

Double Eccentric Cargo Oil Butterfly Valve



ACE VALVE



Double Eccentric Cargo Oil Butterfly Valve



AV ACE VALVE COMPANY LIMITED
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Specification of Double Eccentric Cargo Oil Butterfly Valve

The valve shall be capable of bi-directional flow and provide bubble tight shut-off at full rated pressure.

TYPE NUMBERING SYSTEM

- AV-OSR Double Eccentric Cargo Oil SEMI-LUG type Butterfly valves
- AV-OLR Double Eccentric Cargo Oil LUG type Butterfly valves
- AV-OFR Double Eccentric Cargo Oil FLANGE type Butterfly valves

STANDARD COMPLIANCE

The face to face dimension shall be in accordance with KSV 7490, JIS F 7480.

PRODUCTION RANGE

- SIZE : DN 50mm (2 inch) ~ DN 1000mm (40 inch)
- WORKING PRESSURE : Up to 40bar
- WORKING TEMPERATURE : -20°C ~ +250°C

APPLICABLE FLANGE

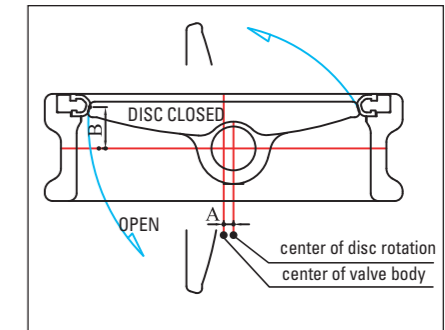
- KS/JIS 5K, 10K, 16K, 20K, 30K
- ASME B 16.5 Class 150LB, 300LB
- EN 1092 PN6, PN10, PN16, PN25
- ISO 7005 PN6, PN10, PN16, PN20, PN25



Double Eccentric Cargo Oil Butterfly valves

The Double Eccentric Design




It effects friction-free contact between body and seat since the rotation axis(stem) of the valve disc is shifted from the center by a distance of the width of A and B, a cam effect is produced which prevents from wearing the seal surface, lessens seating torque and offers longer service life and easy operation.



Application of piping system

- Cargo oil system in the tanker
- Water ballast system
- Tank cleaning system
- Cargo tank venting and Inert gas system
- Bilge and Drainage system
- Sea water system
- Fresh water system
- Fuel oil and Diesel oil system
- Other piping system where applicable

Classification by Connection type

Appearance	Type	General Characteristics
	AV-OSR (SEMI-LUG)	<ul style="list-style-type: none"> • General Applications <ul style="list-style-type: none"> - Shipbuilding industry, water works, heating and ventilation, power plants, chemical industry etc. • Similar as wafer type except a pair of the threaded bolt hole at upper and lower side in way of the stem for easy maintenance of adjacent pipe. • Easy handling and light weight. • Less quantity of bolt hole and easy installation. • Keep liquid remained during repairing adjacent pipe.
	AV-OLR (LUG)	<ul style="list-style-type: none"> • General Applications at dead end pipe. • Ring shape bolt hole for bolting with flange. • Keep pressure inside during repairing adjacent one side pipe. • Different flange shape. • Possible damage on full face gasket. • Hard repairing corroded bolt. • More man-hour for installation. • Heavy weight.
	AV-OFR (FLANGE)	<ul style="list-style-type: none"> • General Applications • Every places in the pipe line complete flange at both end. • Suitable to general pipe flange. • Suitable for shipside valve in the ship. • Keep pressure inside during repairing adjacent pipe. • Heavy weight. • Easy Repairing

Double Eccentric Cargo Oil Butterfly valves

Schema of Double Eccentric type

It is provided of heavy load designed for high pressure and high-flow rate application.

It is widely adopted for cargo oil valves of tankers, FPSO, terminal and high flow rate piping with abundant reference.

Semi-Lug, Lug and double flange type connections are available.

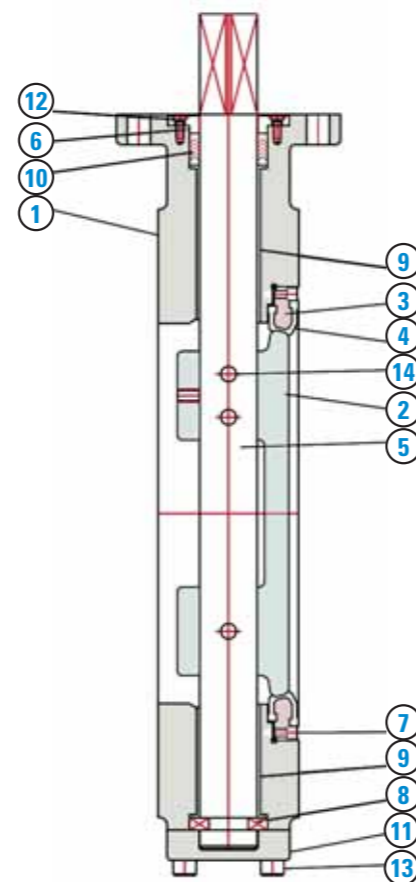
Operations

The following operation of the valve is available, the choice depending upon the valve location and the type of work and service for which the valve is used.

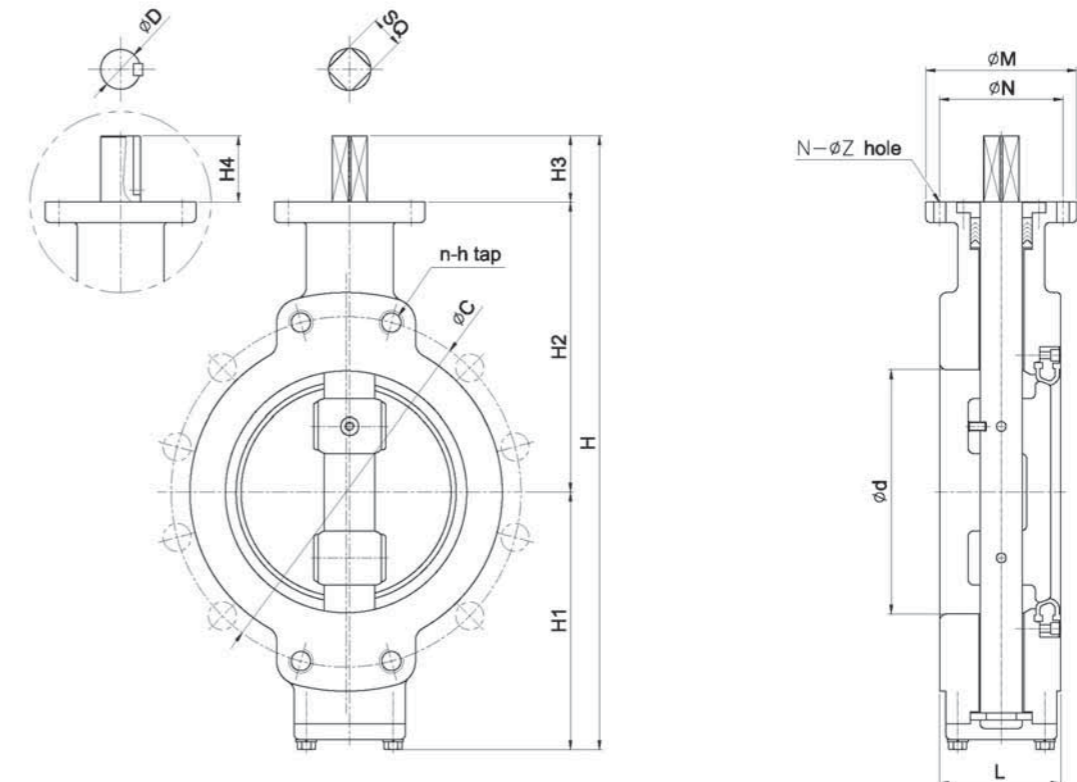
- Manual lever operation
- Manual worm gear operation
- Single or double acting pneumatic actuator operation
- Hydraulic actuator operation
- Electric motor actuator operation

Construction of Materials

NO.	PART NAME	MATERIAL
1	BODY	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
2	DISC	STAINLESS STEEL / CAST STEEL ALUMINUM BRONZE / ALLOY STEEL
3	RETAINER	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
4	SEAT	NBR / VITON
5	STEM	STAINLESS STEEL (SS304, 316, 410)
6	GLAND BUSH	STAINLESS STEEL / BRONZE
7	RETAINER BOLT	STAINLESS STEEL / GALV. STEEL
8	THRUST PLATE	STAINLESS STEEL / BRONZE
9	STEM BARING	STAINLESS STEEL + PTFE
10	PACKING	NBR / VITON
11	BOTTOM COVER	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
12	GLAND BOLT	STAINLESS STEEL / GALV. STEEL
13	BOOTOM BOLT	STAINLESS STEEL / GALV. STEEL
14	DISC PIN	STAINLESS STEEL / GALV. STEEL



Double Eccentric Cargo Oil Semi-Lug Type

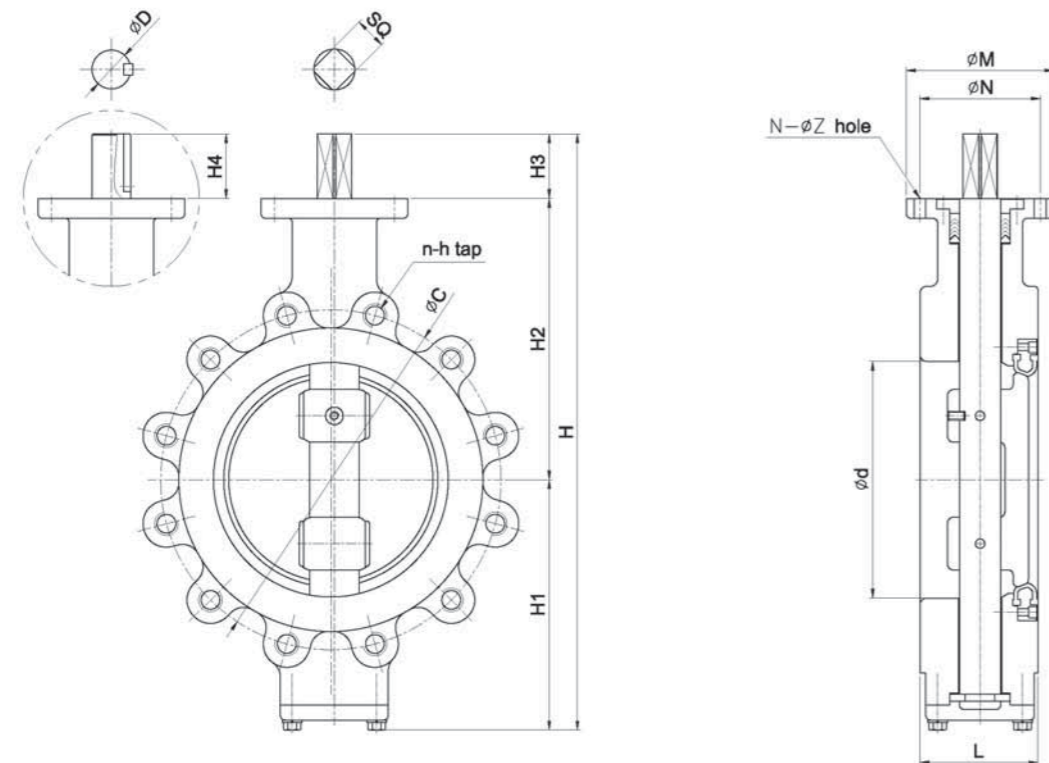


VALVE DIMENSIONS

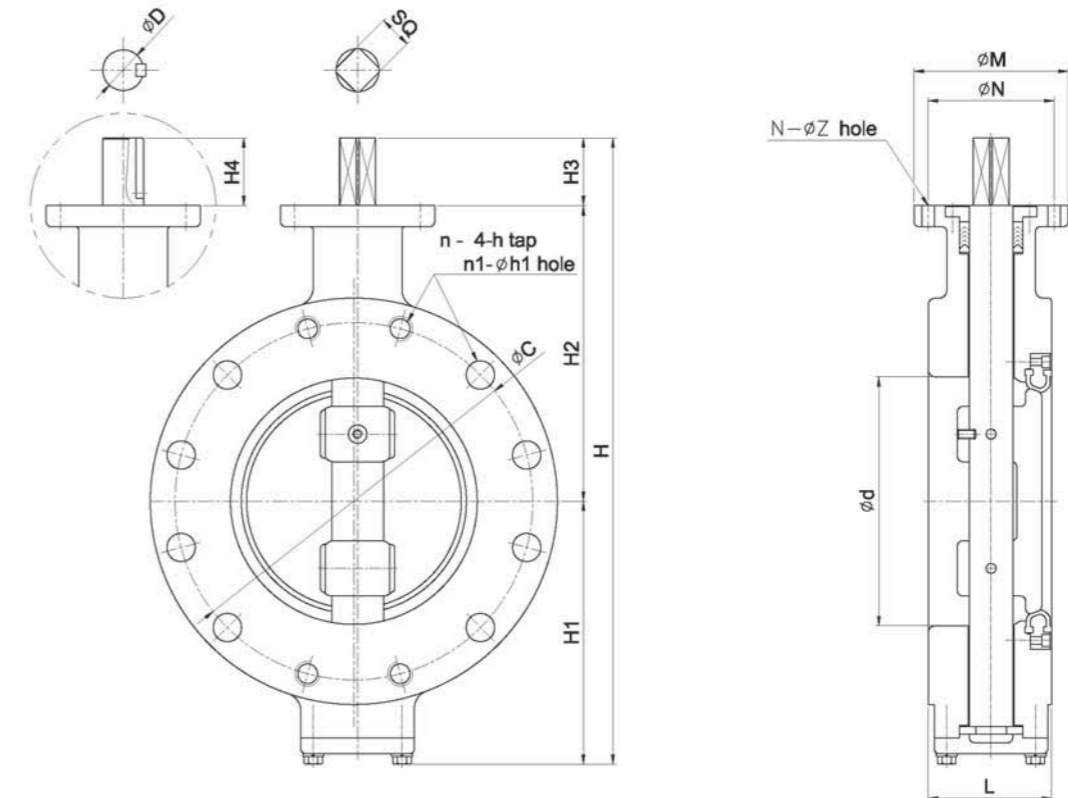
SIZE		d	L	H	H1	H2	H3	STEM			TOP FLANGE			WEIGHT (APPROX.) (kg)		
inch	mm							SQ	D	H4	KEY	TYPE	N		M	N- Z
2"	50	62	44	276	113	130	33	12	16	33	5 x 5	F07	70	90	4-9	5
2.5"	65	75	46	286	118	135	33	12	16	33	5 x 5	F07	70	90	4-9	6
3"	80	90	62	300	127	140	33	12	19	33	6 x 6	F07	70	90	4-9	8
4"	100	106	65	339	146	160	33	12	19	33	6 x 6	F07	70	90	4-9	11
5"	125	128	70	407	162	190	55	17	22	55	8 x 7	F10	102	125	4-12	18
6"	150	150	90	459	189	215	55	17	25	55	8 x 7	F10	102	125	4-12	25
8"	200	202	100	509	214	240	55	27	32	55	10 x 8	F10	102	125	4-12	36
10"	250	250	110	606	256	285	65	27	40	65	12 x 8	F14	140	175	4-18	48
12"	300	300	110	655	275	315	65	27	40	65	12 x 8	F14	140	175	4-18	68
14"	350	335	120	749	309	350	90	36	50	90	14 x 9	F16	165	210	4-22	75
16"	400	390	130	820	350	380	90	36	50	90	14 x 9	F16	165	210	4-22	110
18"	450	440	150	890	383	417	90	46	55	90	16 x 10	F16	165	210	4-22	125
20"	500	490	160	955	420	445	90	50	65	90	20 x 12	F16	165	210	4-22	185
22"	550	540	170	1021	454	477	90	50	70	90	20 x 12	F16	165	210	4-22	265
24"	600	594	200	1128	488	520	120	50	80	120	22 x 14	F25	254	300	8-18	315
26"	650	644	210	1178	513	545	120	-	80	120	22 x 14	F25	254	300	8-18	385
28"	700	700	220	1262	552	590	120	-	80	120	22 x 14	F25	254	300	8-18	480
30"	750	750	230	1333	583	620	130	-	85	130	22 x 14	F30	298	350	8-23	590
32"	800	800	240	1410	625	655	130	-	90	130	25 x 14	F30	298	350	8-23	685
34"	850	850	240	1470	655	685	130	-	95	130	25 x 14	F30	298	350	8-23	797
36"	900	900	240	1585	690	735	160	-	100	160	28 x 16	F35	356	415	8-33	905
40"	1000	1000	240	1725	760	805	160	-	110	160	32 x 18	F35	356	415	8-33	1210

unit : mm

Double Eccentric Cargo Oil Lug Type



Double Eccentric Cargo Oil Flange Type



VALVE DIMENSIONS

unit : mm

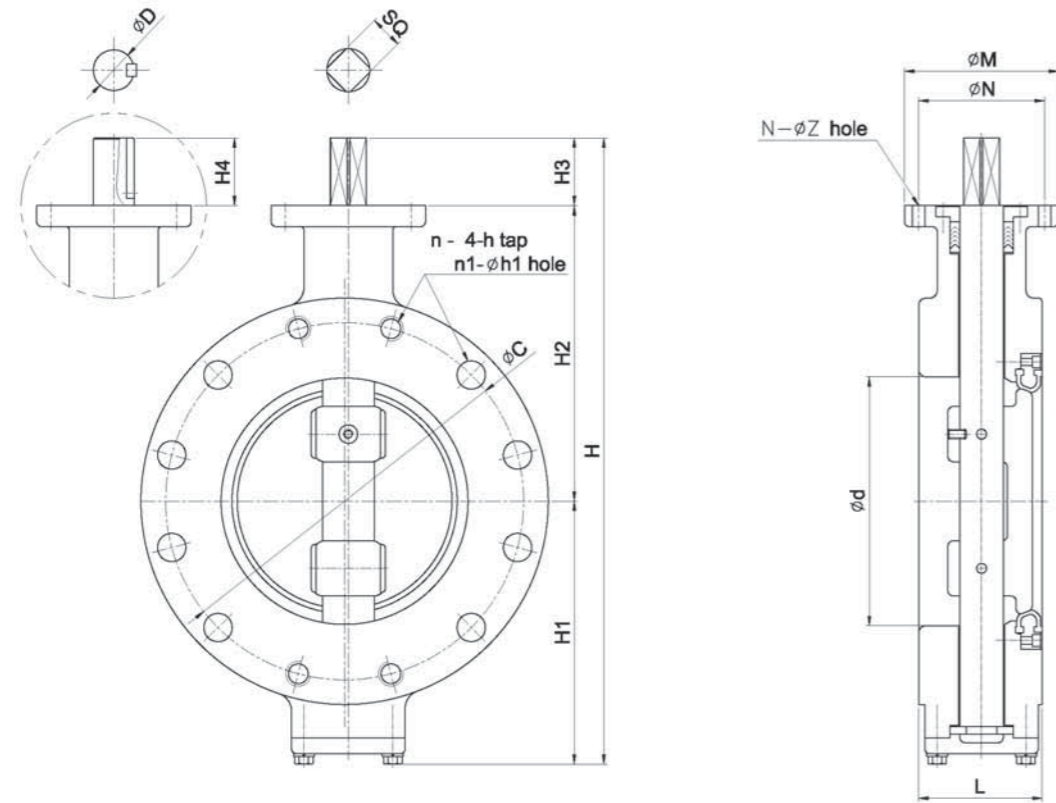
SIZE		d	L	H	H1	H2	H3	STEM				TOP FLANGE				WEIGHT (APPROX.) (kg)
inch	mm							STEM TOP FLANGE			TYPE	N	M	N- Z		
								SQ	D	H4					KEY	
2"	50	62	44	276	113	130	33	12	16	33	5 x 5	F07	70	90	4-9	7.5
2.5"	65	75	46	286	118	135	33	12	16	33	5 x 5	F07	70	90	4-9	9.5
3"	80	90	62	300	127	140	33	12	19	33	6 x 6	F07	70	90	4-9	11
4"	100	106	65	339	146	160	33	12	19	33	6 x 6	F07	70	90	4-9	15
5"	125	128	70	407	162	190	55	17	22	55	8 x 7	F10	102	125	4-12	20
6"	150	150	90	459	189	215	55	17	25	55	8 x 7	F10	102	125	4-12	29.5
8"	200	202	100	509	214	240	55	27	32	55	10 x 8	F10	102	125	4-12	42
10"	250	250	110	606	256	285	65	27	40	65	12 x 8	F14	140	175	4-18	60
12"	300	300	110	655	275	315	65	27	40	65	12 x 8	F14	140	175	4-18	75
14"	350	335	120	749	309	350	90	36	50	90	14 x 9	F16	165	210	4-22	87
16"	400	390	130	820	350	380	90	36	50	90	14 x 9	F16	165	210	4-22	125
18"	450	440	150	890	383	417	90	46	55	90	16 x 10	F16	165	210	4-22	159
20"	500	490	160	955	420	445	90	50	65	90	20 x 12	F16	165	210	4-22	200
22"	550	540	170	1021	454	477	90	50	70	90	20 x 12	F16	165	210	4-22	280
24"	600	594	200	1128	488	520	120	50	80	120	22 x 14	F25	254	300	8-18	345
26"	650	644	210	1178	513	545	120	-	80	120	22 x 14	F25	254	300	8-18	410
28"	700	700	220	1262	552	590	120	-	80	120	22 x 14	F25	254	300	8-18	520
30"	750	750	230	1333	583	620	130	-	85	130	22 x 14	F30	298	350	8-23	675
32"	800	800	240	1410	625	655	130	-	90	130	25 x 14	F30	298	350	8-23	795
34"	850	850	240	1470	655	685	130	-	995	130	25 x 14	F30	298	350	8-23	900
36"	900	900	240	1585	690	735	160	-	100	160	28 x 16	F35	356	415	8-33	1100
40"	1000	1000	240	1725	760	805	160	-	110	160	32 x 18	F35	356	415	8-33	1250

VALVE DIMENSIONS

unit : mm

SIZE		d	L	H	H1	H2	H3	STEM				TOP FLANGE				WEIGHT (APPROX.) (kg)
inch	mm							STEM TOP FLANGE			TYPE	N	M	N- Z		
								SQ	D	H4					KEY	
2"	50	62	44	276	113	130	33	12	16	33	5 x 5	F07	70	90	4-9	8
2.5"	65	75	46	286	118	135	33	12	16	33	5 x 5	F07	70	90	4-9	10
3"	80	90	62	300	127	140	33	12	19	33	6 x 6	F07	70	90	4-9	12
4"	100	106	65	339	146	160	33	12	19	33	6 x 6	F07	70	90	4-9	16
5"	125	128	70	407	162	190	55	17	22	55	8 x 7	F10	102	125	4-12	22
6"	150	150	90	459	189	215	55	17	25	55	8 x 7	F10	102	125	4-12	38
8"	200	202	100	509	214	240	55	27	32	55	10 x 8	F10	102	125	4-12	45
10"	250	250	110	606	256	285	65	27	40	65	12 x 8	F14	140	175	4-18	65
12"	300	300	110	655	275	315	65	27	40	65	12 x 8	F14	140	175	4-18	84
14"	350	335	120	749	309	350	90	36	50	90	14 x 9	F16	165	210	4-22	100
16"	400	390	130	820	350	380	90	36	50	90	14 x 9	F16	165	210	4-22	145
18"	450	440	150	890	383	417	90	46	55	90	16 x 10	F16	165	210	4-22	185
20"	500	490	160	955	420	445	90	50	65	90	20 x 12	F16	165	210	4-22	245
22"	550	540	170	1021	454	477	90	50	70	90	20 x 12	F16	165	210	4-22	295
24"	600	594	200	1128	488	520	120	50	80	120	22 x 14	F25	254	300	8-18	370
26"	650	644	210	1178	513	545	120	-	80	120	22 x 14	F25	254	300	8-18	460
28"	700	700	220	1262	552	590	120	-	80	120	22 x 14	F25	254	300	8-18	555
30"	750	750	230	1333	583	620	130	-	85	130	22 x 14	F30	298	350	8-23	705
32"	800	800	240	1410	625	655	130	-	90	130	25 x 14	F30	298	350	8-23	865
34"	850	850	240	1470	655	685	130	-	995	130	25 x 14	F30	298	350	8-23	977
36"	900	900	240	1585	690	735	160	-	100	160	28 x 16	F35	356	415	8-33	1185
40"	1000	1000	240	1725	760	805	160	-	110	160	32 x 18	F35	356	415	8-33	1340

Double Eccentric Cargo Oil Butterfly Valve



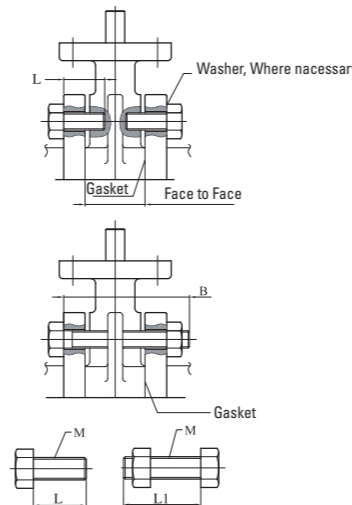
FLANGE DIMENSIONS

unit : mm

SIZE	JIS 10K			JIS 16K			JIS 20K			ASME 150LB			ASME 300LB			BS 4504 PN 10			BS 4504 PN 16			
	inch	mm	C	n	h	C	n	h	C	n	h	C	n	h	C	n	h	C	n	h	C	n
2"	50	120	4	M16	120	8	M16	120	8	M16	120.5	4	5/8	127	8	5/8	125	4	M16	125	4	M16
2.5"	65	140	4	M16	140	8	M16	140	8	M16	139.5	4	5/8	149	8	3/4	145	4	M16	145	4	M16
3"	80	150	8	M16	160	8	M20	160	8	M20	152.5	4	5/8	168	8	3/4	160	8	M16	160	8	M16
4"	100	175	8	M16	185	8	M20	185	8	M20	190.5	8	5/8	200	8	3/4	180	8	M16	180	8	M16
5"	125	210	8	M20	225	8	M22	225	8	M22	216.5	8	3/4	235	8	3/4	210	8	M16	210	8	M16
6"	150	240	8	M20	260	12	M22	260	12	M22	241.5	8	3/4	270	12	3/4	240	8	M20	240	8	M20
8"	200	290	12	M20	305	12	M22	305	12	M22	298.5	8	3/4	330	12	7/8	295	8	M20	295	12	M20
10"	250	355	12	M22	380	12	M24	380	12	M24	362	12	7/8	387.5	16	1	350	12	M20	355	12	M24
12"	300	400	16	M22	430	16	M24	430	16	M24	432	12	7/8	451	16	1 1/8	400	12	M20	410	12	M24
14"	350	445	16	M22	480	16	M30	480	16	M30	476	12	1	514.5	20	1 1/8	460	16	M20	470	16	M24
16"	400	510	16	M24	540	16	M30	540	16	M30	539.5	16	1	571.5	20	1 1/4	515	16	M24	525	16	M27
18"	450	565	20	M24	605	20	M30	605	20	M30	578	16	1 1/8	628.5	24	1 1/4	565	20	M24	585	20	M27
20"	500	620	20	M24	660	20	M30	660	20	M30	635	20	1 1/8	686	24	1 1/4	620	20	M24	650	20	M30
22"	550	680	20	M30	720	20	M36	720	20	M36	392.2	20	1 1/4	692.15	24	1 1/4	-	-	-	-	-	-
24"	600	730	24	M30	770	24	M36	770	24	M36	749.5	20	1 1/2	725	20	M27	770	20	M27	770	20	M33
26"	650	780	24	M30	820	24	M36	820	24	M36	806.5	24	1 1/4	806.45	24	1 1/2	-	-	-	-	-	-
28"	700	840	24	M30	875	24	M39	875	24	M39	863.5	28	1 1/4	863.6	28	1 1/2	840	24	M27	840	24	M33
30"	750	900	24	M30	935	24	M39	935	24	M39	914.5	28	1 1/4	914.4	28	1 1/2	-	-	-	-	-	-
32"	800	950	28	M30	990	24	M45	990	24	M45	978	28	1 1/2	977.9	28	1 1/2	950	24	M30	950	24	M36
34"	850	1000	28	M30	1040	24	M45	1040	24	M45	1029	32	1 1/2	1028.7	32	1 1/2	-	-	-	-	-	-
36"	900	1050	28	M30	1090	28	M45	1090	28	M45	1086	32	1 1/2	1085.85	32	1 1/2	1050	28	M30	1050	28	M36
40"	1000	1160	28	M36	1210	28	M52	1210	28	M52	1200	36	1 1/2	1200.15	36	1 1/2	1160	28	M33	1170	28	M39

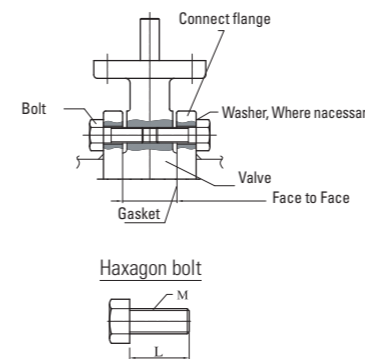
Bolting Dimensions

SEMI-LUG TYPE



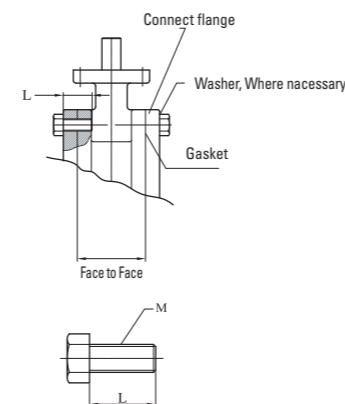
SIZE	JIS 10K			JIS 16K			JIS 20K			
	inch	mm	BOLT SIZE	PIPE FLANGE(T)	BOLT Q'TY	BOLT SIZE	PIPE FLANGE(T)	BOLT Q'TY	BOLT SIZE	PIPE FLANGE(T)
2"	50	M12	14	4	M16	16	4	M16	16	8
2.5"	65	M12	14	4	M16	18	4	M16	18	8
3"	80	M16	14	4	M16	18	8	M20	20	8
4"	100	M16	16	8	M16	18	8	M20	22	8
5"	125	M16	16	8	M20	20	8	M22	22	8
6"	150	M16	18	8	M20	22	8	M22	24	12
8"	200	M20	20	8	M20	22	12	M22	26	12
10"	250	M20	22	12	M22	24	12	M24	28	12
12"	300	M20	22	12	M22	24	16	M24	30	16
14"	350	M22	24	12	M22	26	16	M30	34	16
16"	400	M22	24	16	M24	28	16	M30	38	16
18"	450	M22	24	16	M24	30	20	M30	40	20
20"	500	M22	24	20	M24	30	20	M30	42	20
22"	550	M24	26	20	M30	32	20	M36	44	20
24"	600	M24	26	20	M30	32	24	M36	46	24
26"	650	M24	26	24	M30	34	24	M36	48	24
28"	700	M24	26	24	M30	34	24	M39	50	24
30"	750	M30	28	24	M30	36	24	M39	52	24
32"	800	M30	28	24	M30	36	28	M45	54	24
34"	850	M30	28	24	M30	36	28	M45	56	24
36"	900	M30	30	24	M30	38	28	M45	58	28
40"	1000	M30	32	28	M36	40	28	M52	62	28

LUG TYPE



SIZE	JIS 10K			JIS 16K			JIS 20K			
	inch	mm	BOLT SIZE	PIPE FLANGE(T)	BOLT Q'TY	BOLT SIZE	PIPE FLANGE(T)	BOLT Q'TY	BOLT SIZE	PIPE FLANGE(T)
2"	50	M12	14	4	M16	16	4	M16	16	8
2.5"	65	M12	14	4	M16	18	4	M16	18	8
3"	80	M16	14	4	M16	18	8	M20	20	8
4"	100	M16	16	8	M16	18	8	M20	22	8
5"	125	M16	16	8	M20	20	8	M22	22	8
6"	150	M16	18	8	M20	22	8	M22	24	12
8"	200	M20	20	8	M20	22	12	M22	26	12
10"	250	M20	22	12	M22	24	12	M24	28	12
12"	300	M20	22	12	M22	24	16	M24	30	16
14"	350	M22	24	12	M22	26	16	M30	34	16
16"	400	M22	24	16	M24	28	16	M30	38	16
18"	450	M22	24	16	M24	30	20	M30	40	20
20"	500	M22	24	20	M24	30	20	M30	42	20
22"	550	M24	26	20	M30	32	20	M36	44	20
24"	600	M24	26	20	M30	32	24	M36	46	24
26"	650	M24	26	24	M30	34	24	M36	48	24
28"	700	M24	26	24	M30	34	24	M39	50	24
30"	750	M30	28	24	M30	36	24	M39	52	24
32"	800	M30	28	24	M30	36	28	M45	54	24
34"	850	M30	28	24	M30	36	28	M45	56	24
36"	900	M30	30	24	M30	38	28	M45	58	28
40"	1000	M30	32	28	M36	40	28	M52	62	28

FLANGE TYPE



SIZE	JIS 10K			JIS 16K			JIS 20K			
	inch	mm	BOLT SIZE	PIPE FLANGE(T)	BOLT Q'TY	BOLT SIZE	PIPE FLANGE(T)	BOLT Q'TY	BOLT SIZE	PIPE FLANGE(T)
2"	50	M12	14	4	M16	16	4	M16	16	8
2.5"	65	M12	14	4	M16	18	4	M16	18	8
3"	80	M16	14	4	M16	18	8	M20	20	8
4"	100	M16	16	8	M16	18	8	M20	22	8
5"	125	M16	16	8	M20	20	8	M22	22	8
6"	150	M16	18	8	M20	22	8	M22	24	12
8"	200	M20	20	8	M20	22	12	M22	26	12
10"	250	M20	22	12	M22	24	12	M24	28	12
12"	300	M20	22	12	M22	24	16	M24	30	16
14"	350	M22	24	12	M22	26	16	M30	34	16
16"	400	M22	24	16	M24	28	16	M30	38	16
18"	450	M22	24	16	M24	30	20	M30	40	20
20"	500	M22	24	20	M24	30	20	M30	42	20
22"	550	M24	26	20	M30	32	20	M36	44	20
24"	600	M24	26	20	M30	32	24	M36	46	24
26"	650	M24	26	24	M30	34	24	M36	48	24
28"	700	M24	26	24	M30	34	24	M39	50	24
30"	750	M30	28	24	M30	36	24	M39	52	24
32"	800	M30	28	24	M30	36	28	M45	54	24
34"	850	M30	28	24	M30	36	28	M45	56	24
36"	900	M30	30	24	M30	38	28	M45	58	28
40"	1000	M30	32	28	M36	40	28	M52	62	28

Torque Required to Operate Valve

- ▶ The torques listed are applicable to water, sea water, lubricating type of hydro carbons and most media at temperature 0~80 °C (32~180°F).
- ▶ The operating speed of the actuator must be considered in order to avoid water hammer when the valve is opened / closed in conjunction with liquid.

Actuator torques can be calculated using the following formulas.

$$T_a = T_b + T_s + T_h = 1.2T_b \pm T_d$$

$$T_s = C_s D^2$$

$$T_b = 4.17 D^2 d f P$$

$$T_d = C_t D^3 P$$

$$T_h = 3.06 D^4$$

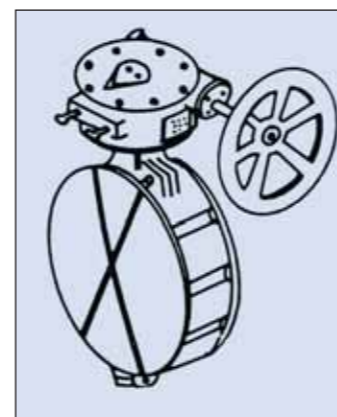
$$V = C_f P = Q / 0.785 D^2$$

- T_a : The required actuator torque (lb-ft)
- T_s : Seating or unseating torque (lb-ft)
- T_d : Dynamic torque (lb-ft)
- Q : Flow (cubic per second)
- V : Velocity (feet per second)
- D : Diameter of valve (feet)
- d : Diameter of shaft (inch)
- P : Pressure drop across valve (psi)
- C_s : Coefficient of seating or unseating torque
- C_t : Coefficient of dynamic torque
- C_f : Coefficient of flow
- f : Bearing friction coefficient

TORQUE TABLE

SIZE		WORKING PRESSURE (bar)								
		5bar			10bar			16bar		
inch	mm	kgf-m	N.m	ft-lb	kg-m	Nm	ft-lb	kg-m	Nm	ft-lb
2"	50	1.03	10.09	7.44	1.19	11.68	8.61	1.85	18.15	13.39
2.5"	65	1.52	14.86	10.96	1.95	19.11	14.09	2.38	23.36	17.23
3"	80	2.22	21.76	16.05	2.95	28.88	21.30	4.16	40.77	30.07
4"	100	4.01	39.28	28.97	5.03	49.26	36.33	6.59	64.55	47.61
5"	125	7.04	69.01	50.90	7.58	74.32	54.81	10.83	106.17	78.30
6"	150	11.92	116.78	86.13	16.03	157.13	115.89	21.67	212.33	156.61
8"	200	26.54	260.11	191.85	31.25	306.25	225.88	41.65	408.21	301.08
10"	250	34.67	339.73	250.57	45.93	450.15	332.01	56.33	552.07	407.18
12"	300	47.13	461.83	340.62	62.40	611.52	451.03	94.47	925.77	682.82
14"	350	67.17	658.23	485.49	89.27	874.81	645.23	132.60	1299.48	958.45
16"	400	89.92	881.18	649.93	119.60	1172.08	864.48	178.53	1749.63	1290.46
18"	450	107.25	1051.05	775.21	155.13	1520.31	1121.32	237.47	2327.17	1716.43
20"	500	139.75	1369.55	1010.13	216.67	2123.33	1566.09	309.40	3032.12	2236.38
22"	550	200.42	1964.08	1448.63	273.00	2675.40	1973.27	411.67	4034.33	2975.57
24"	600	316.33	3100.07	2286.49	338.87	3320.89	2449.37	472.80	4633.44	3417.45
26"	650	322.83	3163.77	2333.47	413.40	4051.32	2988.10	626.60	6140.68	4529.13
28"	700	362.92	3556.58	2623.20	499.20	4892.16	3608.27	698.40	6844.32	5048.11
30"	750	463.67	4543.93	3351.43	593.67	5817.93	4291.09	848.47	8314.97	6132.81
32"	800	520.00	5096.00	3758.62	698.53	6845.63	5049.07	1063.40	10421.32	7686.37
34"	850	606.67	5945.33	4385.05	828.53	8119.63	5988.73	1105.22	10831.12	7988.63
36"	900	812.50	7962.50	5872.84	984.53	9648.43	7116.31	1603.33	15712.67	11589.07
40"	1000	1031.33	10107.07	7454.59	1144.00	11211.20	8268.96	1902.33	18642.87	13750.27

Method for Carrying & Keeping



- Be careful not to get a scratch on Disc edge and Seat ring. The openings must be protected by plywood or other protector when carrying valve.
- Valve must not be shocked and shaken too much. It may cause the crack of neck, lever, handle and body
- Valve must be protected from sunlight.
- Valve to be kept and transported under partially opened.
- The suitable temperature from -10 °C to 70 °C and humidity between 10% ~ 60% to be maintained.
- During valve storage, check the smooth operation once per month.

Installation Instructions

General

- Valves can be installed in the pipe line in any position.
- Before installing valves, the pipe line must be cleaned from dirt and welding residues. otherwise, seat may be damaged.
- Also the pipeline must be free from tension and electric current.
- When handling valves, be careful to avoid contact with or impact by other equipment.
- Check carefully whether valve seat / disc surface, as well as mating face, are all clean.
- Tighten again, if any, all bolts loosened during transport and / or handling.
- Open and close valves to check proper operation.
- Do not put a weight on the lever or gear handle during valve operation.
- If possible, install valves in the direction of arrow mark on it for easier access and maintenance.
- Do not use valve as a substitute for jack when putting pipes in alignment.
- The span of pipeline having connection between valve and pipe should be free from such excessive loading as may cause serious bending.
- Do not weld the piping around the valve area under the condition that the valve is installed.

Installation on new pipeline

- Shut partially valve disc until disc profile is at least 10mm within the body.
- Align the two flanges with the valve body.
- Flange gaskets should be positioned, aligned with bore.
- Span the body with some flange-bolts and tighten the bolts partially. Finish tightening by uniform cross bolting.
- Use the flange-valve-flange unit for pipe centering.
- Tack-weld the flanges to the pipe.
- Remove the bolts and the valve from the flanges. Just perform tack-welding only when the valve is inserted, as high heat temperature can damage valve seat.
- Weld flanges to the pipe and wait until completely cooled down.
- Install the valve in accordance with the instruction.

Replacement of Packing

- Before replacing gland packing or a seat ring, close upstream valve and detach the valve from the piping.