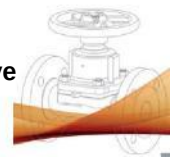
DIAPHRAGM VALVES

WEIR TYPE: THREADED= **3001,** FLANGED STRAIGHT THROUGH TYPE UNLINED=**3004,** FLANGED STRAIGHT THROUGH TYPE SOFT RUBBER LINED=**3004SRL**.

Please read this manual before storing, transporting, or installing your valve



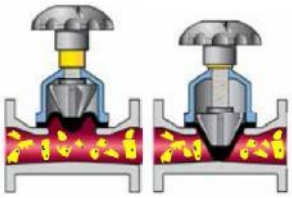
OVERVIEW & INTRODUCTION

- **Diaphragm valves are linear and bi-directional, for isolating or regulating flow.**
- **They are bolted bonnet design with rising stem and are clockwise closing.**
- **Extended life, reliability, safety, and ease of use combined with an essentially simple design, result in low maintenance for minimum running costs.**

VALVE FEATURES

> **Wide selection of body lining and diaphragm materials provides an effective and economical solution to suit most varieties of corrosive and erosive applications.**

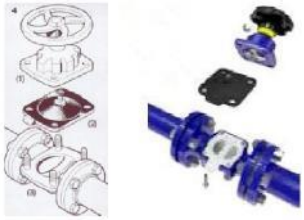
> **The Straight through type provides superior abrasion resistance, can handle high density solids, and at same time ensure leak-free shut off. It is for isolating duty only and is not suitable for throttling.**



> **The Weir type is suitable for throttling and isolating but is unsuitable for slurries.**

> **All working parts of the valves are isolated from the line media and to ensure the valve's long working service life..**

> **Three-part design allows maintenance without removing the valve body from the pipeline, resulting in lower maintenance costs.**



> **Flanged rubber lined valves have full face lining protecting the flange face and requiring no gasket.**

> **Either types can be installed in any position without affecting successful operation.**

RUBBER DIAPHRAGM

DN15-20

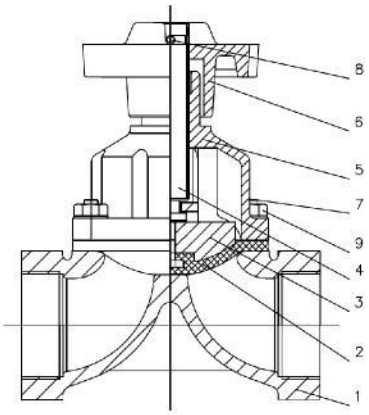
DN25-80

DN100-

Name	Main material	Material code No.	Nominal Size (DN)	Applicable temperature
Natural rubber	NR+BR	NR	15-300	−40 to 80℃
Chloroprene rubber	CR	CR	15-300	−5 to 90℃
Butyl rubber	IIR	BG	15-300	−25 to 90℃
Nitrile rubber	NBR	AB	15-300	5 to 80℃
E P D M	EPDM	EP	15-300	−40 to 120℃

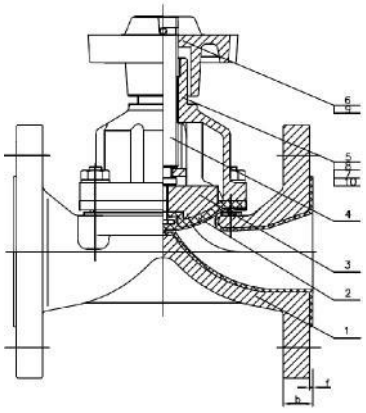
VALVE STRUCTURE & COMPONENT MATERIALS

- **SCREWED END**



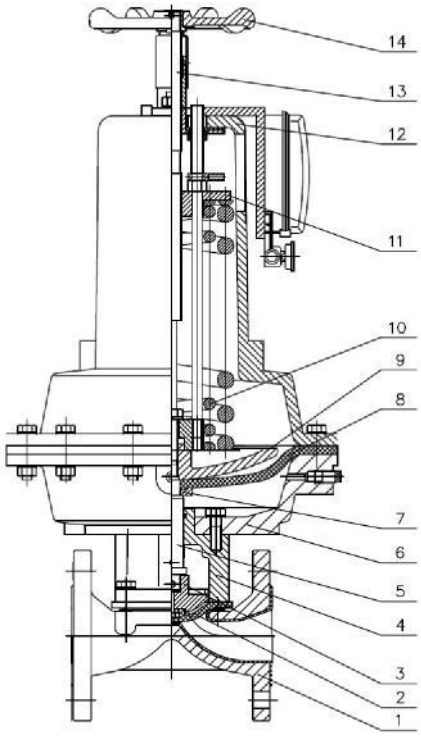
NO.	Part Name	Material
1	Body	Cast Iron
2	Diaphragm	N.R/Butyl Rubber/EPDM
3	Disc	Cast Iron
4	Stem	2Cr13
5	Bonnet	Cast Iron
6	Handwheel	Cast Iron
7	Stud	Carbon Steel
8	Spring Pin	SS304
9	Hex. Nut	SS304

- **FLANGED END**



NO.	Part Name	Material
1	Body	Cast Iron + NR/BR/EPDM
2	Diaphragm	N.R/Butyl Rubber/EPDM
3	Disc	Cast Iron
4	Stem	2Cr13
5	Bonnet	Cast Iron
6	Handwheel	Cast Iron
7	Stud	Carbon Steel
8	Spring Pin	SS304
9	Hex. Nut	SS304

PNEUMATIC ACTUATED



NO.	Part Name	Material
1	Body	Cast Iron + NR/BR/EPDM
2	Diaphragm	N.R/Butyl Rubber/EPDM
3	Disc	Cast Iron
4	Bonnet	Cast Iron
5	Low Stem	2Cr13
6	Low Cap	Cast Steel
7	Diaphragm Plate	A3
8	Pneumatic Diaphragm	Natural Rubber
9	Diaphragm Bracket	Cast Iron
10	Spring	65 Mn
11	Spring Upper Plate	Cast Iron
12	Upper Cap	A3
13	Upper Stem	45#
14	Hand wheel	Cast Iron

OPERATION AND STORAGE

⚠ Leave protective caps and covers on the valve until installation. Inspect for damaged or missing items upon delivery.

- Store the valve in a dry place to avoid surface corrosion. Spare diaphragms to be stored in a dark place.
- Do not stack valves on top of each other, use care when handling.
- Working pressure should not be higher than nameplate marking.

INSTALLATION

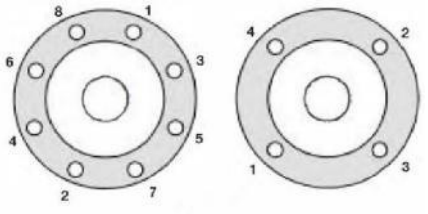
> The diaphragm valves may be installed in any position; horizontal, vertical, or other.

>When replacing an existing valve, always exhaust the pressure and drain the process media from the line before starting.

> Use suitable gaskets between the valve and pipeline flanges. (Gaskets not required for rubber lined valves).

> Diaphragm valves displace fluid when closing. Therefore they are not suitable for use in ‘locked line’ conditions.

- Tighten the flange bolts evenly with appropriate torque as below bolting sequence shown:



⚠ Over closure of the diaphragms valve by hand wheel, air pressure or spring force can damage the internal working or the valves and is the number one cause of premature valve failure. Use only enough closing force to effect tight shut off.

MAINTENANCE.

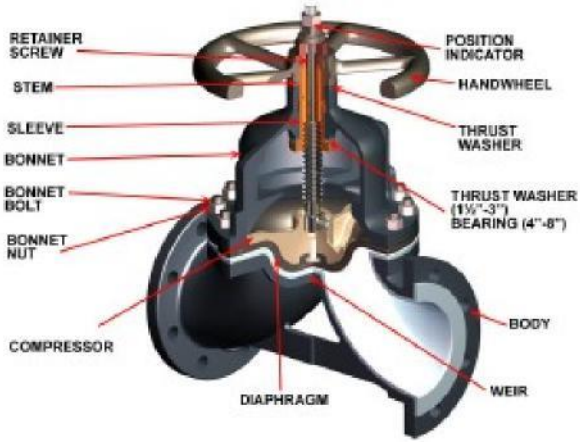
- LUBRICATION
  - Bonnet should be greased on a regular schedule via nipples provided.
- BONNET BOLT TORQUE
  - The below table represents average bonnet bolt torque values- the correct torque will produce a slight extrusion of the diaphragm between the body and bonnet flanges. Below is in ft/lbs.

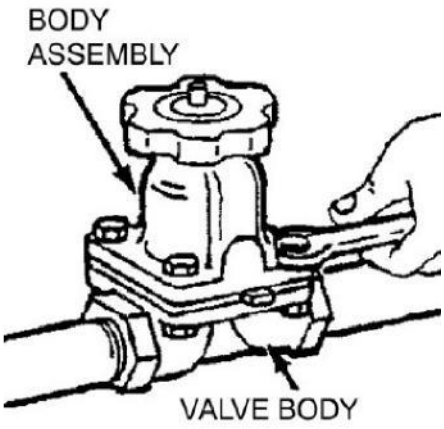
Size	1/2	3/4	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12
Torque	35	30	40	100	100	170	240	200	420	420	420	420

- REPLACING THE DIAPHRAGM

a. Bonnet Removal

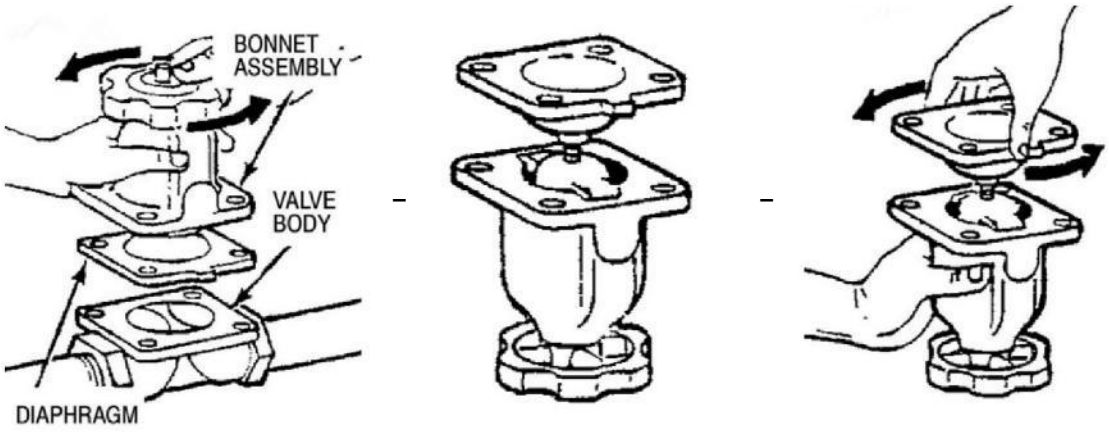
It is not necessary to remove the valve from the pipeline. However, no disassemble should be attempted until the line has been depressurized. Disassemble the valve by removing cap screws, bolts or nuts that connect bonnet assembly to the valve body.





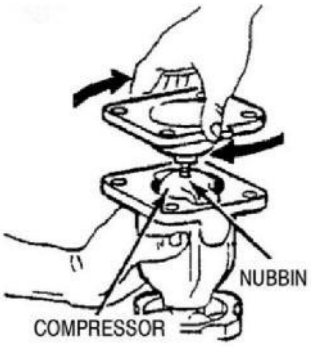
b. Diaphragm Removal

The diaphragms are attached to the compressor by a screw stud or by two pins. All diaphragms types are removed by turning the diaphragm in a counter clockwise direction until the studs is screwed out of the compressor. The diaphragm may then be lifted out.



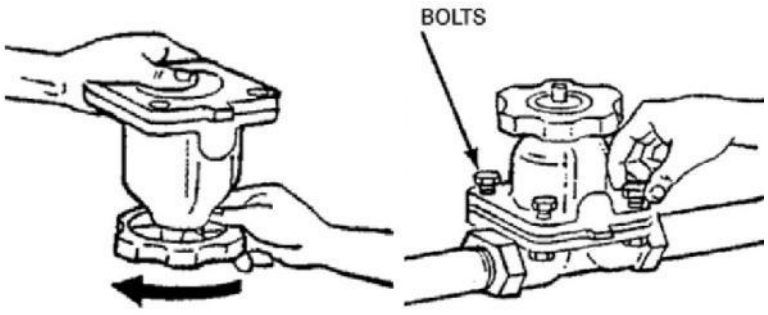
c. Reassembly

Sealing is affected across the weir by means of a slightly raised bead on the diaphragm. Perform following procedures to assure a good fit between this bead and the weir so that moderate compressor force is all that is necessary to close at full line pressure. Faulty installation may produce large crushing forces or lead to the use of such forces in operation. This could result in premature diaphragm failure. Place stud in mating thread of compressor and turn diaphragm clockwise until the round nubbin bottoms out snugly in the cavity of the compressor. Do not over tighten the stud to line up the bolt holes in the diaphragm and bonnet as stud adhesion may be destroyed. If force seems excessive back off up to 180° to produce correct alignment.



d. Final Assembly

Move hand wheel counterclockwise to the "valve full open" position so that the diaphragm is pulled up to its full limit of upward travel. Mount bonnet assembly on the body and install, bolts, cap screws, or nuts to finger-tightness. Now turn handwheel clockwise to the full closed position so that the diaphragm has light contact against the weir. Tighten fasteners diagonally and evenly, gradually turning valve toward the open position to relieve compress or forces against the diaphragm as the bonnet is being clamped downward. This procedure results in the diaphragm sealing bead seating snugly against the body weir without crushing and without excessive stretching of the diaphragm in service. After the diaphragm is firmly clamped between body and bonnet, the valve may be opened and tighten the fasteners.



REPLACING THE PNEUMATIC ACTUATOR DIAPHRAGM

⚠ The springs are compressed to cause considerable force, making disassembly and assembly dangerous unless proper methods are employed.

1. Isolate the operator from air supply. Disconnect airlines from operator housing.

2. Remove four of the bolts and nuts, at equal spacing, that hold the spring housing to the pressure cap. Replace these four with 6" long threaded rods and secure them with nuts on each side of the connecting flange, Remove the remaining bolts and nuts that hold the housing flanges together.

3. Carefully, and alternately, loosen the nuts holding the threaded rods. This will relax the springs to the point where the housing can safely be removed. Remove acorn hex nut from sliding stem, remove operator diaphragm plate.

4. Remove operator diaphragm. Remove second operator diaphragm plate and check that second hex nut is secure against shoulder on sliding stem. Place second operator diaphragm plate back on sliding stem and install new operator diaphragm, making sure the holes on the diaphragm periphery line up with the holes in the operator housing. Reassemble in reverse order.