Installation, Operation and Maintenance Manual

PROVAL V101-V102 Series

Wafer / Lug Butterfly Valves

IOM-V101-102-2401

PROVAL V101-V102 Series

Butterfly Valves

Section 1: Before You Start

This section explains:

- Base Safety Procedures
- Protection Guidelines
- Storage Guidelines
- Handling Guidelines

Installation, adjustment, putting into service, use, assembly, disassembly and maintenance of the butterfly valve must be performed by qualified personnel.

WARNING !

Nonobservance of the safety instructions may lead to personal injury and danger for both the environment and the valve itself. Nonobservance of these safety instructions will also forfeit the user's warranty

---

1.1 Base Safety Procedures

-Personnel making any adjustment to the valves must utilize suitable equipment. All required personal protection means must be worn.
- Installation and handling of the valves must only be done by personnel that is trained in all aspects of manual and mechanical handling techniques.
- Ensure that valve pressure/temperature limitations marked on the valves tagplate are within the service conditions.

1.2 Protection

Proval butterfly valves are delivered with protection in accordance with the Proval Engineering Instructions, to protect the valve from damaging. Wrapping and/or covers must be left in place until installation of the valve.

1.3 Storage

Storage must be off the ground in a clean, dry and dark indoor area.

1.4 Handling

To prevent damage during handling, the valves must be lifted by hand or using appropriate lifting equipment. The valves must be protected from external events e.g. bumps, hitting and vibrations during transport. Any flange protection needs to be removed before the valve is mounted in the pipeline. Lift the valve with great care from the transport package (crate, pallet). While handling or installing the valve, ensure that no damage occurs to the valve, the pneumatic/electrical or hydraulic actuator or other instruments.

Section 2: Introduction

2.1 Identification

The closing element in the butterfly valves is a rotating shaft that is placed on a vertical axis. The sealing is provided between the metal flap and the elastic or plastic sealing elements covering the inside of the body. The sealing element also serves as a flange seal betvveen the valve and the pipe. Advantages of such valves are; low pressure loss, easy opening and closing, good sealing, light vveight and small footprint.

2.1.1 Superiorities of Proval Butterfly Valves

- Flow indication marked, ISO standard valve rotating shaft
- Easy removable, anti blow-out plate
- Name plates includes all valve material and usage data incuding valve serial number
- Long neck for easy insulation,
- PTFE / Bronze bushing provides low torque and longer seat life by centering the disc and avoids leakage from stem due to non-centric rotation
- Integral o-ring system on seat avoid the leakage from stem
- 2 Pc shaft construction disc provides higher flow rates (kv) and lower pressure loss in pipeline
- Special groove on body provides less torque figures in operation and improves the life cycle of seat
- O-ring to ensure 100% leak free operation
- Easy removable lower cap provides easy dismantling of the valve to replace any defected parts on maintenance
- According to ISO 5211 direct mount ISO pad
- Upper stem bushing
- EN1092 PN10, PN16 ANSI 125/150 and BS10 Table-D, Table-E suitable flange holes

2.1.2 Application Areas

- Heating, ventilating and air conditioning systems
- Water treatment and distributing systems
- Mining industry
- Shipbuilding and drilling plant
- Food and chemistry industries
- Fire extinguisher systems
- Water, sea water, dust, gas, wastewater and air

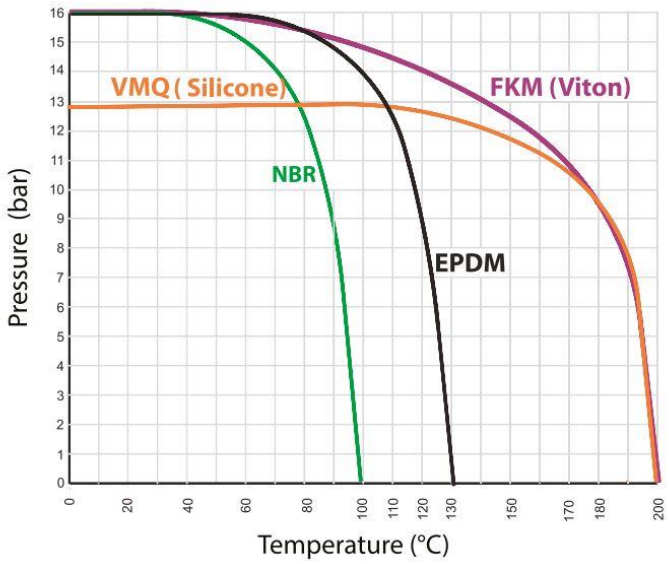
2.1.3 Control Types

- Hand operated
- Reducer
- Single Action Pneumatic Actuator
- Double Acting Pneumatic Actuator
- With Electric Actuator / On-Off

2.2 Technical Data

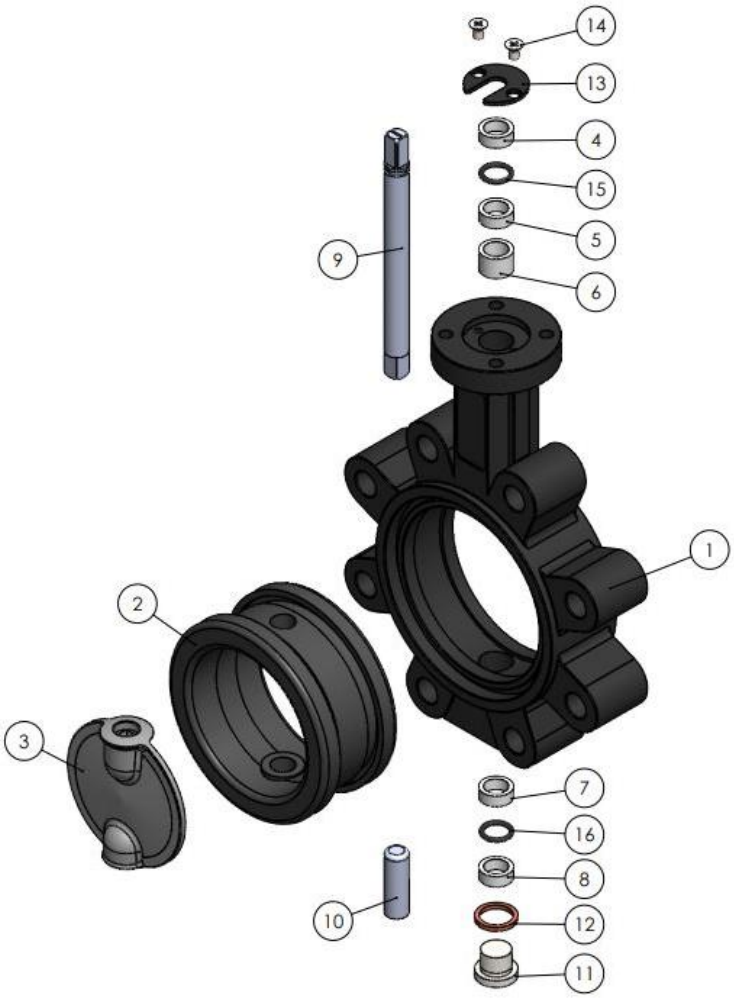
Design Standart	EN 558 Series 20
	ISO5752 Series 20
	API609 Table 1
	BS5155 Series 4
Flange Drilling	En 1092 PN 6/10/16
	ANSI B 16.5 Class 150
Mounting Flange	ISO5211
Testing Standart	EN12266-1/2
	ISO 598 Table 5
	ISO5280, Category 3
	ANSI B16-104, Class VI
Sizes	DN 25 – DN 600
Pressure Rating	Max 16 Bar
Working Temperature	-30 °C / +200 °C

2.2.1 Pressure - Temperature Diagram

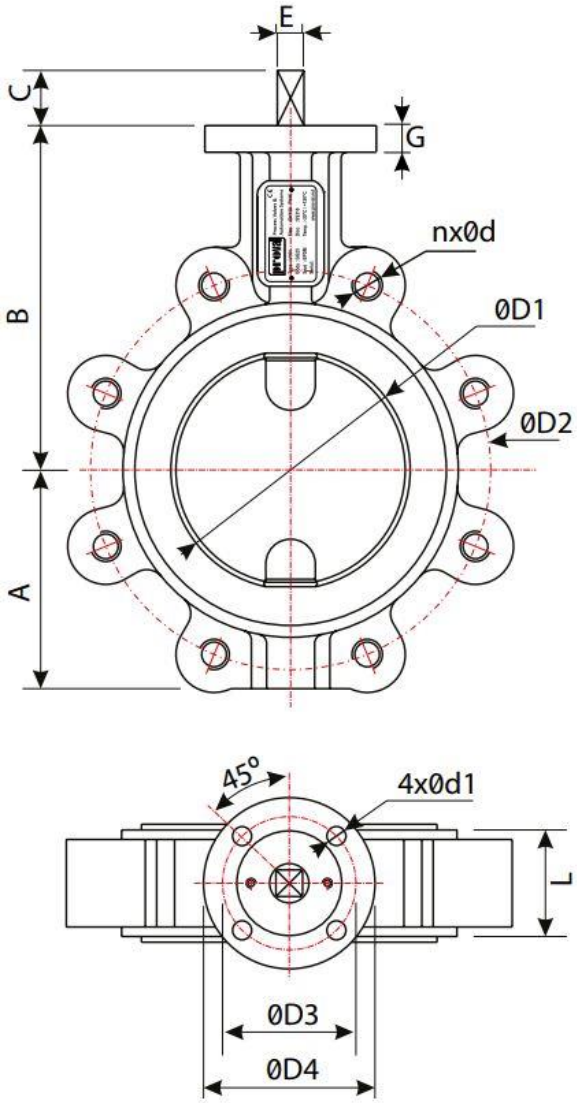


2.3 Material List

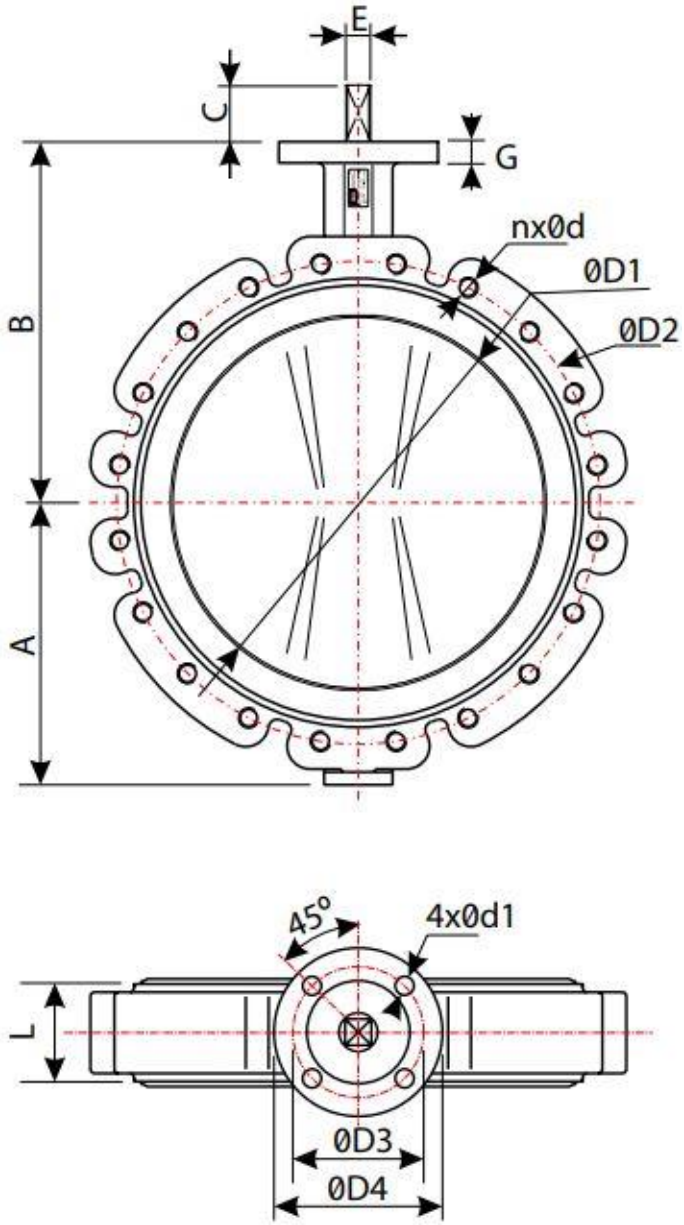
No.	Part Name	Material
1	Body	Epoxy Coated GG25 Cast Iron
		Epoxy Coated GGG40 Ductile Iron
		A216 WCB
		AISI316 Stainless Steel
2	Seat	EPDM (-30 °C / +130 °C)
		NBR (-20 °C / +100 °C)
		Silicone (-30 °C / +200 °C)
		Viton (-15 °C / +200 °C)
		NR / SBR (-20 °C / +80 °C)
3	Disc	AISI316 Stainless Steel
		Rilsan Caoted GGG40 Ductile Iron
		Alu-Bronze
		HALAR / ETFE Lined AISI316 SS.
4/5/6/7/8	Bushing	Bronz / PTFE
9	Upper Stem	AISI420 Stainless Steel
		AISI316 Stainless Steel
10	Lower Stem	AISI420 Stainless Steel
		AISI316 Stainless Steel
		AISI304 Stainless Steel
11	Cap	Carbon Steel
12	Sealing Seat	Brass
13	Stoper	Carbon Steel
14	Screw	Stainless Steel
15/16	O-Ring	NBR/Viton



2.4 Dimension



Ölçü	ØD1	ØD2			ISO5211	ØD4	nxØd			4xØd1	A	B	C	L	E	G	M	N	S	P	ØR
(DN)		PN10	PN16	#150			PN10	PN16	#150												
50	51,2	125	125	120,6	50	65	4x16	4x16	4x5/8"UNC	7	63	126	16	43	9	13	180	33	84	54	140
65	65,6	145	145	139,7	50	65	4x16	4x16	4x5/8"UNC	7	69	133	16	46	9	13	180	33	84	54	140
80	80	160	160	152,4	50	65	4x16	4x16	4x5/8"UNC	7	86	152	16	46	9	13	180	33	84	54	140
100	102,2	180	180	190,5	70	90	8x16	8x16	8x5/8"UNC	10	106	170	19	52	11	14	284	33	84	54	160
125	125,6	210	210	215,9	70	90	8x16	8x16	8x3/4"UNC	10	115	181	25	6	14	14	284	33	124	67	160
150	150,6	240	240	241,3	70	90	8x20	8x20	8x3/4"UNC	10	128	196	25	56	14	14	284	33	124	67	160
200	200,4	295	295	298,4	102	125	8x20	12x20	8x3/4"UNC	12	160	138	30	60	17	14	350	45	124	67	250
250	249	350	355	361,9	102	125	12x20	12x24	12x7/8"UNC	12	190	258	39	68	22	14	350	45	157	73	300
300	299,2	400	410	431,8	102	125	12x20	12x24	12x7/8"UNC	12	235	300	39	78	22	20	350	45	157	73	300

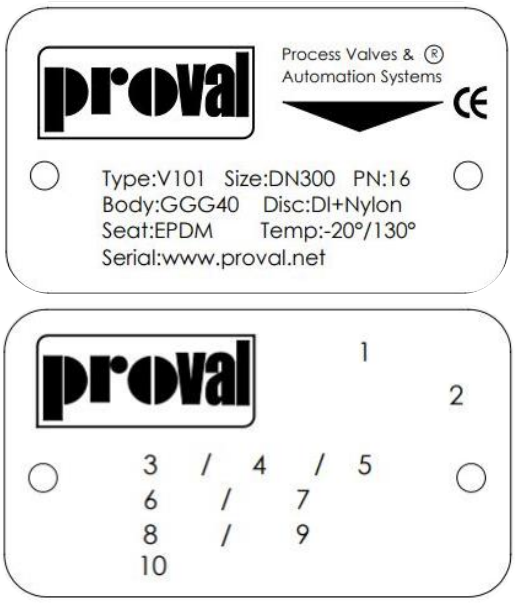


DN	A	B	H	E	G	L	P	S	ØR	ØD2			ØD4	(ØD3)	4-ØD1	nxØd		
										PN10	PN16	#150				PN10	PN16	#150
350	260	310	40	27	22	78	97	201	300	460	470	476	150	125	4-14	26x30	26x24	12x1 1/8 UNC
400	315	340	40	27	23	102	105	230	300	515	525	540	175	140	4-18	16x24	16x27	16x1 1/8 UNC
450	330	375	40	36	25	114	110	230	400	565	585	578	175	140	4-18	20x24	20x27	16x1 1/4 UNC
500	348	450	40	36	27	127	110	23	400	620	650	635	175	140	4-18	20x24	20x30	20x1 1/4 UNC
600	438	500	50	46	27	154	124	301	400	725	770	749	210	165	4-23	20x27	20x33	20x1 3/8 UNC

2.5 Torque Values

DN	Torque (Nm)	
	PN10	PN16
50	10	12
65	12	15
80	26	40
100	24	44
125	80	85
150	60	90
200	130	140
250	300	350
300	310	350
350	550	625
400	755	846
450	1012	1131
500	1350	1431
600	2111	2301
700	3272	3599
800	4308	4739
900	5257	5783
1000	8920	9818
1200	12555	13811

2.6 Marking



2 - CE Declaration

3 - Valve Type

4 - Valve Size

5 - Valve Working Pressure

6 - Valve Body Material

7 - Valve Disc Material

8 - Valve Seat Material

9 - Valve Working Temperature

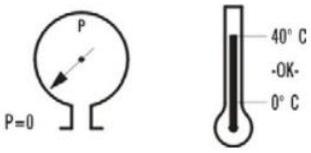
10 - Valve Serial Number

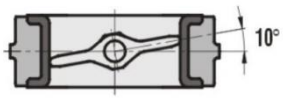
Section 3: Installation

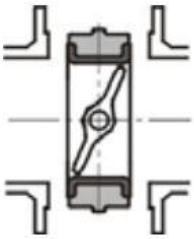
3.1 Visual Valve Inspection

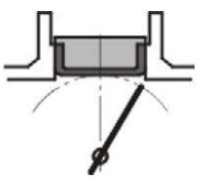
- Confirm that the materials of construction listed on the valve are appropriate for the service intended and are as specified.
- Check if valve and actuator are not damaged during transport or handling

3.2 Before Assembly / Installation Conditions

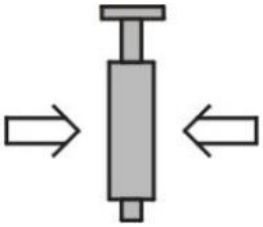


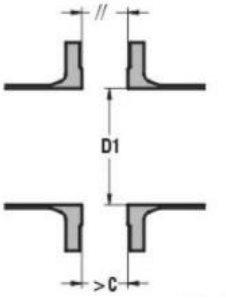


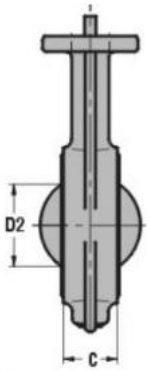




- The working pressure and ambient temperature of the line must be suitable.
- The line must be depressurized before installing the valve
- Ensure that valve materials are compatible with the pipeline fluid.
- Inspect the valve to be certain the waterway is free from dirt and foreign matter. Be certain the adjoining pipeline is free from any foreign material such as rust and pipe scale or welding slag that could damage the seat and disc.
- To prevent damage to the disc and seat during installation, the valve disc must be slightly open but not extending beyond the valve liner face Positioningthe disc in this “almost closed” position will reduce seat interference and initial torque build-up during valve installation.
- Verify that pipeline flanges are free from metallic chips and weld spatter.
- Verify that pipeline flanges are located on the same centreline and are parallel
- Verify that nothing hinders the complete moving of the disc during opening or closing, in particular at the internal weld seams or at the pipe ends.



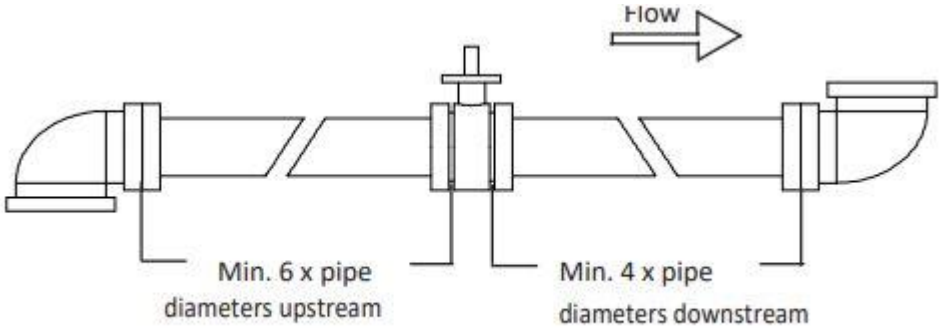




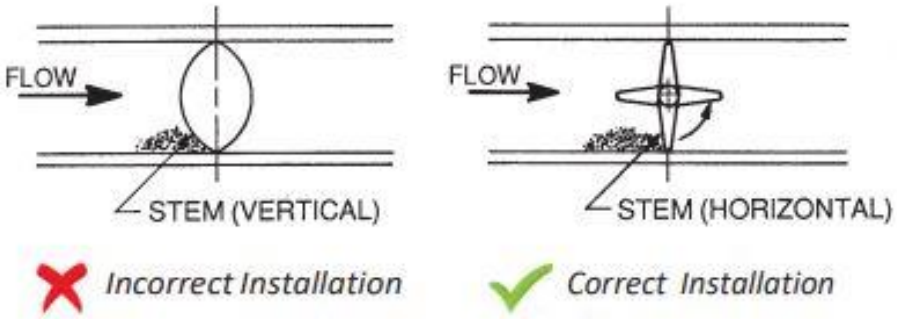
- The valves are bi-directional and can be fitted in either direction relative to the flow. The valve will control flow equally in either direction. The recommended installation position is shaft horizontal and the lower discedge opening downstream (especially for slurry service and media with a tendency for sedimentation)
- Verify that inside diameter of pipeline flange is in accordance withthe minimum and maximum diameters given by the manufacturer.
- Adjacent piping must be positioned so that minimal piping stresses are transmitted to the valve flanges during or after installation
- Check matching of flange drilling pattern of valve and pipe flange before assembly. The use of flange-gaskets is not allowed since it might damage the valve. Use flange bolting in accordance with appropriate standard.
- Mating flange faces must be in good condition and free of dirt and/or inclusions. Both pipe insides must be well cleaned before installing the valve.

3.3 Installation Conditions

1 The valves must not be installed close to curves!
Consideration must be given to the location of the valves in the piping system. The valve must not be placed too close to other valves, elbows, etc. as it is perfor- mance may be affected. It is recommended that the valve have a minimum of six pipe diameters upstream (see below figure) and four pipe diameters downstream between it and other valves, elbows, etc. in the piping system.

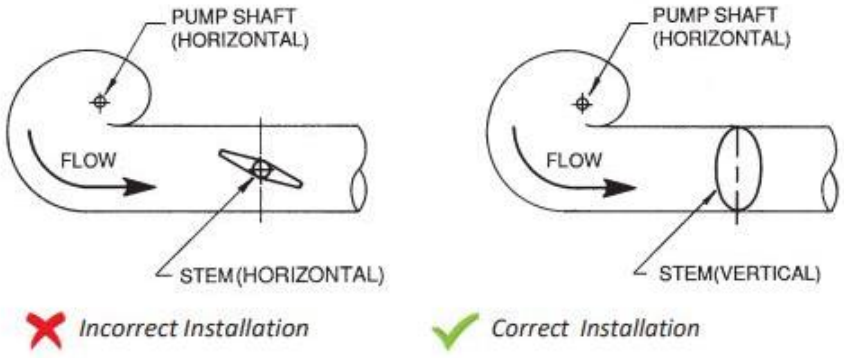


2 Slurry Service or Sedimentation

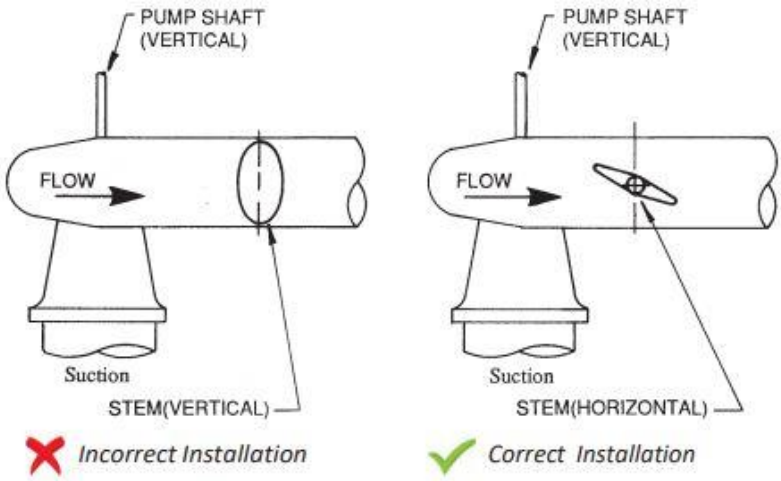


3 Butterfly Valves Located at the Discharge of a Pump

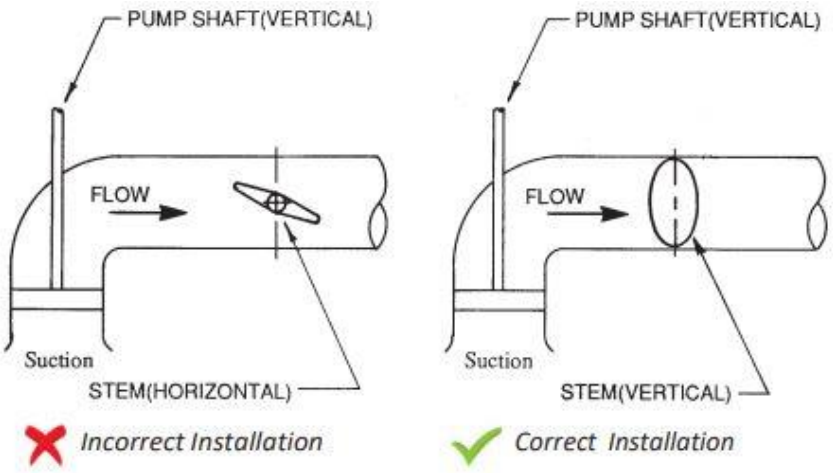
- Centrifugal Pump - pump shaft Horizotal and stem horizontal



- Centrifugal Pump - pump shaft vertical and stem horizontal

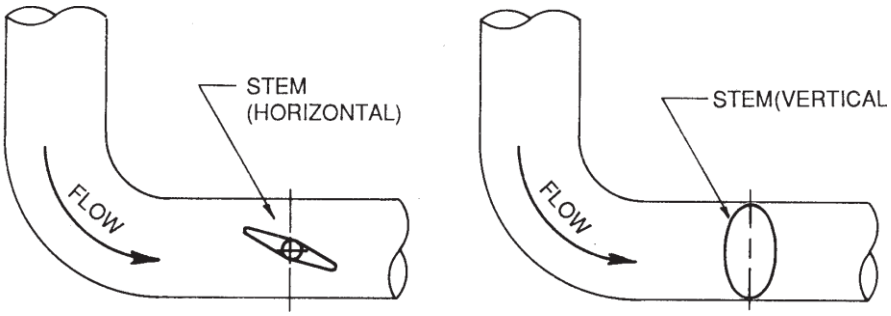


- Axial Pump – pump shaft vertical and stem vertical

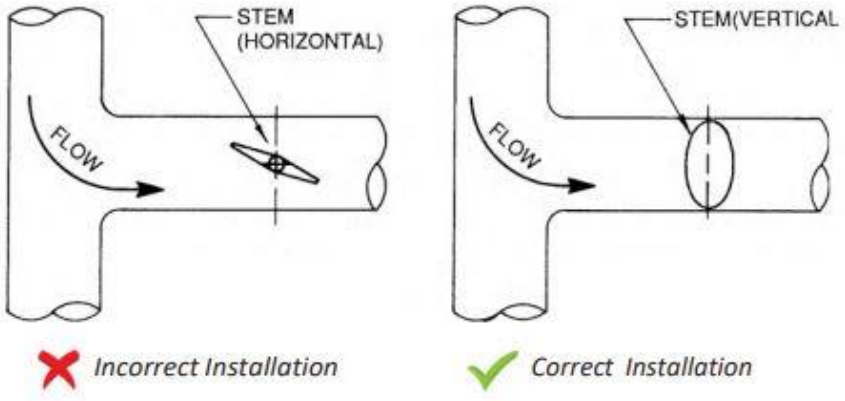


4 Butterfly Valves Located Downstream of a Bend or Pipe Reduce

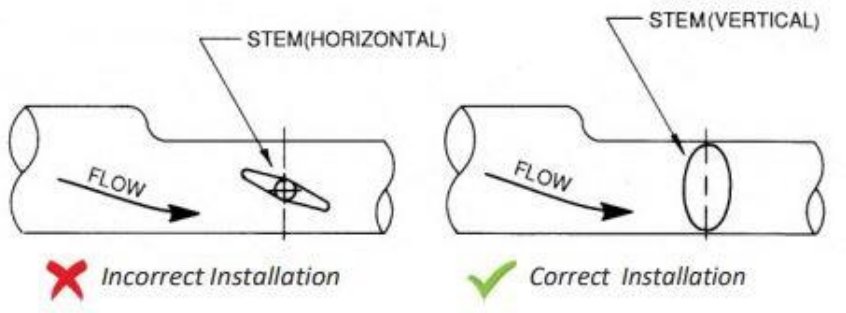
- Bend



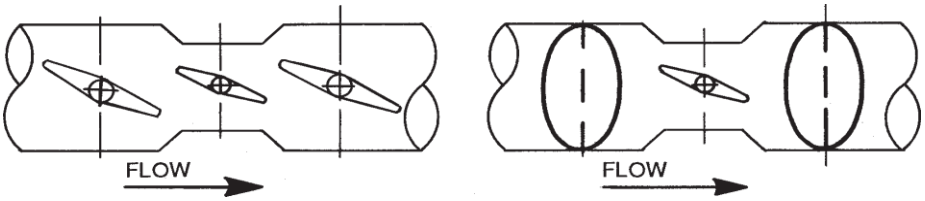
- T line



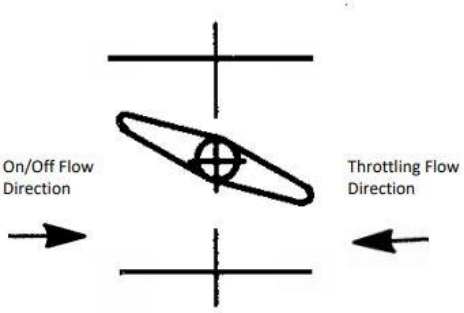
- Pipe Installation



- Butterfly Valves in Combination for Control/Isolation Applications



- Flow Direction of On/Off and Throttling Control Butetrfly Valves



3.4 List of tools

- Pneumatic screwing machine
- Open ended spanner
- Ring spanner
- Boxspanner
- Screwdrivers
- Hammer
- Wedges
- Crow bar
- Silicone grease if authorized

3.5 Assembly

WARNING !

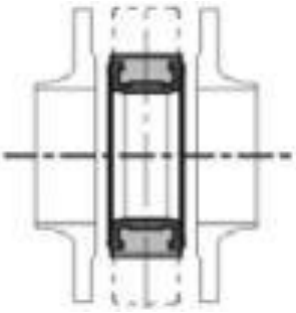
It is the responsibility of the valve user -and not the valve manufacturer- to ensure that the pipeline system has been built professionally and the valve has been properly installed.

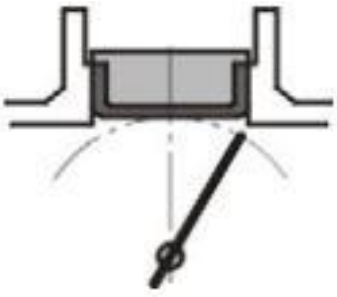
Be sure the line is depressurized and drained.

1- Insert valve between pipeflanges and center using several tie-rods.

2- With the disc in near-closed position, center each mating flange with the valve body.

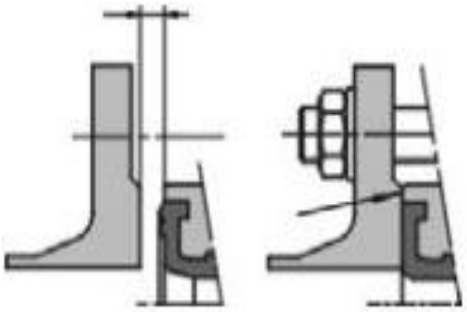
Make sure you are able to turn the disc carefully to a more closed/open position to prevent the discedge from touching the adjacent flanges while positioning the valve.





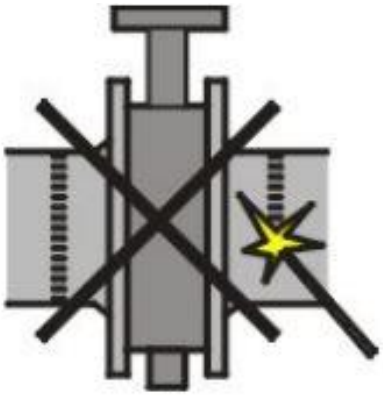
3- Screw up progressively the nuts until metal to metal contact is achieved between the valve body and pipeline flanges, by making sure the good centering of the body compared with the flange is maintained.

(Use the flange-valve-flange assembly for fit-up and centering to the pipe



4- Tack-weld the flanges to the pipe

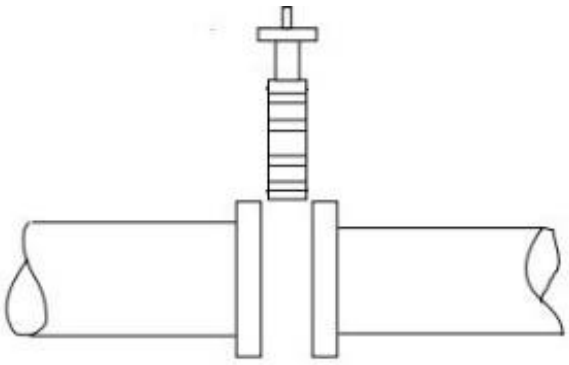
Do not finish-weld the flanges to the pipe with the valve bolted between the flanges as this will result to serious heat-damage to the composite body and the flange sealing rubber O-ring.



5- Remove the boltings and remove the valve from between the flanges.

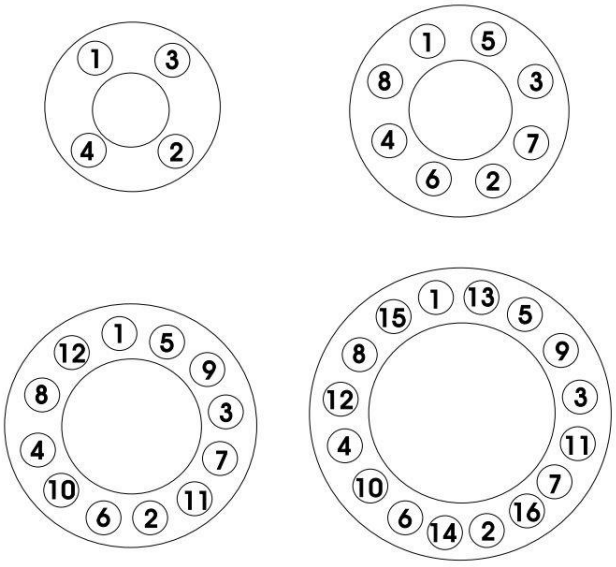
6- Finish-weld the flanges to the pipe and allow the flanges to cool completely

7- Spread the pipe flanges apart enough to allow the valve body to be located between the flanges withoutctually contacting the flange surface.



8- Insert the valve between the flanges
9- Tighten the flange bolts hand tight.
10- Slowly close and open the valve to check for adequate disc clearance
11- Using the sequence shown in Figure, tighten the flange bolts

Recommended torques (Nm) for flange bolting.
Do not exceed the mentioned bolting torques shown below table, as this can lead to overloading of the body.



DN	PN 10	PN 16
40	40	40
50	40	40
65	40	40
80	50	50
100	50	55
125	50	60
150	50	65
200	60	75
150	75	100
300	90	150
350	100	165
400	100	165
450	175	270
500	175	270
600	300	340

3.6 Commissioning/Decommissioning

3.6.1 Actuated Valves

- Electrical cables may only be connected by qualified personnel.
- The applicable electrical regulations (e.g. IEC and national standards), also for equipment in hazardous locations, must be observed. All electrical equipment such as actuator, switchboard, magnetic valve drive, limit switch etc. must be installed in floodproof dry locations. Voltage and frequency must match the valves stated on the identity plate.

3.6.2 Commissioning

- Prior to commissioning the valve, the pressure, temperature and material data stated on the valve must be compared to the actual operating conditions in the piping system to check whether the valve can withstand the loads occurring in the system.
- Possible pressure surges (water hammer) must not be exceed the highest admissible pressure. Adequate precautions must be taken. In new pipe systems and especially after repair work, the system must be flushed with the valves fully open to remove solids, e.g. weld beads, which may damage the seats.
- The position of the disc is indicated by the pointer of the actuator or by handle lever. The valves are closed by turning in the clockwise direction (top view) and opened in the counterclockwise direction.
- Before commissioning, the shut-off-function of the valves must be checked by repeated opening and closing.
- Adjustable end stops and torque limiter of actuators have been adjusted in factory.

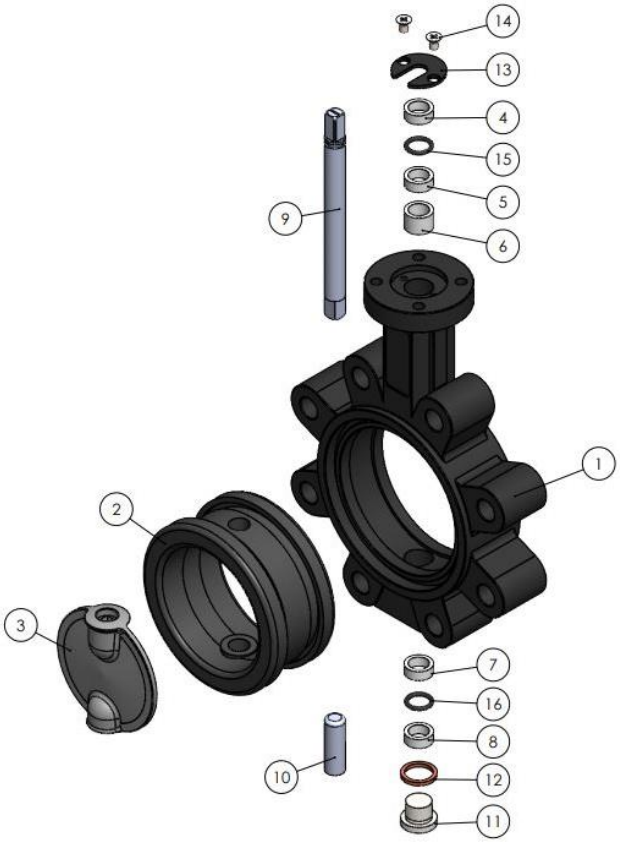
3.6.3 Decommissioning

- During extended shutdown periods, liquids liable to change their condition due to polymerization, crystallization, solidification etc. must be drained from the piping system. If necessary, the piping system must be flushed with the valves fully open.

3.7 Butterfly Valve Disassembly Instructions

1. Position valve flat with the disc (3) in the closed position.
2. Unscrew and remove the Stopper plate (13) from the body.
3. Remove the upper stem (9) from the disc.
4. Unscrew and remove the cap 11) from body. Remove the o-ring (16).
5. Remove the lower Stem (10) from disc.
6. Remove the valve disc (3) from the body making sure not to damage the seat or disc sealing edge.
7. Seat (2) can be removed with hand.
8. Remove shaft bushings (4,5,6,7,8) as required.

3.8 Butterfly Valve Assembly Instructions



1. Clean all parts, inspect for defects.
2. Apply small amounts of silicone Grease to inside body and upper and lower shaft holes.
3. Insert the shaft bushings (4,5,6,7,8) into the body (1) being careful not to allow intrusion into the body seat bore.
4. Install the seat (2) into the body, making sure the shaft holes in the seat line up with the body.
5. Completely coat the inside surfaces of the seat with silicon Grease. Push the disc (3) into the seat in the open position. Line up the shaft holes of the disc as close as possible with the shaft holes in the seat body.
6. Insert the lower stem (10) through the body using a twisting motion to align the keyway paralel with the disc.
7. Insert the upper stem (9) through the body using a twisting motion to align the keyway paralel with the disc.
8. Insert the stopper plate (13) through the upper stem then screw the body.
9. Insert the o-ring(12) and cap (11) then screw the body.

Section 4: Maintanance

WARNING !

Depressurize and, if necessary in case of dangerous fluids, drain the line and flush with appropriate cleaning fluid before starting any maintenance. Failure to do so may cause serious personal injury and/or equipment damage. Before disassembling the valve, ensure the valve has been decontaminated correctly from any harmful gasses or liquids and that it is within a safe temperature range for handling. Personnel making any adjustments to the valves must utilize suitable equipment. All required personal protection means must be worn. Only personnel trained in all aspects of manual and mechanical handling techniques must carry out handling of the valves.

Periodic preventative maintenance practices are recommended for all BF Series valves.

1. Operate the valve from full open to full closed to assure operability.
2. Check flange bolting for evidence of loosening and correct as needed.
3. Inspect the valve and surronding area for previous or existing leakage at flat faced or shaft connections.
4. Check piping and/or wiring to actuators and related equipment for looseness and correct as needed.

4.1 Valve Removal from Piping and Actuator Disconnecting

- Please check what is the relevant spare kit. Place the disc at 10 ° opening.
- The entire valve must be unpressurized and must have cooled down sufficiently so that the temperature of the medium is lower than 60 ° C, to prevent scalding
- Opening pressurized valves will cause danger to life and limb! lf toxic or highly flammable substances or liquids whose residues may cause corrosion by interaction with the air humidity were handled by the valve, then the valve must be drained and flushed or vented. lf necessary, wear safety clothing and a face guard/mask. Depending on the installation position, any liquid remaining in the valve may have to be removed.
- Prior to possible transport, the valves must be flushed and drained carefully. lf you have any questions please contact your Sales Office.

WARNING !

lf actuators powered by an external source of energy (electric, pneumatic, hydraulic) need to be removed from the valves or dismantled, the energy supply must be shut down prior to starting any repair work.

1- Remove the valve from the piping with its actuator. **Do not damage the liner during removal the valve from the pipe.**
2- Therefore, pull apart the pipe flanges to allow sufficient clearance.
3- Identify the mounting position of the actuator.
4- Disconnect the actuator and take care of all bolting parts**.**

4.2 Troubleshooting Guide

PROBLEM	PROBLEM CAUSE	RECTIFICATION
Noise occurring	Valve running above capacity	Check operating conditions and design features. Change the valve mounting location or replace the valve with a valve type suitable for the place of use.
	Incorrect mounting. (Valve too close to a reducer, elbow, check valve, etc.)	Change the mounting position.
Valve will not completely close	The electric actuator is not working properly.	Check actuator electrical connection and settings.
	There is dirt in the valve	Clean the valve to remove the dirt.
	Foreign material is trapped inside the valve.	Remove foreign material by backwashing or removing the valve.
Valve has a leaking.	Valve not fully closed	Turn the valve to the fully closed position by checking the mechanical position indicator.
	There is dirt in the valve	Turn it on and off to remove the dirt and flush the valve with the valve open.
	The sealing ring is worn or damaged.	Replace the sealing ring.
Torque is high..	Foreign material accumulation on the body seat. (lime, sand, etc.)	Backwash the valve or manually clean the foreign material
	Dry line, dry sealing ring.	Apply grease or silicone to the body seat and sealing ring.
There is a leak at the flange connection in the pipeline.	The flange connection between the body and the pipeline is not sealed.	Check the body-flange connections, tighten as necessary. If the leak cannot be fixed by tightening the flanges:
		Ensure pipeline flanges are flush and coplanar and/or replace body gasket.
There is a leak in the lower flange gasket.	Bottom flange bolts loose	Check bottom flange bolts, tighten if necessary.
	Spiral winded gasket damaged	Replace spiral winded gasket.
The valve does not work efficiently.	Insufficient air supply.	Increase air supply pressure and/or flow.
	Actuator/stem adapter not aligned	Disassemble and realign the actuator.

For further technical support please contact the factory or your local representative,

TR Sales Office : S.Ilknur Keles Sokak No: 7, Kozyatagi Mah. Kadikoy 34742, Istanbul -Turkiye
Tel : +90 216 420 00 74 – e-mail : info@proval.net

TR Facrory : KOBI OSB, 1 Cad 32 Sok No:10 Dilovasi 41480, Kocaeli -Turkiye
Tel : +90 262 728 14 74 – e-mail : info@proval.net