WALLOW™
THE PRECISE CONTROL

CNP engineers pvt ltd

Resilient Seated Butterfly Valves

Wafer Style - Series F200 – Exotic / Non Exotic Material
Lug Style - Series F220 – Exotic / Non Exotic Material
Designed in accordance with:- BS 593
Other Design Standards :- IS:13095, API 609 CAT "A"
Size Range:- 2" ~ 24" (DN50 to DN600)

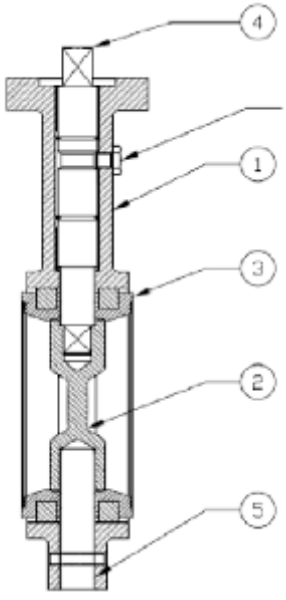
Design Features:-

- Bubble-tight shut-off at full rating in both directions.
- Aerodynamic profiled disc to enhance the flow capacity
- The unique replaceable seat with Aluminium backup ring (DN50 to DN300) & without Aluminium backup ring (DN350 to DN600) designated to resist chemical / corrosive attack during service provides a long service life.
- Pipe insulation made easy to access actuator fitment with extended neck of the body
- Only two parts in contact with the fluid
- Face to face dimensions according to (ISO 3202 Part3, K1) ISO 5752 series20 and DIN EN 558-1, series20.
- Wafer valve has four locating holes to keep valve aligned to the pipe to avoid flange joint leakage
- Valve Operators
  - Handle (F300) on DN50 - DN200 valves.
  - Gear operators (F320) on DN250 - DN600 valves.
  - Pneumatic or Electric Actuator (F340)
- The (F220) lugged valve is suitable for End of Line service
- Valve Automation / Control Valve:
  - Easily converted at site by fitting pneumatic or electric actuators on ISO top flange with / without any mounting brackets.

Technical Notes

Size range	: Figure (200) (Wafer style) DN50 – DN600 : Figure (220) (Lugged style) DN50 - DN600	
Pressure	: 6/10/16 bar (max) Shut Off –Both Directions, End of line service	
Temperature (°C)	: EPDM seat	-34°C to140°C
	NBR seat	-20°C to 80°C
	Viton	-20°C to 150°C
	HNBR	-20°C to 120°C
End Connections	: As per EN1092-1, EN1759-1, PN6-10-16 and ASME B 16.5 Class 150	

Design Specification:-



Square drive shaft connection in disc and at a square / keyway operator ensures bubble tight shutoff

Shaft protected by anti - blow out screw

Body casting made out from lost wax (investment casting / Shell molding / sand casting guarantees smooth surface which allows easy draining f chemical spillage

The unique replaceable seat with Aluminium backup ring (DN50 to DN 300) & without Aluminium backup ring (DN350 to DN600) designated to resist chemical / corrosive attacks during service provides a long service life.

Aerodynamic profiled disc will reduce pressure drop to enhance flow capacity

A fixed lower shaft takes all side thrusts and acts like a trunnion to keep disc in position at all positions.

Material Type:-

No	Description	Material type	Material Grade	Grade	DIN NO	UNS NO
1	Body	Austenitic SS	ASTM A351 Gr CF8	304	1.4308	J92600
			ASTM A351 Gr CF8M	316	1.4408	J92900
			ASTM A351 Gr CF3	304L	1.4309	J92700
			ASTM A351 Gr CF3M	316L	1.4409	J92800
			ASTM A744 CN7M	ALLOY 20	1.4500	N08007
			ASTM A351 Gr CF8C	347	1.4552	J92710
		Duplex SS	ASTM A890 CD4MCu	1A	1.4470	J93370
			ASTM A890 CD4MCuN	1B	1.4517	J93372
			ASTM A890 CE3MN	5A	1.4410	J93404
		Bronze Alloy	ASTM B148 C95800	Ni Al Bronze	2.4856	C95800
			ASTM B61	Bronze		C92200
			ASTM B62	Bronze		C83600
		Nickel Copper	ASTM A494 Gr M31-1	MONEL K400	2.4360	N04400
		Nickel alloy	ASTM A 494 Gr N7M	HASTEALLOY B	2.4800	N30007
				HASTEALLOY C	2.4819	N10276
		Titanium	ASTM B367 Gr C2	Titanium	3.7035	R50400
		Cast iron	IS:210 - FG 260	GG25 EN - GJL - 250	0.6025	–
		Ductile Iron / SG Iron	IS:1865 - SG400/15	GGG50 EN - GJL - 450 - 10	0.7050	–
2	Disc	Austenitic SS	ASTM A351 Gr CF8	304	1.4308	J92600
			ASTM A351 Gr CF8M	316	1.4408	J92900
			ASTM A351 Gr CF3	304L	1.4309	J92700
			ASTM A351 Gr CF3M	316L	1.4409	J92800
			ASTM A744 CN7M	ALLOY 20	1.4500	N08007
			ASTM A351 Gr CF8C	347	1.4552	J92710
		Duplex SS	ASTM A890 CD4MCu	1A	1.4470	J93370
			ASTM A890 CD4MCuN	1B	1.4517	J93372
			ASTM A890 CE3MN	5A	1.4410	J93404
		Bronze Alloy	ASTM B148 C95800	Ni Al Bronze	2.4856	C95800
			ASTM B61	Bronze		C92200
			ASTM B62	Bronze		C83600
		Nickel Copper	ASTM A494 Gr M31-1	MONEL K400	2.4360	N04400
		Nickel alloy	ASTM A 494 Gr N7M	HASTEALLOY B	2.4800	N30007
				HASTEALLOY C	2.4819	N10276
		Titanium	ASTM B367 Gr C2	Titanium	3.7035	R50400
		Ductile Iron / SG Iron	IS:1865 - SG400/15	GGG50 EN - GJL - 450 - 10	0.7050	–
3	Seat	EPDM	–	–	–	–
		NBR	–	–	–	–
		VITON	–	–	–	–
		HNBR	–	–	–	–
4	Top Shaft	SS316 / SS316L	ASTM A 276 TYPE 316 / 316L	–	1.4401/1.4404	–
		SS304	ASTM A 276 TYPE 304	–	1.4301	–
		SS410	ASTM A 276 TYPE 410	–	1.4006	–
5	Bottom Shaft	SS316 / SS316L	ASTM A 276 TYPE 316 / 316L	–	1.4401/1.4404	–
		SS304	ASTM A 276 TYPE 304	–	1.4301	
		SS410	ASTM A 276 TYPE 410	–	1.4006	
6	DU Bush	Dry Unlubricated Bush	–	–	–	–

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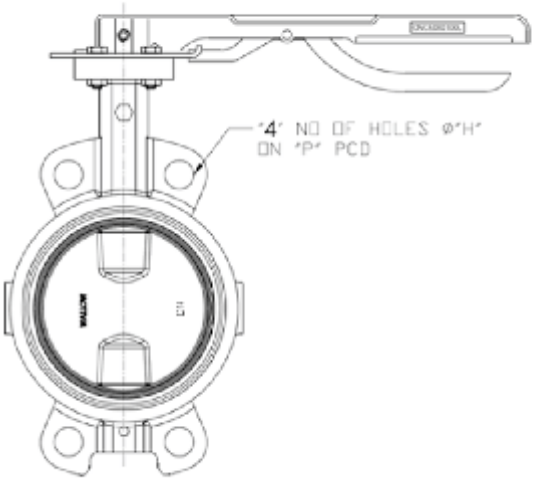
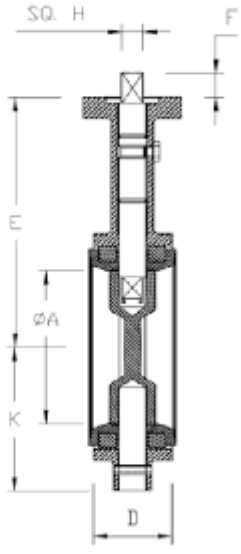
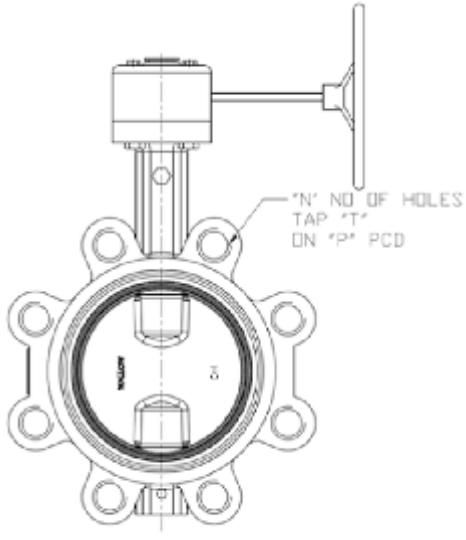
Wafer (F200) & Lugged (F220) design sizes 2” TO 12” (DN50 TO DN300)

Wafer (F200)





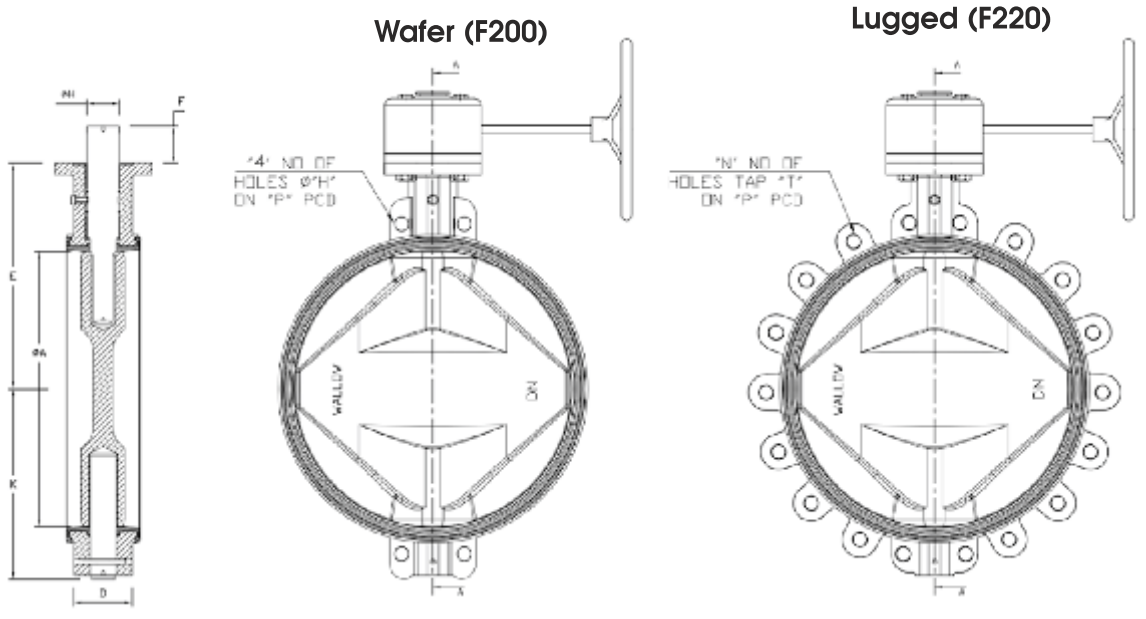
Lugged (F220)



Diamensions:-

Size		ØA	D	E	SHAFT CONNECTIONS		ISO Type	K	WEIGHT (Kgs)		Flange Drilling Standard	PCD (P)	Hole size (H)	Tap size (T)	No of holes (N)
Inch	DN				F	H (Square) -0.05			F200	F220					
2"	50	57	43	130	15	14	F05	78	2.9	3.5	BS EN1092-1 - PN6	110	14	M12	4
											BS EN1092-1 - PN16 / PN10	125	18	M16	4
											ASME B16.5 - Class 150	120.7	3/4"	5/8" UNC	4
2.5"	65	71	46	146	15	14	F05	83	3.2	4	BS EN1092-1 - PN6	130	14	M12	4
											BS EN1092-1 - PN16 / PN10	145	18	M16	4
											ASME B16.5 - Class 150	139.7	3/4"	5/8" UNC	4
3"	80	83.5	46	150	15	14	F05	91	3.7	4.6	BS EN1092-1 - PN6	150	18	M16	4
											BS EN1092-1 - PN16 / PN10	160	18	M16	8
											ASME B16.5 - Class 150	152.4	3/4"	5/8" UNC	4
4"	100	106	52	165	15	14	F05	105	4.4	8.09	BS EN1092-1 - PN6	170	18	M16	4
											BS EN1092-1 - PN16 / PN10	180	18	M16	8
											ASME B16.5 - Class 150	190.5	3/4"	5/8" UNC	8
5"	125	129	56	178	20	17	F07	127	7.4	10.9	BS EN1092-1 - PN6	200	18	M16	8
											BS EN1092-1 - PN16 / PN10	210	18	M16	8
											ASME B16.5 - Class 150	215.9	7/8"	3/4" UNC	8
6"	150	154	56	193	20	17	F07	140	8.4	12.4	BS EN1092-1 - PN6	225	18	M16	8
											BS EN1092-1 - PN16 / PN10	240	22	M20	8
											ASME B16.5 - Class 150	241.3	7/8"	3/4" UNC	8
8"	200	198	60	228	20	17	F07	154	19	22	BS EN1092-1 - PN6	280	18	M16	8
											BS EN1092-1 - PN10	295	22	M20	8
											BS EN1092-1 - PN16	295	22	M20	12
											ASME B16.5 - Class 150	298.5	7/8"	3/4" UNC	8
10"	250	247	68	268	24	22	F10	190	24	35.5	BS EN1092-1 - PN6	335	18	M16	12
											BS EN1092-1 - PN10	350	22	M20	12
											BS EN1092-1 - PN16	355	26	M24	12
											ASME B16.5 - Class 150	362	1"	7/8" UNC	12
12"	300	285	78	298	24	22	F10	240	39.5	49	BS EN1092-1 - PN6	395	22	M20	12
											BS EN1092-1 - PN10	400	22	M20	12
											BS EN1092-1 - PN16	410	26	M24	12
											ASME B16.5 - Class 150	431.8	1"	7/8" UNC	12

Wafer (F200) & Lugged (F220) design sizes 14" TO 24" (DN350 TO DN600)



Diamensions:-

Size		ØA	D	E	SHAFT CONNECTIONS			ISO Type	K	WEIGHT (Kgs)		Flange Drilling Standard	PCD (P)	Hole size (H)	Tap size (T)	No of holes (N)
Inch	DN				F	øH	KEY			F200	F220					
14"	350	326	78	318	65	45	14 X 9	F14	257	43	55	BS EN1092-1 - PN6	445	22	M20	12
												BS EN1092-1 - PN10	460	22	M20	16
												BS EN1092-1 - PN16	470	26	M24	16
												ASME B16.5 - Class 150	476.2	1 1/8"	1"	12
16"	400	368	102	350	65	45	14 X 9	F14	292	56	77	BS EN1092-1 - PN6	495	22	M20	12
												BS EN1092-1 - PN10	515	26	M24	16
												BS EN1092-1 - PN16	525	30	M27	16
												ASME B16.5 - Class 150	539.8	1 1/8"	1"	16
18"	450	416	114	373	65	45	14 X 9	F14	315	73	91	BS EN1092-1 - PN6	550	22	M20	16
												BS EN1092-1 - PN10	565	26	M24	20
												BS EN1092-1 - PN16	585	30	M27	20
												ASME B16.5 - Class 150	577.8	1 1/4"	1 1/8"	16
20"	500	495	127	410	65	45	14 X 9	F14	351	96	137	BS EN1092-1 - PN6	600	22	M20	20
												BS EN1092-1 - PN10	620	26	M24	20
												BS EN1092-1 - PN16	650	33	M30	20
												ASME B16.5 - Class 150	635	1 1/4"	1 1/8"	20
24"	600	605	154	490	80	70	20 X 12	F16	413	166	219	BS EN1092-1 - PN6	705	26	M24	20
												BS EN1092-1 - PN10	725	30	M27	20
												BS EN1092-1 - PN16	770	36	M33	20
												ASME B16.5 - Class 150	749.3	1 3/8"	1 1/4"	20

NOTES

Dimensions are nominal ± 2mm.

1. Valves DN50 to DN200 are supplied standard with handles (F300).
   Valves DN250 to DN600 are supplied standard with gear operators (F320).
   Valves can be supplied with Pneumatic or Electric Actuators (F340) or Electric Actuator (F360) as per requirement.
2. * The Weight shown includes the standard operator up to DN200 & Bare shaft for DN300 and above sizes.
3. These dimensions are for reference only; actual dimensions may vary.
4. The details of Figure 200/220 and the datasheet is at the sole discretion of CNPEPL under the registered trademark of WALLOW.
   This can be changed / altered at the sole discretion of CNPEPL.

Butterfly Valve Torque Data

Resilient Seated Concentric Butterfly Valve TORQUE (N.m)														
SIZE (INCHES)	2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
SIZE (DN)	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600
PN10	13	20	26	40	61	88	150	220	340	440	570	975	1130	1745
PN16	13	21	28	44	68	99	160	245	390	675	915	1180	1495	3015

1. Given Torques are for wet valve condition for water as flowing media.
2. Please contact CNPEPL if you need valve for specifically different material.
3. Torque given is required for valve operation only. Please consider efficiency of gearbox / Actuator while selection of gearbox / Actuator, as per manufacturer's recommendation. Or use CNPEPL recommended gearbox / Actuator only

Butterfly Valve Cv Flow Coefficient Data:-

Service	Pressure rating	
Bidirectional	200 PSI	16 BAR
Dead End	150 PSI	10 BAR

Butterfly Valve is mated between two flanges for bidirectional service and the disc is in the closed position.
Butterfly Valve is installed for dead-end service without a downstream flange. Disc is in the closed position. Please note, standard valves are not designed for dead-end service. Dead-end service must be specified by the customer.

Flow Rate Limits (On/Off Service)		
Fluids	20 ft/sec	6 m/sec
Gases	175 ft/sec	54 m/sec

This table lists velocity limits for on/off services only. Additionally, for throttling service, the flow velocity should not exceed 20 ft/sec for liquids and 175 ft/sec for gases.

Seat Material Temperature Ratings		
Buna - N	+10 ~ 180 °F	-12 ~ 82 °C
EPDM	-30 ~ 225 °F	-34 ~107 °C

This table lists the theoretical temperature limits for elastomers. During actual service, hardening of the elastomer may cause the torque to exceed the structural limits of the valve.

Butterfly Valve Cv Flow Coefficient Value (GPM@IΔP)									
Valve Size		Angle of Valve Disc Rotation							
Inches	DN	10°	20°	30°	40°	50°	60°	70°	80°	90°
2"	50	0.06	3.2	8	14	28	44	69	100	112
2.5"	65	0.09	6.1	11	24	46	77	117	175	190
3"	80	0.21	9.2	17	38	71	115	185	273	300
4"	100	0.31	16	35	77	138	232	364	543	599
5"	125	0.51	28	61	134	235	395	618	925	1030
6"	150	0.78	46	95	206	365	610	957	1435	1575
8"	200	2.2	90	200	407	725	1200	1900	2853	3130
10"	250	3	155	310	693	1235	2044	3200	4860	5330
12"	300	4	240	500	1080	1900	3166	5010	7500	8260
14"	350	6	340	720	1545	2760	4570	7232	11011	11940
16"	400	8.2	465	985	2125	3795	6300	9940	14825	16401
18"	450	11.3	620	1305	2825	5025	8325	13200	19802	21704
20"	500	14.5	792	1650	3630	6470	10695	16800	25405	27912
24"	600	22.7	1223	2590	5610	10020	16530	26150	39240	43118

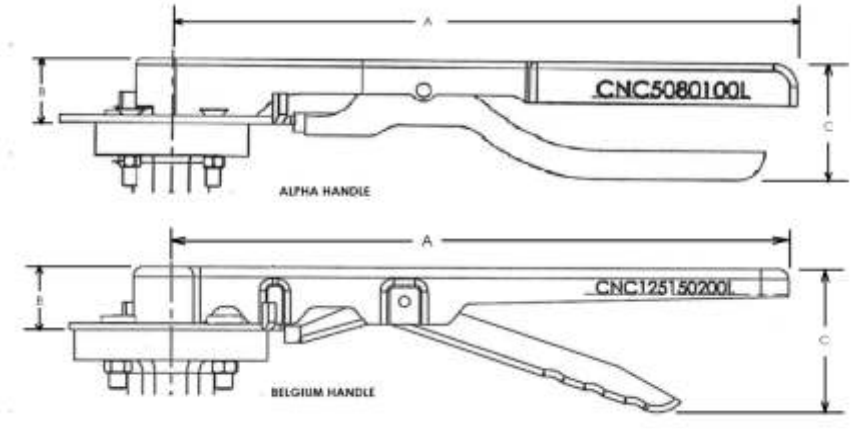
This chart can be used as a guide only due to the numerous variations of flow conditions that may occur during actual service.

$$Cv = Q * \sqrt{\frac{G}{\Delta P}}$$

Cv = Flow Coefficient
Q = Specific gravity of liquid at 60°F
G = Flow rate in U.S. gallons per minute (GPM)
ΔP = Pressure drop in pounds per square inch (PSI)

The Flow Coefficient (designated as Cv) is a physical measurement that specifies the number of gallons per minute (GPM) that can pass through a piping component, at room temperature, and create a one (1) psi differential (ΔP) across the piping component.

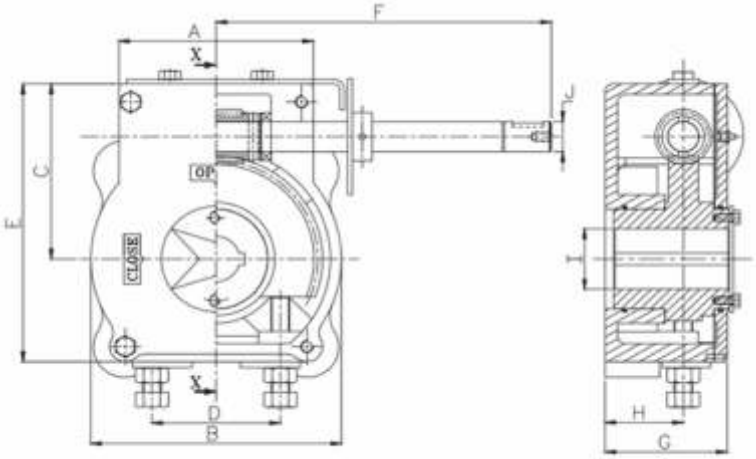
Accessories :-



HANDLEVER	A (mm)	B (mm)	C (mm)	SQ (mm) FOR ASSEMBLY WITH SHAFT	WEIGHT (Kg)
ALPHA	265	26	52	1	0.435
BELGIUM	262	27	52	17	0.458

NOTES:-
1. Dimensions and weights are for reference only. Request certified drawings if required specifically.
2. Handles and Lock / Notch Plate have slots in them which can be used to lock the valve in open or close position.

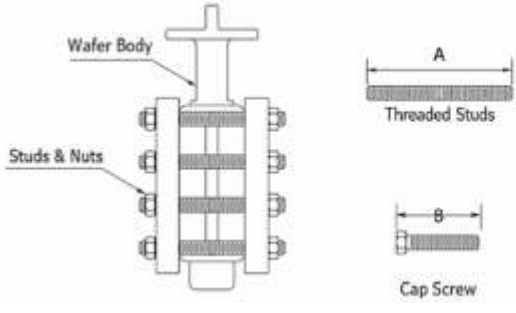
Gearbox Data:



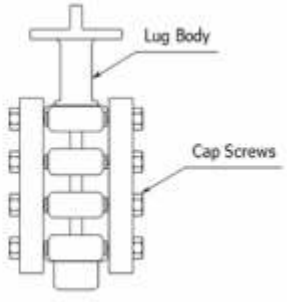
FRONT VIEW SECTION VIEW X-X

SIZE (INCHES)	SIZE (DN)	A	B	C	D	E	F	G	H	I	J
2"	DN50	72	72	54	42	81	111	55	34	20	12
2.5"	DN65	72	72	54	42	81	111	55	34	20	12
3"	DN80	72	72	54	42	81	111	55	34	20	12
4"	DN100	72	72	54	42	81	111	55	34	20	12
5"	DN125	72	72	54	42	81	111	55	34	20	12
6"	DN150	72	72	54	42	81	111	55	34	20	12
8"	DN200	90	90	66	58	111	161.5	53.5	27.5	22	12
10"	DN250	110	110	81	64	121	153	60	33	35	15
12"	DN300	110	110	81	64	121	153	60	33	35	15

Flange Bolting Data



F200 - WATER BODY



F220 - LUGGED BODY

WAFER STYLE FLANGED BOLT DATA - WITH THREADED STUDS			
VALVE SIZE	QUANTITY PER VALUE	BOLT SIZE	STUD BOLT LENGTH "A"
2	4	5/8" - 11	4.75
2.5	4	5/8" - 11	5.25
3	4	5/8" - 11	5.25
4	4	5/8" - 11	5.5
5	4	3/4" - 10	6
6	4	3/4" - 10	6
8	4	3/4" - 10	6.5
10	4	7/8" - 9	7
12	4	7/8" - 9	7.75

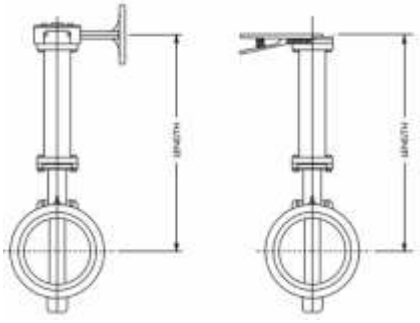
1. Flange bolting information is in accordance with ASME 16.5 Class 150 specifications

WAFER STYLE FLANGED BOLT DATA - WITH THREADED STUDS			
VALVE SIZE	QUANTITY PER VALUE	BOLT SIZE	CAP SCREW LENGTH "B"
2	8	5/8" - 11	4.75
2.5	8	5/8" - 11	5.25
3	8	5/8" - 11	5.25
4	16	5/8" - 11	5.5
5	16	3/4" - 10	6
6	16	3/4" - 10	6
8	16	3/4" - 10	6.5
10	24	7/8" - 9	7
12	24	7/8" - 9	7.75

1. Flange bolting information is in accordance with ASME 16.5 Class 150 specifications

Other Accessories:-

Shaft Extension & Chain Wheel



Shaft Extensions

Shaft extensions are utilized to elevate the operating location of the butterfly valve. The top mounting pad of the shaft extension provides the same dimensions as the valve's mounting pad. This ensures a universal mounting flange that can accommodate all types of operators (10-position handle kits, gear operators, electric actuators, or pneumatic actuators).
Shaft Extensions can be fabricated from carbon or stainless steel and range in length from 3" (75mm) to 16' (5m approx.). Beyond the upper limit, the structural integrity of the valve shaft becomes a factor and requires special design consideration.
Please contact the CNPEPL direct for design assistance

Chain Wheels

The primary purpose of a chain wheel actuator is to provide ground level control of hard-to-reach valves. This capability saves time and helps minimize the risk of personal injury during valve installation. Chain wheels are available in a variety of materials and configurations. Please contact the CNPEPL so we can recommend the appropriate chain wheel configuration for your specific application.
The picture to the left shows how an adjustable sprocket rim can be fastened to the round hand wheel of a gear operator.

How to order WALLOW Butterfly Valve:-

ILLUSTRATION

Final Code :-	C150C16A7A1FELA								
Essentricity	**Size**	**Body type**	**Pressure rating**	**Body**	**Disc**	**Shaft**	**Seat**	**Operation**	**Body drilling to suit between Flanges**
C	**150**	**C**	**1**	**6A**	**7A**	**1F**	**E**	**L**	**A**
Concentric	**150**	**WAFER**	**PN10**	**Cast Iron - FG260**	**SG Iron - SG400/15**	**SS 410**	**EPDM**	**LEVER**	**CL150**

Size (DN)	Size (INCHES)	Code	BODY TYPE	CODE	PRESS RATE	CODE	Material	PART	Code
50	2"	O50	WAFER	C	PN6	3	ASTM A351 Gr CF8M (i.e. SS316)	CASTING	1A
65	2.5"	O65	LUG	L	PN10	1	ASTM A216 Gr WCB	CASTING	1B
80	3"	O80			PN16	6	ASTM A351 Gr CF8 (i.e SS304)	CASTING	1C
100	4"	100			CL150	5	NAB - Nickel Al Bronze	CASTING	2A
125	5"	125					Alu-Bronze	CASTING	2B
150	6"	150					Al - LM16	CASTING	5A
200	8"	200					Cast Iron - FG260	CASTING	6A
250	10"	250					SG Iron - SG400/15	CASTING	7A
300	12"	300					ASTM A351 Gr CF3M (i.e. SS316L)	CASTING	1G
350	14"	350					DUPLEX 4A	CASTING	1K
400	16"	400					BRONZE B62	CASTING	2C
450	18"	450					ASTM B148 C95800	CASTING	2E
500	20"	500					AB2 - Aluminium Bronze	CASTING	2F
600	24"	600					UNS C95500 - Aluminium bronze	CASTING	2G

Material		PART	Code	Material	PART	Code	OPERATION CODE		Flange Drilling	CODE
ASTM A 276 TYPE SS 316		SHAFT	1D	EPDM	RUBBER	E	BARE SHAFT	B	CL150	A
ASTM A 276 TYPE SS 304		SHAFT	1E	NBR	RUBBER	N	LEVER	L	PN16	B
ASTM A 276 TYPE SS 410		SHAFT	1F	VITON	RUBBER	V	GEARBOX	G	PN10	C
NAB - NES 747 - PART2		SHAFT	2D	PTFE	RUBBER	P	ACTUATOR	A	PN6	D
ASTM A 276 TYPE SS 316L		SHAFT	1H	HYP	RUBBER	R	LEVER WITH LOCK	M		
Monel K400		SHAFT	3B							
Monel K500		SHAFT	3C							