GEKO
CONTROL-VALVES

Doc No: GK0501
Rev No: A/0

Butterfly Valves
Operation Instruction

☐ CONTROLLED COPY

☐ UNCONTROLLED COPY

PREPARED BY_____DATE_____
REVIEWED BY_____DATE_____
APPROVED BY_____DATE_____

Rev. No.	Rev. Page/ Section	Change Description	Effect. Date	Rev. Sheet No.
A/0	All	First issue	2018/3/19	

CONTENTS

1. General

1.1 Thanks for your selection of Geko butterfly valve. As a type of pressure equipment, valve has potential of pressure hazards. Carefully read this instruction for your safety selection, storage, installation, application and maintenance of valve.

1.2 Geko butterfly valve is regarded as standard product designed to API 609 and ASME B16.34, adequate strength is designed according to the class and definite safety allowance is provided. The design, production and inspection of valve is ensured by a strict quality assurance system approved by Notified Body.

1.3 As standard products, butterfly valve design takes no consideration of each specific working condition since it is too wide. The user or the designer of the pipeline system must select correct class and material in accordance with the special working condition, or contact with Geko for special design of valve. Consideration shall be paid by the user for the following on selection of valve:

——Whether the pressure-temperature rating is beyond as specified in ASME B16.1 ASME B16.34.

——The design takes no consideration of traffic, wind and earthquake loading

— — The valve design takes consideration of corrosion for normal fluid, no consideration is taken for corrosive fluid.

——The valve design takes no consideration of wear.

——The design takes no consideration of specific fatigue

——The design takes no consideration of reaction forces and moments which result from the supports, attachments, piping, etc.

——The design takes no consideration of pressure raising or suddenly cooling due to decomposition of unstable fluids.

1.4 After pass the final assessment procedures, valves shall be marked with CE marking, CE marking is eternally fixed on top flange of the body.

2. Application and Technical Parameters

2.1 Scope

The series valves are widely used in petroleum, chemical, power plant and allied industries for shut off or connection of pipeline.

2.2 Technical Parameters:

Design standard:	API609-1997, ASME B16.34-1996
Flange dimension:	ASME B16.1-1998 for PN10(125lb) cast iron ASME B16.5-1996 for PN20(150lb) carbon steel and stainless steel
End type:	LUG, WAFER
Face to face dimension:	API609-1997
Nominal pipeline size:	50~600 mm(2~24”)
Nominal pressure:	10bar (125LB), 20bar (150LB)
Temperature range:	Refer to Table 4
Fluid:	Refer to Table 4
Body material:	ASTM material, refer to Table 2

Trim material: Refer to Table 3
Valve test: API 598-1996

3. Please refer to Fig 1 and Fig 2 for valve structure, Table 1 for main dimensions.

Fig 1

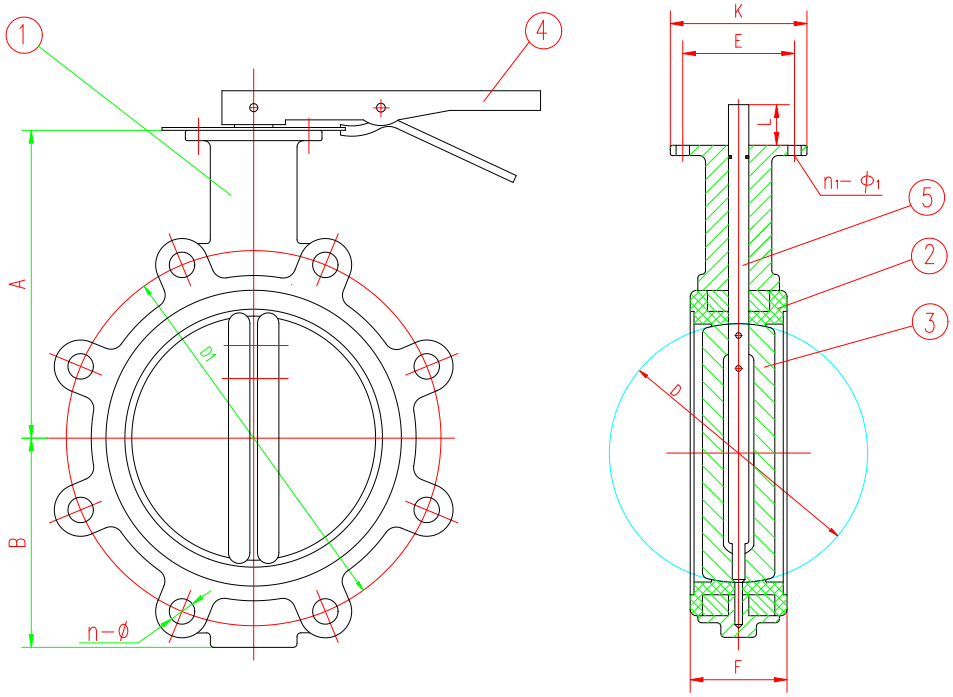

Fig 2

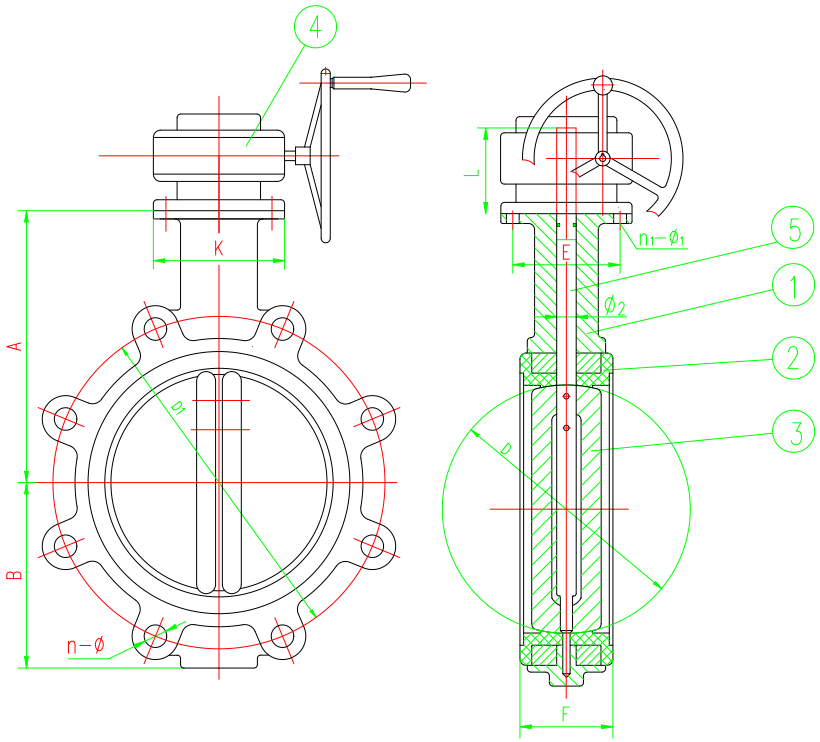

Table 1 DN50~600 (2-24") 10bar(125LB) & 20bar(150LB) Butterfly valve main dimensions

DN	A	B	D1	E	F	n- ϕ	K	L	n- ϕ 1
50	162	80	120.5	70	46.1	4-5/8-11UNC	140	92	2.3
65	175	89	139.5	70	49.1	4-5/8-11UNC	140	92	3.0
80	181	95	152.5	70	48.4	4-5/8-11UNC	140	92	3.0
100	200	114	190.5	70	55.3	8-5/8-11UNC	140	92	4.5
125	213	127	216	70	58.8	8-3/4-10UNC	160	92	4.5
150	225	140	241.5	70	59.1	8-3/4-10UNC	230	92	7.0
200	260	175	298.5	102	64.1	8-3/4-10UNC	230	125	7.0
250	292	203	362	102	71.8	12-7/8-9UNC	265	125	9.5
300	337	242	432	102	81	12-7/8-9UNC	265	125	9.5
350	368	267	476	102	79.5	12-1-7UNC	285	125	15
400	400	302	539.5	165	90	16-1-7UNC	285	210	15
450	422	318	578	165	109	16-1 1/8-7UNC	300	210	19
500	479	349	635	165	135	20-1 1/8-7UNC	300	210	19
600	562	562	749.5	165	156	20-1 1/4-7UNC	400	210	33

4. Main Parts and Material

Table 2 Material for main parts

Parts Name	Materials					
Body	A126-B	A216 WCB	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M
Bolt	Carbon Steel	Carbon Steel	193-B8			
Nut	Carbon Steel	Carbon Steel	A194 8			

Stud	Carbon Steel	Carbon Steel	A193-B8			
Handle	Cast Iron	Cast Iron				
Service pressure	10bar(125LB)	20bar(150LB)				
Service temperature	-29~148	-29~427	-29~537	-29~537	-29~427	-29~454

Table 3 Trim material

Stem	Disc	Seat ring
F6a, F304, F316, F304L, F316L	CA15,CF8,CF8M, CF3,CF3M, Ductile Iron +ENP	EPDM, BUNA-N, VITON, PTFE, NEOPRENE, HYPALON

The service temperature of mid line butterfly valve depends on the type of sealing material and body material

Table 4 Service temperature and fluid according to seat ring material

	EPDM	NBR	BUNA-N	VITON	PTFE	NEOPRENE	HYPALON
Service temperature	-29~135 (2~16”)	-12~82	-12~82	-12~135	4~135	-6~93	-17~135
	-29~107 (18~24”)						
Fluid	Water, oil, general service						

5. Working Principle and Structure Description

5.1 Working principle

The main function of butterfly valve is to control fluid flow rate in pipeline: turn handle or other actuator, the disc will rotate; lock the disc at the specified angle by locking device; the fluid flow rate depends on the disc angle; when the disc is turned 90^0 to the valve bore center line, the pipeline is cut off.

5.2 Structure description

5.2.1 This series valve uses soft sealing structure. PTFE is used both as stem packing and the seat ring material. The sealing between the stem and seatring, disc and the seatring are realized by elastic of the non-metal.

5.2.2 Wafer or lug type is used as connection to pipeline.

5.2.3 Stem two ends use double D structure to prevent mis-operation, The handle direction is always same as the disc.

5.2.4 Stem and disc fixed by paper pins for anti-blow-off and electric continuity.

5.2.5 This series butterfly valves do not have fire safe structure, as the soft sealing will burnt away in fire.

5.2.6 Handle or worm wheel is common used as actuator. In user's opinion, associated electric, hydraulic or pneumatic actuator may be used provided conforming relevant EC directives and bearing CE marking.

6. Valve Transportation

6.1 Before transportation, a hoist and nylon straps are required for large valve. Valve package shall be examined for damage. Valve shall be in full-close status. For mis-opened valve, the sealing surface shall be cleaned and valve re-closed.

6.2 Hoist and nylon straps shall be placed under the valve body, no stem or actuator.

6.3 The paint, nameplate and flange sealing surface shall be protected during transportation, rough handling is forbidden.

6.4 Don't unpack when the valve is not ready for installation. The valve shall be placed at a safety location against weather.

7. Valve Storage

7.1 Valves should be stored in a suitable sheltered location to prevent contamination by weather, dampness or foreign materials. End protection should remain in place until the valves are ready for installation.

7.2 If valves are stores for extended periods of time they should be routinely checked for deterioration. Valve shall be re-tested prior to use.

8. Valve Installation

8.1 Carefully check valve identification against service requirements before installation.

8.2 Check the inside of bore and the sealing surface before installation, remove any attached dirty with clean soft cloth.

8.3 Check the actuator to prevent block before installation.

8.4 For easy operation, it is better the valve actuator to be at location 1.2m from the ground. Where the center of valve and the actuator is over 1.8m from the ground, a platform shall be built for the frequently operated valve. For pipeline with numbers of valves, valves shall be installed on the same platform as likely as possible for easy operation.
For single valve installed at location over 1.8m and less operated, apparatus may be used such as chain-wheel, extension bar, move platform and move ladder etc.
Where valve is installed underground, extension bar or ground-well shall be set. For safety purpose, the ground-well shall be covered.

8.5 For valve installed on horizontal pipeline, the stem is suitable at uprightness position; or, the downward stem shall be inconvenience for operation and maintenance, as well the valve is liable to corrosion. If the ground valve slant installed, operation and maintenance shall also be inconvenience.

8.6 When valves are installed in pipeline side by side, enough space shall be kept for operation, maintenance and dismantle. The clearance of hand-wheels shall not less than 100mm; in case of narrow clearance, valves shall be installed interleaving.

8.7 User shall select proper bolting, gasket according to the working temperature, working pressure and fluid, equally fasten the bolts in a diagonal pattern. Bolt shall be with full thread, bolt over 1 inch in diameter shall use 7UNC serial thread.

9. Valve Application and Maintenance

9.1 Valve operation

9.1.1 When handle is used as actuator
The valve full open position is designed as the axial of handle is parallel to the pipeline. Turn the handle clockwise to perpendicular to the pipeline, the valve will be fully closed; Turn the handle anticlockwise to parallel to the pipeline, the valve will be fully opened.

9.1.2 When gear operator is used as actuator
The valve full open position is designed as "OPEN" position as indicated on the gear operator. Turn the handwheel clockwise to the "CLOSE" position as indicated on the gear operator, the valve is fully closed. Turn the handwheel anticlockwise to the "OPEN" position as indicated on the gear operator, the valve is fully opened.

9.1.3 When other actuator is used
Valve to be operated in accordance with associated actuator specification.

9.2 Valve in service shall be periodically examined to ensure a good sealing, no packing aged, no sufficient wear and body corrosion that may affect safety; Otherwise, the valve shall be repaired or replaced immediately. Valve for oil and water shall be inspected every three months, valve for corrosive fluid shall be inspected per month or according to local law.

9.3 Upon reparation, valve shall be re-assembled, inspected tested, meanwhile the replaced parts shall be listed for reference.

9.4 User may select valve bolt and nut of proper size for replacement.

9.5 User may repair the valve-sealing surface providing a successful shell test and sealing test.

9.6 Generally valve trim prefers replacement to reparation. It is better to use provided part as replacement. If part produced by valve manufacturer is not available due to emergency, user shall produce the part to Geko drawing and inspect prior to replacement. Geko takes no responsibility for loss caused out of part produced other than Geko.

9.7 It is not recommended for reparation of valve pressure-containing part by user. If the pressure-containing part is used for a long time and consequently defection occurs and affect safety use, user shall replace the valve with a new one.

9.8 Welding repair on valve in service is forbidden.

9.9 Valve in service shall not be knocked, walked on or used as weight support.

9.10 Valve for high temperature service shall be identified with warning mark or separated to prevent personnel injury.

10. Potential Failure and Troubleshooting

Failure	Cause	Troubleshooting
Leakage through stem sealing	1. Dirties between sealing surfaces 2. Sealing damaged	1. Remove dirty 2. Repair or replace the sealing
Leakage through disc sealing	1. Dirties between sealing surfaces	1. Remove dirty 2. Repair or replace the sealing

	2. Sealing damaged	
Operation failure	1. Stem bent 2. Foreigner existence between stem and bearing	1. Rectify or replace the stem 2. Clean foreign substance

11. Quality Warrant

11.1 Geko warrants its valves to the original purchaser for a period of 18 months from and after the date of delivery to the original customer, against defects in material and workmanship under proper and normal use and service and not caused of resulting from improper application or usage, improper installations, improper maintenance and repairs, modifications or alterations.

11.2 Purchaser shall give notice to Geko upon finding of any defect or assuming defect, Geko has privilege to check the facts of the defect.

11.3 Geko sole obligation under this warranty shall be limited to the follows:

—repair of the material or,

—replacement of the parts and materials or,

—refund the purchase price or collect the defected products from the original purchaser.

11.4 Geko is not responsible to claims caused from unexpected natural disaster such as earthquake, typhoon etc.

11.5 The scope and limitation of warranty can be changed through the agreement between Geko and purchaser.

12. Servicing

12.1 Where contractually specified, the manufacturer may provide field installation and adjustment.

12.2 The manufacturer will trace the quality of sold valve and provide service to customer requirements.

Service Contact:

Geko Flow Control Technology (Changzhou) Co., Ltd
Tel:0515-85503155 Fax:0515-85503133
E-mail:info@geko-union.com
URL: www.geko-union.com
Address:No. 67 Shunshan Road, Tianning District, Changzhou,Jiangsu Province