USER'S MANUAL

FLUOROPOLYMER LINED COMPOSITE PLASTIC DIAPHRAGM VALVE

ANSI 150lbs

AEGIS®
FLOW TECHNOLOGIES
Specializing in Hazardous Service Process Valves & Automation

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(1) General operating instructions

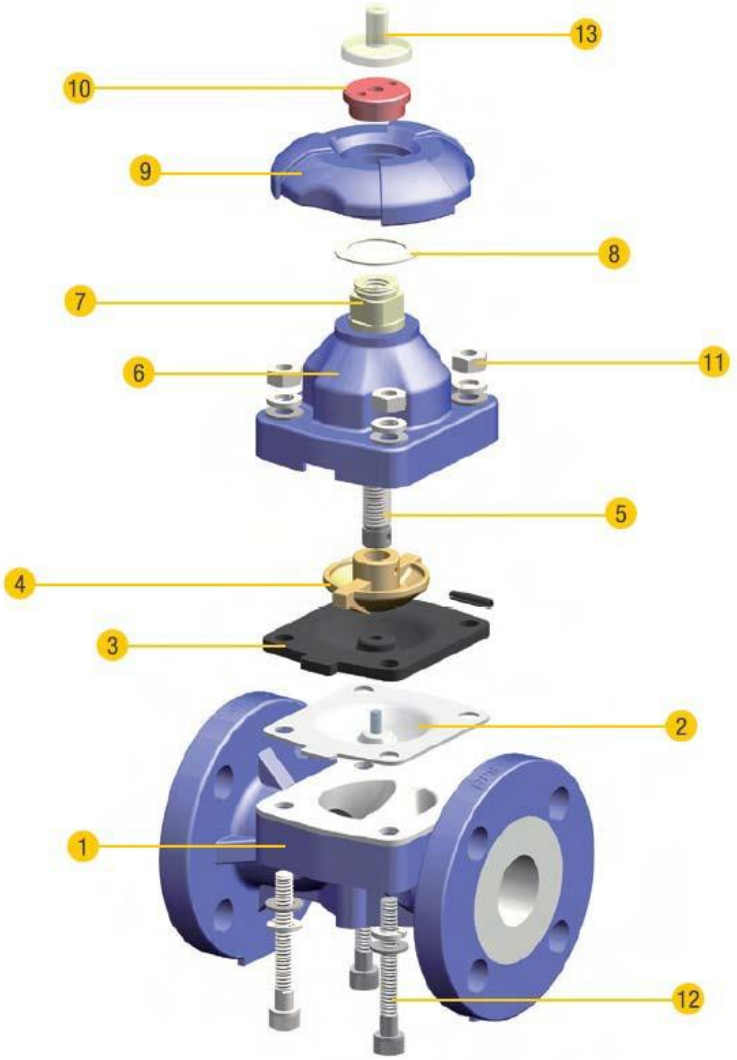
- **Operating the valve within the pressure VS temperature range.**
  (The valve can be damaged by operating beyond the allowable rage)
- **Bonnet bolt torque should to checked before installation, as they may become loose long-term storage. A periodic check of the valve condition as well as bonnet & flange bolt torque should be made part of preventative maintenance program properly re-tightening the bolts as necessary. It is especially important to re-tighten all bolts during the first shutdown.**
- **Do not step on the valve or apply excessive weight on valve. (It can be damaged.)**
- **Do not exert excessive force in closing or opening the valve.**
- **Make sure to consult a waste treatment dealer to dispose of the valve.**
- **Allow sufficient space for maintenance and inspection.**
- **Keep the valve away from excessive heat or fire. (It can be deformed or destroyed.)**
- **The valve should be operated by hand.**

(2) General instruction for transportation, unpacking and storage

All LDV/SC for Chlorine service are cleaned, dried, assembled, tested and packaged according to Aegis® Procedures

- **Keep the valve packed in the carton or box as delivered until installation.**
- **Keep the valve away from coal tar, creosote (antiseptic for wood), termite insecticides, vermicides, and paint. (The could cause swelling and damage the valve.)**
- **Do not impact or drop the valve. (it can be damaged.)**
- **Avoid scratching the valve with any sharp object.**

(3) Name of parts



No.	DESCRIPTION	MATERIAL			
1	BODY	PPS+GF40% with PFA	PP+GF30% with PFA(PVDF)	PVC with PFA(PVDF)	
2	DIAPHRAGM	M-PTFE, PTFE (Option: PVDF DIAPHRAGM)			
3	CUSHION RUBBER	EPDM, VITON			
4	COMPRESSOR	PPS+GF40%			
5	SPINDLE	SUS304			
6	BONNET	PPS+GF40%	PPA+GF40%	PP+GF30%	PVC
7	SPINDLE BUSH	BRASS, POM			
8	HANDLE GASKET	PTFE			
9	HAND WHEEL	PPS+GF40%	PP+GF30%	PVC	
10	HAND WHEEL CAP	POM			
11	NUT, SPRING WASHER	SUS304			
12	WENCH BOLT	SUS304			
13	INDICATOR CAP	PC			

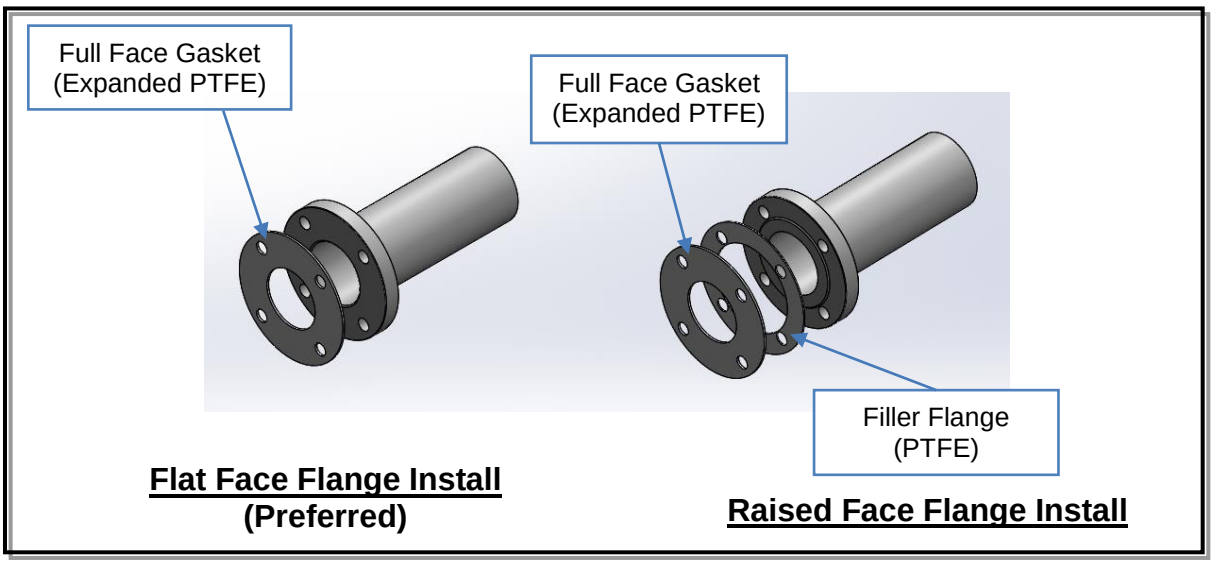
(4) Installation Procedure

Items for installation	
(1) Torque wrench	(2) Spanner
(3) FF gasket	(4) Bolt, nut, washer

Procedure:

1. **Remove protective flange covers only when the valve is ready to be installed.**
2. **Set the FF gasket between the flanges.**

CAUTION
It is recommended that the diaphragm valve be installed against Flat Face flanges with an Expanded PTFE Full Face Gasket. When installation against Raised Face flanges is unavoidable, a PTFE Filler Flange or Compensation Ring is recommended and should be installed between the Expanded PTFE Full Face Gasket and the Raised Face Flange. See Annex A for Filler Flange Dimensions



3. Insert washer and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten them by hand.

3.1. The piping must be stress free to eliminate any reactive forces that could act on the valve. The alignment tolerances of the piping system should be based off ASME B31.3 Code paragraph 335.1.1.

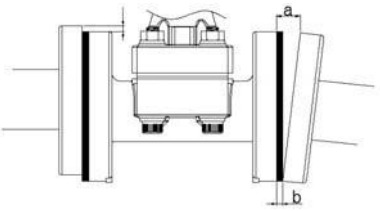
CAUTION

The parallelism and axial misalignment of the flange surface should be under the values shows in the following table to prevent damage the valve.
(A failure to observe them can cause destruction due to stress application to the pipe.)

UNIT: mm(inch)

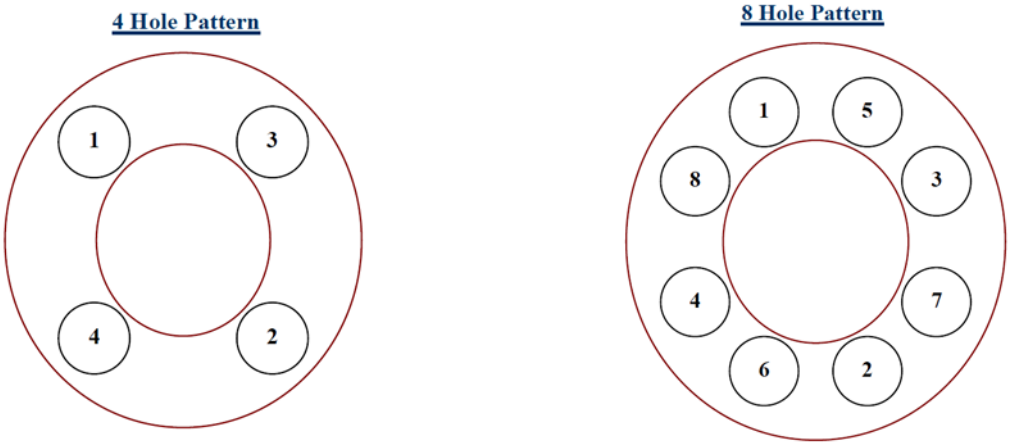
Size	Axial misalignment	Parallelism (a-b)
1/2"~1"	1.0 (0.04)	0.5 (0.02)
1-1/2"~2"	1.0 (0.04)	0.8 (0.03)
3"~4"	1.0 (0.04)	1.0 (0.04)

Axial misalignment **Parallelism**



4. Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner. (Refer to Fig.1.)

4.1. All bolts shall be lubricated and installed hand tight. Once hand tight check to see if LDV/SC is flat against mating flange. While torqueing bolts, a crossing pattern must be followed. Torque should be increased in increments of 25% after completion of each crossing pattern. Recommended bolting torques and tightening patterns are below. Care should be taken to avoid over-torqueing which may lead to cold flow of the PFA sealing surface, or damage to the PPS Body.



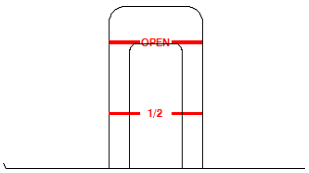
Flange Size	25%Torque		50% Torque		75% Torque		Full Bolting Torque	
	In-lbs	(N-m)	In-lbs	(N-m)	In-lbs	(N-m)	In-lbs	(N-m)
1/2"	38.7	(4)	77.4	(9)	116.1	(13)	154.8	(17.5)
3/4"	38.7	(4)	77.4	(9)	116.1	(13)	154.8	(17.5)
1"	44.25	(5)	88.5	(10)	132.75	(15)	177	(20)
1-1/2"	44.25	(5)	88.5	(10)	132.75	(15)	177	(20)
2"	49.75	(6)	99.5	(11)	149.25	(17)	199	(22.5)
3"	66.375	(7)	132.75	(15)	199.125	(22)	265.5	(30)
4"	88.5	(10)	177	(20)	265.5	(30)	354	(40)

CAUTION
Avoid excessive tightening (The valve can be damaged)

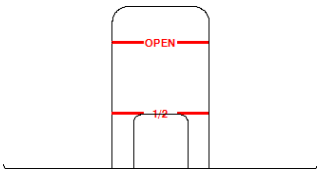
(5) Operating Procedure

- **Open and shut the valve by rotating hand wheel**
- **The top of the travel stop will be flush with the top of the hand wheel when the valve is fully closed.**

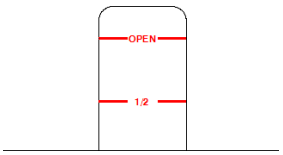
(Nominal size: 15~50mm (1/2"~2")



Full open

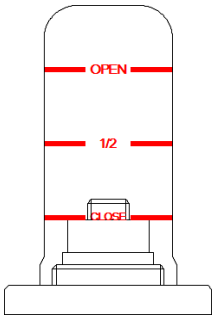


Half open

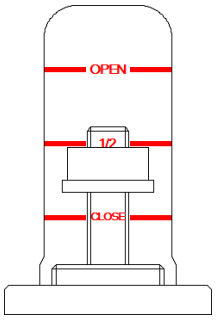


Full shut

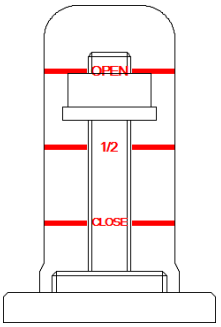
(Nominal size: 80~100mm (3"~4")



Full open



Half open



Full shut

CAUTION

The valve is designed for manual operation only
(The use of assist device may damage the valve.)

(6) Diaphragm replacement procedure

- **Items for replacement**

(1) Torque wrench	**(2) Spanner , Hex wrench**
(3) Protective gloves	**(4) Goggles**

CAUTION
Wear protective gloves and goggles because some fluid is left in the body. **(You can be injured by working without them)**

- **Procedure**
  1) **Drain fluid completely from the pipe line.**
  2) **Remove valve bonnet from the body.**
  3) **Turn handle of valve clockwise until the compressor comes out of the bonnet.**
  4) **Turn the diaphragm clockwise to remove the diaphragm and mount the new diaphragm by reversing step.**
  5) **Mount the bonnet to the valve by reversing Step 2. Tighten bonnet bolts by hand only.**
  6) **Rotate the handle 360° counter-clockwise.**
  7) **Using a torque wrench, tighten the bonnet bolts in a diagonal, cross-cross pattern.**

Bonnet torque value						unit: in.*lbf. (N*m)
Size	**1/2"~3/4" (15A~20A)**	**1" (25A)**	**1-1/2" (40A)**	**2" (50A)**	**3" (80A)**	**4" (100A)**
Torque value	**51.3(5.8)**	**69 (7.8)**	**106(12)**	**173.5 (19.6)**	**78.8 (26)**	**86 (30)**

(7) Inspection items

- **Inspection the following items.**
  1) **Check for any flaw, crack, or deformation on the outside / inside.**
  2) **Check whether fluid leak to the outside.**
  3) **Check whether the hand wheel cap has been loosened.**
  4) **Check whether the bonnet bolting has been loosened.**
  5) **Check whether the hand wheel can be operated smoothly.**

(8) Troubleshooting

Problem	Cause	Treatment
Fluid is leaking past the fully closed position.	Solid particles have lodged in the valve.	Clear the solid particle from the valve.
	Media has worn diaphragm and / or weir.	Replace.
Valve cannot fully open.	The diaphragm has pulled off the stem.	Replace diaphragm.
	The metal joint failed.	Remove Diaphragm & compressor and replace joint
The hand wheel spins freely.	The stem is broken	Disassemble bonnet and replace the stem
	The metal joint failed	Remove Diaphragm & compressor and replace joint
Valve leaks between body and bonnet	Bonnet bolts have loosened	Re-tighten.
	Media has crystallized on the diaphragm.	Disassemble and clean on a regular basis. Replace failed diaphragm, if necessary.
	The diaphragm has failed due to fatigue.	Replace.
Valve leaks from stem.	The diaphragm has failed.	Replace.

Annex A

Filler Flange Instructions

Filler Flange thickness shall be equal to the height of the raised face with a tolerance of +0.000 inches / -0.010 inches. For example, 150# mating flanges that comply with ASME B16.5, having a raised face of 0.063 inches, will require a Filler Flange with a thickness of 0.053 inches to 0.063 inches. Lined Flanges and Fittings have raised face heights that differ between manufacturers. In these cases, the raised face height shall be measured, and an appropriate thickness shall be used.