



*Valves, Automation & Controls*

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February 10, 2012  
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# **Installation, Operation, and Maintenance Manual**

## **SERIES 17**

### **WAFER AND LUG TYPE *BUTTERFLY VALVE***

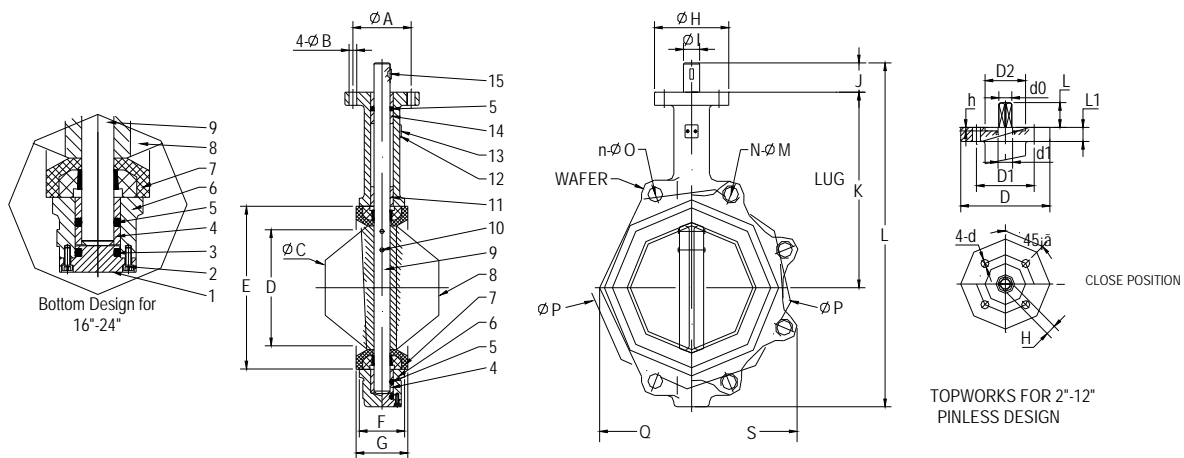


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● **FEATURE**

1. Small in size, light in weight, easy to install and maintain, can be install at any position of pipeline.
2. Simple and compact construction, minimized space occupied.
3. Quick quarter-turn action, minimized torque to operate.
4. Flow character trend to straight line, satisfied regulation.
5. Tens of thousands working cycle guarantee a long service life.
6. Zero leakage under bubble-tight test to perform tight shut-off.
7. Different material can be selected as different medium to meet up various fields.

● **ASSEMBLE DRAWING**



**MAIN PARTS AND MATERIAL**

ITEM	PART	SPECIFICATION
1*	Button Cover	Steel ASTM A108 1035
2*	Bolt	Steel GB 700-88 Q235A
3*	"O"Ring	NBR/EPDM
4	Bushing	Lubricated Bronze ASTM B584 C83600/PTFE/316SS
5	"O"Ring	NBR/EPDM
6	Body	ASTM A126 CL.B/ASTM A536/ASTM A395/ASTM A216 WCB
7	Liner	Rubber EPDM/BUNA/VITON/PTFE
8	Disc	ASTM B148 C95400/ASTM A536 65-45-12/ASTM A351 CF8M
9	Stem	Stainless Steel ASTM A582 416SS/ASTM A276 316SS
10	Taper Pin	Stainless Steel ASTM A582 416SS/ASTM A276 316SS
11	Bushing	Lubricated Bronze ASTM B584 C83600/PTFE/316SS
12	Nameplate	ALUMINUM/COPPER
13	Rivet	ALUMINUM
14	Bushing	Lubricated Bronze ASTM B584 C83600/PTFE/316SS
15	Key	Steel ASTM A108 1045

Note : 1. The parts with \* are just for DN400(16") ~DN600(24") valves.  
 2. Item1,2 and 3 are not available for DN350 (14")  
 3. DN50-DN300 is pinless design.



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● **TECHNICAL PERFORMANCE**

Nominal Pressure		200PSI(2"-12")	150PSI(14"-24")
Testing Pressure	Shell	300PSI	225PSI
	Seat	220PSI	165PSI
Service Temperature		BUNA	-12°C~+82°C
		EPDM	-35°C~+110°C
Service Medium	Fresh Water, Sea Water, Sewage, Air, Steam, Food, Medicine, Oil, Acid &Alkali, salt and etc.		



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● **DIMENSIONS & WEIGHT OF TYPE WAFER AND LUG BUTTERFLY VALVE**

SIZE		A	B	C	D	E	F	G	H	I	J
inch	mm	DIA.	DIA.	DIA.	PIPE I.D.	DIA.	BODY	SEAT	DIA.	DIA.	
2	50	/	/	52.9	32.3	76.3	42.0	45.0	/	/	/
2 1/2	65	/	/	64.5	46.1	89.0	44.7	47.6	/	/	/
3	80	/	/	78.8	64.4	103.9	45.2	49.0	/	/	/
4	100	/	/	104	86.3	135.0	52.1	54.7	/	/	/
5	125	/	/	123.3	110.6	159.0	54.4	58.0	/	/	/
6	150	/	/	155.6	134.8	188.4	55.8	58.6	/	/	/
8	200	/	/	202.5	192.4	238.1	60.6	63.4	/	/	/
10	250	/	/	250.5	241.7	292.3	65.6	70.0	/	/	/
12	300	/	/	301.6	291.8	344.1	76.9	80.1	/	/	/
14	350	102	12	333.3	322.0	375.1	75.2	79.5	140	31.6	45
16	400	140	18	389.6	380.0	439.5	85.7	90.0	197	33.2	51
18	450	140	18	440.5	428.0	490.5	104.6	109.0	197	38.0	51
20	500	140	18	491.6	480.0	535.4	130.3	135.0	197	41.1	64
24	600	165	23	592.5	562.0	654.0	151.4	156.0	276	50.6	70

SIZE		K	L	N	M	n	O	P	Q	S	WEIGHT(kgs)	
inch	mm				DIA.		DIA.	DIA.			"A"	"LT"
2	50	161	273	4	5/8	4	19	120.6	118	118	2.5	3.8
2 1/2	65	175	296	4	5/8	4	19	139.7	137	137	3.2	4.2
3	80	181	308	4	5/8	4	19	152.4	143	178	3.6	4.7
4	100	200	346	8	5/8	8	19	190.5	156	206	4.9	9.0
5	125	213	372	8	3/4	8	22.4	215.9	190	238	7.0	10.9
6	150	226	397	8	3/4	8	22.4	241.3	212	266	7.8	14.2
8	200	260	480	8	3/4	8	22.4	298.4	268	329	13.2	18.2
10	250	292	540	12	7/8	12	25.4	361.9	325	393	19.2	26.8
12	300	337	624	12	7/8	12	25.4	431.8	403	462	32.5	40.0
14	350	368	680	12	1	12	28.4	476.2	436	515	41.3	56.0
16	400	400	760	16	1	16	28.4	539.7	488	579	61	96.0
18	450	422	801	16	1 1/8	16	31.8	577.8	539	627	79	122.0
20	500	480	905	20	1 1/8	20	31.8	635	593	696	128	202.0
24	600	562	1091	20	1 1/4	20	35.1	749.3	816	821	188	270.0

**Note: 1. The above dimensions for connected flange conform to ANSI B16.1 125**

2. The lug type butterfly valve can be installed as dead-end service with common bolts.

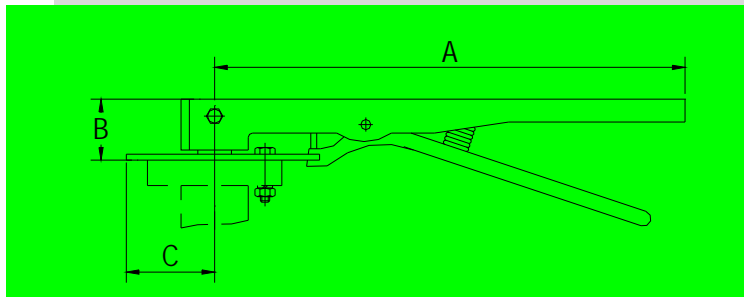


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● **TOP-WORKS FOR 2"-12":**

SIZE	D	D1	D2	d1	d0	L	L1	h	H	d
DN50(2")	Φ65	Φ50	Φ41	Φ12.6	Φ12.1	32	12	6	9	Φ7
DN65(2.5")	Φ65	Φ50	Φ41	Φ12.6	Φ12.1	32	14	6	9	Φ7
DN80(3")	Φ65	Φ50	Φ41	Φ12.6	Φ12.1	32	13	6	9	Φ7
DN100(4")	Φ90	Φ70	Φ53	Φ15.77	Φ14.1	32	16	6	11	Φ10
DN125(5")	Φ90	Φ70	Φ53	Φ18.92	Φ18.1	32	14	6	14	Φ10
DN150(6")	Φ90	Φ70	Φ53	Φ18.92	Φ18.1	32	14	6	14	Φ10
DN200(8")	Φ125	Φ102	Φ58	Φ22.1	Φ22.1	45	14	6	17	Φ12
DN250(10")	Φ125	Φ102	Φ68	Φ28.45	Φ28.2	45	16	6	22	Φ12
DN300(12")	Φ140	Φ102	Φ68	Φ31.6	Φ28.2	45	20	6	22	Φ12

● **OUTLINE DIMENSION AND WEIGHT OF LEVER HANDLE**



Valve Size	A	B	C	Weight- kg
DN50~DN150	267	32	52	0.65
DN200	359	45	75.2	1.45
DN250、DN300	499	45	75.2	2.30

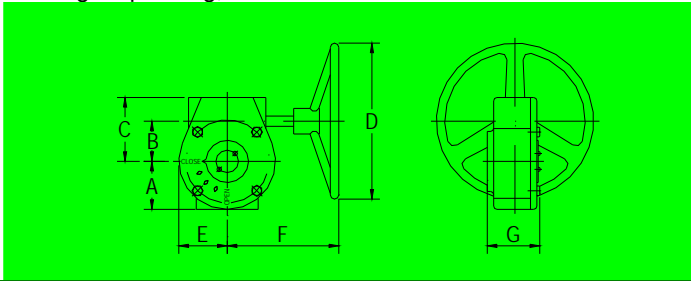


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● **OUTLINE DIMENSION AND WEIGHT ONE-STAGE WORMGEAR**

**Feature :**

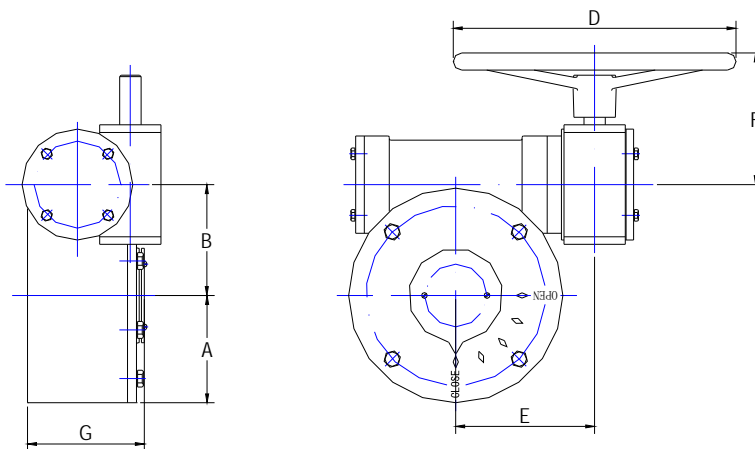
- ◇ Small in size, light in weight, heavy output torque.
- ◇ Light operating, accurate and obvious indication.



MODEL	VALVE SIZE	A	B	C	D	E	F	G	OUTPUT TORQUE-NM	WEIGHT kg
3D-15	2"-6"	54	45	73	150	53	155	68	170	5.2
3D-50	8"&0"	77	66	100	300	77	222	76	700	12.3
3D-120	12"&14"	81	78	117	300	81	213	81	1200	14.4
3D-250	16"&18"	120		160	300	130	251	120	2500	32.0

● **OUTLINE DIMENSIONS AND WEIGHT OF TWO-STAGE PLANET WORMGEAR**

Feature: The planet structure is the same axis with the worm. A compact in structure and perfect appearance ;



MODEL	VALVE SIZE	A	B	D	E	F	G	OUTPUT TORQUE-NM	WEIGHT kg
3D-30/250	DN500	107	100	300	169	154	124	2500	41.0
3D-30/400	DN600	138	125	300	191	154	129	4000	48.0



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● **INSTALLATION**

**CAUTION :**

- ✧ The position that install valve should be convenient to operate, maintain and change valve.
  - ✧ When the valve mentioned in this manual installed, the medium direction in pipeline isn't in account.
  - ✧ The valve can work with its best function if installing a filter in front of the valve.
  - ✧ The valve is forbidden to install in a pipeline, the nominal pressure of which is higher than the valve to prevent accidents.
1. Select a suitable valve according to the size and pressure of the pipeline.
  2. Unpack the valve and check the valve as follow:
    - ✧ Confirm the valve meet the working condition according to the nameplate and other information.
    - ✧ Inspect the seat, inner chamber, connected surface and the disc sealing. There should be no damage or any other sundries inside.

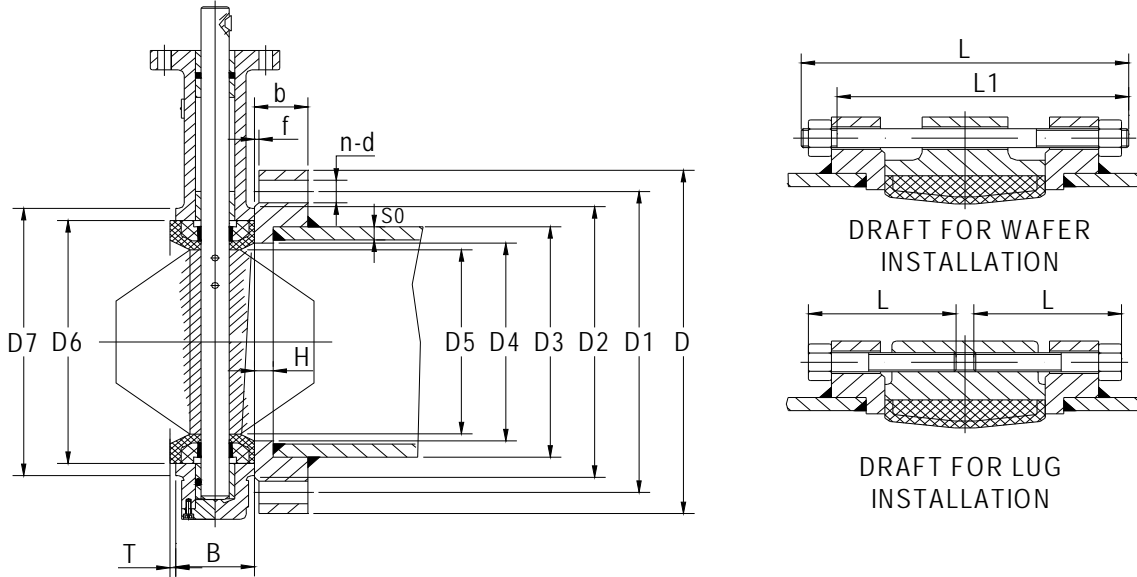
**CAUTION :**

- In case that there are sundries between the sealing surface of seat and disc, the sealing surface both disc and seat will be damaged when move the disc.
  - Any damage on the surface of liner and disc sealing will make the sealing failure.
- ✧ Check actuator. If it is tightly bolted with valve.
  - ✧ Operate the valve to check if it can be operated smoothly and in accurate position.
  - ✧ Confirm the mounting flange is matched with pipe flange.
3. According to the weight and intended position to install of the valve, choose the suitable tools to install the valve by referring to the following information of Assemble Drawing, Dimensions for Mounting Flange and Installation, Size & Numbers for Installation Bolts.



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**Installation Drawing for Wafer and Lug Type Butterfly Valve**



**Dimensions for Mounting Flange and Installation for Wafer and Lug Type**

size	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600
	inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
O.D. PIPE	do	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9	355.6	406.4	457	508	610
O.D. flange	D	152	178	191	229	254	279	343	406	483	533	597	635	699	813
PCD	D1	120.6	139.7	152.4	190.5	215.9	241.3	298.4	361.9	431.8	476.2	539.7	577.8	635	749.3
Dia. raised face	D2	92	105	127	157	186	216	270	324	381	413	470	533	584	692
ID of flange	D3	61.5	77.5	90.5	116	141.5	170.5	221.5	276.5	327.5	359.5	411	462	513.5	616.5
ID of pipe	D4	50	65	80	100	125	150	208	255	308	340	405	455	505	605
Boss Thickness	H	4	4	4	4	4	4	5	6	6	7	7	8	8	8
Raised face	f	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Dia. & Nos of holes	n-d	4-φ19	4-φ19	4-φ19	8-φ19	8-φ22.4	8-φ22.4	8-φ22.4	12-φ25.4	12-φ25.4	12-φ28.4	16-φ28.4	16-φ31.8	20-φ31.8	20-φ35.1
Flange Thickness	b	19	22	24	24	24	25	28	30	32	35	37	40	43	48
Disc Chord	D5	32	46	64	90	111	145	192	242	292	322	380	428	473	572
OD seat	D6	76	89	104	135	159	188	238	292	344	375	440	491	535	654
OD body	D7	89	108	120	150	181	208	260	320	375	405	470	521	565	693
Face to face	B	42	44.7	45.2	52.1	54.4	55.8	60.6	65.6	76.9	76.5	85.7	104.6	130.3	151.4
Min. thickness	S0	3.5	4	4	4	4	4.5	6	8	8	9	9	9	9	9
Raised face seat	T	1.5	1.5	1.9	1.3	1.8	1.4	1.4	2.2	1.6	1.5	2.15	2.2	2.35	2.3

**Note: The above dimensions conform to ANSI B16.1 125**





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**Caution :**

- ✧ Before installing, inspect the pipe, if any material, tool or other sundries are forgotten inside. These sundries will do serious damage to the valve.
  - ✧ The dimensions of connected flange should keep the liner a complete contact with the flange.
  - ✧ The connected bolts should be tightened in a sequence of diagonal with even force. Or else, leakage will occur from the connected flange.
4. When finishing installed, clear worksite, operate the valve to confirm the valve can work well and keep the valve in required status.

**Caution :**

- When a shell test for the pipeline is conducted, the valve should be fully opened.
- After finishing installed completely, a caution mark or any other method should be taken to prevent people not on business from operating the valve.

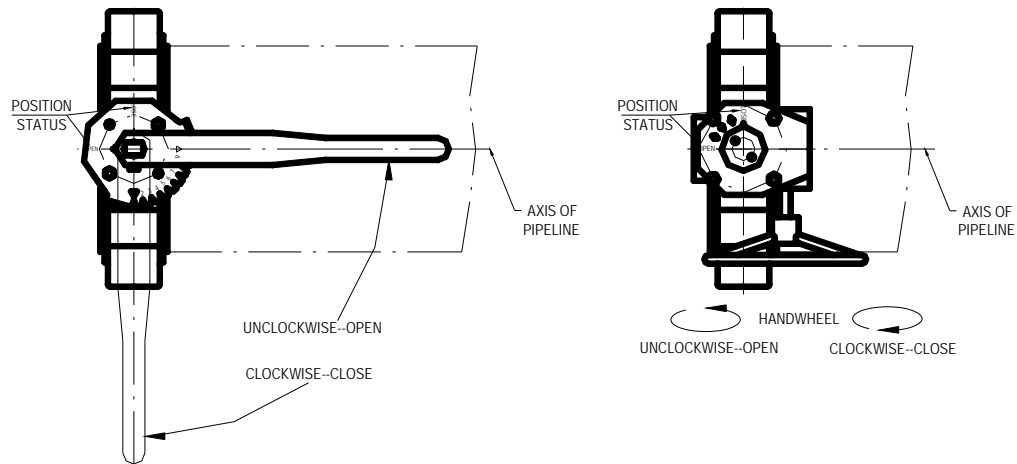
● **STORAGE AND OPERATION**

1. Valves not in use should be stored in a dry and clean room. Disc should be at 5-10 degree open.
2. When operating valve in pipeline, check the status of the valve first, then operate.

**Caution :**

- When a valve is stuck to operate, it should be checked and maintained timely. It is forbidden to operate the valve with heavy force, or else, the valve or actuator will be damaged.

◆ **OPEN AND CLOSE INDICATOR AND OPERATING DIRECTION**



**CAUTIONS FOR ACTUATOR :**

- ✧ The hand-wheel of gearbox is designed according to rated torque. It is forbidden to input an extra heavy torque to operate. The extra heavy torque will damage the actuator.
- ✧ In case that the disc moves normally but in incorrect open or close position, loose the adjusting screw first, operate the hand-wheel to move the disc at the correct close position, then tighten the adjusting screw. The same way to open position.
- ✧ In case that disc is in the correct open or close position but the indicator deviate the correct position, loose the screw for indicator, adjust the indicator to correct position, then tighten the screw.



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● **MAINTENANCE AND REPAIR**

1. Bushings for the valves mentioned in this manual are all self-lubricated, no lubricant is needed
2. A periodic check of lubrication for worm gear should be conducted annually. When the grease in the gear box is dirty or black, dismount and clean the worm gear and box with gasoil or kerosene. Pour proper lithic-lubricant, turn the worm gear 2-3 full travels to make the lubricant adhered on the gear surface even. At last, cover the box, tighten bolts, re-install the actuator on the valve.
3. Check and clean the position indicator periodically to keep it in a obvious and correct position.
4. Often check the connected flange. In case of light leakage, inspect the connecting bolt. If it still leak after the bolts re-tightened, the valve should be dismounted and repaired.
5. Often check the end of stem. In case of leakage, the valve should to be dismounted and repaired.
6. When the valve is failure in sealing, it should be dismount and repaired.

◆ **COMMON BREAKDOWNS AND SOLUTION**

BREAKDOWN	REASON	SOLUTION
Valve is failure in sealing	1. Sealing surface of seat is scratched.	Change seat.
	2. Sundries are adhered on sealing surface of seat.	Clean sundries
	3. Sealing surface of disc is damaged.	Repair or change disc.
	4. Disc is not at the correct close position	Check and repair actuator.
	5. Seat is corroded out of shape.	Check the media. Choose a valve with suitable sealing material.
	6. Seat is ageing.	Change valve
Leaking at end of stem	1. The sealing at stem hole of seat is failure.	Change seat
	2. The "O" sealing ring is damaged.	Change the "O" sealing ring
	3. The taper pin connecting disc and stem is loose	Check and repair the taper pin
	4. Seat or "O" sealing ring is ageing.	Change seat or "O" ring
Leaking between seat and connected flange	1. The connecting bolts are loose or unevenly tightened.	Tighten the connecting bolts evenly.
	2. There are sundries between surface of liner and flange.	Clean sundries
	3. End surface of seats is scratched.	Change seat.
	4. Surface of flange is damaged.	Check and repair flange
	5. Seat is corroded out of shape.	Check the media. Choose a valve with suitable sealing material.
	6. Seat is ageing.	Change seat