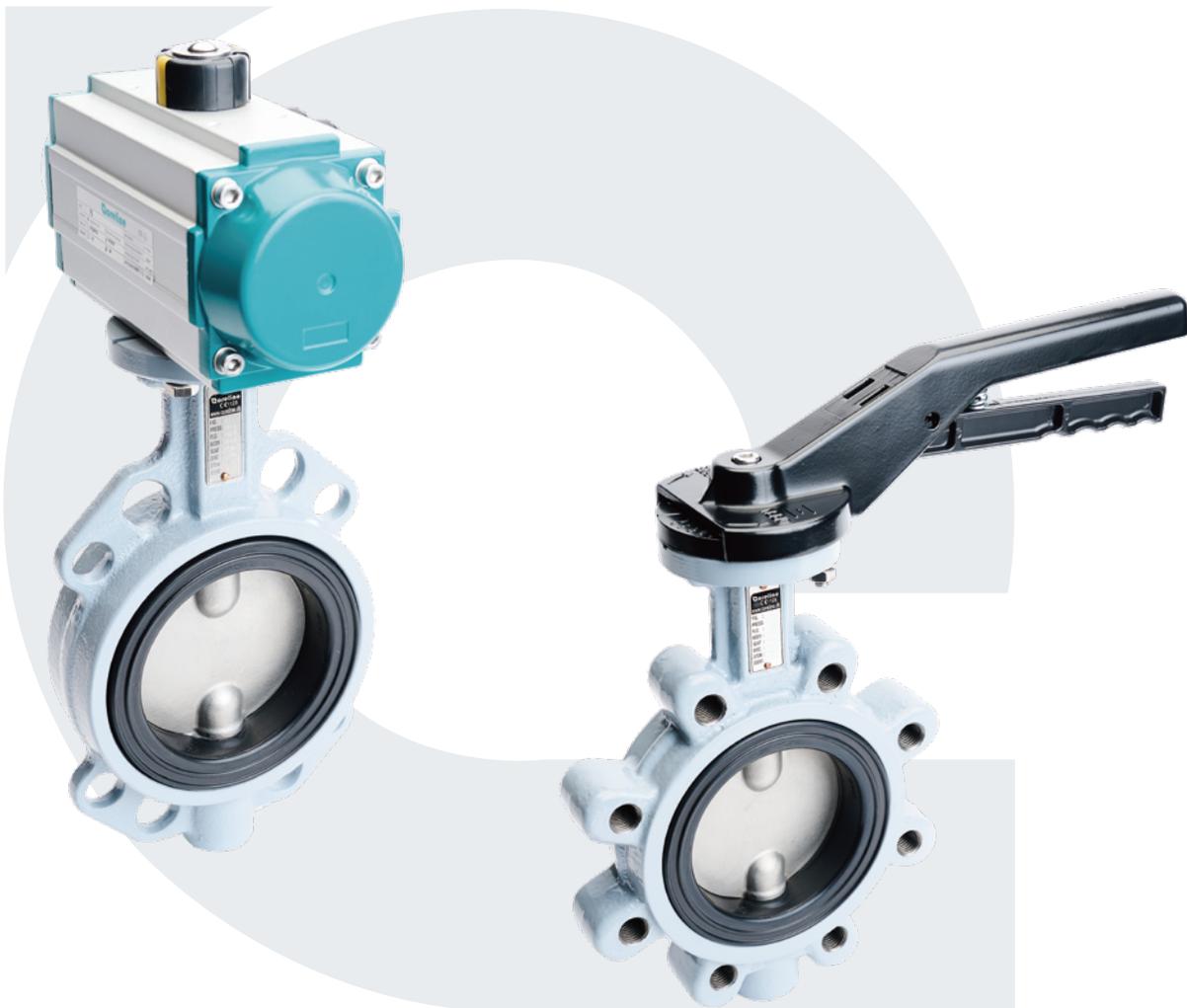


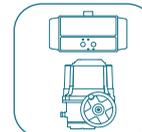
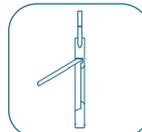
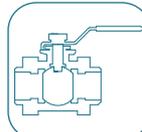
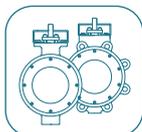
Rubber seat butterfly valves

Fig.223 : Wafer

Fig.224 : Lug



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General description and specifications

General description

Butterfly valves are suitable for on/off and regulation for many different medias in pipelines.

The advantages are short face to face dimension, low weight, low torque and cheap price compare to many other valve types.

Please notice that rubber have limitations for media and temperature. Check table.

The disc for open/close is in center of valve. There may be situation where this is not applicable.

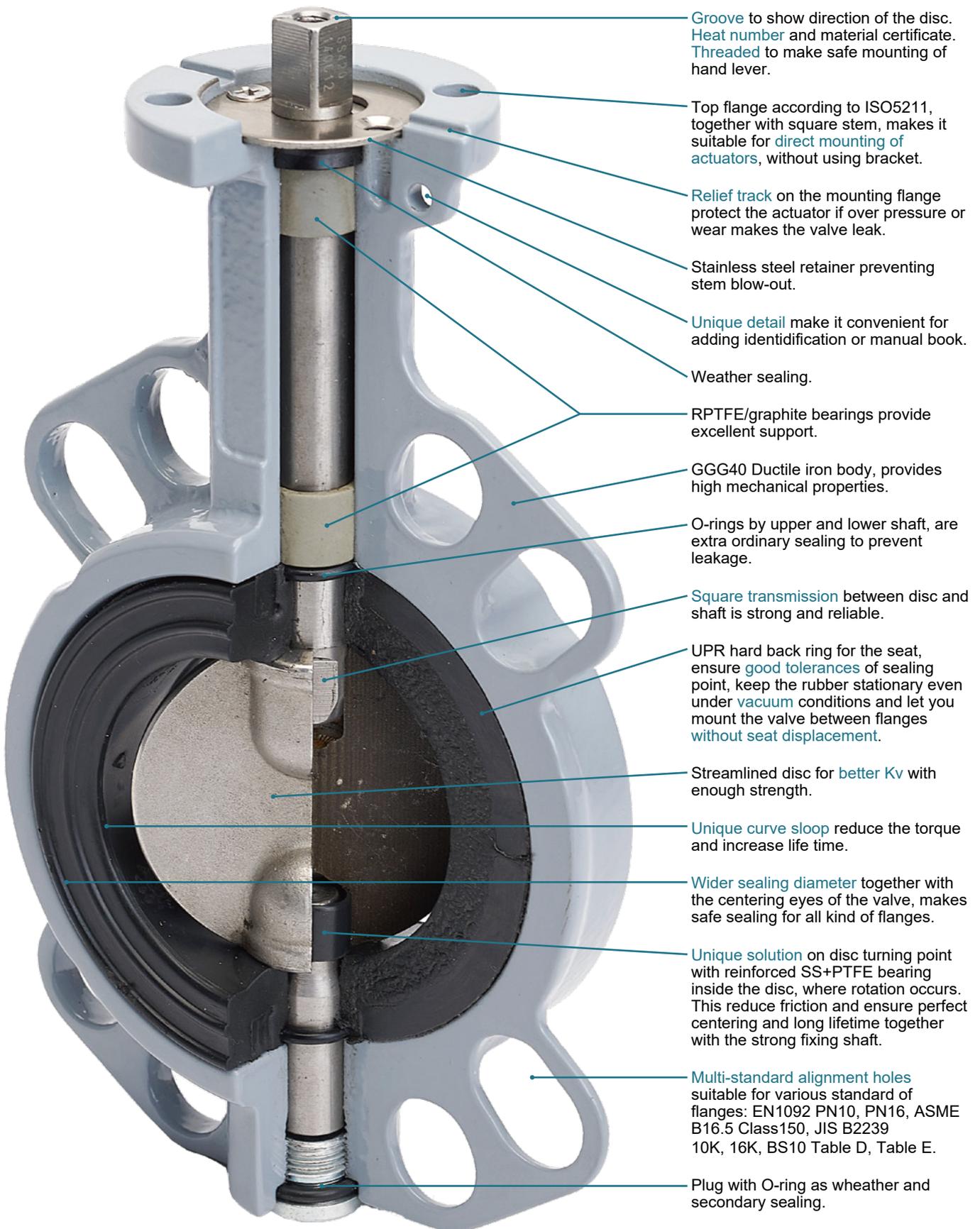


Specification

Nominal diameter:	DN25-DN2000
Standard differential pressure:	16 bar for DN25-DN200, 10 bar for DN250-DN2000
Max. differential pressure:	20 bar for DN25-DN600 16 bar for DN700-DN2000
Vacuum:	0.001 bar absolute (depending on medium and temperature)
Flange accommodation:	DN40-DN300: EN1092 PN10, PN16. ASME B16.5 Class150. JIS B 2239 10K, 16K. BS10 Table D, Table E DN350-DN2000: EN1092 PN10, PN16. ASME B16.5 Class150. BS10 Table D, Table E
Face to face:	EN558 Series 20; API 609 Table 1
Top flange:	EN ISO 5211
Temperature range:	-20°C to +150°C (depending on pressure, medium and material)
Tightness test:	ISO 5208 Rate A; EN 12266-1 Rate A; ANSI/FCI 70-2 Class VI



Design features



Groove to show direction of the disc. Heat number and material certificate. Threaded to make safe mounting of hand lever.

Top flange according to ISO5211, together with square stem, makes it suitable for direct mounting of actuators, without using bracket.

Relief track on the mounting flange protect the actuator if over pressure or wear makes the valve leak.

Stainless steel retainer preventing stem blow-out.

Unique detail make it convenient for adding identification or manual book.

Weather sealing.

RPTFE/graphite bearings provide excellent support.

GGG40 Ductile iron body, provides high mechanical properties.

O-rings by upper and lower shaft, are extra ordinary sealing to prevent leakage.

Square transmission between disc and shaft is strong and reliable.

UPR hard back ring for the seat, ensure good tolerances of sealing point, keep the rubber stationary even under vacuum conditions and let you mount the valve between flanges without seat displacement.

Streamlined disc for better Kv with enough strength.

Unique curve sloop reduce the torque and increase life time.

Wider sealing diameter together with the centering eyes of the valve, makes safe sealing for all kind of flanges.

Unique solution on disc turning point with reinforced SS+PTFE bearing inside the disc, where rotation occurs. This reduce friction and ensure perfect centering and long lifetime together with the strong fixing shaft.

Multi-standard alignment holes suitable for various standard of flanges: EN1092 PN10, PN16, ASME B16.5 Class150, JIS B2239 10K, 16K, BS10 Table D, Table E.

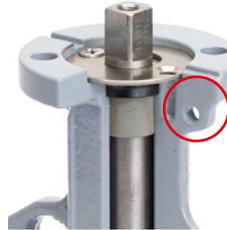
Plug with O-ring as weather and secondary sealing.

Design features



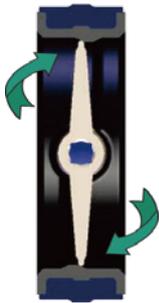
Advantages by bonding rubber to UPR hard back ring:

- Better tolerance;
- Suitable for vacuum application;
- Mounting between flanges without seat displacement.



Unique hole under mounting flange:

- Make it convenient to hang ion or tag identification.



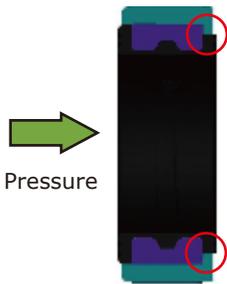
Seat designed with curve slope:

- Flexibility reduces torque value, saving money for actuator.
- Achieve longer lifetime than traditional seats.



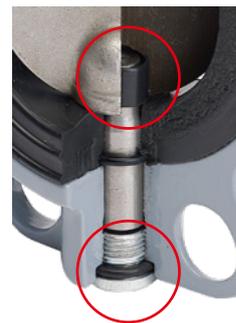
Strong square interface between disc and shaft ensure no operation stop.

Second sealing with replaceable O-ring on the back of the seat.



Retaining edge design on the LUG body/seat back ring:

This makes the LUG valve bear uni-directional full pressure when mounted against single flange at the end of pipeline.

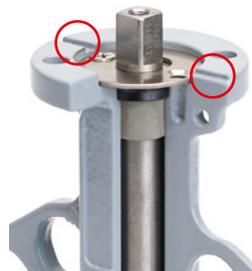


Disc turning point with SS+PTFE bearing inside give perfect tolerances, reduce torque ensure longer lifetime.

Plug is used on the bottom of the valve, preventing shaft to blow-out. O-ring by the plug offers a third sealing.



There is a groove inside back ring and together with curve slope, it brings a low torque between the disc and the seat by operating.

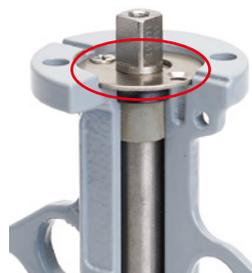


Groove on top flange will protect direct mounted actuator, if high pressure leakage happens.



Two-piece shaft design enhances low Kv and avoids turbulence, much better than one-piece shaft.

Disc sealing area is precisely machined and polished for torque and wears control.



Stainless steel blow-out safety arrangement, prevent accidents.

Below is U-ring as weather sealing.

Seat options and specifications

Applicable medium temperature range

SEAT MATERIAL	Safety temp. range	Lowest instantaneous temp.	Max. instantaneous temp.
EPDM-H	-20°C~+125°C	-40°C	+130°C
EPDM-H black FDA/EU1935	-20°C~+125°C	-40°C	+130°C
EPDM white FDA	-20°C~+85°C	-30°C	+100°C
NBR (Eq. Nitrile)	-15°C~+85°C	-30°C	+100°C
X-NBR (wear resistant)	-15°C~+85°C	-30°C	+110°C
HNBR	-30°C~+150°C	-40°C	+170°C
Hi-NBR (for heavy oil)	-15°C~+100°C	-30°C	+110°C
FPM (Eq. FKM, Viton)	-15°C~+150°C	-20°C	+150°C
FEPM (for steam)	-15°C~+150°C	-20°C	+150°C
Natural rubber	-30°C~+80°C	-40°C	+100°C
Silicone rubber (no steam)	-20°C~+150°C	-30°C	+150°C
Silicone rubber (for steam)	-20°C~+120°C	-30°C	+150°C
PTFE	-15°C~+150°C	-20°C	+150°C

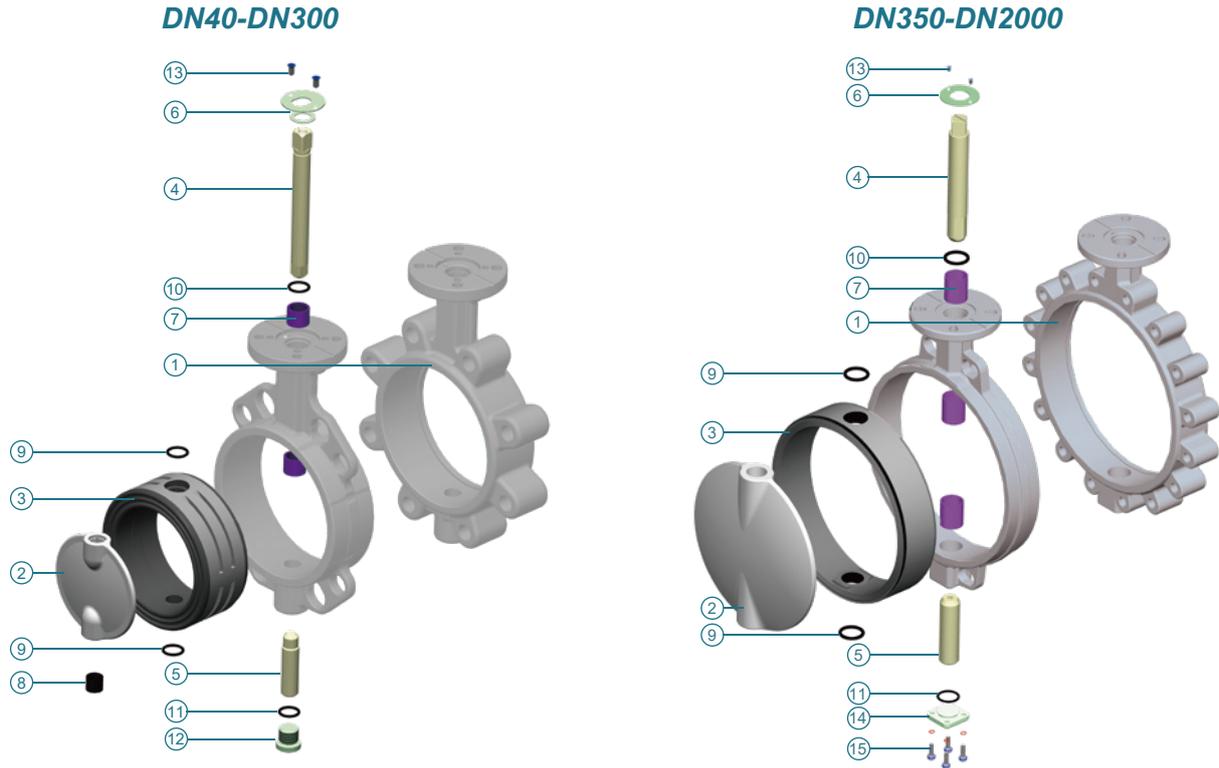
**) The temperature specifications for the above rubber valve seats apply to standard conditions. For special operating scenarios, please contact Coreline for technical supports.*

Chart for medium resistance

RUBBER MATERIAL	SUITABLE FOR	NOT SUITABLE FOR
EPDM	Water, steam (<125°C), alcohol, glycol, caustic soda, ozone, food products, glycerine, salts, acids	Mineral oil, petrol, diesel oil, strong acids, aromatic hydrocarbons, polar solvents, steam (>125°C)
NBR	Mineral oil, grease, air, seawater, glycerine, natural gas, vegetable oils, diluted acids	Ozone, aromatic hydrocarbons, ketones, strong acids, strong bases, chlorinated hydrocarbons, steam
FPM	Oil, grease, acids, aromatic hydrocarbons, fuels, hydraulic fluids, hot water and steam (up to 150°C)	Steam (>150°C), ketones, polar solvents, chlorinated hydrocarbons, strong oxidizers
FEPM	Acids, alkalis (low concentration), fuels, steam (up to 230°C), oxidizers	Gasoline (high aromatic), hydrocarbons, chlorinated solvents, strong alkalis, superheated steam (>230°C)
Natural Rubber	Abrasive medium, boric acid, citric acid, glycerine, nitrogen, lactic acid, water, mild alkalines	Steam, petrol, diesel oil, aromatic hydrocarbons, ketones, strong acids, strong bases
Silicone	Food products, ammonia, glycerine, low-pressure steam (<120°C), mild acids and alkalines, alcohols	Steam (>120°C), diesel oil, aromatic hydrocarbons, ketones, strong acids, chlorinated hydrocarbons
PTFE	Almost all mediums	Strong abrasives, high mechanical loads, molten alkali metals, high-energy radiation

**) The listed media compatibility covers only typical examples. If you are uncertain about specific applications, please consult Coreline.*

Parts list and material specification



No.	Part name	Material	Specification	No.	Part name	Material
1	Body	Ductile iron	EN 1563 EN-GJS-400-15	4/5	Stem	SS420
		Low-Temperature ductile Iron	GB/T 32247 QT400-18L (-40°C)			SS431
		Stainless steel	ASTM A351 CF8M ¹⁾			SS316
2	Disc	Stainless steel	ASTM A351 CF8	6	Preventing plate	17-4PH
			ASTM A351 CF8M			2507
			ASTM A351 CF3M			2205
		Alloy steel	2507 (UNS S32750 / EN 1.4410)			SS201
			2205 (UNS S32205 / EN 1.4462)			SS316
Aluminium bronze	C95800	7	Body bearing	RPTFE with graphite		
Ductile iron	Halar or Nylon coated	8	Disc bearing	SS+PTFE		
3	Seat ²⁾	EPDM-H	-20°C~+125°C	9	O-ring ⁴⁾	Same as seat
		EPDM-H FDA/EU1935 (Black)	-20°C~+125°C	10	Weather seal	NBR
		EPDM FDA (White)	-20°C~+85°C	11	Anti-dust seal	NBR
		NBR (Eq. Nitrile)	-15°C~+85°C	12	Plug	Steel galvanized
		X-NBR (Wear resistant)	-15°C~+85°C	13	Screw	SS304
		HNBR	-30°C~+150°C			SS316
		Hi-NBR (For oil sludge)	-15°C~+100°C	14	Bottom cover	Same as body
		FPM (Eq. FKM, Viton)	-15°C~+150°C			15
		FEPM (For steam)	-15°C~+150°C	SS316		
		Natural rubber	-30°C~+80°C			
		Silicone rubber (No steam)	-20°C~+150°C			
		Silicone rubber (For steam)	-20°C~+120°C			
		PTFE ³⁾	-15°C~+150°C			

Notes:

1) Only available for Fig.223 DN40-DN300.

2) Rubber seat with hard UPR backup.

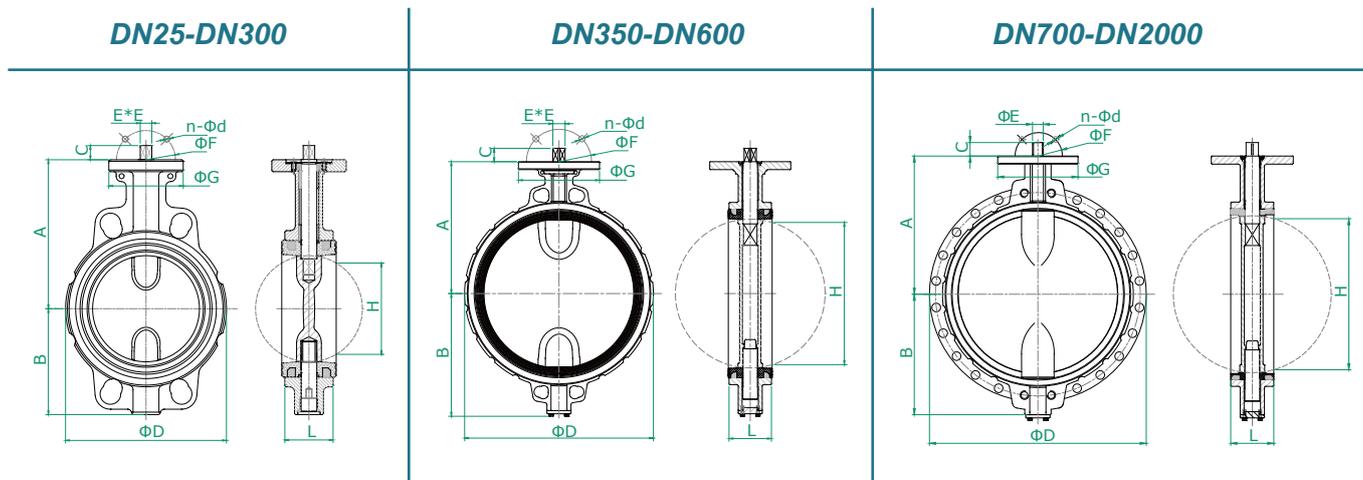
3) Available with EPDM and FPM backup. Temperature range depends on backup material.

4) Not applicable for sizes ≥ DN700.

5) The above temperature range for the valve seats are provided as reference for general working conditions. Please note that the actual applications may vary due to the different media, pressure etc. in the pipeline.

6) Contact Coreline for other materials or special requirements.

Fig. 223 Dimensions

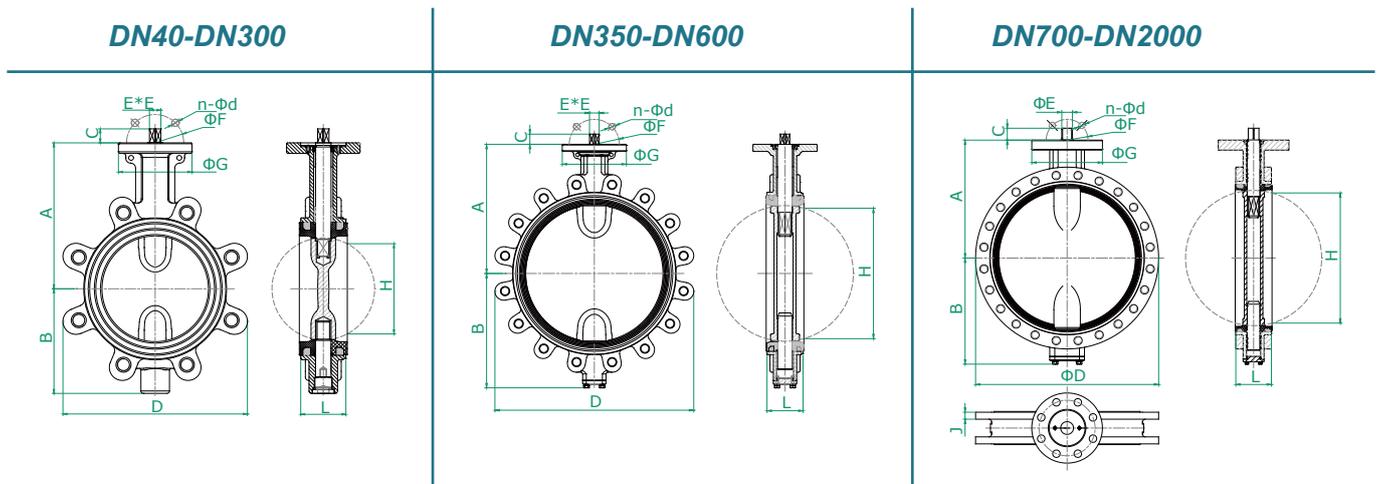


DN	INCH	A	B	C	D	E	F	n	d	G	H		Rubber sealing Dia.	L	[kg]
											Rubber	PTFE			
25/32	1", 1-1/4"	108	60	13.5	72	9×9	50	4	7	65	13.5	-	60	32	1.4
40	1-1/2"	113	67.5	13.5	86	11×11	50	4	7	65	30	-	67.98	33	1.6
50	2"	126	76	13.5	102	11×11	50	4	7	65	36.43	37.1	84.3	43	1.9
65	2-1/2"	134	82	13.5	116	11×11	50	4	7	65	48.45	51.05	96.7	46	2.3
80	3"	157	95.5	13.5	132	11×11	50	4	7	65	70.32	66.42	109.8	46	3
100	4"	167	113.5	17.5	157	14×14	50+70	4	7+9	90	87.64	93.1	136.4	52	4.8
125	5"	180	129	17.5	195	14×14	70	4	9	90	117.27	118.46	169.1	56	6.4
150	6"	203	142	18.5	218	17×17	70	4	9	90	144.65	143.09	190.9	56	7
200	8"	228	172	24.5	271	22×22	102	4	11	125	192.34	195.7	242	60	12.2
250	10"	266	213	24.5	329	22×22	102	4	11	125	241.78	246.42	296.9	68	19
300	12"	291	242	26.5	382	27×27	102+125	4+4	12+14	150	291.6	296.7	346.2	78	26
350	14"	332	273	30	422	27×27	125+140	4+4	14+18	175	329	-	380.77	78	35
400	16"	363	317	30	484	27×27	125+140	4+4	14+18	175	376	-	437.93	102	52
450	18"	397	348	39	542	36×36	140+165	4+4	18+22	210	425	-	488.55	114	70
500	20"	425	393	49	597	46×46	140+165	4+4	18+22	210	475	-	539.35	127	83
600	24"	498	453	49	708	46×46	165+254	4+8	22+18	300	573	-	640.9	154	157
700	28"	626	531	90	928	φ 63.1	254	8	18	300	674	-	744.1	165	252
750	30"	660	564	90	984	φ 63.1	254	8	18	300	727	-	794.2	165	290
800	32"	666	601	90	1061	φ 63.1	254	8	18	300	771	-	849.4	190	367
900	36"	722	660	110	1170	φ 74.7	254	8	18	300	839	-	946.5	203	465
1000	40"	806	728	120	1290	φ 83.7	298	8	22	350	939	-	1052.55	216	606
1100	44"	826	771	140	1404	φ 94.7	298	8	22	350	1036	-	1162.25	255	805
1200	48"	941	874	150	1511	φ 104.7	298	8	22	350	1137	-	1263.65	276	900
1400	56"	1000	940	175	1685	φ 139.9	356	8	32	415	1351	-	-	279	1158
1600	64"	1155	1085	195	1930	φ 160	356	8	32	415	1548	-	-	318	1684
1800	72"	1200	1170	195	2170	φ 174.5	406	8	39	475	1703	-	-	356	2645
2000	80"	1363	1360	245	2345	φ 199	406	8	39	475	1938	-	-	406	4000

Notes:

- 1) Different pressure may cause different dimension of "D".
- 2) To ensure proper installation and operation, the inner diameter of the pipe shall be larger than the disc chord length "H".
If the pipe bore is equal to or close to the disc chord length, the valve disc may interfere with the pipe or flange during opening/closing, which could cause damage.
- 3) The listed weights are for reference only.

Fig. 224 Dimensions



DN	INCH	A	B	C	D	E	F	n	d	G	H		Rubber sealing Dia.	L	[kg]
											Rubber	PTFE			
40	1-1/2"	113	67.5	13.5	113	11×11	50	4	7	65	30	-	67.98	33	2.3
50	2"	126	76	13.5	117	11×11	50	4	7	65	36.43	37.1	84.3	43	2.8
65	2-1/2"	134	82	13.5	131	11×11	50	4	7	65	48.45	51.05	96.7	46	3.1
80	3"	157	95.5	13.5	176	11×11	50	4	7	65	70.32	66.42	109.8	46	4
100	4"	167	113.5	17.5	206	14×14	50+70	4	7+9	90	87.64	93.1	136.4	52	5.8
125	5"	180	129	17.5	236	14×14	70	4	9	90	117.27	118.46	169.1	56	9.3
150	6"	203	142	18.5	258	17×17	70	4	9	90	144.65	143.09	190.9	56	10.5
200	8"	228	172	24.5	321	22×22	102	4	11	125	192.34	195.7	242	60	17.4
250	10"	266	213	24.5	395	22×22	102	4	11	125	241.78	246.42	296.9	68	28.1
300	12"	291	242	26.5	461	27×27	102+125	4+4	12+14	150	291.6	296.7	346.2	78	40
350	14"	332	273	30	511	27×27	125+140	4+4	14+18	175	329	-	380.77	78	49
400	16"	363	317	30	580	27×27	125+140	4+4	14+18	175	376	-	437.93	102	79
450	18"	397	348	39	630	36×36	140+165	4+4	18+22	210	425	-	488.55	114	104
500	20"	425	393	49	700	46×46	140+165	4+4	18+22	210	475	-	539.35	127	135
600	24"	498	453	49	823	46×46	165+254	4+8	22+18	300	573	-	640.9	154	215
700	28"	626	531	90	928	φ 63.1	254	8	18	300	674	-	744.1	165	342
750	30"	660	564	90	984	φ 63.1	254	8	18	300	727	-	794.2	165	400
800	32"	666	601	90	1061	φ 63.1	254	8	18	300	771	-	849.4	190	485
900	36"	722	660	110	1170	φ 74.7	254	8	18	300	839	-	946.5	203	605
1000	40"	806	728	120	1290	φ 83.7	298	8	22	350	939	-	1052.55	216	776
1100	44"	826	771	140	1404	φ 94.7	298	8	22	350	1036	-	1162.25	255	985
1200	48"	941	874	150	1511	φ 104.7	298	8	22	350	1137	-	1263.65	276	1190
1400	56"	1000	940	175	1685	φ 139.9	356	8	32	415	1351	-	-	279	1380
1600	64"	1155	1085	195	1930	φ 160	356	8	32	415	1548	-	-	318	2054
1800	72"	1200	1170	195	2170	φ 174.5	406	8	39	475	1703	-	-	356	3075
2000	80"	1363	1360	245	2345	φ 199	406	8	39	475	1938	-	-	406	4500

Notes:

- 1) Different pressure may cause different dimension of "D".
- 2) To ensure proper installation and operation, the inner diameter of the pipe shall be larger than the disc chord length "H".
If the pipe bore is equal to or close to the disc chord length, the valve disc may interfere with the pipe or flange during opening/closing, which could cause damage.
- 3) The listed weights are for reference only.

Valve torques (N*M)

Size	Standard disc differential pressure						Increased PN16 disc	Increased PN20 disc	Reduced PN6 disc	MAST value		
	EPDM/ NBR/ FPM seat				FDA seat	PTFE seat						
	$\Delta P=3\text{bar}$	$\Delta P=6\text{bar}$	$\Delta P=10\text{bar}$	$\Delta P=16\text{bar}$	$\Delta P=16\text{bar}$	$\Delta P=10\text{bar}$	$\Delta P=16\text{bar}$	$\Delta P=20\text{bar}$	$\Delta P=6\text{bar}$	SS420	SS431	17-4 PH
DN40	9	9	10	11	15			15	7	55	87	163
DN50	10	10	11	12	20	13		16	8	55	87	163
DN65	15	16	17	18	30	20		25	10	100	159	298
DN80	23	24	25	26	40	30		40	15	100	159	298
DN100	35	36	37	38	60	50		60	22	121	193	361
DN125	45	48	52	57	90	60		80	35	206	328	615
DN150	90	95	100	105	150	125		150	55	206	328	615
DN200	185	190	195	200	300	245		256	91	331	527	986
DN250	260	270	280		450	350	380	450	170	719	1144	2140
DN300	300	320	340		550	400	400	510	230	931	1481	2771
DN350	500	550	600				720	870	400	1481	2356	4408
DN400	620	700	800				870	1100	500	1481	2356	4408
DN450	920	1000	1200				1600	2000	700	3510	5584	10449
DN500	1600	1900	2200				3700	5700	950	3510	5584	10449
DN600	2200	2500	2800				4900	7800	1600	6540	10404	19471
DN700	3300	3600	3900				7300		2520	12157	19341	36195
DN750	4400	4800	5300				8900		3400	12157	19341	36195
DN800	6200	6700	7300				11000		4700	12157	19341	36195
DN900	7100	7700	8300				13000		5400			
DN1000	10000	11000	12000				24000		7700			
DN1100	14000	15000	16000				32000		11000			
DN1200	17000	19000	21000				42000		14000			
DN1400	21000	23000	25000				50000		17000			
DN1600	30000	32000	34000				70000		23000			
DN1800	33000	36000	38000				80000		26000			
DN2000	36000	38000	40000				90000		30000			

Notes:

- 1) The torque above are not including safety factor. Add a safety factor 1.2~1.3 for sizing or consult the factory.
- 2) MAST: Maximum Allowable Stem Torque. Please contact Coreline for MAST values for other materials.

Service and medium factor - Actuator Sizing

Service factor [SF]	Multiply by	Medium factor [MF]	Multiply by	Medium factor [MF]	Multiply by
ON/OFF operation	1.15	Lubricating liquid/gas	0.90	For dry service (Dry gas/air)	1.25
Modulating operation	1.25	Viscous Liquids, Molasses	1.30	Dirty air slurry, natural gas, dirty slurry,	1.50-1.80
*) 2 cycle/day "NC"	1.15	Degreasing liquid	1.25	Lime water, chlorin gas, oxygen, powder	1.50-1.80
***) 1 cycle/week "NC"	1.50	Saturated steam	1.20	Hydrodynamic torque	NA

OBS: Butterfly valve torque is 100% by 0° to 6° angle and 33% from 7° to 90° angle.

* Valve is completely closed and opened 2 times a day minimum.

** Valve is completely closed and opened only one time per week or longer.

Having a long period without maneuvering the valve, will increase the breakaway torque.

EXAMPLE OF ACTUATOR SIZING: Simple ON/OFF operation, Medium: Molasses,

Valve: 223 DN100. $1.15[\text{SF}] \times 1.30[\text{MF}] \times 38[\text{Nm}] = 56.8\text{Nm}$ (Sizing torque actuator)

Only choose one Service factor [SF] and one Medium factor [MF] when calculating the sizing torque.

Flow capacities and valve sizing

Kv values-valve sizing Coefficients (M³/H at 1Bar ΔP)

DN	10°	20°	30°	40°	50°	60°	70°	80°	90°
40		1	3	7	14	26	38	47	52
50		2	6	13	29	47	70	97	105
65		3	11	26	49	77	121	170	212
80		6	28	54	91	140	213	301	390
100		19	38	79	140	232	412	590	676
125		27	84	156	248	385	624	945	1120
150	7	51	129	224	363	572	977	1490	1798
200	22	114	229	401	639	1018	1755	2680	3100
250	33	171	334	634	970	1530	2650	4105	5200
300	49	250	490	925	1416	2231	3865	6351	7350
350	118	301	631	1131	1918	3081	4963	8035	9993
400	153	393	824	1478	2506	4024	6482	10983	12595
450	195	498	1043	1871	3170	5093	8210	13695	16850
500	240	615	1288	2309	3913	6287	10128	17250	19306
600	345	885	1853	2958	5635	9054	14584	24980	28323
700	390	930	2210	3750	6959	11100	19200	33080	39700
750	450	1160	2400	4350	7890	12900	21200	36750	45350
800	520	1330	2650	5030	8890	14350	23750	39900	49530
900	600	1680	3350	6470	11890	19520	31700	52750	62000
1000	710	2210	4300	8100	15130	23720	40050	67000	81000
1100	990	3020	5980	10050	17580	28970	48950	83500	10580
1200	1278	4050	7650	12600	20100	34500	56750	99570	121000
1400	1470	5180	10100	18150	32000	51370	88900	142100	161000
1600	1730	7200	14530	26530	45400	71500	118700	198000	229000
1800	2020	8100	18750	34230	52130	90350	143780	243250	280000
2000	2320	9000	21320	40350	57980	110200	169870	278980	320000

Valve Sizing

Determining the size of butterfly valves for control purposes should not be done on the basis of the nominal diameter of the pipe but should be calculated on the basis of the operating characteristics in order to attain the correct control characteristics.

Butterfly valves Fig. 223 / Fig. 224 from Coreline valve are designed with approximately equal percentage characteristics over an opening angle of 65°.

You only need to consider the opening angle when determining the size of control valves. When determining the valve nominal diameter calculate the Kv value from the below formula:

Liquid:

$$K_v = Q \times \sqrt{\frac{W}{\Delta p}}$$

Gas:

$$K_v = \frac{V_N}{514} \sqrt{\frac{G \times T}{\Delta p \times p_d}}$$

Kv = Flow coefficient

Q = Max. flow volume in m³/h

w = Exact weight in kg/m³

Δp = Pressure drop in bar

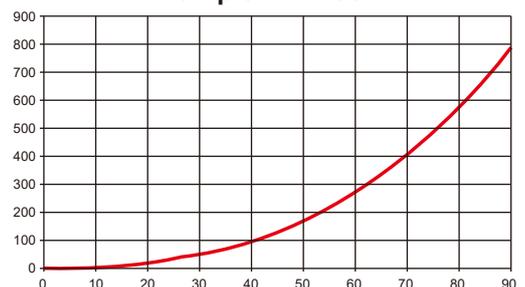
V_N = Max. flow in Nm³/h

G = Exact weight in kg/Nm³

T = Absolute temp. in ° Kelvin

p_d = Absolute pressure downstream in bar

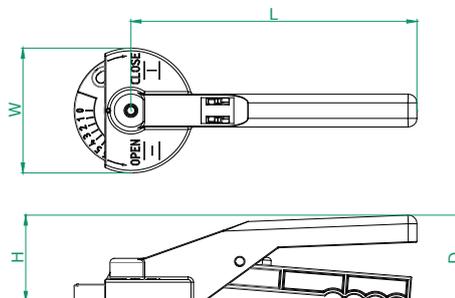
Example: DN 100



Hand lever dimensions

Fig.500 Aluminium hand lever

Excellent design and comfortable operating 90° in 10 positions. The lever is fixed by screw on top of stem to avoid the lever getting loose by operation or vibrations. For safety, the hand lever can be locked in position by bolt/nut or a locker. Material is AL-Si alloy, which has better performance than Al-Mg and Al-Zn alloy. Electrophoresed surface treatment, which has stronger adhesion than traditional painting and much better resistance to corrosion.



Size	D	H	L	W	Stem drive	[kg]
DN25-DN80	56	65	195	74	F05 - 9×9,11×11	0.28
DN100-DN125	78	82	269	101	F07 - 14×14	0.63
DN150	78	82	269	101	F07 - 17×17	0.63
DN200-DN250	101	100	330	145	F10 - 22×22	1.46

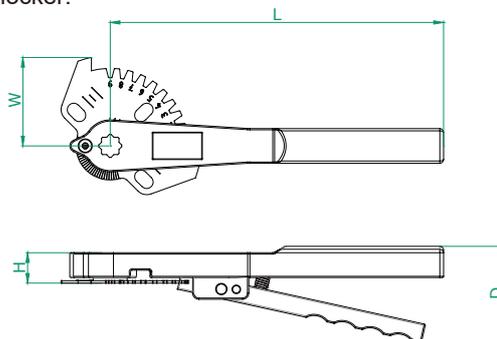
Fig.503 GGG40 and CF8M hand lever

GGG40 and CF8M hand lever have the same shape and share the same angle plate and locker.

GGG40 hand lever has strong electrophoresed surface treatment. CF8M hand lever is with precise casting which has very smooth surface.

Locker and plate in stainless steel SS316 and spring in SS321.

Good design and comfortable operating 90° in 10 positions, but also adjustable screw to choose any position for regulation. The lever is fixed by screw on top of stem and not by side of stem, to avoid the lever getting loose by operation or vibrations. For safety, the hand lever can be locked in position by bolt/nut or a locker.



Size	D	H	L	W	Stem drive	[kg]
DN40-DN80	53	23	195	60	F05 - 11×11	0.8
DN100-DN125	77	30	267	73	F07 - 14×14	1.2
DN150	77	30	267	73	F07 - 17×17	1.2
DN200-DN250	75	30	330	99	F10 - 22X22	1.6

Gear box dimensions

Fig.520

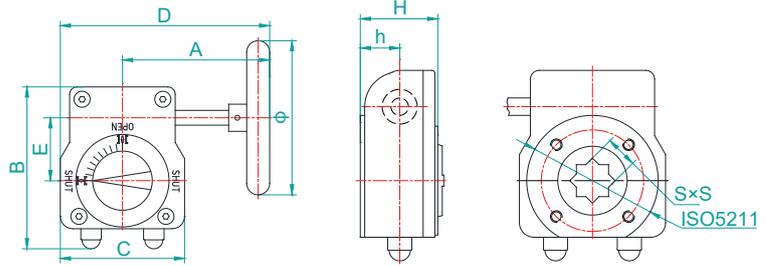


Fig.521

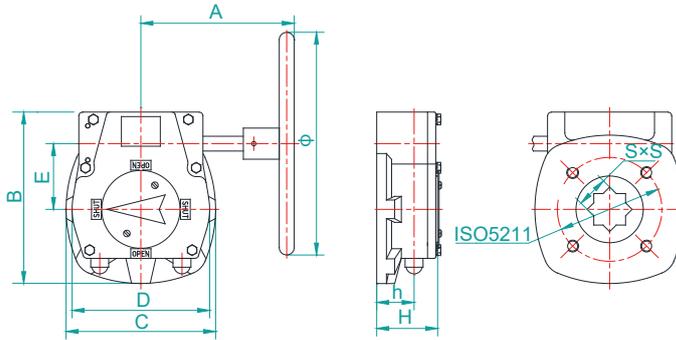


Fig.521

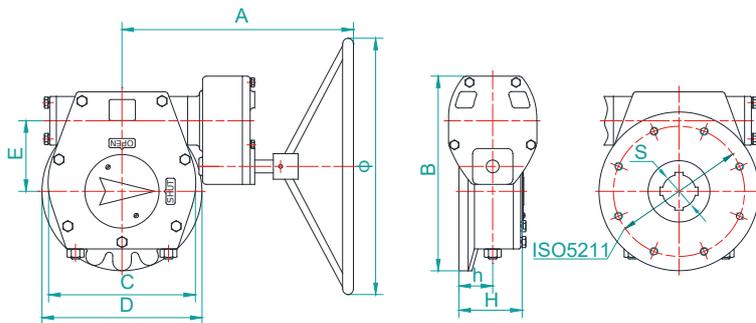


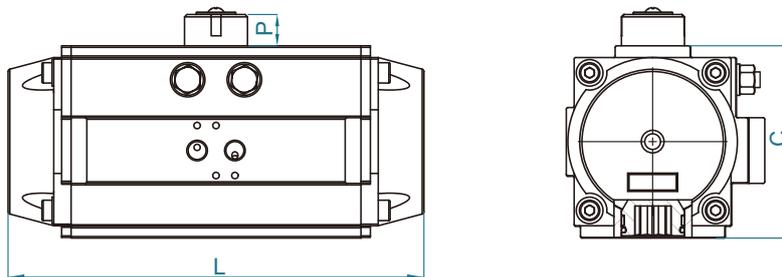
Fig.223/224 Size	Gear Box Model	Output [Nm]	Ratio	Input [Nm]	A	B	C	D	E	Φ	h	H	ISO5211	S	[kg]	Material
DN25/32	520-10S	150	40:1	13	115	114	80	155	40	125	24	49	F05+F07	9 x 9	1.3	Housing: Aluminium
11 x 11																
14 x 14																
DN100-DN125	520-10AS	250	40:1	25	178	114	80	218	40	200	26	52	F05+F07	17 x 17	1.7	Input shaft: SS410
DN200-DN250	520-15S	500	37:1	50	200	132	100	250	50	250	30	60	F07+F10	22 x 22	3.1	Gear: Ductile iron
DN300														27 x 27		
DN350	521-MX12	1200	42:1	125	210	184	134	-	70	300	38	68.5	F10+F12, F10+F14	27 x 27	8	Housing: Cast iron
DN400																
DN450	521-MX15	2800	70:1	185	302	252	210	-	105	500	66	98.5	F12+F16, F14	36 x 36	19	Housing: Cast iron
DN500														46 x 46		
DN600	521-MX16	4000	88:1	200	325	330	300	-	130	500	56	98.5	F16+F25	46 x 46	33	Housing: Cast iron
DN700-DN750	521-M36	8000	210:1	180	448	380	286	310	138	500	73	130	F25	φ _{max} 85	66	Worm shaft: SS410
DN800-DN900	521-M50S	11000	250:1	180	480	446	355	355	181	500	80	160	F25	φ _{max} 110	109	
DN1000	521-M50	16000	612:1	190	555	440	355	355	181	600	80	160	F30	φ _{max} 110	122	Gear: Ductile iron
DN1100	521-M60	24000	720:1	220	616	528	463	415	237	700	82	165	F30	φ _{max} 160	188	
DN1200	521-M65	35000	882:1	230	648	572	558	415	282	700	84	172	F30	φ _{max} 160	255	Gear: Ductile iron
DN1400																
DN1800	521-M70	50000	1242:1	200	686	657	610	475	309	700	107	225	F35	φ _{max} 160	310	Gear: Ductile iron
DN1800																
DN2000	521-M75	70000	1430:1	240	706	697	692	475	349	700	110	231	F40	φ _{max} 180	440	

Notes:

- Gearbox sizing is based on the torque of Fig. 223/224 valves with EPDM-H, EPDM, NBR, or FPM seats under standard pressure. Seats such as FDA-EPDM or PTFE require higher torque (see page 10 for values at different materials and pressure ratings).
- Standard gearbox is supplied with C3 painting. For other materials or painting requirements, contact Coreline.

Fig.540N/541N pneumatic actuator sizing - 6bar air supply

Fig.540N/541N Rack & pinion pneumatic actuators



Sizing - Fig.540N Air/Air

Fig.223/224		Sizing - Fig.540N Air/Air [6bar air supply]							
Size	Torque [Nm]	Size	Output torque [Nm]	ISO5211	Stem drive	C [mm]	P [mm]	L [mm]	[kg]
DN40	11	50	22.6	F03+F05	11×11	70	20	151	1.08
DN50	12	50	22.6	F03+F05	11×11	70	20	151	1.08
DN65	18	65	45.9	F03+F05+F07	11×11	89	20	168	1.91
DN80	26	65	45.9	F03+F05+F07	11×11	89	20	168	1.91
DN100	38	75	60.4	F05+F07	14×14	100	20	182	2.41
DN125	57	85	98.1	F05+F07	14×14	113	20	210	3.32
DN150	105	95	147	F05+F07	17×17	123	20	261.8	4.98
DN200	200	125	318.1	F07+F10	22×22	159	30	320	10.24
DN250	280	140	526.4	F10+F12	22×22	178	30	401	15.1
DN300	340	140	526.4	F10+F12	27×27	178	30	401	15.1
DN350	600	160	802.2	F10+F12	27×27	200	30	459	21.3
DN400	800	190	1212	F10+F14	27×27	232	30	495	29.3
DN450	1200	210	1579.4	F14	36×36	255	30	529	37.7
DN500	2200	270	3524.6	F16	46×46	331	30	737	82
DN600	2800	300	4128.8	F16	46×46	354	30	784	108

Sizing - Fig.541N Air/Spring

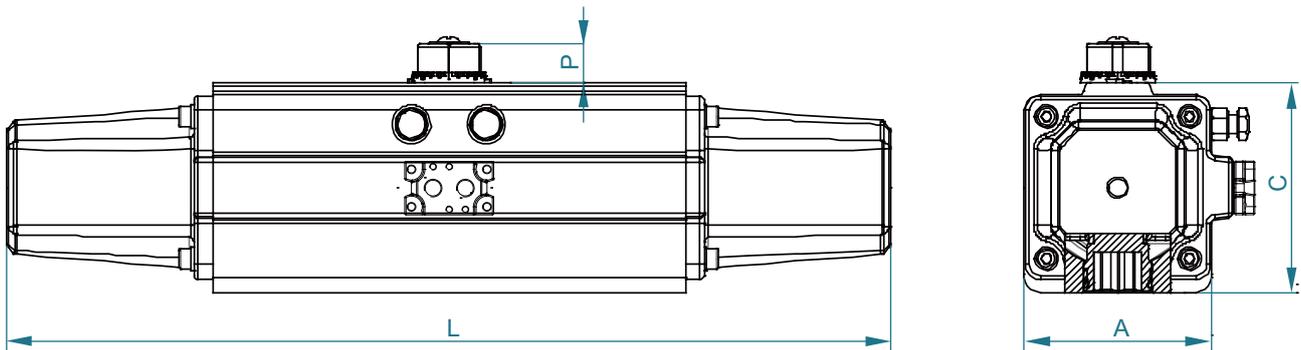
Fig.224/224		Sizing - Fig.541N Air/Spring [6bar air supply]								
Size	Torque /Nm	Size	Torque air /Nm 0° - 90°	Torque spring /Nm 90° - 0°	ISO5211	Stem	C /mm	P /mm	L /mm	[kg]
DN40	11	65 S12	28.6 - 19	26.9 - 17.3	F03+F05+F07	11×11	89	20	168	2.21
DN50	12	65 S12	28.6 - 19	26.9 - 17.3	F03+F05+F07	11×11	89	20	168	2.21
DN65	18	85 S12	62.1 - 35.7	62.4 - 36	F05+F07	11×11	113	20	210	4.26
DN80	26	85 S12	62.1 - 35.7	62.4 - 36	F05+F07	11×11	113	20	210	4.26
DN100	38	95 S12	88.2 - 58.9	88.1 - 58.8	F05+F07	14×14	123	20	261.8	5.86
DN125	57	110 S12	116.5 - 68	131.5 - 83	F07+F10	14×14	136	20	285.2	7.17
DN150	105	125 S12	188.5 - 129.5	188.6 - 129.6	F07+F10	17×17	159	30	320	12.54
DN200	200	160 S12	455.9 - 275.2	527 - 346.3	F10+F12	22×22	200	30	459	23.75
DN250	280	190 S12	741.6 - 468	744 - 470.4	F10+F14	22×22	232	30	495	33.81
DN300	340	190 S12	741.6 - 468	744 - 470.4	F10+F14	27×27	232	30	495	33.81
DN350	600	240 S12	1423.1 - 897.3	1423.4 - 897.6	F12+F16	27×27	292	30	618	77.76
DN400	800	270 S12	2047.2 - 1477.9	2046.7 - 1477.4	F14	27×27	331	30	737	90.6
DN450	1200	270 S12	2047.2 - 1477.9	2046.7 - 1477.4	F14	36×36	331	30	737	90.6

Notes:

- 1) Please consider a safe factor of 1.2~1.3 on the given torque values for the sizing; torque values given are for EPDM-H seats.
- 2) The sizing of actuator to valve dimension are calculated on standard working conditions for Fig.223/224 butterfly valves.
- 3) The actuators can also be delivered to other kind of quarter turn valves.

Fig.544 scotch yoke pneumatic actuator sizing - 6bar air supply

Fig.544 Scotch yoke pneumatic actuators



Sizing - Fig.544 Air/air (Double acting)

Fig.223/224		Sizing - Fig.544 Double acting				Fig.544 Double acting - Dimensions [mm]					
Size	1) Torque [Nm]	Model	Output torque [Nm] - Air supply 6bar			ISO5211	Stem drive	P	A	C	L [DA]
			0	45°	90°						
DN125	57	544100DA	121.8	60.9	121.8	F05+F07	14×14	20	78	89	228
DN150	105	544150DA	184.7	92.4	184.7	F05+F07	14×14	20	88	100	258
DN200	200	544250DA	283.6	141.8	283.6	F07+F10	17×17	20	100	113	301
DN250	280	544350DA	397.6	198.8	397.6	F07+F10	22×22	20	110	123	340
DN300	340	544450DA	529.9	265	529.9	F10+F12	22×22	20	120	136	366
DN350	600	544800DA	951.3	475.7	951.3	F10+F12	22×22	30	142	159	450
DN400	800	5441000DA	1287.5	643.75	1287.5	F14	36×36	30	160	178	483
DN450	1200	5441500DA	1853	926.5	1853	F14	36×36	30	180	200	563
DN500	2200	5443000DA	3675.6	1837.8	3675.6	F16	46×46	30	230	250	697

Sizing - Fig.544 Air/spring (Spring return)

Fig.223/224		Sizing - Fig.544 Spring return							Fig.544 Spring return - Dimensions [mm]					
Size	1) Torque [Nm]	Model	Air torque [Nm] - Air supply 6bar			Spring torque [Nm]			ISO5211	Stem drive	P	A	C	L [SR]
			0	45°	90°	0	45°	90°						
DN100	38	544100SR3	71.7	30.5	50.2	50.2	30.5	71.7	F05+F07	14×14	20	78	89	360
DN125	57	544150SR3	127.8	54.3	89.4	76.1	46.2	108.7	F05+F07	14×14	20	88	100	398
DN150	105	544350SR3	234	99.5	163.9	163.6	99.4	233.8	F07+F10	22×22	20	110	123	521
DN200	200	544800SR3	559.6	237.8	391.7	391.7	237.8	559.6	F10+F12	22×22	30	142	159	677
DN250	280	544800SR3	559.6	237.8	391.7	391.7	237.8	559.6	F10+F12	22×22	30	142	159	677
DN300	340	5441000SR3	757.4	321.9	530.2	530.2	321.9	757.4	F14, F12	36×36	30	160	178	769
DN350	600	5441500SR3	1090	463.3	763	763	463.3	1090	F14	36×36	30	180	200	880
DN400	800	5442000SR3	1482.9	635	1057.3	960	586.4	1385.6	F14	36×36	30	202	222	895
DN450	1200	5443000SR3	2162	918.8	1513.3	1513.5	918.9	2162.2	F16	46×46	30	230	250	1080

1) Please consider a safe factor of 1.2~1.3 on the given torque values for the sizing; torque values given are for EPDM-H seats. The sizing of actuator to valve dimension are calculated on standard working conditions for Fig.223/224 butterfly valves. The actuators can also be delivered to other kind of quarter turn valves.

Fig.545 scotch yoke pneumatic actuator sizing - 6bar air supply

Fig.545 Scotch yoke pneumatic actuators

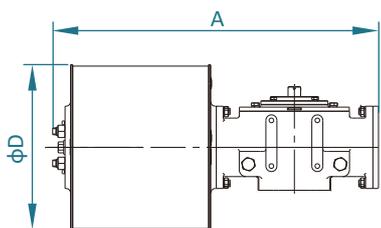


Fig.545 Air/air (Double acting)

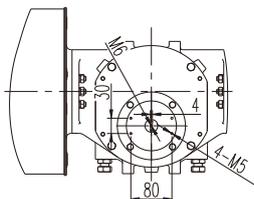


Fig.545 Air/spring (Spring return)

Sizing - Fig.545 Air/air (Double acting)

Fig.223/224			Sizing - Fig.545 Double acting					
Size	ISO5211	1) Torque [Nm]	Model	Output torque [Nm] - Air supply 6bar		ISO5211	A [mm]	D [mm]
				Start/End	Run			
DN450	F14+F16	1200	545-1-200	2,132	1,125	F14	658	223
DN500	F14+F16	2200	545-1-250	3,403	1,796	F14	658	280
DN600	F16+F25	2800	545-2-250	4,197	2,216	F16	709	280
DN700	F25	3900	545-2-300	6,065	3,201	F16, F25	709	332
DN750	F25	5300	545-3-300	7,294	3,850	F25	828	332
DN800	F25	7300	545-3-350	8,746	4,616	F25	828	362
DN900	F25	8300	545-3-400	11,543	6,092	F25	828	413
DN1000	F30	12000	545-4-500	22,154	11,692	F30	982	514
DN1100	F30	16000	545-4-500	22,154	11,692	F30	982	514
DN1200	F30	21000	545-5-500	28,718	15,157	F35, F30	1217	514
DN1400	F35	25000	545-5-600	41,563	21,936	F35	1217	616
DN1600	F35	34000	545-5-600	41,563	21,936	F35	1217	616
DN1800	F40	38000	545-6-600	50,766	26,793	F40	1536	616
DN2000	F40	40000	545-6-600	50,766	26,793	F40	1536	616

Sizing - Fig.545 Air/spring (Spring return)

Fig.223/224			Sizing - Fig.545 Spring return									
Size	ISO5211	Torque [Nm]	Model	Air torque [Nm] - Air supply 6bar			Spring torque [Nm]			ISO5211	A [mm]	D [mm]
				0	45°	90°	0	45°	90°			
DN300	F10+F12	340	545-1-200-SR4	1441	732	1333	718	353	619	F14, F12	1370	220
DN350	F12+F14	600	545-1-200-SR3	875	410	678	1313	645	1132	F14	1370	220
DN400	F12+F14	800	545-1-200-SR3	875	410	678	1313	645	1132	F14	1370	220
DN450	F14+F16	1200	545-1-250-SR1	1800	870	1496	1743	847	1465	F14	1370	220
DN500	F14+F16	2200	545-2-300-SR1	3025	1355	2111	3614	1687	2778	F16	1440	274
DN600	F16+F25	2800	545-3-300-SR2	3273	1404	2047	4795	2235	3675	F25	1600	327
DN700	F25	3900	545-3-350-SR1	3530	1444	1941	6219	2899	4767	F25	1600	327
DN750	F25	5300	545-4-400-SR3	6781	2790	3791	9336	4206	6603	F30, F25	1932	408
DN800	F25	7300	545-4-500-SR1	12099	5404	8381	12586	5746	9189	F30, F25	1932	408
DN900	F25	8300	545-5-500-SR4	16572	6887	9527	17538	7557	11100	F35, F25	2275	508
DN1000	F30	12000	545-5-600-SR2	24699	10009	13230	25892	10899	15411	F35, F30	2275	508
DN1100	F30	16000	545-6-600-SR4	27413	10639	12904	34600	14762	21341	F40, F30	2702	682
DN1200	F30	21000	545-6-700-SR2	40065	15448	18475	49840	21098	30110	F40, F30	2702	682
DN1400	F35	25000	545-6-700-SR2	40065	15448	18475	49840	21098	30110	F40, F35	2702	682
DN1600	F35	34000	545-7-700-SR3	42117	17523	24286	57016	25792	40721	F48, F35	3590	682
DN1800	F40	38000	545-7-900-SR2	91966	42979	70902	67109	30339	47859	F48, F40	3590	682
DN2000	F40	40000	545-7-900-SR1	82619	35832	53163	83319	36871	56401	F48, F40	3590	682

1) Please consider a safe factor of 1.2~1.3 on the given torque values for the sizing; torque values given are for EPDM-H seats. The sizing of actuator to valve dimension are calculated on standard working conditions for Fig.223/224 butterfly valves. The actuators can also be delivered to other kind of quarter turn valves.

Fig.555/556 electrical actuator sizing

Fig.555/556 electrical actuators



Fig.556 Electrical actuators



Fig.555 Electrical actuators

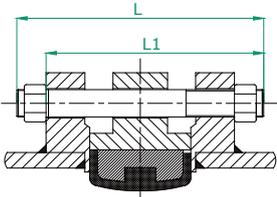
Sizing - Fig.555/556 electrical actuators

Fig.223/224				Sizing - Fig.555/556				
Size	ISO5211	Drive shaft	¹⁾ Torque [Nm]	Model	Output torque [Nm]	Drive shaft	ISO5211	Weight [kg]
DN25/32	F05	11×11	11	556-005	50	14×14	F05+F07	3.6
DN40	F05	11×11	11	556-005	50	14×14	F05+F07	3.6
DN50	F05	11×11	12	556-005	50	14×14	F05+F07	3.6
DN65	F05	11×11	18	556-005	50	14×14	F05+F07	3.6
DN80	F05	11×11	26	556-005	50	14×14	F05+F07	3.6
DN100	F05+F07	14×14	38	556-008	80	14×14	F05+F07	4.6
DN125	F07	14×14	57	556-010	100	14×14	F05+F07	13
DN150	F07	17×17	105	555-015	150	17×17	F07+F10	17.3
DN200	F10	22×22	200	555-030	300	17×17	F10+F12	22
DN250	F10	22×22	280	555-050	500	22×22	F10+F12	23
DN300	F10+F12	27×27	340	555-050	500	27×27	F10+F12	23
DN350	F12+F14	27×27	600	555-080	800	27×27	F12+F14	29
DN400	F12+F14	27×27	800	555-120	1200	27×27	F12+F14	29
DN450	F14+F16	36×36	1200	555-200	2000	36×36	F14+F16	83
DN500	F14+F16	46×46	2200	555-300	3000	46×46	F14+F16	83
DN600	F16+F25	46×46	2800	555-400	4000	46×46	F16+F25	83

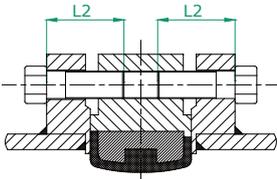
1) Please consider a safe factor of 1.2~1.3 on the given torque values for the sizing; torque values given are for EPDM-H seats. The sizing of actuator to valve dimension are calculated on standard working conditions for Fig.223/224 butterfly valves. The actuators can also be delivered to other kind of quarter turn valves.

Bolt quantity and length for valve installation

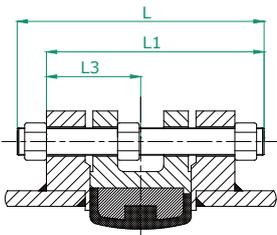
223 DN40-DN2000



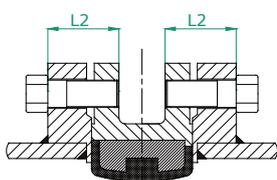
224 DN40-DN600



224 DN700-DN2000 Type 1 Connection



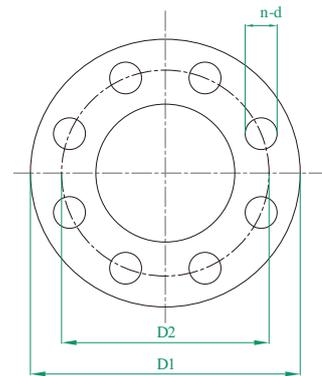
224 DN700-DN2000 Type 2 Connection



DN	Flange	Wafer type connection				Lug type connection		
		Bolt Dia.	Qty of bolts	L	L1	Qty of bolts	L2	L3
40	PN10	M16	4	135	115	4x2	35	
	ANSI150	1/2" - 10 UNC	4	120	100	4x2	35	
50	PN10	M16	4	145	125	4x2	40	
	ANSI150	5/8" - 11 UNC	4	130	110	4x2	40	
65	PN10	M16	4	150	130	4x2	40	
	ANSI150	5/8" - 11 UNC	4	140	120	4x2	45	
80	PN10	M16	8	150	130	8x2	40	
	ANSI150	5/8" - 11 UNC	4	145	125	4x2	45	
100	PN10	M16	8	160	140	8x2	45	
	ANSI150	5/8" - 11 UNC	8	150	130	8x2	45	
125	PN10	M16	8	165	145	8x2	50	
	ANSI150	3/4" - 10 UNC	8	155	130	8x2	50	
150	PN10	M20	8	175	150	8x2	50	
	ANSI150	3/4" - 10 UNC	8	160	135	8x2	50	
200	PN10	M20	8	180	155	8x2	55	
	PN16	M20	12	185	160	12x2	55	
250	ANSI150	3/4" - 10 UNC	8	170	145	8x2	55	
	PN10	M20	12	200	175	12x2	60	
300	PN16	M24	12	210	185	12x2	60	
	ANSI150	7/8" - 9 UNC	12	190	165	12x2	60	
350	PN10	M20	12	210	185	12x2	65	
	PN16	M24	12	230	200	12x2	65	
400	ANSI150	7/8" - 9 UNC	12	200	175	12x2	60	
	PN10	M20	16	215	190	16x2	65	
450	PN16	M24	16	240	210	16x2	65	
	ANSI150	1" - 8 UNC	12	220	190	12x2	65	
500	PN10	M24	16	255	230	16x2	75	
	PN16	M27	16	280	250	16x2	75	
600	ANSI150	1" - 8 UNC	16	245	215	16x2	80	
	PN10	M24	20	275	245	20x2	80	
700	PN16	M27	20	310	280	20x2	80	
	ANSI150	1 1/8"-7UNC	16	265	235	16x2	80	
800	PN10	M24	20	295	260	20x2	85	
	PN16	M30	20	335	300	20x2	90	
900	ANSI150	1 1/8"-7UNC	20	285	250	20x2	90	
	PN10	M27	20	310	280	20x2	100	
1000	PN16	M33	20	385	350	20x2	100	
	ANSI150	1 1/4"-7UNC	20	335	300	20x2	110	
1200	PN10	M27	24	335	300	24x2	100	130
	PN16	M33	24	370	330	24x2	115	150
1400	ANSI150	1 1/4"-7UNC	28	385	345	28x2	120	160
	PN10	M30	24	375	340	24x2	115	150
1600	PN16	M36	24	425	380	24x2	130	175
	ANSI150	1 1/2"-6UNC	28	440	395	28x2	135	185
1800	PN10	M30	28	400	365	28x2	115	155
	PN16	M36	28	455	410	28x2	135	185
2000	ANSI150	1 1/2"-6UNC	32	475	430	32x2	145	195
	PN10	M33	28	435	395	28x2	125	165
2200	PN16	M39	28	485	440	28x2	145	190
	ANSI150	1 1/2"-6 UNC	36	485	440	36x2	145	190
2400	PN10	M36	32	505	365	32x2	145	195
	PN16	M45	32	505	460	32x2	145	195
2600	ANSI150	1 1/2" -6UNC	44	560	515	44x2	170	220
	PN10	M39	36	500	455	36x2	120	175
2800	PN16	M45	36	545	495	36x2	140	195
	ANSI150	1 3/4" -5UNC	48	620	575	48x2	180	235
3000	PN10	M45	40	565	515	40x2	135	190
	PN16	M52	40	630	575	40x2	160	220
3200	ANSI150	1 3/4" -5UNC	52	565	515	52x2	135	190
	PN10	M45	44	620	575	44x2	150	205
3400	PN16	M52	44	685	630	44x2	175	230
	ANSI150	1 3/4" -5UNC	60	620	575	60x2	150	205
3600	PN10	M45	48	680	635	48x2	160	215
	PN16	M56	48	770	710	48x2	190	250
3800	ANSI150	2" - 4.5UNC	64	680	635	64x2	160	215

Mating flange dimensions

- ISO 7005/1/2/3 PN6,10,16,20 Metallic Flanges
- DIN2501 PN6,10,16 Flanges, Mating Dimensions
- BS4504 PN6,10,16 Flanges and Bolting, Metric Series
- ANSI B16.5 CLASS150 Pipe Flanges and Flanged Fittings
- MSSSP44 Class150 Steel Pipeline Flanges
- BS10 Flanges and Bolting for Pipes, Valves and Fittings
- API605 CLASS150 Large Diameter Carbon Steel Flanges
- JISB2211 JIS 5K Basic Dimensions of 5bar Ferrous Materials Pipe Flanges
- JISB2212 JIS 10K Basic dimensions of 10bar Ferrous Materials Pipe Flanges
- JISB2213 JIS 16K Basic dimensions of 16bar Ferrous Materials Pipe Flanges

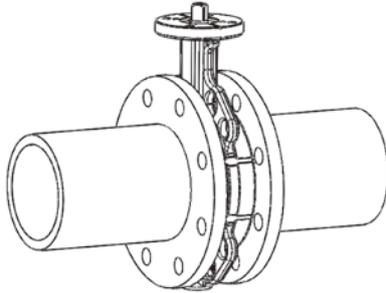


Size		PN6 (cast iron)					PN 10 (cas tiron)					PN 16 (cas tiron)					PN20					ANSI Class150					MSS/BS. Class150						
DN	NPS	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n		
40	1 1/2"	130	110	14	M12	4	150	110	18	M16	4	150	110	18	M16	4	130	98.5	16	M14	4	127	98.5	15.9	1/2	4							
50	2"	140	110	14	M12	4	165	125	19	M16	4	165	125	19	M16	4	150	120.5	18	M16	4	152	120.6	19.1	5/8	4							
65	2.5"	160	130	14	M12	4	185	145	19	M16	4	185	145	19	M16	4	180	139.5	18	M16	4	178	139.7	19.1	5/8	4							
80	3"	190	150	19	M16	4	200	160	19	M16	8	200	160	19	M16	8	190	152.5	18	M16	4	191	152.4	19.1	5/8	4							
100	4"	210	170	19	M16	4	220	180	19	M16	8	220	180	19	M16	8	230	190.5	18	M16	8	229	190.5	19.1	5/8	8							
125	5"	240	200	19	M16	8	250	210	19	M16	8	250	210	19	M16	8	255	216.0	22	M20	8	254	215.9	22.4	3/4	8							
150	6"	265	225	19	M16	8	285	240	23	M20	8	285	240	23	M20	8	280	241.5	22	M20	8	279	241.3	22.4	3/4	8							
200	8"	320	280	19	M16	8	340	295	23	M20	8	340	295	23	M20	12	345	298.5	22	M20	8	343	298.5	22.4	3/4	8							
250	10"	375	335	19	M16	12	395	350	23	M20	12	400	355	28	M24	12	405	362.0	26	M24	12	406	362.0	25.4	7/8	12							
300	12"	440	395	23	M20	12	445	400	23	M20	12	455	410	28	M24	12	485	432.0	26	M24	12	483	431.8	25.4	7/8	12	483	432	25	7/8	12		
350	14"	490	445	23	M20	12	505	460	23	M20	16	520	470	28	M24	16	535	476.0	29.5	M27	12	533	476.3	28.5	1	12	535	476	29	1	12		
400	16"	540	495	23	M20	16	565	515	28	M24	16	580	525	31	M27	16	600	540.0	29.5	M27	16	597	539.8	28.5	1	16	595	540	29	1	16		
450	18"	595	550	23	M20	16	615	565	28	M24	20	640	585	31	M27	20	635	578.0	32.5	M30	16	635	577.9	31.8	1 1/8	16	635	578	32	1 1/8	16		
500	20"	645	600	23	M20	20	670	620	28	M24	20	715	650	34	M30	20	700	635.0	32.5	M30	20	699	635.0	31.8	1 1/8	20	700	635	32	1 1/8	20		
600	24"	755	705	26	M24	20	780	725	31	M27	20	840	770	37	M33	20	815	749.5	32.5	M33	20	813	749.3	31.1	1 1/4	20	815	749	35	1 1/4	20		
700	28"	860	810	26	M24	24	895	840	31	M27	24	910	840	37	M33	24																	
750	30"	920	865	31	M27	24	965	900	34	M30	24	970	900	37	M33	24																	
800	32"	975	920	31	M27	24	1015	950	34	M30	24	1025	950	40	M36	24																	
900	36"	1075	1020	31	M27	24	1115	1050	34	M30	28	1125	1050	40	M36	28																	
1000	40"	1175	1120	31	M27	28	1230	1160	37	M33	28	1255	1170	43	M39	28																	
1100	44"	1305	1240	34	M30	32	1340	1270	37	M33	32	1355	1270	43	M39	32																	
1200	48"	1405	1340	34	M30	32	1455	1380	40	M36	32	1485	1390	49	M45	32																	

It should be noted that the diameters of the bolt holes in steel and copper alloy flanges are different from cast iron flanges.

Size		BS TABLE D					BS TABLE E					JIS 5K					JIS 10K					JIS 16K									
DN	NPS	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n	D1	D2	d	Bolt	n
40	1 1/2"	133.4	98.4	15.9	1/2	4	133.4	98.4	15.9	1/2	4	120	95	15	M12	4	140	105	19	M16	4	140	105	19	M16	4	140	105	19	M16	4
50	2"	152.4	114.3	19.1	5/8	4	152.4	114.3	19.1	5/8	4	130	105	15	M12	4	155	120	19	M16	4	155	120	19	M16	8	155	120	19	M16	8
65	2.5"	165.1	127.0	19.1	5/8	4	165.1	127.0	19.1	5/8	4	155	130	15	M12	4	175	140	19	M16	4	175	140	19	M16	8	175	140	19	M16	8
80	3"	184.2	146.1	19.1	5/8	4	184.2	146.1	19.1	5/8	4	180	145	19	M16	4	185	150	19	M16	8	200	160	19	M16	8	200	160	23	M20	8
100	4"	215.9	177.8	19.1	5/8	4	215.9	177.8	19.1	5/8	8	200	165	19	M16	8	210	175	19	M16	8	225	185	23	M20	8	225	185	23	M20	8
125	5"	254.0	209.6	19.1	5/8	8	254.0	209.6	19.1	5/8	8	235	200	19	M16	8	250	210	23	M20	8	270	225	25	M22	8	270	225	25	M22	8
150	6"	279.4	235.0	19.1	5/8	8	279.4	235.0	22.2	3/4	8	265	230	19	M16	8	280	240	23	M20	8	305	260	25	M22	12	305	260	25	M22	12
200	8"	336.6	292.1	19.1	5/8	8	336.6	292.1	22.2	3/4	8	320	280	23	M20	8	330	290	23	M20	12	350	305	25	M22	12	350	305	25	M22	12
250	10"	406.4	355.6	22.2	3/4	8	406.4	355.6	22.2	3/4	12	385	345	23	M20	12	400	355	25	M22	12	430	380	27	M24	12	430	380	27	M24	12
300	12"	457.2	406.4	22.2	3/4	12	457.2	406.4	25.4	7/8	12	430	390	23	M20	12	445	400	25	M22	16	480	430	27	M24	16	480	430	27	M24	16
350	14"	527.1	469.9	25.4	7/8	12	527.1	469.9	25.4	7/8	12	480	435	25	M22	12	490	445	25	M22	16	540	480	33	M30	16	540	480	33	M30	16
400	16"	577.9	520.7	25.4	7/8	12	577.9	520.7	25.4	7/8	12	540	495	25	M22	16	560	510	27	M24	16	605	540	33	M30	16	605	540	33	M30	16
450	18"	641.4	584.2	25.4	7/8	12	641.4	584.2	25.4	7/8	16	605	555	25	M22	16	620	565	27	M24	20	675	605	33	M30	20	675	605	33	M30	20
500	20"	704.9	641.4	25.4	7/8	16	704.9	641.4	25.4	7/8	16	655	605	25	M22	20	675	620	27	M24	20	730	660	33	M30	20	730	660	33	M30	20
600	24"	825.5	755.7	28.5	1	16	825.5	755.7	31.7	1 1/8	16	770	715	27	M24	20	795	730	33	M30	24	845	770	39	M36	24	845	770	39	M36	24
700	28"											875	820	27	M24	24	905	840	33	M30	24	960	875	42	M39	24	960	875	42	M39	24
750	30"	997.0	927.1	31.7	1 1/8	20	997.0	927.1	34.9	1 1/4	20	945	880	33	M30	24	970	900	33	M30	24	1020	935	42	M39	24	1020	935	42	M39	24
800	32"											995	930	33	M30	24	1020	950	33	M30	28	1085	990	48	M45	24	1085	990	48	M45	24
900	36"	1174.8	1092.2	34.9	1 1/4	24	1174.8	1092.2	34.9	1 1/4	24	1095	1030	33	M30	24	1120	1050	33	M30	28	1185	1090	48	M45	28	1185	1090	48	M45	28
1000	40"											1195	1130	33	M30	28	1235	1160	39	M36	28	1320	1210	56	M52	28	1320	1210	56	M52	28
1100	44"											1305	1240	33	M30	28	1345	1270	39	M36	28	1420	1310	56	M52	32	1420	1310	56	M52	32
1200	48"	1492.3	1409.7	34.9	1 1/4	32	1492.3	1409.7	38.1	1 3/8	32	1420	1350	33	M30	32	1465	1380	39	M36	32	1530	1420	56	M52	32	1530	1420	56	M52	32

Installation Guide



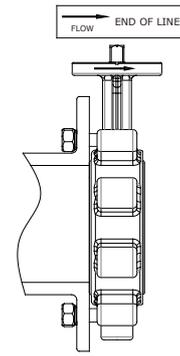
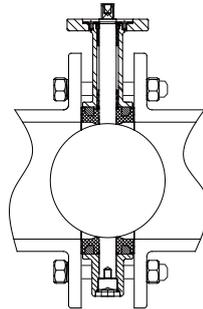
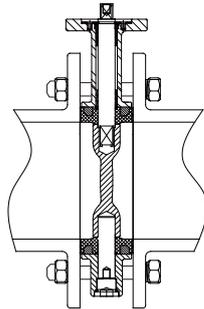
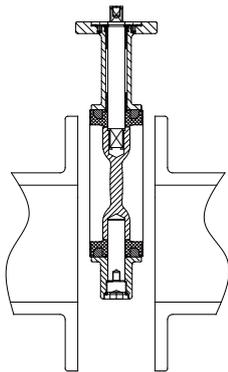
- Check that the specifications on the identification plate meet the requirements regarding pressure, temperature and media.
- The piping must have a straight line and the flanges have to be parallel. Furthermore there must be a distance between the flanges, corresponding to the face-to-face dimensions of the butterfly valve.
- The butterfly valve can be mounted in any direction. However if there are a lot of dirt particles on the bottom of the pipe, it will be suitable to mount the disc.
- Before commissioning, the pipework has to be rinsed out to remove dirt and remnants of welding material, to avoid damage on the liner. During the rinsing procedure, the butterfly valve has to be positioned as open and may not be operated before the rinsing has been completed.
- Welding operations may not be performed nearby the butterfly valve, as welding drops can damage the liner.
- Do not use gaskets. The liner works as sealing to the atmosphere.
- Where vacuum, high flow rate or water hammering can occur, flanges without a loose collar should be used, to obtain the best conditions.

Carefully place the butterfly valve between the flanges, with the disc in closed position.

Check that the flange covers the area of the liner. Afterwards tighten the bolt on the flange by hand.

Carefully open and close the valve to check that the disc centralizes and the disc does not touch the flange. With the disc in the open position, tighten crosswise with a wrench.

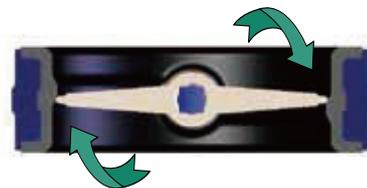
Ensure that 2240 lug butterfly valve is installed in proper flow direction for end of pipe service: the flow arrow direction on valve nameplate or body should be in accordance with the flow direction of medium.



As the butterfly valves are equipped with the unique wave shaped liner, the operation of the valves, either free stem, handle or gear operated, has to follow the guidelines as shown below.



A small triangular shaped figure is placed on the liner, this triangle indicates which way the disc opening. Turn disc Anticlockwise towards arrow to open



Turn Clockwise to close the valve, the valve sealing in the area of -2° to 2° range. If lower torque necessary, stop the disc to the 2° to 0° range; If tighter sealing necessary, stop the disc to the 0° to -2° range.

The content or parameters are indicative and can be changed without any notice.

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