Cap (18). See table below for the correct spring to keep.

Valve Size	Spring to open
1/2"	NA (Same spring both configuration)
3/4"	Large Diameter Outer Spring
1"	Large Diameter Outer Spring
1 1/2"	Small Diameter Inner Spring
2"	Small Diameter Inner Spring

16. Install the Piston (13) upside down on the spring and screw the Housing (7) down while holding the Cap (18) hexagon.
17. Push the Stem (3) up so its tip is showing thru the Piston (13) center hole and tight the Locknut (15) with the proper value shown at the end of this section.
18. Install Indicator (16).
19. Screw back the Sight Glass (20) with the O-Ring (19).
20. Adjust port orientation as required. See section 3.2 for details.

Assembly torque values		
Valve Size	Nut (10)	Locknut (15)
1/2"	225 in/lbs	110 in/lbs
3/4"	225 in/lbs	110 in/lbs
1"	225 in/lbs	110 in/lbs
1 1/2"	450 in/lbs	230 in/lbs
2"	450 in/lbs	230 in/lbs

## 4. Maintenance



Spring to close exploded view



Spring to open exploded view

#### 4.1 Replacing the diaphragm

1. Relieve system pressure ensuring that all line media has drained.
2. In the open position, remove actuator from valve by unfastening the four bolts.
3. Remove used diaphragm.
4. Assure that the diaphragm and valve body are dry and clean.
5. In the closed position, attach new diaphragm to the compressor.
  - a. For bayonet connection, MPTFE faced diaphragm: Insert bayonet and rotate ¼ turn clockwise.
  - b. For threaded connection elastomer diaphragm: Engage threads fully then slack to align bolt holes.
6. In the open position, install the top works on the valve body and hand-tighten bolts
7. Actuate the actuator twice to properly position the diaphragm.
8. In the closed position, finish tightening bolts to the value shown in section 3.1 in a diagonal pattern.

#### 4.2 Replacing seal kit

##### 4.2.1 Spring to close or double acting

1. Remove actuator from valve by unfastening the four bolts (put actuator in open position for spring to close configuration).
2. Remove diaphragm and Compressor insert (1) if the diaphragm is of the screw type.
3. Place Bonnet (5) in a vise and hold Housing (7) with the assembly key on the hexagon.
4. Unscrew the Cap (18) completely and remove Housing O-Ring (8). Prior to install the new Housing O-Ring, apply a coat of solid lubricant (graphite dispersed in isopropanol works well) to ease later Cap installation and removal.
5. Unscrew Sight Glass (20) and replace O-Ring (19) with a new one.
6. Take out the Spring Set (17), unscrew Indicator (16) and Locknut (15) by preventing the Stem (3) from turning using an Allen key.
7. Take out the Piston (13), remove Piston Seal (14) and replace it with a new one.
8. Remove Stem (3) from Bonnet (5), remove Stem O-Ring (4) and replace it with the new one. The Piston Washer (11) and Piston Washer O-Ring (12) should be lying on the bonnet, take them out and replace the O-ring with a new one.
9. Unscrew the Nut (10) and take out Spring Washer (9).
10. Remove Housing (7), remove the O-Ring (6) and replace with a new one.
11. Reinstall Housing (7), Spring Washer (9) and Nut (10). Add a drop of Loctite 274 on the internal thread of the Nut and tighten to the value shown at the end of section 3.
12. Grease Bonnet (5) bore, Housing (7) bore and Stem (3) with with Orapi CT-609, Dow Corning 111, or an equivalent grease.
13. Insert Stem (3) in the bonnet with the Compressor (2) installed.
14. Place Piston Washer (11) on the Stem (3) shoulder and place O-Ring (12) on the Piston Washer.
15. Place the Piston (13) inside the Housing (7) and on the Stem (3).
16. Tighten the Locknut (15) with the proper value shown at section 3. Reinstall the Compressor Insert (1) if required; add a drop of Loctite 274 on the Compressor thread prior to do so.
17. Install Indicator (16) and put back the Spring Set (17).
18. Screw back the Sight Glass (20) with the O-Ring (19).
19. Adjust port orientation as required. See section 3.2 for details.
20. See section 4.1 to reinstall the actuator on the valve.

##### 4.2.2 Spring to open

1. Remove actuator from valve by unfastening the four bolts.
2. Remove diaphragm and Compressor Insert (1) if the diaphragm is of the screw type.
3. Unscrew Sight Glass (20) and replace O-Ring (19) with a new one.
4. Unscrew Indicator (16) and Locknut (15) by preventing the Stem (3) from turning using an Allen key.
5. Place Bonnet (5) in a vise and hold Cap (18) with the assembly key on the hexagon.
6. Unscrew the Housing (7) completely and remove Housing O-Ring (8). Prior to install the new Housing O-Ring, apply a coat of solid lubricant (graphite dispersed in isopropanol works well) to ease later Cap (18) installation and removal.
7. Take out the Piston (13), remove Piston Seal (14) and replace it with a new one.
8. Take out the Spring Set (17).

9. Remove Stem (3) from Bonnet (5), remove Stem O-Ring (4) and replace it with the new one. The Piston Washer (11) and Piston Washer O-Ring (12) should be lying on the bonnet, take them out and replace the O-Ring with a new one.
10. Unscrew the Nut (10) and take out Spring Washer (9).
11. Remove Cap (18), remove the O-Ring (6) and replace with a new one.
12. Reinstall Cap (18), Spring Washer (9) and Nut (10). Add a drop of Loctite 274 on the internal thread of the Nut and tighten to the value shown at the end of section 3.
13. Grease Bonnet (5) bore, Housing (7) bore and Stem (3) with with Orapi CT-609, Dow Corning 111, or an equivalent grease.
14. Insert Stem (3) in the Bonnet (5) with the Compressor (2) installed.
15. Install the Spring Set (17) in the Cap (18).
16. Install the Piston (13) on the spring and screw the Housing (7) down while holding the Cap (18) hexagon.
17. Push the Stem (3) up so its tip is showing thru the Piston (13) center hole and tight the Locknut (15) with the proper value shown at the end section 3.
18. Install Indicator (16).
19. Screw back the Sight Glass (20) with the O-Ring (19).
20. Adjust port orientation as required. See section 3.2 for details.
21. See section 4.1 to reinstall the actuator on the valve.

## 5. Ordering information

Valve Size	REPLACEMENT DIAPHRAGM PART NUMBERS				Maintenance Tool Kit	Actuator Seal Repair Kit
	MPTFE Faced EPDM Backed	MPTFE Faced FKM Backed	EPDM	FKM		
	<i>BAYONET</i>	<i>BAYONET</i>	<i>THREADED</i>	<i>THREADED</i>		
½"	1KS-50	1PS-50	2E-50	2V-50	MTK-0050	RK-0050
¾"	1KS-75	1PS-75	2E-75	2V-75	MTK-7510	RK-7510
1"	1KS-10	1PS-10	2E-10	2V-10		
1 ½"	1KS-15	1PS-15	2E-15	2V-15	MTK-1520	RK-1520
2"	1KS-20	1PS-20	2E-20	2V-20		

\*The maintenance tool kit contains (2) special keys to hold the hexagon on the Cap and Housing.