

TIANJIN ZHONGFA VALVE

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BUTTERFLY VALVE

Wafer type Technical Manual

www.zfa valves.com



Introduction



Concentric butterfly valve, also known as zero eccentric butterfly valve, because its shaft, valve seat, valve plate are symmetrical, all in the center of the butterfly valve. In addition, it is also called soft seat butterfly valve, the valve seat is made of elastic materials such as EPDM or NBR.



Soft seat wafer butterfly valves are compact and light-weight, making them easy to install and suitable for tight spaces. The design allows for fluid flow in both directions, enhancing its versatility in various applications.

Soft seat wafer butterfly valve is also called dovetail butterfly valve. In a dovetail butterfly valve, the valve seat (usually made of elastomer or polymer) has a groove or "dovetail" profile that fits snugly into a matching shape in the valve body. This design holds the seat firmly in place, preventing it from moving or shifting when the valve is opened and closed.

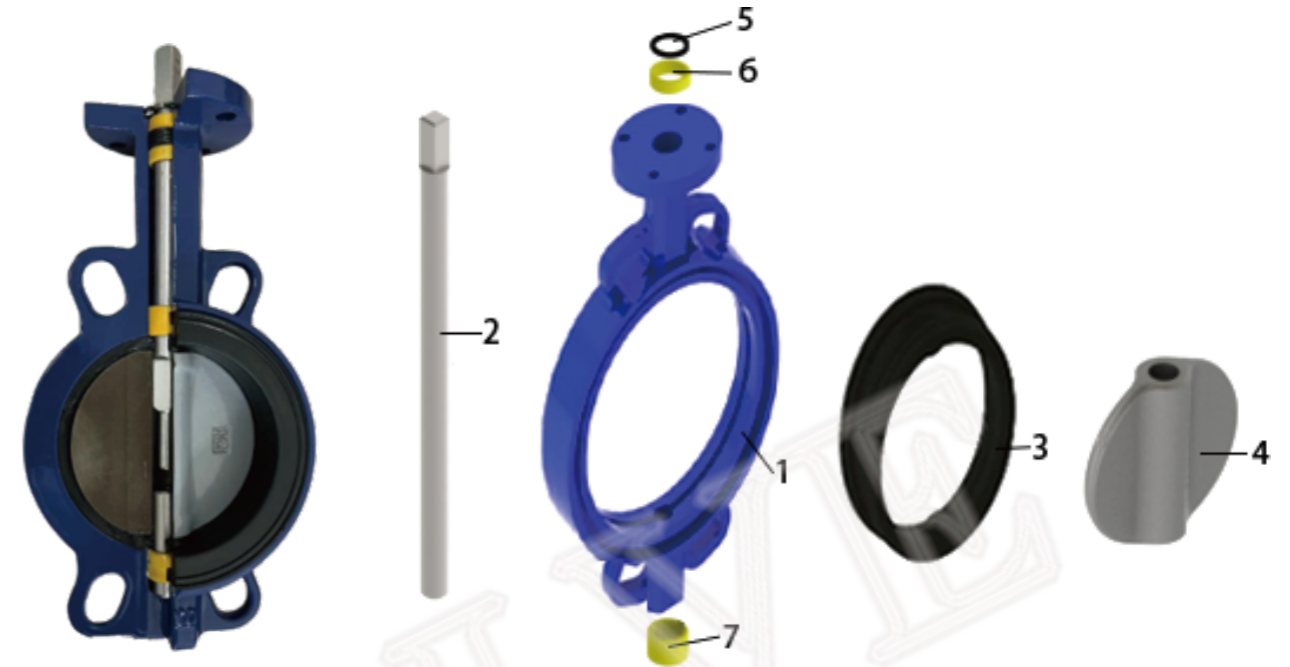
This replaceable seat wafer butterfly valve is a versatile and practical type of butterfly valve, it features a design that allows easy replacement of the sealing seat without replacing the entire valve body. It designed for applications where the seat may need to be replaced due to wear, chemical compatibility changes, or specific maintenance requirements.

Applications of Dovetail Butterfly Valves

Dovetail butterfly valves are commonly used in applications where a strong, reliable seal is necessary, and where high cycling or minor vibration may be present. Typical industries include:

- ★Water and Wastewater Treatment: Effective for isolating and regulating flow with minimal leakage.
- ★Food and Beverage Processing: The secure seat retention helps maintain hygiene standards by preventing seat movement that could trap contaminants.
- ★HVAC Systems: Used for airflow and water circulation in commercial and industrial buildings.
- Chemical Processing: Suitable for low- to medium-pressure applications with mild chemicals.

Material



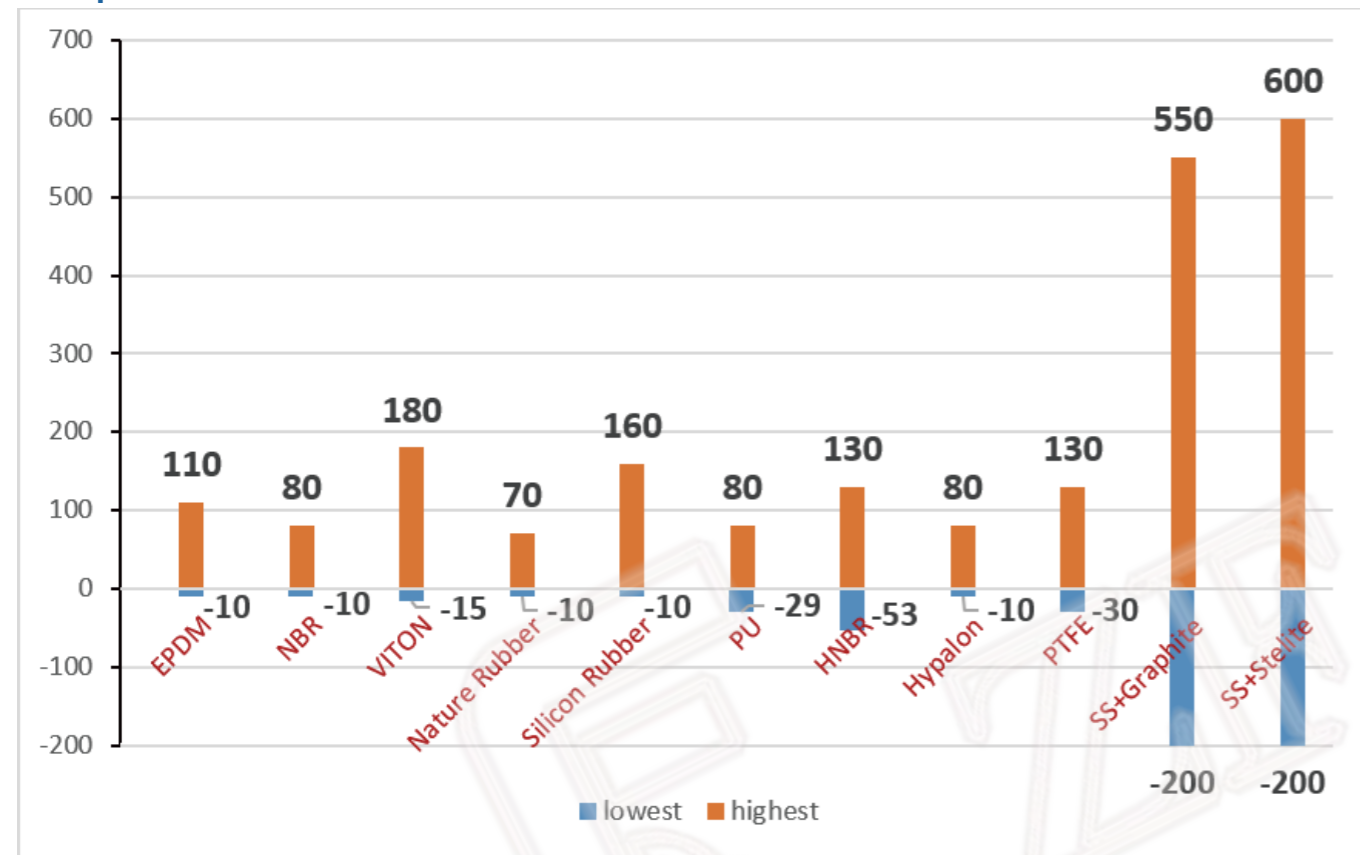
Item	Parts	Material
1	Body	Ductile Iron GGG50 GGG40
		Casting Iron GGG25
		WCB A216
		LCB/LCC A352
		Stainless Steel CF8 CF8M CF3 CF3M
		Duplex SS 2205 2507
		Aluminum Bronze 95400 95500 95800
2	Disc	Ductile Iron Nickel Coated Nylon Coated FPA Coated PTFE Lined EPDM Lined
		WCB A216
		LCB/LCC A352
		Stainless Steel CF8 CF8M CF3 CF3M
		Duplex SS 2205 2507
		Aluminum Bronze 95400 95500 95800
3	Seat	Rubber EPDM NBR VITON Nature Rubber Silicon Rubber PU HNBR Hypalon
		PTFE
		SS+Graphite
		SS+Stellite
4	Stem	AISI304
		AISI316
		AISI420(2Cr13)
		AISI431
		1.4462
		17-4PH
		Monel
5	"O" Ring	Rubber EPDM NBR
6	Bushing (short)	PTFE
		Aluminum Bronze
7	Bushing (long)	PTFE
		Aluminum Bronze

Parameters

Torque, Nm

DN	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200
PN6	8	8	13	20	32	51	82	140	230	320	480	710	890	1200	2000	3040	4100	5800	8400	12000
PN10	9	9	15	23	35	60	100	168	280	360	600	920	1355	1600	2600	4100	5400	7092	11000	20000
PN16	11	11	18	27	45	70	110	220	380	500	960	1500	1887	2500	4100	6204	8782	12142	16122	26984

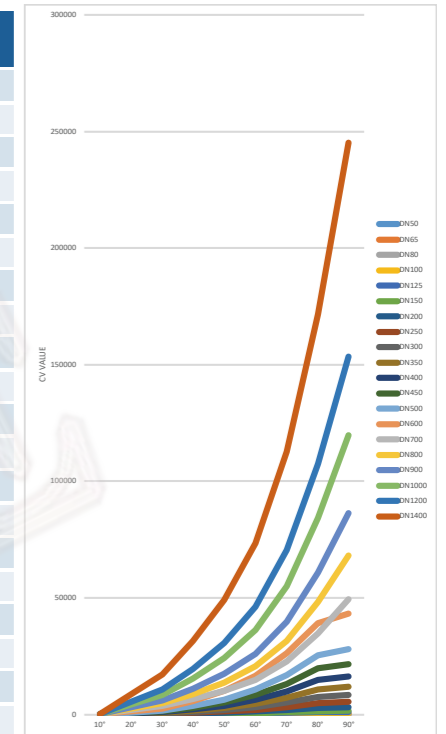
Temperature & Resistance of Valve Seat



NAME	APPLICATIONS	TEMP. RATING
EPDM	Water, potable water, seawater, alcohols, organic salts dissolutions, mineral acid solutions, mineral bases alkaline	-10°C to 110°C
NBR	Mineral and vegetable oils, gas, non-aromatic hydrocarbons, animal fats, vegetable fats, air	-10°C to 80°C
VITON	Acids, fats, hydrocarbons, vegetable and mineral oils, fuels	-15°C to 180°C
Nature Rubber	Salts, hydrochloric acid, metal coating solutions, wet chlorine.	-10°C to 70°C
Silicon Rubber	Low and high-temperature resistance, food grade Hydrocarbons, acids, bases, atmospheric agents	-10°C to 160°C
PU	nonaggressive chemical applications such as water, wastewater and seawater	-29°C to 80°C
HNBR	Water, Potable Water, Wastewater.	-53°C to 130°C
Hypalon	Mineral acid dissolutions, organic and inorganic acids, oxidizing substances,	-10°C to 80°C
PTFE	water, oil, steam, air, slurries, and corrosive fluids	-30°C to 130°C
SS+Graphite	High temperature and high pressure environments, such as steam systems, chemical and petroleum industries.	-200°C to 550°C
SS+Stellite	all medium	-200°C to 600°C

Cv Value- Flow Rate Coefficient

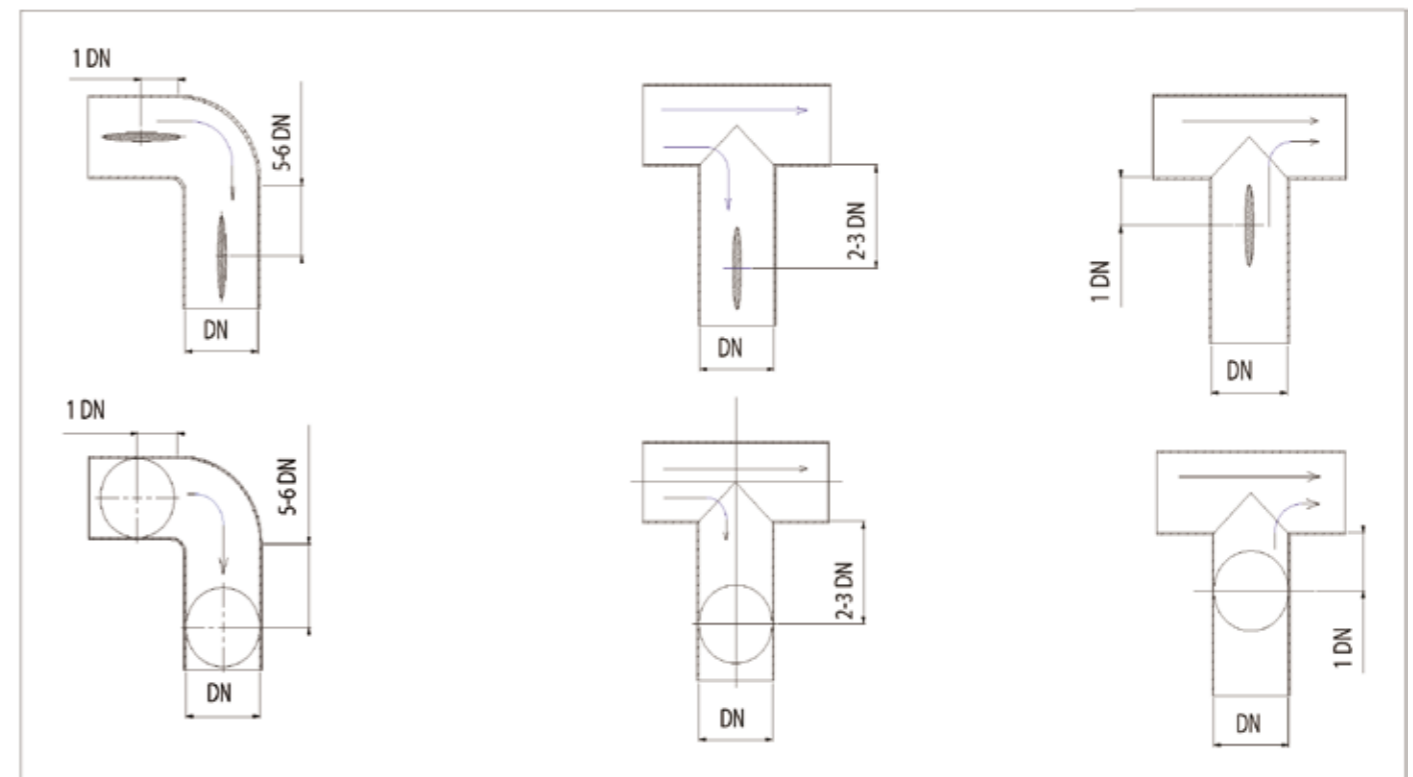
Size(mm)	10°	20°	30°	40°	50°	60°	70°	80°	90°
50	0.1	5	12	24	45	64	90	125	155
65	0.2	8	20	37	65	98	144	204	220
80	0.3	12	22	39	70	116	183	275	302
100	0.5	17	36	78	139	230	364	546	600
125	0.8	29	61	133	237	392	620	930	1022
150	2	45	95	205	366	605	958	1437	1579
200	3	89	188	408	727	1202	1903	2854	3136
250	4	151	320	694	1237	2047	3240	4859	5340
300	5	234	495	1072	1911	3162	5005	7507	8250
350	6	338	715	1549	2761	4568	7230	10844	11917
400	8	464	983	2130	3797	6282	9942	14913	16388
450	11	615	1302	2822	5028	8320	13168	19752	21705
500	14	791	1674	3628	6465	10698	16931	25396	27908
600	22	1222	2587	5605	9989	16528	26157	39236	43116
700	36	1813	3639	6636	10000	14949	22769	34898	49500
800	45	2387	4791	8736	13788	20613	31395	48117	68250
900	60	3021	6063	11055	17449	26086	39731	60895	86375
1000	84	4183	8395	15307	24159	36166	55084	84425	119750
1200	106	5370	10741	19641	30690	46065	70587	107568	153450
1400	174	8585	17171	31398	49060	73590	112838	171710	245300



Installation Solution

The responsibility for installing butterfly valves lies with a client, who must comply with local safety regulations. The handling of the valves, including the controls, must be carried out by personnel trained and competent in the technical aspects of handling. Before installation, the pipeline must be depressurized and purged to avoid any risk to the operator. The piping must be aligned correctly to avoid any unnecessary stress on the valve body.

It is important to check the compatibility of the connection flanges with the operating pressure: the PN number of the flanges must be greater than or equal to the operating pressure. The valve must not be used to spread the flanges, as it is a fragile part that can be damaged easily. A turbulence zone that can cause premature wear of the valve components, it is therefore recommended to respect the following distances to extend its service life.

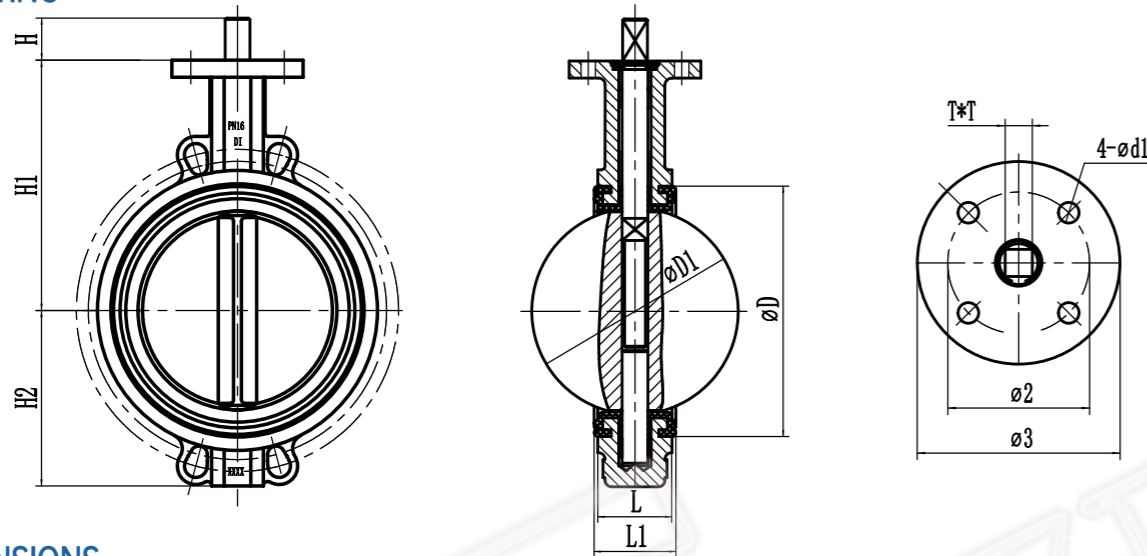


WAFER TYPE ZW-01

TECHNICAL DATA

Size Range	NPS 1-1/2" to 24" DN 40 to DN 600
Seat Style	Hard Back Seat
Pressure Rating	PN6 PN10 PN16 PN25 CL150 JIS 10K
Flange Drilling	PN6 PN10 PN16 ASME B16.5 CL150 JIS 10K
Face to Face	EN558-20 ISO 5752-20 API 608 Table 1 BS 5155-4
Top Flange	ISO 5211
Tightness Test	ISO 5208 API 598 EN 12266-1

DRAWING



DIMENSIONS

SIZE	øD	øD1	L	L1	H	H1	H2	ø2	ø3	4-ød1	T*T
DN25	55	33	26	29	30	122	48	50	65	7	11
DN40	65	43.1	33	36	30	139	70	50	65	7	11
DN50	82	53.08	42.5	46.1	30	140	60	70	90	10	11
DN65	94	64.82	45.6	49	30	150	67	70	90	10	11
DN80	111.2	79.04	45.6	48.4	30	160	87	70	90	10	11
DN100	140	104.04	52	56	30	180	105	70	90	10	11
DN125	166	123.3	56	60	30	190	118	70	90	10	14
DN150	187	155.68	56	60	30	210	130	70	90	10	14
DN200	246.8	201.9	60	64	35	235	166	102	125	12	17
DN250	301.5	250.45	68	72	35	270	197	102	125	12	22
DN300	352	301.55	78	83	35	305	231	102	125	12	22
DN350	390	333.8	78	83	35	360	255	125	150	14	22
DN400	452	389	102	106	50	381	293	140	175	18	27
DN450	510	439.2	114	118	50	425	325	140	175	18	27
DN500	564	491.4	127	132	50	470	363	140	175	18	36
DN600	651	579	153	159	60	565	425	165	210	22	36

* Please consult our sales staff to obtain detailed dimensions for other specifications.

Actuator Options

Hand-Lever



- ★Description: The handlever actuator uses a manual lever to rotate the valve's disc. The lever is typically connected to a shaft that turns the valve's stem.
- ★Operation: The user manually rotates the lever to open or close the valve. This actuator is most suitable for smaller butterfly valves (DN50 to DN300).
- ★Advantages: Simple, low-cost option. Requires minimal maintenance. No external power source needed.

Worm Gear



- ★Description: A worm gear actuator utilizes a worm and gear mechanism to convert rotational motion into torque that turns the valve's stem. This actuator is often used when high torque is needed with relatively slow operation.
- ★Operation: The worm gear reduces the speed of the manual input (usually from a handwheel) and amplifies the torque to move the valve disc. This means the user can operate larger valves with lower effort.
- ★Advantages: Provides precise control. High torque output. Can hold position under pressure due to self-locking worm gear.

Electric



- ★Description: Electric actuators use an electric motor to turn the valve's stem. These actuators are typically controlled by a switch, control panel, or automated control system.
- ★Operation: The electric motor drives a gear or gearbox, which in turn rotates the valve's stem to open or close the valve. Electric actuators can be equipped with limit switches and feedback sensors for more precise control and integration into automated systems.
- ★Advantages: Remote and automated operation. Easy integration with control systems (SCADA, PLC). Suitable for large and complex installations.

Pneumatic

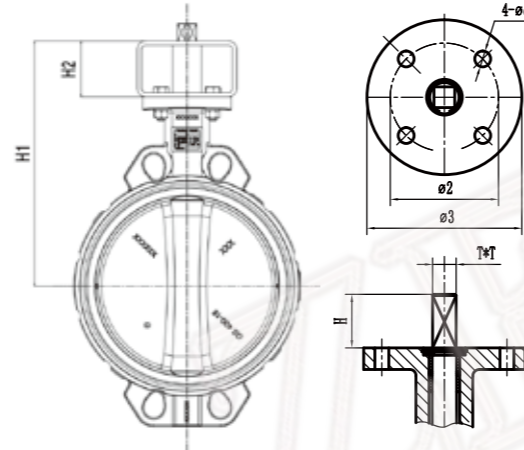


- ★Description: Pneumatic actuators use compressed air to drive a piston or diaphragm, which in turn operates the valve stem. These actuators are typically used for faster opening and closing of the valve.
- ★Operation: When compressed air is supplied to the actuator, the pressure forces a piston or diaphragm to move, rotating the valve stem and opening or closing the valve. Pneumatic actuators can be single-acting (spring return) or double-acting (no spring return, requiring air supply in both directions).
- ★Advantages: Fast response and high speed. Can be used in hazardous or explosive environments due to the absence of electrical components. Simple design with minimal maintenance.

Top Flange For Actuator

DN	Top Flange	F03		F04		F05		F07		F10		F12		F14		F16	
		H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
40	—	190	—	190	—	190	—	190	—	210	—	—	—	—	—	—	—
50	—	199	—	199	—	199	—	199	—	219	—	—	—	—	—	—	—
65	—	205	—	205	—	205	—	205	—	225	—	—	—	—	—	—	—
80	—	210	—	210	—	210	—	210	—	230	—	—	—	—	—	—	—
100	—	235	—	235	—	235	—	235	—	255	—	—	—	—	—	—	—
125	F07/o14	—	—	249	—	249	60	249	60	269	—	—	—	—	—	—	—
150	F07/o14	—	—	262	—	262	60	262	60	282	—	—	—	—	—	—	—
200	F07/o14	—	—	285	—	285	60	285	60	305	—	—	—	—	—	—	—
250	F10/o17	—	—	—	—	346	80	346	80	346	80	346	80	356	90	356	90
300	F10/o22	—	—	—	—	370	80	370	80	370	80	370	80	380	90	380	90
350	F12/o27	—	—	—	—	—	—	—	—	395	90	395	90	395	90	395	90

SIZE	H	φ2	φ3	4-φd1	T
DN50	30	70	90	10	11
DN65	30	70	90	10	11
DN80	30	70	90	10	11
DN100	30	70	90	10	11
DN125	30	70	90	10	14
DN150	30	70	90	10	14
DN200	35	102	125	12	17
DN250	35	102	125	12	22
DN300	40	102	125	12	22



Bolts & Nuts

DN	EN 1092 PN6		EN 1092 PN10		EN 1092 PN16		EN 1092 PN25		ASME /ANSI B16.5 Class 150		BS10-d		BS10-e		JIS2238 & JIS2239 10K		JIS2238 & JIS2239 16K	
	rods Qty	φ	rods Qty	φ	rods Qty	φ	rods Qty	φ	rods Qty	φ	rods Qty	φ	rods Qty	φ	rods Qty	φ	rods Qty	φ
32/40	4	M12	4	M16	4	M16	4	M16	4	M14	4	1/2"	4	1/2"	4	M16	4	M16
50	4	M12	4	M16	4	M16	4	M16	4	M16	4	5/8"	4	5/8"	4	M16	8	M16
65*	4	M12	8	M16	8	M16	8	M16	4	M16	4	5/8"	4	5/8"	4	M16	8	M16
80	4	M16	8	M16	8	M16	8	M16	4	M16	4	5/8"	4	5/8"	8	M16	8	M20
100	4	M16	8	M16	8	M16	8	M20	8	M16	4	5/8"	8	5/8"	8	M16	8	M20
125	8.0	M16	8	M16	8	M16	8	M24	8	M20	8	5/8"	8	5/8"	8	M20	8	M22
150	8.0	M16	8	M20	8	M20	8	M24	8	M20	8	5/8"	8	3/4"	8	M20	12	M22
200	8.0	M16	8	M20	12	M20	12	M24	8	M20	8	5/8"	8	3/4"	12	M20	12	M22
250	12.0	M16	12	M20	12	M24	12	M27	12	M24	8	3/4"	12	3/4"	12	M22	12	M24
300	12.0	M20	12	M20	12	M24	16	M27	12	M24	12	3/4"	12	7/8"	16	M22	16	M24

Certificates

TEST 100%
OEM SERVICE
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WRAS



CE



ISO