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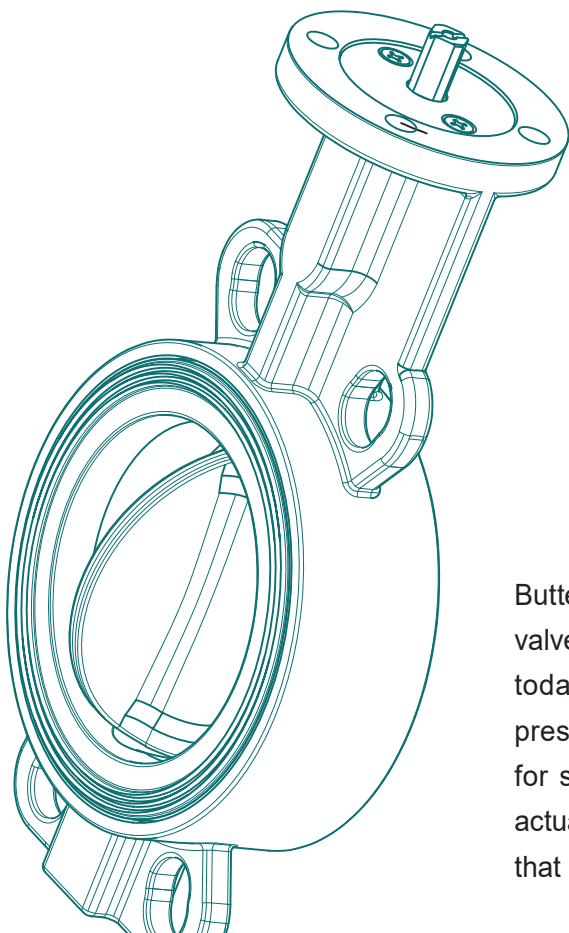
# WEARSTAR Butterfly Valves



Centric Butterfly Valves  
Series A31/A32 Wafer/Lug  
for Wear Resistant and Abrasive service

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Butterfly valves are one of the fastest growing types of control valves today for a number of reasons. The control provided by today's butterfly valve is more than adequate for many low-pressure-drop applications and other standard services. Size for size, larger flow coefficient, less frictional forces, smaller actuator, naturally high pressure-recovery factor, all these mean that butterfly valves are preferred in applications.




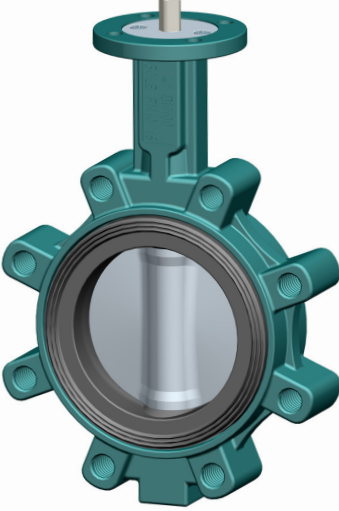
ABC valve focuses on Automatic Butterfly valve Control. Manufacturing systems and products are certified by ISO9001, BV Marine, PED CE, FDA, DVGW, WRAS, KTW, Fire Test Certification. These create good conditions for us to service customers worldwide with ABC high quality products at competitive price.



# General information

Series A31 & A32 Abrasion resistant centric butterfly valves feature a lock type seat, spherical sealing surface disc and strong stem-to-disc connection for easy use in many industrial applications especially **Mining Industry, dry bulk conveying, paper mills, and all users of Slurry and High Abrasion applications.**

With the field replaceable seat fully isolating the body and shaft from the media, and the heavy duty construction **for severe vacuum up to 285 psi, the valves are also widely used in food and beverage processing, vacuum desulphurization plants, shipbuilding, HVAC, etc.**

Series	A31 Wafer centric butterfly valve	A32 Lug centric butterfly valve
Picture		
Connection	Wafer	Lug
Nominal diameter	DN50-DN1600	
Max. working pressure	Up to 20bar	
Standard working pressure	Full vacuum to 16bar for DN50-DN200, Full vacuum to 10bar for DN250-DN2000	
Flange accommodation	EN1092 PN10/16, ASME B16.5 Class150	
Face to face	EN558 Series 20, API 609 Table 1	
Top flange	ISO 5211	
Tightness check	ISO 5208 Category 3, API 598 Table 5	
Temperature range	-40°C to +200°C (Depending on pressure, medium and material)	
Operation	Hand level, gear box, pneumatic actuator, electric actuator	

# Features & Benefits

## A31 A32 Valve Design

Blow out proof shaft with position indication

ISO5211 top flange together with stem square suitable for direct mounting of actuators

Stem anti-blowout design keep safety in field use

Dirt-scraper prevents moisture penetrating into the shaft area

Extended valve neck allowing insulation

Body locating holes for proper installation and centering of the valve between flanges

The field replaceable seat fully isolates the body and shaft from the media. In addition the improved seat design provides elevated dead end shutoff performance

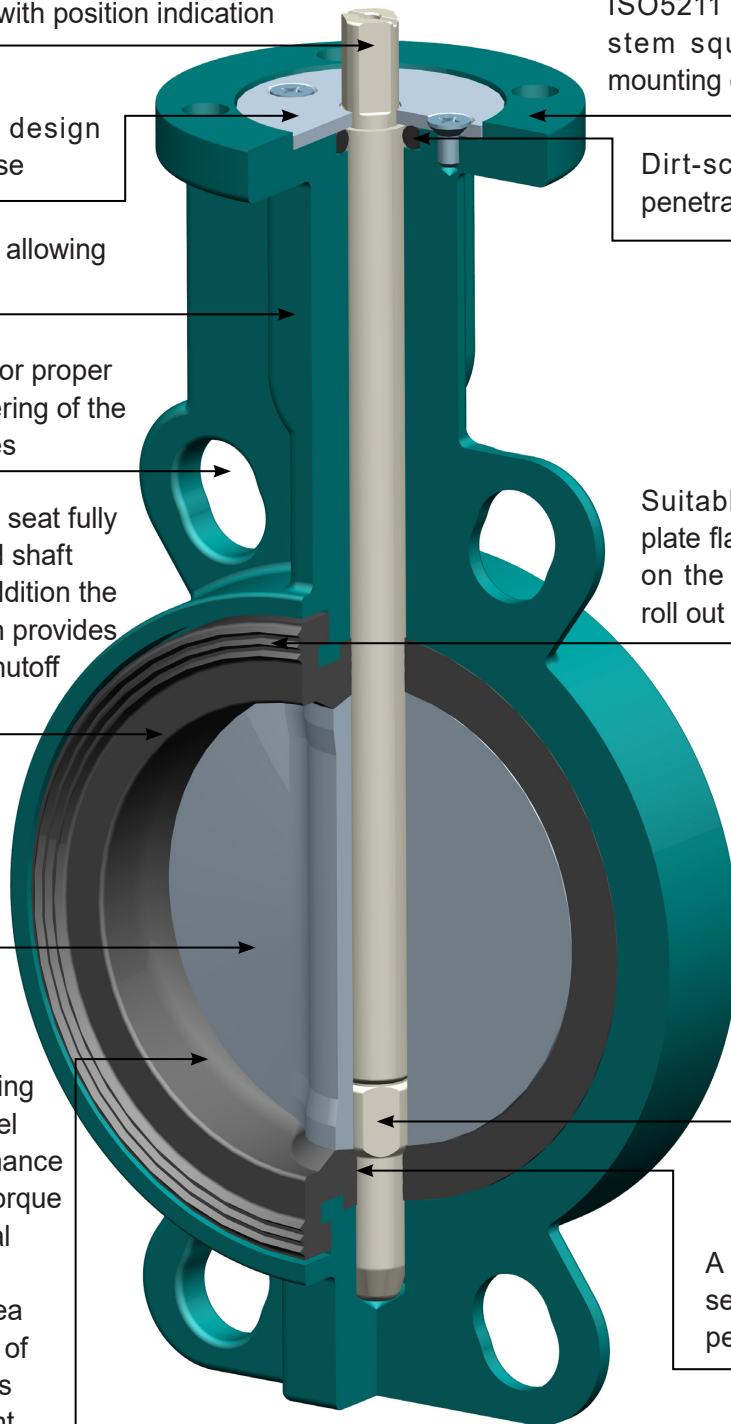
Suitable for slip-on flange and plate flanges. The sealing grooves on the tightening face eliminates roll out of seat

Thin disc stem for excellent flow characteristics and bi-directional shut off

High-strength through stem with close tolerance of square driving the disc fast and firmly, eliminates stem retention components being exposed to the media

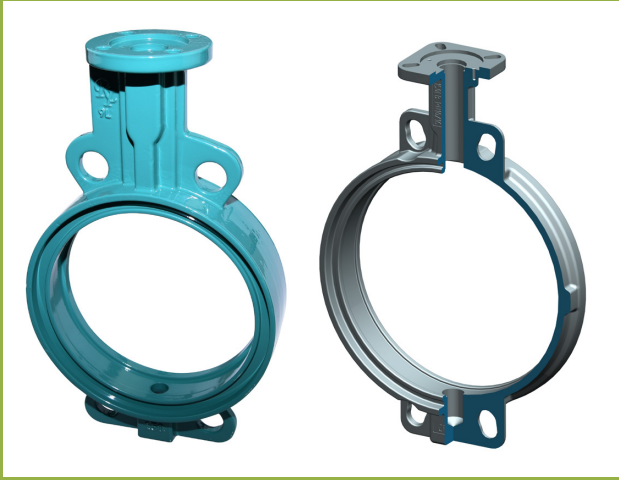
For rubber seat, calculated curve mating with disc closing travel allows better performance in reducing friction, torque and wear than normal design. For PU seat, cylindrical sealing area kept for convenience of production, also PU is enough wear resistant

A additional back seat O-ring secures increased valve performance



# Key Component Features

## Body



- System 1 powder epoxy coating, 250μ
- Types: Wafer, Lug
- Multi-standard alignment holes suitable for mounting flanges:  
EN1092 PN10,PN16, ANSI 150LB
- ISO 5211 top flange according to valve torque
- Extended valve neck allowing insulation
- Extra thickness for stability of performance

## Disc



- Thin disc stem for excellent flow characteristics and bi-directional shut off
- High strength disc design ensures the valve stand on high pressure up to 285 psi
- Spherically machined disc provides good sealing performance and extended life for rubber line

## Seat



- Easy seat replacement
- Fully isolates the body and shaft from the media
- Lock design of the seat provides elevated dead end shutoff performance
- Trouble-free mounting between flanges of both slip-on and plate type
- The sealing grooves on the tightening face eliminates roll out of seat and enhances lock of the liner, together with the lock construction, idea for full vacuum applications and high frequency open-close movement
- A unique dynamic wave line on rubber seat provides a highly efficient seal
- Reduced torque
- Extended sealing life span
- Making automation a very price competitive
- Unique composition PU liner of high abrasion resistance, high strength, high elasticity, high tear resistance, high impact resistance stand for all applications of slurry and dry bulk conveying

# Key Component Features

## Shaft



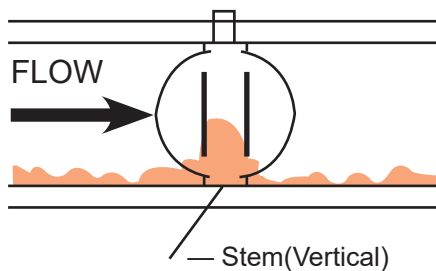
- ISO 5211 driving square with arrow indicating disc position
- High-strength through shaft for stable disc support
- Square connection of close tolerance driving the disc fast and firmly
- Nylon coating inside body stem hole as shaft bearing for cast iron body, RPTFE shaft bearing for stainless steel body

## Shaft Retainer and Seal



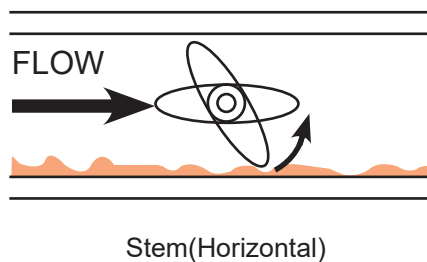
- Stainless steel retaining washer for blow out protection
- External shaft sealing under retaining washer for a third sealing to shaft and a dirt-scraper preventing moisture penetrating into shaft area

For slurries, sludge, mine tailing, pulp stock, dry cement, and media with sediment or particles, install the resilient seated valve with the stem in the horizontal position with the lower disc edge opening in the down stream direction.



### **INCORRECT INSTALLATION**

Sludge builds up on disc



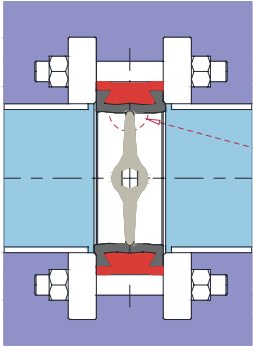
### **CORRECT INSTALLATION**

Sludge passes under disc

# Seat Design Comparing

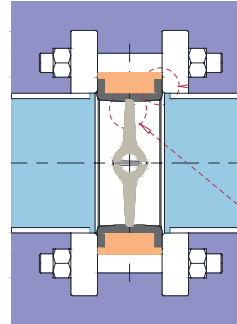
## Why WEARSTAR Seat Is the Preferred Choice for Shut off

### Conventional Booted Seat



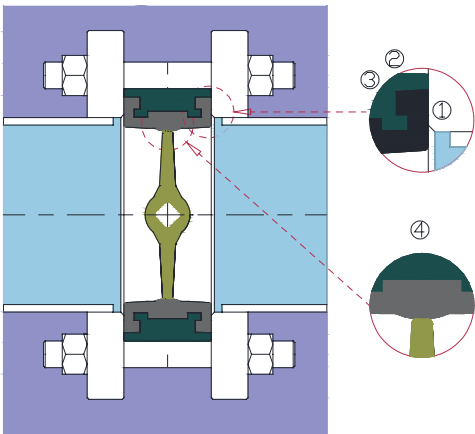
- ① Booted seat bulging around disc contact points, this making inside diameter of seating area distorted.
- ② Disc pressed into the liner and rubber wrapping around disc sealing surface, disc may stick together with rubber after long time closing, when disc opening, the rubber may be teared.

### Molded Seat



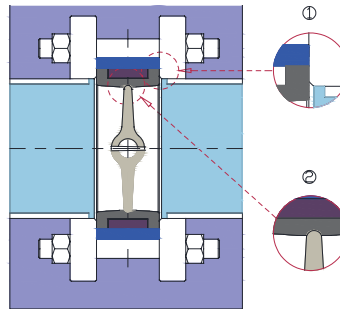
- ① Rubber may be squeezed between body and flange, this may damage valve seat.
- ② Disc pressed into the liner and rubber wrapping around disc sealing surface, disc may stick together with rubber after long time closing, when disc opening, the rubber may be teared.

### WEARSTAR Seat



- ① Sealing surface to flange is wide enough.
- ② When pressed by flange, there is space on the body groove for rubber expand, elasticity always kept alive.
- ③ Grooves inside body internal diameter and body face to face lock each other, together with sawtooth face against flange, keep the seat stably on position.
- ④ Cubical dynamic wave line designed for excellent sealing against disc. Sealing realizing by perfect contact of disc and seat.

### Cartridge Seat



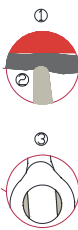
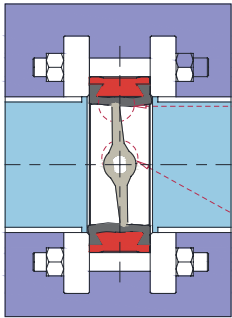
- ① Sealing width to flange is not enough, this may cause leakage between valve and flange if the valve installed slightly deviated from the correct position.
- ② Disc pressed into the liner and rubber wrapping around disc sealing surface, disc may stick together with rubber after long time closing, when disc opening, the rubber may be teared.

Feature	WEARSTAR Seat	Cartridge Seat	Molded Seat	Conventional Booted Seat
Replaceable	YES	YES	NO	YES
Vacuum Service	YES	YES	YES	NO
Dead End Service	YES	YES	YES	NO
Deformation Resistant	YES	YES	YES	NO
Plate flange suitable	YES	Conditional	YES	YES
Elasticity alive	YES	YES	NO	YES
Dynamic contact seating	YES	NO	NO	NO
Spherical disc machining	YES	NO	NO	NO

# Seat Design Comparing

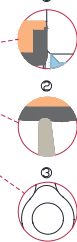
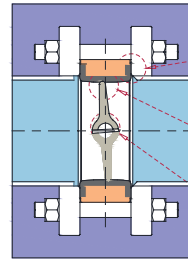
## Why WEARSTAR Seat Is the Preferred Choice for Regulating

### Conventional Booted Seat



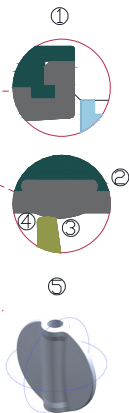
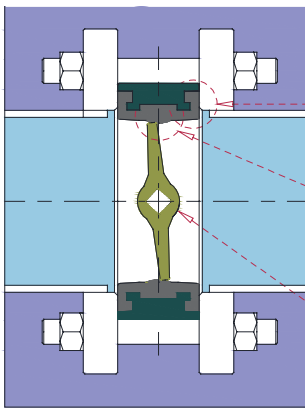
- ① Disc pulling up rubber when turning against the seat, this may cause damage to rubber or leakage.
- ② Disc sealing with liner by wipe into rubber, this causes rubber material wearing off during opening and closing.
- ③ Cross edge between circle and flat sealing surface on the disc may scratch rubber after many cycles.

### Molded Seat



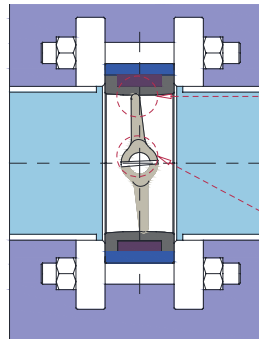
- ① No space for rubber expanding after pressing of disc, this may cause rubber not bounce back after closing.
- ② Disc sealing with liner by wipe into rubber, this causes rubber material wearing off during opening and closing.
- ③ Cross edge between circle and flat sealing surface on the disc may scratch rubber after many cycles.

### WEARSTAR Seat



- ① Rubber firmly kept in position by grooves locking.
- ② When pressed by disc, there is space inside body groove for rubber expand, elasticity always kept alive.
- ③ Cubical dynamic wave line sealing against disc by perfect contacting, brings better performance in reducing friction, torque and wear.
- ④ Calculated dynamic curve allows operating torque to be adjusted according to working pressure.
- ⑤ The machining of disc is spherically smooth and unhindered, valve life time is lengthened significantly.

### Cartridge Seat

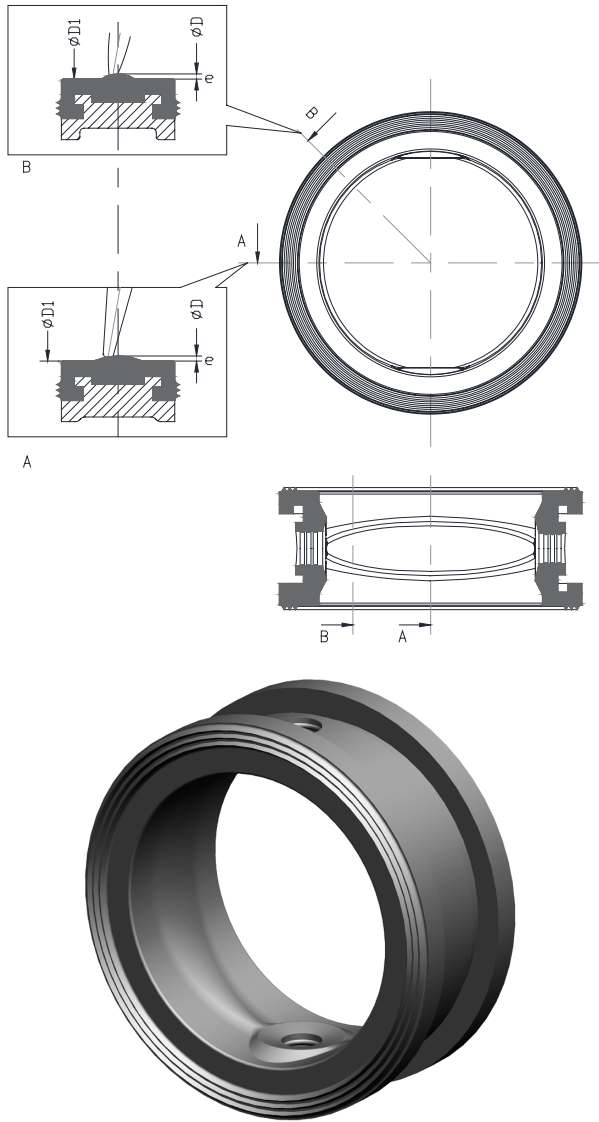


- ① Disc sealing with liner by wipe into rubber, this causes rubber material wearing off during opening and closing.
- ② Cross edge between circle and flat sealing surface on the disc may scratch rubber after many cycles.

Feature	WEARSTAR Seat	Cartridge Seat	Molded Seat	Conventional Booted Seat
Rubber Stability	YES	YES	YES	NO
Calculated Contact Seating	YES	NO	NO	NO
Rebound Resilience	YES	NO	NO	YES
Low Friction	YES	NO	NO	NO
Less Wear	YES	NO	NO	NO
Low Torque	YES	NO	NO	NO
Long Life Time	YES	NO	NO	NO
Torque Adjustable	YES	NO	NO	NO

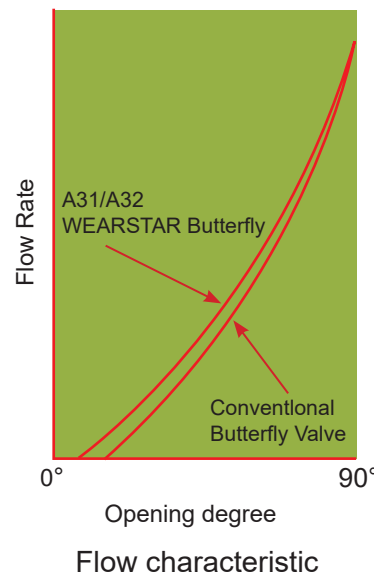
# Superior WEARSTAR Curve for Rubber Seat

## Why Curve Calculation Is Very Important and False Curve Not Work



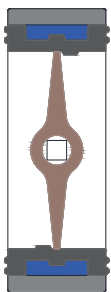
By the cubic dynamic raised curve design on inside diameter of the seat, the disc contacts simultaneously around the entire seat during closure which keeps the disc always in contacting state with seat and reduces friction area between disc and seat. The operation of torque for the valve is substantially reduced and the lifetime is significantly increased. In combination with the spherical machining of disc, the lifetime is lengthened by 350%.

PU seat is enough wear resistant, cylindrical no curve inside sealing area kept for convenience of production.

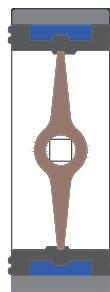


Flow characteristic at small valve opening is starting earlier and closing to linear than conventional design.

### False curve design

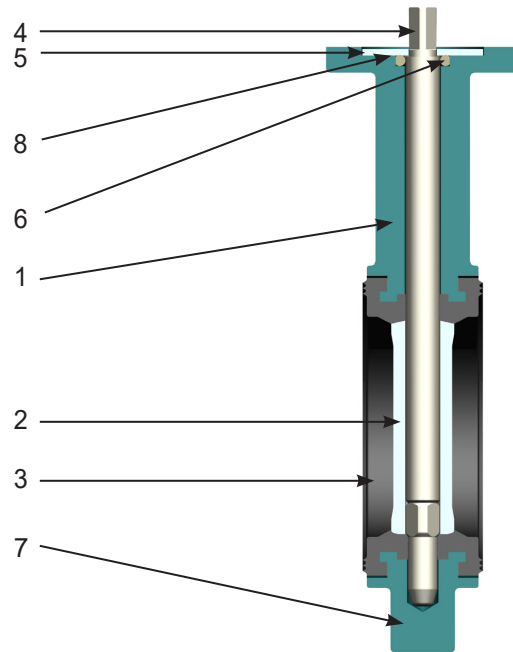


This existing false curve design made the disc contact with seat just in one ideal state and this ideal state on a line does not exist in reality because of disc casting and machining tolerance. This either caused leakage or made the closing torque higher even than conventional.



This another existing false curve design cause the disc need press into seat deeper into rubber. By analyzing and site test, it is clear that the interference between disc and seat has to be bigger, because the slope on liner made the rubber go away easier than conventional. This caused both opening and closing torque higher than conventional, sometimes caused valve difficult to open or stem breaking.

A31

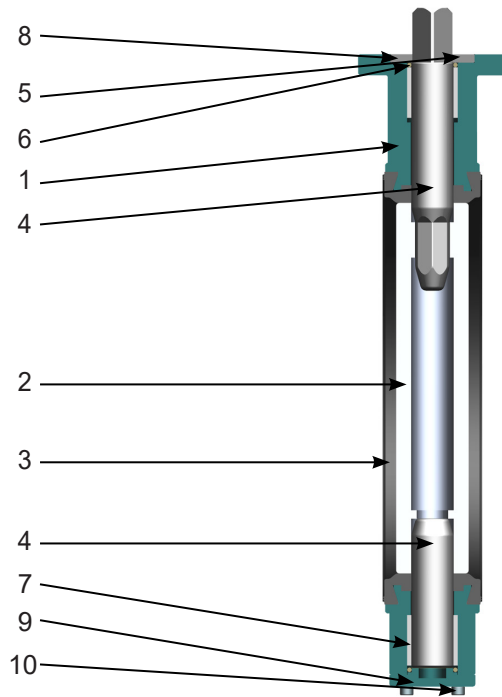


## Parts list and material specification

No.	Part name	Material	Standard	Surface Treatment
1	Body	Cast Iron	ASTM A126 Class B	Epoxy RAL5021
		Ductile Iron	ASTM A536 Gr.65-45-12(GGG40)	Epoxy RAL5021
		Cast Steel	ASTM A216 WCB	System 5 coating Grey
		Stainless Steel	ASTM A351 CF8	Passivation
ASTM A351 CF8M	Passivation			
2	Disc	Ductile iron Nickel plated	ASTM A536 65-45-12	Nickel plating
		Ductile iron Nylon coated	ASTM A536 65-45-12	Rilsan
		Stainless Steel	ASTM A351 CF8	Passivation
			ASTM A351 CF8M	Passivation
		SS Tungsten coated	ASTM A351 CF8	Tungsten coating
		SS PU coated	ASTM A351 CF8	PU coating
		Duplex	1.4462, 2205	Passivation
Super Duplex	2507	Passivation		
3	Seat	Nitrile Rubber	NBR(BUNA-N)	
		Wear-resistant Nitrile	XNBR	
		Copolymer EPDM	EPDM,	
		Copolymer EPDM-HT	EPDM-HT	
		Polyurethane	PU	
		Fluorelastomer	FPM(VITON)	
		PTFE	PTFE with EPDM back	
4	Stem	Stainless Steel	SS431	
5	Retainer	Stainless Steel	SS304	
6	Weather seal	Nitrile Rubber	NBR(BUNA-N)	
7	Bearing	Nylon Bonded	Nylon	Rilsan
		RPTFE (for SS body)	RPTFE with Graphite I.D.	
8	Screw	Stainless Steel	SS304	

# Structure and Material

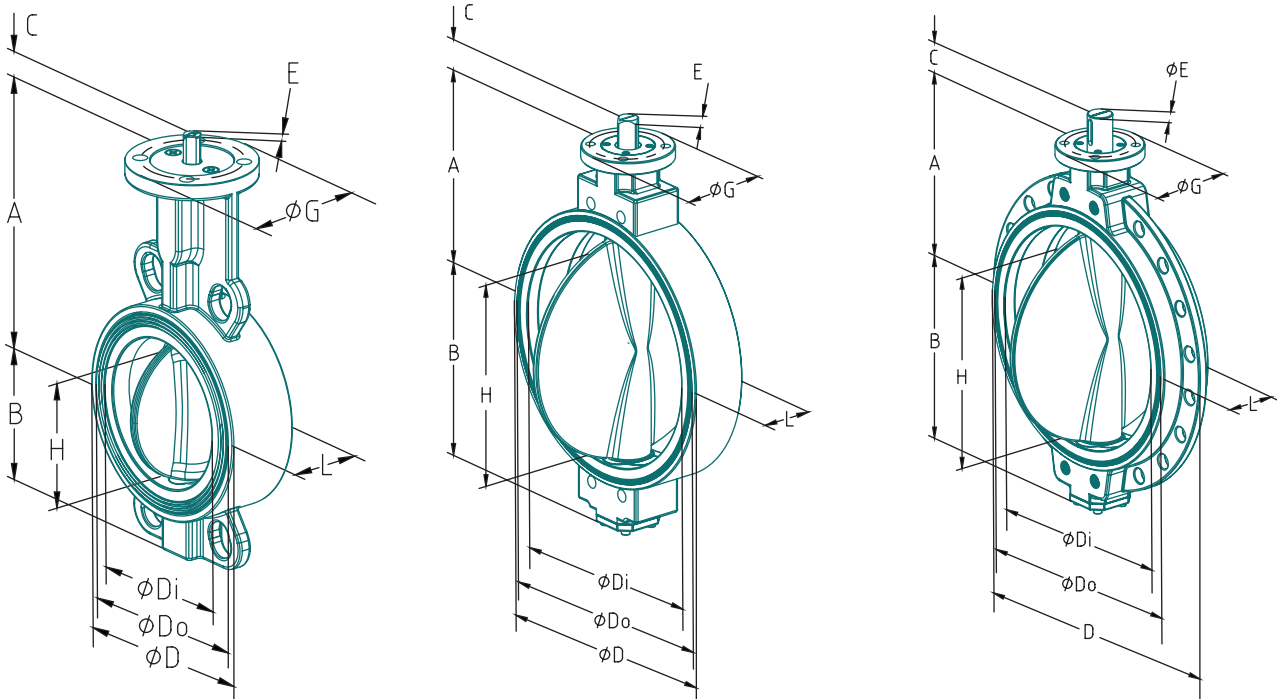
A31



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		Stainless Steel	ASTM A351 CF8	Passivation
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		SS PU coated	ASTM A351 CF8	PU coating
		Duplex	1.4462, 2205	Passivation
		Super Duplex	2507	Passivation
3	Seat	Nitrile Rubber	NBR(BUNA-N)	
		Wear-resistant Nitrile	XNBR	
		Copolymer EPDM	EPDM,	
		Copolymer EPDM-HT	EPDM-HT	
		Polyurethane	PU	
		Fluorelastomer	FPM(VITON)	
		PTFE	PTFE with EPDM back	
4	Stem	Stainless Steel	SS431	
5	Retainer	Stainless Steel	SS304	
6	Weather seal	Nitrile Rubber	NBR(BUNA-N)	
7	Bearing	RPTFE	RPTFE with Graphite I.D.	
8	Screw	Stainless Steel	SS304	
9	Bottom Cover	Same as body	Same as body	Same as body
10	Bolt	Stainless Steel	SS304	

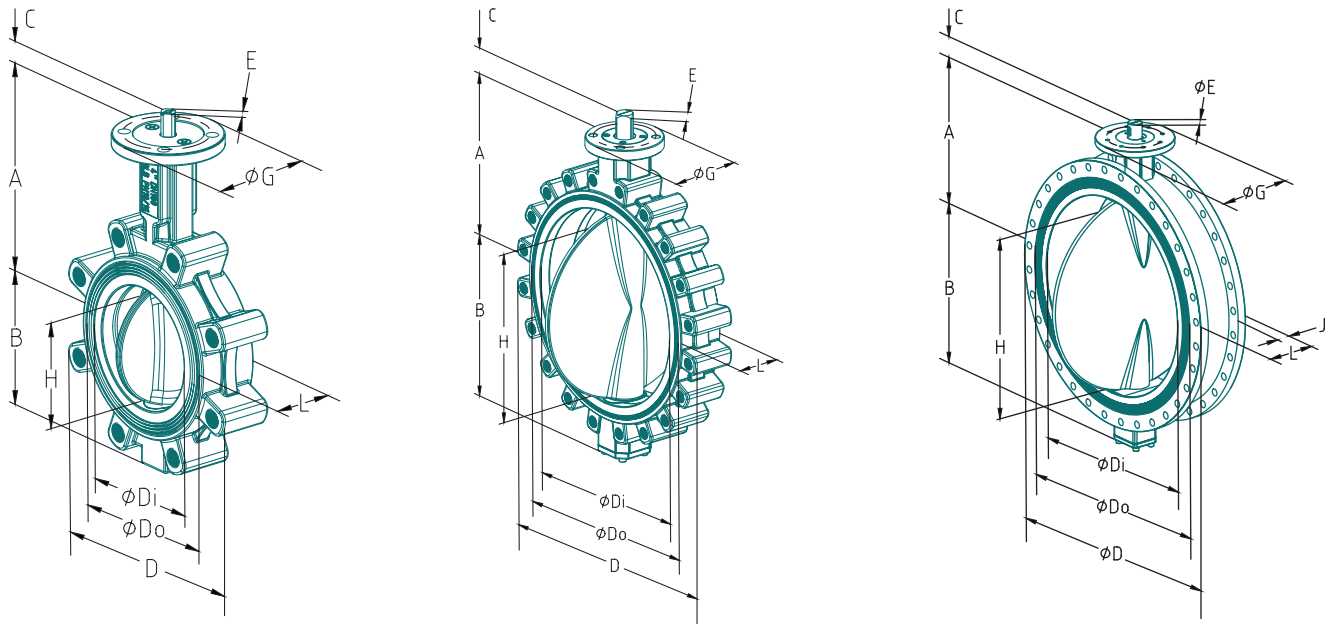
# A31 Dimensions



SIZE		A	B	C	D	Di	Do	E	Top Flange	d	G	H	L	Weight (kg)
DN	INCH													
25/32	1"1/4"	110	51	13.5	75	34	61	9	F05	8	70	19	30	1.5
40	1 1/2"	130	54	13.5	85	42	71	9	F05	8	70	28	33	2
50	2"	135	72	19	94	52	86	11	F07	10	90	32	43	3
65	2 1/2"	150	83	19	115	67	104	11	F07	10	90	50	46	4
80	3"	161	92	19	135	81	122	11	F07	10	90	69	46	5
100	4"	177	105	19	151	101	140	11	F07	10	90	88	52	6
125	5"	195	120	19	185	127	141	14	F07	10	90	115	56	8
150	6"	208	133	19	204	151	195	14	F07	10	90	141	56	9
200	8"	239	170	25	265	202	248	17	F07	10	90	194	60	13
250	10"	281	200	32	320	254	301	22	F10/F12	12/14	150	240	68	23
300	12"	316	236	32	375	300	354	22	F10/F12	12/14	150	290	78	31
350	14"	332	254	40	425	339	401	22	F12	14	150	330	80	43
400	16"	367	301	40	475	388	451	27	F12	14	150	377	102	58
450	18"	397	341	65	535	440	515	36	F14	18	175	425	114	95
500	20"	437	382	65	590	490	573	36	F14	18	175	475	127	125
600	24"	522	464	80	695	590	660	46	F16	22	210	570	154	180
700	28"	640	523	90	910	681	752.8	63.1	F25	18	310	674	164	252
750	30"	656	546	90	984	750	832	63.1	F25	18	310	727	172	290
800	32"	681	581	90	1025	781	854	63.1	F25	18	310	771	190	367
900	36"	732	638	110	1125	880	948.5	74.7	F25	18	310	839	203	465
1000	40"	820	705	120	1255	981	1056.5	83.7	F30	22	310	939	214	606
1100	44"	830	780	140	1355	1065	1183	94.7	F30	22	376	1036	254	805
1200	48"	942	846	150	1485	1180	1270	104.7	F30	22	376	1137	254	900
1400	56"	1000	940	175	1685	1376	1470	139.9	F35	32	415	1351	279	1158
1600	64"	1150	1085	195	1930	1570	1695	160	F35	32	415	1548	318	1684

★ Do/Di flange sealing face dimension is a big advantage of Magic Series butterfly valve which suitable for both slip-on and plate flange. Serrated sealing face eliminates roll out of seat.

# A32 Dimensions



SIZE		A	B	C	D	Di	Do	E	Top Flange	d	G	H	J	L	Weight (kg)
DN	INCH														
25/32	1"1 1/4"	110	51	13.5	101	34	61	9	F05	8	70	19	26	30	1.5
40	1 1/2"	130	54	13.5	108	42	71	9	F05	8	70	28	26	33	2
50	2"	135	72	19	116	52	86	11	F07	10	90	32	34	43	3
65	2 1/2"	150	83	19	131	67	104	11	F07	10	90	50	36	46	4
80	3"	161	92	19	177	81	122	11	F07	10	90	69	36	46	6
100	4"	177	105	19	206	101	140	11	F07	10	90	88	40	52	9
125	5"	195	120	19	236	127	141	14	F07	10	90	115	44	56	10
150	6"	208	133	19	258	151	195	14	F07	10	90	141	44	56	11
200	8"	239	170	25	321	202	248	17	F07	10	90	194	50	60	20
250	10"	281	200	32	395	254	301	22	F10/F12	12/14	150	240	57	68	29
300	12"	316	236	32	461	300	354	22	F10/F12	12/14	150	290	66	78	42
350	14"	332	254	40	511	339	401	22	F12	14	150	330	62	80	55
400	16"	367	301	40	580	388	451	27	F12	14	150	377	84	102	75
450	18"	397	341	65	630	440	515	36	F14	18	175	425	94	114	150
500	20"	437	382	65	700	490	573	36	F14	18	175	475	110	127	170
600	24"	522	464	80	823	590	660	46	F16	22	210	570	120	154	250
700	28"	640	523	90	910	681	752.8	63.1	F25	18	310	674	164	345	345
750	30"	656	546	90	984	750	832	63.1	F25	18	310	727	172	410	410
800	32"	681	581	90	1025	781	854	63.1	F25	18	310	771	190	490	490
900	36"	732	638	110	1125	880	948.5	74.7	F25	18	310	839	203	610	610
1000	40"	820	705	120	1255	981	1056.5	83.7	F30	22	310	939	214	780	780
1100	44"	830	780	140	1355	1065	1183	94.7	F30	22	376	1036	254	990	990
1200	48"	942	846	150	1485	1180	1270	104.7	F30	22	376	1137	254	1200	1200
1400	56"	1000	940	175	1685	1376	1470	139.9	F35	32	415	1351	279	1400	1400
1600	64"	1150	1085	195	1930	1570	1695	160	F35	32	415	1548	65	318	2100

★ Do/Di flange sealing face dimension is a big advantage of Magic Series butterfly valve which suitable for both slip-on and plate flange. Serrated sealing face eliminates roll out of seat.

# Seating Torques(N\*M)

SIZE		Operating Pressure					Maximum Allowable Shaft Torque
DN	INCH	3.5bar	6bar	10bar	16bar	20bar	
25/32	1"/1 1/4"	3	4	5	6	8	100
40	1 1/2"	4	5	5	7	10	100
50	2"	6	7	7	8	12	270
65	2 1/2"	9	10	11	13	25	270
80	3"	13	15	18	22	30	270
100	4"	16	18	25	30	45	270
125	5"	25	30	40	50	65	580
150	6"	38	45	55	65	120	580
200	8"	50	70	90	110	250	1080
250	10"	150	180	200	230	450	1800
300	12"	200	230	270	350	700	1800
350	14"	300	350	410	700	900	1800
400	16"	500	600	680	850	1300	2700
450	18"	700	750	850	1200	1700	5900
500	20"	1000	1200	1500	2500	3200	5900
600	24"	1400	1700	1900	3000	3900	8600
700	28"	1900	2500	3500	8000		18000
750	30"	2500	3200	4500	9000		18000
800	32"	3900	4700	6500	11000		18000
900	36"	4500	5100	7500	14000		24000
1000	40"	6000	6900	10500	24000		37000
1100	44"	7900	8500	13500	29000		49000
1200	48"	10500	13000	19750	40000		65000
1400	56"	15200	18000	23700			72000
1600	64"	20120	25000	33000			105000

**Note:**

1. The charted values are based for water, Temp: 0°C to 40°C. Valve opens at least once a month.
2. The charted values are based on the initial breakaway torque under operating pressure.
3. The torque values listed above do not include a safety factor. The recommended factor see safety factor guide below.
4. The effect of dynamic torque is not considered in tabulation.
5. The charted values are based for standard EPDM, NBR and PU seat, for white EPDM and NBR seat, multiply value by 1.3, for other material seat, consult us.

## Safety factor guide

Service condition	Service type	Media type	Safety factor	Multiply
1	Normal	Water, Sea water, Hydrocarbon	25%	1.25
2	Light	Lubricating oil	15%	1.15
3	Heavy	Dry air, Solvents	45%	1.45
4	Heavier	Non-lubricant powder	65%	1.65
5	Extreme	Abrasives, Cement	90%	1.9

# Kv Values





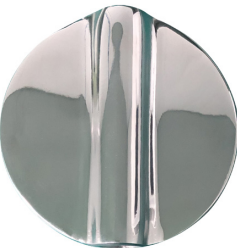
SIZE		Kv (m³/h at 1bar ΔP)								
DN	INCH	10°	20°	30°	40°	50°	60°	70°	80°	90°
25/32	1/1 1/4"	0.5	0.8	1	5	10	16	26	35	39
40	1 1/2"	1	2	3	8	15	25	38	45	49
50	2"	1	2	6	13	28	46	69	95	103
65	2 1/2"	1.5	3	11	25	48	75	119	167	208
80	3"	3	6	27	53	89	137	209	295	382
100	4"	8	19	37	77	137	227	404	578	662
125	5"	13	26	82	153	243	377	612	926	1098
150	6"	25	50	126	220	356	561	957	1460	1762
200	8"	60	112	224	393	626	998	1720	2626	3038
250	10"	80	168	327	621	951	1499	2597	4023	5096
300	12"	120	245	480	907	1388	2186	3788	6224	7203
350	14"	140	295	618	1108	1880	3019	4864	7874	9793
400	16"	190	385	808	1448	2456	3944	6352	10763	12343
450	18"	240	488	1022	1834	3107	4991	8046	13421	16513
500	20"	300	603	1262	2263	3835	6161	9925	16905	18920
600	24"	400	867	1816	2899	5522	8873	14292	24480	27757
700	28"	450	930	2210	3750	6959	11100	19200	33080	39700
750	30"	500	1160	2400	4350	7890	12900	21200	36750	45350
800	32"	620	1330	2650	5030	8890	14350	23750	39900	49530
900	36"	790	1680	3350	6470	11890	19520	31700	52750	62000
1000	40"	1050	2210	4300	8100	15130	23720	40050	67000	81000
1100	44"	1400	3020	5980	10050	17580	28970	48950	83500	105800
1200	48"	1900	4050	7650	12600	20100	34500	56750	99570	121000
1400	56"	2400	5180	10100	18150	32000	51370	88900	142100	161000
1600	64"	3500	7200	14530	26530	45400	71500	118700	198000	229000

Kv=The number of m3 per hour of 20°C water at 1bar pressure drop.

$Cv=1.167Kv$






Cv=The number of US gallons per minute of 60°F water at 1psi pressure drop.

# Disc Material Guide

Prefered Material	Material	General	Recommended for	Not recommended for
<b>CF8</b> SS 304		Popular for a wide range of chemical and environmental applications.	Air, Kerosene, Oils, Ketones, Hydrocarbons, Solvents, Detergents, Salts, Organic acids, Potable water, Steam	Inorganic acids
<b>CF8M</b> SS 316		Strong for industrial use and corrosion resistant for a wide range of chemical and environmental applications	Air, Kerosene, Oils & Fuels, Ketones, Hydrocarbons, Solvents, Detergents, Salts, Organic acids, Potable, water, Steam, Sea water, Beer, Freon, Gasoline, Oxygen,	Inorganic acids
<b>DI-NP</b> Ductile iron Nickle plated		Ductile iron disc for strength, plated with Nickle for corrosion resistance and increased abrasion resistance	Air, Kerosene, Oils, Ketones, Hydrocarbons, Solvents, Detergents, Salts, Concentrated organic acids	Inorganic acids, Diluted organic acids
<b>Tungsten coating</b> Tungsten coated SS304		CF8 coated with Tungsten for high abrasion application	Slurry, Powder, Granulate	Hydrofluoric acid, Nitric acid
<b>Polished</b> Polished SS316		All the benefits of stainless steel strength and corrosion resistance, plus a highly polished surface of Ra0.25 for sanitary applications	Sanitary applications, Potable water, Medicine, Milk, Beer, Beverage	Inorganic acids



★ Preferred materials are used as standard for most of applications and work well on WEARSTAR valve for abrasive service.

# Disc Material Guide

Optional Material	Material	General	Recommended for	Not recommended for
<b>2205 or 1.4462</b> Duplex steel		Stronger and more corrosion resistant than SS316 and SS316L, high resistant to stress corrosion	Potable water, Sea water, Demineralized water, Solvents, Foodstuff, Chemical fertilize, Petroleum, Concentrated nitric acid, Hot and cold exchanger, Formic acid, Acetic acid, Chlorinated acid	Temperature more than 250°C , Oxidative chloride
<b>2507</b> Super duplex steel		Stronger and more corrosion resistant than 1.4462, high resistant to stress corrosion	Potable water, Sea water, Demineralized water, Solvents, Foodstuff, Chemical fertilize, Petroleum, Concentrated nitric acid, Hot and cold exchanger, Formic acid, Acetic acid, Chlorinated acid, Alkali, Chlor-alkali	Oxidative chloride
<b>Hastelloy</b> Hastelloy C		Highly corrosion resistant to most of media	Wet chlorine, Various oxidizing chlorides, Chloride solution, Sulfuric acid and oxidizing salts	Hot concentrated nitric acid
<b>Halar</b> (ECTFE) Halar coated SS304		CF8 disc for strength, coated with Halar for high corrosion resistance and abrasion resistance	Acids, Alkali, Organic solvents, Sticky fluids, PH values between 1 and 14. Max 120°C	Hydrofluoric acid
<b>PU coating</b> PU coated SS304		CF8 coated with PU for extremely abrasion application	Slurry, Powder, Granulate	Temperature more than 100°C

★ Optional materials are for special requirements and need minimum order quantities for production. Consult us for specific quantity for different materials.

# Seat Materials

Prefered Seat Material	Material	Code	Recommended for	Not Recommended for	Temperature Min (°C)	Temperature Max (°C)
EPDM		EPDM	Water, Sea Water, Air, Brine, Abrasives, Phosphates, Esters, Ketones, Alkali, Food Compounds, Liquids and Solids, Dilute Inorganic Acids, Caustic Soda	Hydrocarbons, Oils, Fats, Dry Air	-15	120
High Temp EPDM		EH	Standard EPDM + Low Pressure Saturated Steam		-15	130
Polyurethane		PU	For protection against wear, idea for medium to heavy slurries in control and on/off	Stong acid liquid, Strong alkali liquid	-20	100
VITON(FPM)		FPM	Hydrocarbons with high concentration of aromatics, Mineral and Halogenated Acids, Phorforic Acid, Alphatic and Aromatic Ethers	Steam, Ketones, Amines, Esters, Alkali	-18	170
F260		F260	Steam, Acetyl chloride, Ammonium hydroxide, Asphalt, Benzenesulfonic acid, Butane liquid, Butyl acetyl ricinolate, Carbon tetrachloride.	Ansul ether, Bromine trifluoride, Cellosolve acetate, Chlorine trifluoride, tetrahydrofuran tetralin, sodium, hydroxide, Tetrahydrofuran	-41	275
BUNA-N (NBR)		NBR	Hydrocarbons with less than 40% of aromatics, Natural Gas, Air, Water, Sea water, Brine, Alcohols, Glycols	Solvents, Benzene, Xylene	-10	85
White BUNA Food Grade		WBF			-15	100
Wear Resistant NBR		XNBR			-20	95

★ Prefered materials are used as standard for most of applications.

# Seat Materials

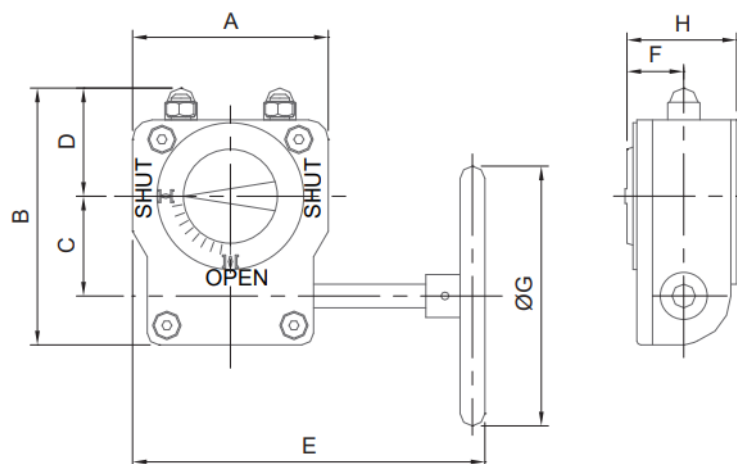
Optional Seat Material	Material	Code	Recommended for	Not Recommended for	Temperature Min (°C)	Temperature Max (°C)
EPDM with WRAS approval		WRAS EP	Water, Sea Water, Air, Brine, Abrasives, Phosphates, Esters, Ketones, Alkali, Food Compounds, Liquids and Solids, Dilute Inorganic Acids, Caustic Soda	Hydrocarbons, Oils, Fats, Dry Air	-15	110
Black EPDM Food Grade		BEF			-15	110
White EPDM Food Grade		WEF			-15	100
Low Temp NBR		LNBR	Standar NBR + Cold Enviroment	Solvents, Benzene, Xylene	-35	70
High temp BUNA (Hydrogenated NBR)		HNBR	Standard NBR+ Low Pressure Saturated Steam		-30	150
Natural Rubber		NR	Abrasive Media	Strong Acids and Bases, Hydrocarbons, Elevate Temperature Applications	-30	80
Silicone Rubber		SR	Beverages, Food	Hydrocarbons, Solvents, Steam	-40	200

★ Optional materials are for special requirements and need minimum order quantities for production. Consult us for specific quantity for different materials.



- Aluminium casted lever, locker and plate, much lighter than iron made.
- Very light weightness makes it a money save choice and convenient for installation and using.
- ASTM A356 Aluminium alloy, as strong as GGG40, more safe than cast iron.
- Handsome looking and comfortable feeling when operating.
- Position can be locked by fixing one bolt and one nut in the lever hole.
- Powder epoxy coating in standard.

SIZE		Handle Code	D	H	L	W	WT(kg)
DN	INCH						
25-40	1"-1 1/2"	OP-L-F5x9x200	56	65	195	74	0.3
50-100	2"-4"	OP-L-F7x11x200	73	82	200	101	0.52
125-150	5"-6"	OP-L-F7x14x270	78	82	269	101	0.6
200	8"	OP-L-F7x17x270	101	100	330	145	1.5



# Gear Box



- Light weight
- Rugged construction
- High strength Aluminium cast house

Normally, 2" to 12" valves are operated by hand lever or Aluminum housing gear box(Figure 3D III ), valves above and including 14" are operated by ductile iron housing gear boxes(Figure M).

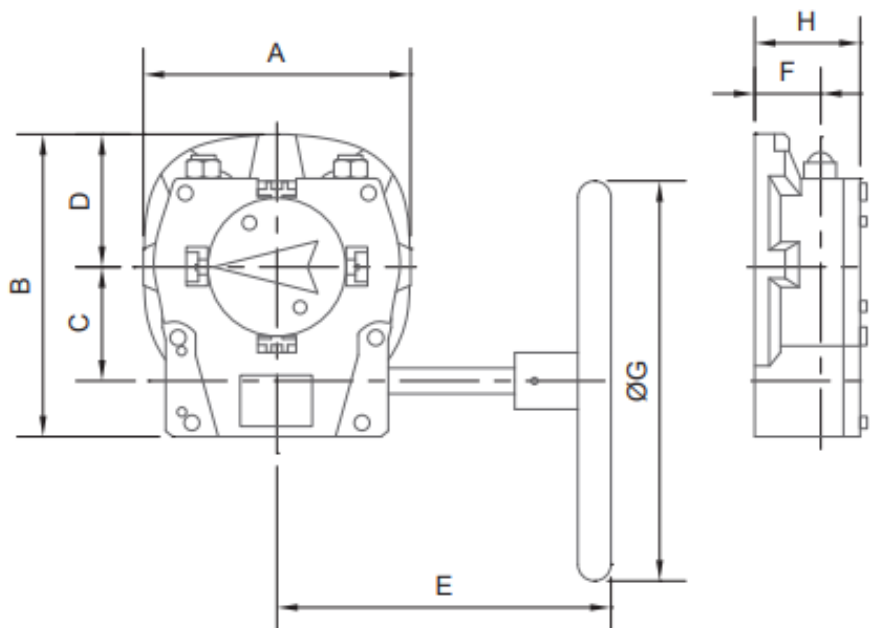
## Aluminum housing gear box

The Figure 3D III (Die casting Aluminum gear box) has a housing made of die casting Aluminum, which has a fine and delicate surface. Suited for HVAC, fire protection and general industrial applications

- Ratios:** From 37:1 to 45:1
- Torque range:** up to 750NM
- Housing:** Die casting Aluminium
- Worm:** Hard Steel
- Gear:** Ductile iron
- Input Shaft:** Stainless Steel

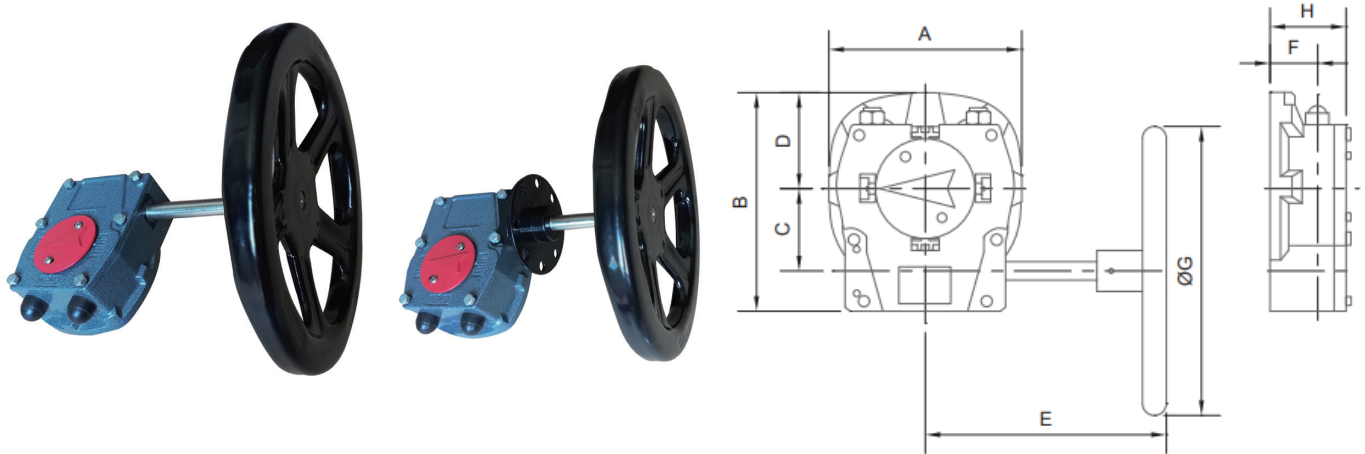
## General Parameters and Dimensions(mm)

SIZE		Gear Code	Ratio	Gear torque (N·M)	Input Torque (NM)	A	B	C	D	E	F	G	H	WT (kg)
DN	INCH													
25-40	1"-1 1/2"	OP-G-M5x9x100	40:1	150	5	80	98	43	45	99	26	100	48	1.3
50-100	2"-4"	OP-G-M5x11x120	40:1	150	5	80	98	43	45	99	26	100	48	1.3
125-150	5"-6"	OP-G-M7x14x140	37:1	250	12	100	115	50	55	115	27	120	54	2
200	8"	OP-G-M7x17x200	37:1	250	12	100	115	50	55	115	27	120	54	2
250-300	10"-12"	OP-G-M10x22x300	45:1	750	30	146	155	60	81	220	38	300	71	5.6



## Ductile iron housing gear box

Figure M gearbox is quarter turn, heavy duty, used for manual operating valves serving water, gas, chemical, power and demanding industrial applications.



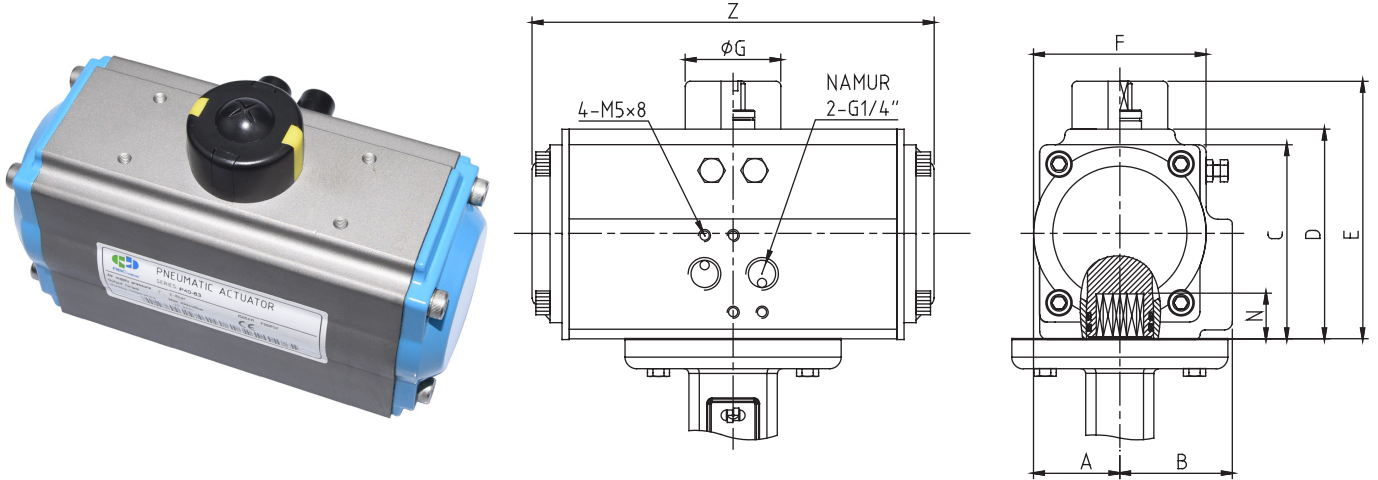
- AWWA requirements can be satisfied
- Padlockable hand wheels are available
- Suitable for high and low temperatures

**Ratios:** From 42:1 to 720:1  
**Torque range:** Up to 32000NM  
**Housing:** Cast iron, Ductile iron  
**Worm:** Hard Steel  
**Gear:** Ductile iron  
**Input Shaft:** Stainless Steel

## General Parameters and Dimensions(mm)

SIZE		Gear Code	Ratio	Gear Torque (N·M)	Input Torque (N·M)	A	B	C	D	E	F	G	H	WT (kg)
DN	INCH													
350	14"	OP-G-M12x22x300	42:1	994	88	165	182	66	76	210	42	300	72	11
400	16"	OP-G-M14x27x400	60:1	1789	110	200	231	89	100	277	50	400	81	14
450-500	18"-20"	OP-G-M15x27x400	68:1	3381	165	252	296	123	118	357	50	400	91	32
600	24"	OP-G-M16x46x500	88:1	4474	169	315	354	153	145	382	50	500	93	44
700-900	28"-36"	OP-G-M36x63x500	184:1	7910	152	310	380	138	155	448	65	500	122	65
1000	40"	OP-G-M50x83x600	250:1	10169	140	355	446	181	178	480	80	600	160	110
1100	44"	OP-G-M60x94x600	720:1	23786	151	415	642	237	208	575	74	600	155	185
1200	48"	OP-G-M60x104x600	720:1	23786	151	415	642	237	208	575	74	600	155	185
1400	56"	OP-G-M70x139x600	816:1	26000	160	628	825	440	305	662	192	600	322	500
1600	64"	OP-G-M80x160x800	1872:1	40000	200	844	977	537	367	830	217	800	372	1020
1800	72"	OP-G-M80x174x800	1872:1	40000	200	844	977	537	367	830	217	800	372	1020
2000	80"	OP-G-M80x199x800	1872:1	40000	200	844	977	537	367	830	217	800	372	1020

# Pneumatic Actuators



## ABC P40 Double acting actuators for A31/A32

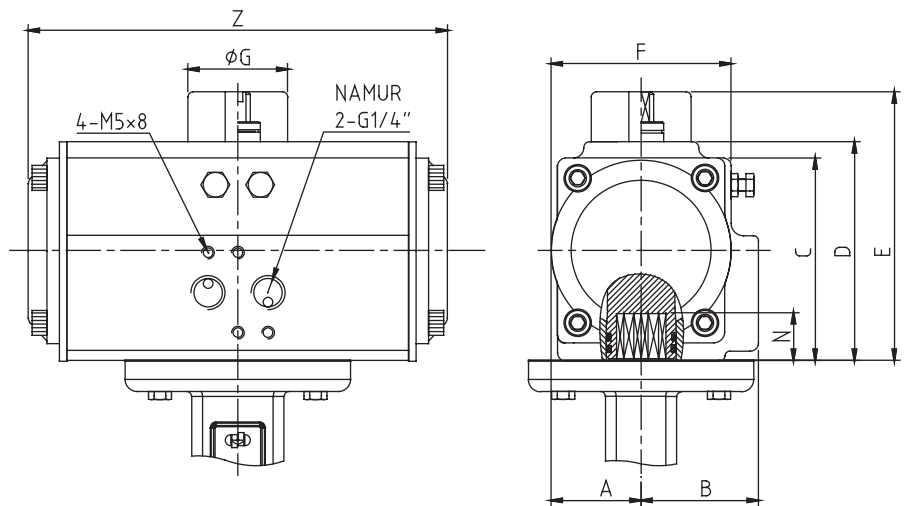
Pneumatic Actuators-Standard Conditions - 4bar Air Supply

A31/A32 size	Valve rating	Actuator size	Actuator No.	Actuator output torque (NM)	Actuator ISO 5211	A	B	C	D	E	F	N	G	Z
DN25/32	PN16	52	OP-PD-52xF3F5x11	16	F03+F05	30	41.5	65.5	72	92	65	14	40	147
DN40	PN16	52	OP-PD-52xF3F5x11	16	F03+F05	30	41.5	65.5	72	92	65	14	40	147
DN50	PN16	63	OP-PD-63F5F7x14	29	F05+F07	36	47	81	87.5	107.5	72	19	40	168
DN65	PN16	63	OP-PD-63F5F7x14	29	F05+F07	36	47	81	87.5	107.5	72	19	40	168
DN80	PN16	63	OP-PD-63F5F7x14	29	F05+F07	36	47	81	87.5	107.5	72	19	40	168
DN100	PN16	75	OP-PD-75F5F7x14	40	F05+F07	42	53	95	99.5	119.5	81	19	40	185
DN125	PN16	83	OP-PD-83F5F7x17	63	F05+F07	46	57	98.5	108.7	128.7	92	21	40	211
DN150	PN16	92	OP-PD-92F5F7x17	90	F05+F07	50	58.5	111	116.5	136.5	98	21	40	262
DN200	PN16	125	OP-PD-125F7F10x22	200	F07+F10	67.5	74.5	145.5	155	175	127.5	26	55	303
DN250	PN10	132	OP-PD-132F7F10x22	278	F10+F12	71	73	154	164	184	133	26	55	368
DN300	PN10	140	OP-PD-140F10F12x27	342	F10+F12	75	77	161	172	192	137.5	31	55	394
DN350	PN10	160	OP-PD-160F10F12x27	532	F10+F12	87	87	184	197	217	158	31	55	458
DN400	PN10	190	OP-PD-190F14x36	851	F12	103	103	216	230	260	189	40	80	528
DN450	PN10	210	OP-PD-210F14x36	1064	F14	113	113	235.5	255	285	210	40	80	532
DN500	PN10	270	OP-PD-270F16x46	2339	F14	147	147	299	326	356	273	50	80	722
DN600	PN10	300	OP-PD-300F16F25x46	3052	F16+F25	203	203	324	348	378	290	60	80	758

Standard conditions: Water, 1KG/L, 20°C

For size bigger than DN600, consult our technical department

# Pneumatic Actuators



## ABC P41 Single acting actuators for A31/A32

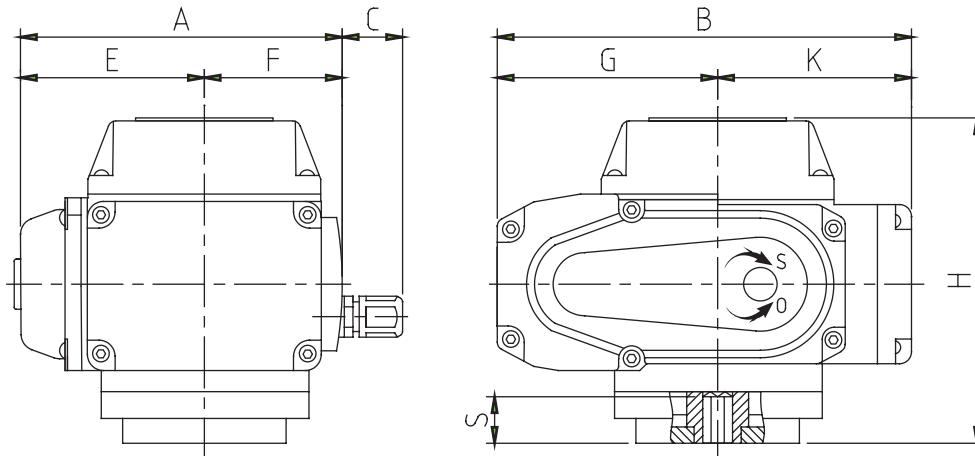
Pneumatic Actuators-Standard Conditions-4bar Air Supply

A31/ A32 size	Valve rating	Actuator size	Actuator No.	Actuator torque air (NM)	Actuator Spring torque (NM)	Actuator ISO 5211	A	B	C	D	E	F	N	G	Z
DN25/32	PN16	63	OP-PD-63F5F7x14	12	11	F05+F07	36	47	81	87.5	107.5	72	18	40	184
DN40	PN16	63	OP-PD-63F5F7x14	12	11	F05+F07	36	47	81	87.5	107.5	72	18	40	184
DN50	PN16	63	OP-PD-63F5F7x14	12	11	F05+F07	36	47	81	87.5	107.5	72	18	40	184
DN65	PN16	75	OP-PD-75F5F7x14	17	17	F05+F07	42	53	94	99.5	119.5	81	18	40	184
DN80	PN16	83	OP-PD-83F5F7x17	25	25	F05+F07	46	57	98.5	108.7	128.7	92	21	40	204
DN100	PN16	92	OP-PD-92F5F7x17	35	37	F05+F07	50	58.5	111	116.5	136.5	98	21	40	262
DN125	PN16	125	OP-PD-125F7F10x22	75	84	F07+F10	67.5	74.5	145	155	175	127.5	21	55	303
DN150	PN16	125	OP-PD-125F7F10x22	75	84	F07+F10	67.5	74.5	145	155	175	127.5	21	55	303
DN200	PN16	140	OP-PD-140F10F12x27	136	137	F07+F10	75	77	161	172	192	137.5	31	55	394
DN250	PN10	190	OP-PD-190F14x36	356	320	F12	103	103	216	230	260	189	40	80	528
DN300	PN10	190	OP-PD-190F14x36	356	320	F12	103	103	216	230	260	189	40	80	528
DN350	PN10	240	OP-PD-240F16x46	653	656	F12	130	130	264.5	289	319	245	50	80	602
DN400	PN10	270	OP-PD-270F16x46	923	1007	F12	147	147	299	326	356	273	50	80	722
DN450	PN10	300	OP-PD-300F16F25x46	1166	1168	F14	203	203	324	348	378	290	60	80	758
DN500	PN10	350	OP-PD-350F16F25x46	1922	1640	F14	230	230	379	408	438	336	60	80	888
DN600	PN10	400	OP-PD-400F16F25x55	2396	2362	F16	258	258	450	480	510	360	60	80	930

Standard conditions: Water, 1KG/L, 20°C

For size bigger than DN600, consult our technical department

# ABC E01 Electric Actuators



A31/ A32 size	Valve rating	Actuator model	Actuator No.	Actuator output torque(NM)	Standard time (S)	Actuator ISO 5211	A	B	C	E	F	G	H	K	S
DN25/32	PN16	E01-02	OP-EC-24F3F5-B	24	20	F03+F05	88	116	30	51	37	66	94	50	23
DN40	PN16	E01-02	OP-EC-24F3F5-B	24	20	F03+F05	88	116	30	51	37	66	94	50	23
DN50	PN16	E01-05	OP-EC-50F5F7-B	50	30	F05+F07	115	168	20	64	51	86	144	82	32
DN65	PN16	E01-05	OP-EC-50F5F7-B	50	30	F05+F07	115	168	20	64	51	86	144	82	32
DN80	PN16	E01-05	OP-EC-50F5F7-B	50	30	F05+F07	115	168	20	64	51	86	144	82	32
DN100	PN16	E01-05	OP-EC-50F5F7-B	50	30	F05+F07	115	168	20	64	51	86	144	82	32
DN125	PN16	E01-10	OP-EC-100F5F7-B	100	30	F05+F07	122	208	22	68	54	98	167	110	33
DN150	PN16	E01-20	OP-EC-200F7F10-B	200	30	F07+F10	148	258	22	86	62	124	201	134	45
DN200	PN16	E01-50	OP-EC-500F7F10-B	500	30	F07+F10	148	258	22	86	62	124	201	134	45
DN250	PN10	E01-50	OP-EC-500F7F10-B	500	30	F07+F10	148	258	22	86	62	124	201	134	45
DN300	PN10	E01-50	OP-EC-500F7F10-B	500	30	F07+F10	148	258	22	86	62	124	201	134	45
DN350	PN10	E01-100	OP-EC-1000F10F12-B	1000	50	F10+F12	156	280	22	95	61	128	215	152	47
DN400	PN10	E01-200	OP-EC-2000F10F12-B	2000	100	F10+F12	156	280	22	95	61	128	215	152	47
DN450	PN10	E01-200	OP-EC-2000F14-B	2000	100	F14	156	280	22	95	61	128	215	152	47
DN500	PN10	E01-400	OP-EC-4000F16F25-B	4000	100	F16+F25	266	439	-	155	111	189	179	250	48
DN600	PN10	E01-400	OP-EC-4000F16F25-B	4000	100	F16+F25	266	439	-	155	111	189	179	250	48

Shell material: Aluminum

Weather proof: IP67

Ambient temperature: -25°C ~60°C

Standard Voltage: 220VAC

Standard control: ON-OFF

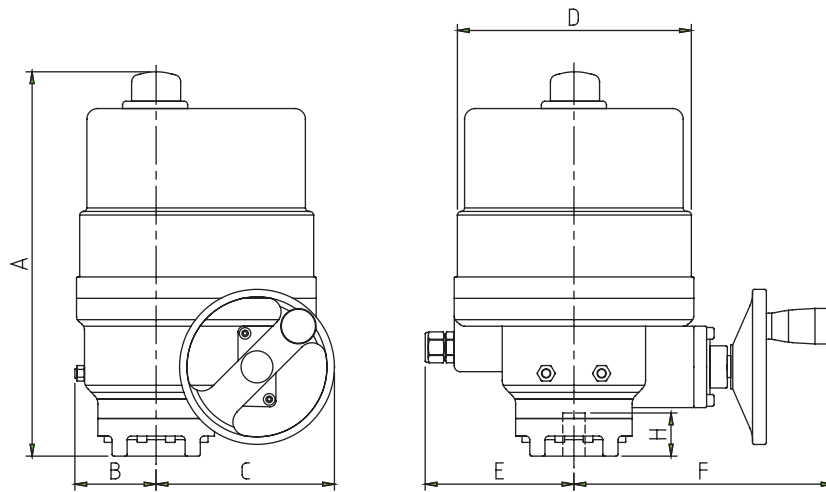
Optional Voltages: 380VAC, 110VAC, 24VDC, 24VAC

Optional control: Modulating

Optional features: Overload protection, Thermal overload signal, Space heater

For size bigger than DN600, consult our technical department

# ABC E02 Electric Actuators



A31/ A32 size	Valve rating	Actuator model	Actuator No.	Actuator output torque (NM)	Standard time	Actuator ISO 5211	A	B	C	D	E	F	H
DN25/32	PN16	E02-5	OP-EM-50F5F7-B	50	21	F05/F07	138	58	58	115	58	82	21
DN40	PN16	E02-5	OP-EM-50F5F7-B	50	21	F05/F07	138	58	58	115	58	82	21
DN50	PN16	E02-5	OP-EM-50F5F7-B	50	21	F05/F07	138	58	58	115	58	82	21
DN65	PN16	E02-5	OP-EM-50F5F7-B	50	21	F05/F07	138	58	58	115	58	82	21
DN80	PN16	E02-5	OP-EM-50F5F7-B	50	21	F05/F07	138	58	58	115	58	82	21
DN100	PN16	E02-10	OP-EM-100F5F7-B	100	26	F05/F07	229	67	91	157	48	167	42
DN125	PN16	E02-10	OP-EM-100F5F7-B	100	26	F05/F07	229	67	91	157	48	167	42
DN150	PN16	E02-20	OP-EM-200F7F10-B	200	28	F07/F10	261	80	126	206	76	197	49
DN200	PN16	E02-20	OP-EM-200F7F10-B	200	28	F07/F10	261	80	126	206	76	197	49
DN250	PN10	E02-35	OP-EM-350F10F12-B	350	32	F10/F12	315	85	137	222	76	208	51
DN300	PN10	E02-50	OP-EM-500F10F12-B	500	32	F10/F12	315	85	137	222	76	208	51
DN350	PN10	E02-80	OP-EM-800F12F14-B	800	36	F12/F14	353	96	166	262	91	230	63
DN400	PN10	E02-110	OP-EM-1100F12F14-B	1100	36	F12/F14	353	96	166	262	91	230	63
DN450	PN10	E02-200	OP-EM-2000F14F16-B	2000	110	F14/F16	457	96	166	262	91	230	76
DN500	PN10	E02-250	OP-EM-2500F14F16-B	2500	110	F14/F16	457	96	166	262	91	230	76
DN600	PN10	E02-400	OP-EM-4000F16F25-B	4000	180	F16/F25	575	175	360	262	175	230	118

Shell material: Aluminum

Weather proof: IP67

Ambient temperature: -25°C ~70°C

Standard Voltage: 220VAC

Standard control: ON-OFF

Standard space heater

Standard intergrated fault alarm: Motor overheating, Overtorque

Optional Voltages: 600VAC, 480VAC, 380VAC, 24VDC

Optional control: Modulating

Optional features: Overload protection

For size bigger than DN600, consult our technical department

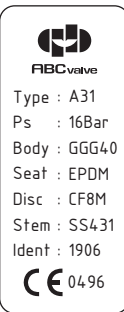
# Installation, Use, Maintenance Instructions

## 1. Storage

- 1) A31 / A32 concentric rubber seat butterfly valve disc open slightly before delivery. The entire valve is protected with a bubble bag. Non-rust metal surface with rust protection coating. If the valve is used for cleaning gases with a "degrease" label, it is recommended that the valve be unpacked until installation.
- 2) The valve is suitable for indoor storage at a temperature of  $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ . The valve should be protected from sunlight.

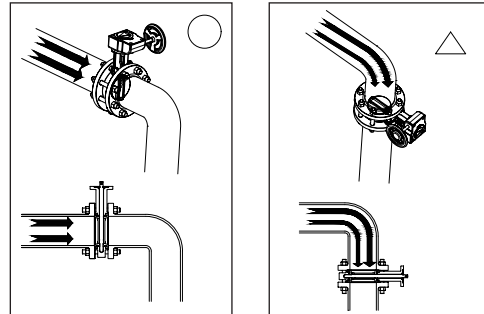
## 2. Check before installation

- 1) Open the valve package
- 2) Check the valve flow path to ensure that there are no debris in the flow path.
- 3) Make sure there are no foreign matter, welding slag, etc. in the supporting pipeline.
- 4) All operating devices, whether manual or automatic, should be installed before the valve is installed in the pipeline and ensure that it is installed correctly.
- 5) Check the valve plate to ensure that the valve material meets the expected operating conditions.



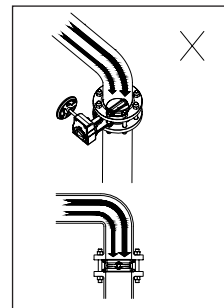
## 3. Installation

### 1) Installation location attention



Good

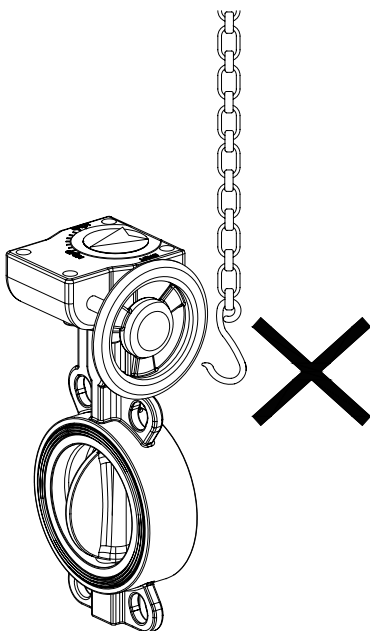
Inevitably acceptable



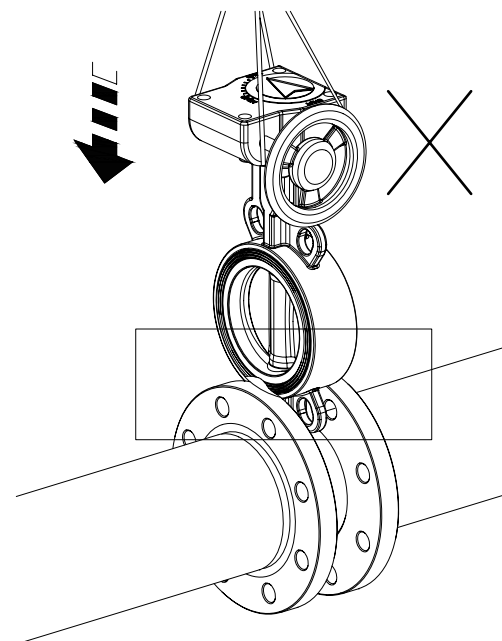
Wrong

### 2) Lifting attention

Valves above DN200 are not allowed to use valve flange correction holes or handwheel as hook points.



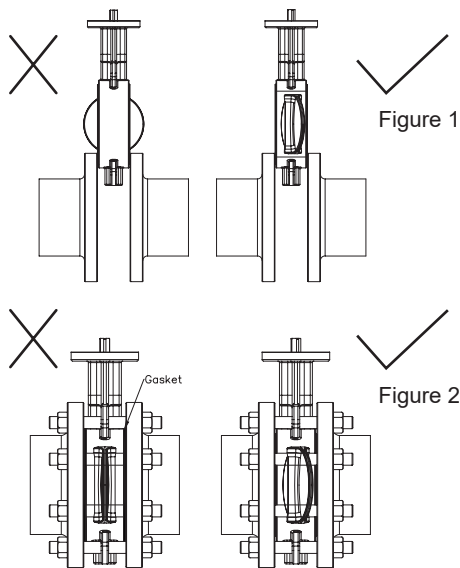
3) There should be enough space between the flanges to allow the valve easily enter between the flanges. If the flange distance is not enough for the valve, the valve seal will be damaged.



# Installation, Use, Maintenance Instructions

4) Do not install flange gaskets

A31 / A32 butterfly valve seat design is designed to directly contact the flange and provide a seal, as shown in Figure 2. Keep the valve plate slightly open, place the valve between the flanges as shown in Figure 1, and position the valve with flange bolts.



5) Before tightening the bolts, make sure that there is no collision during the valve plate switching process and carefully open the valve as shown in Figure 3.

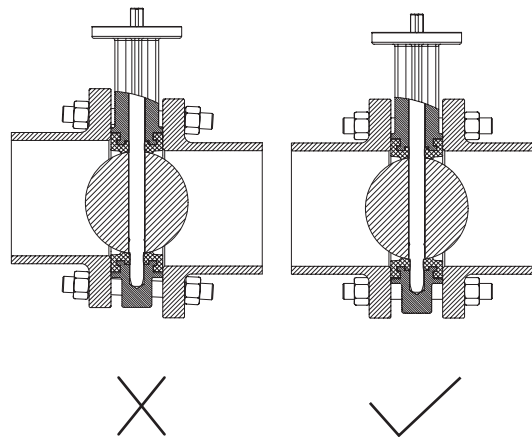


Figure 3

6) Tighten the flange bolts in the order shown in Figure 4.

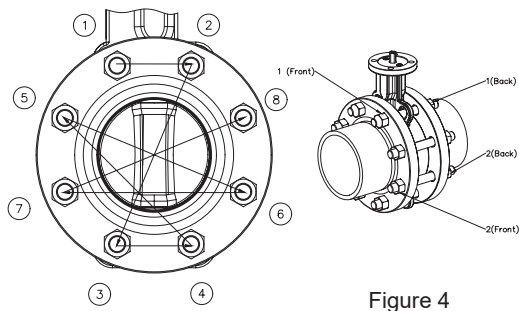


Figure 4

7) Flange bolt tightening force refers to the following table

Bolt specification	bolt tightening torque (N*M)
M16	230
M20	450
M24	780
M30	1550
M36	2700

## 4. Valve maintenance

1) The valve is recommended to be fully open and closed several times every three months without special maintenance.

2) If the parts need to be replaced, please refer to the valve structure in Figure 5. In general, please contact ABC Valves before replacing parts.

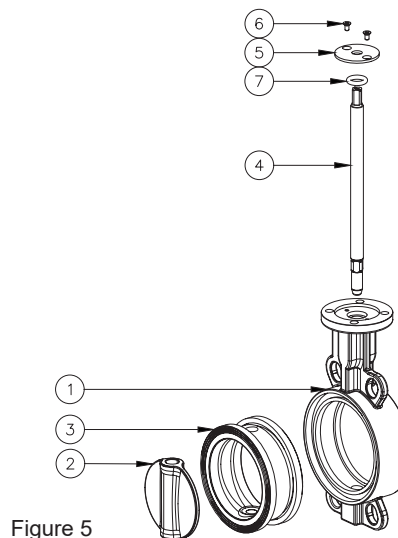
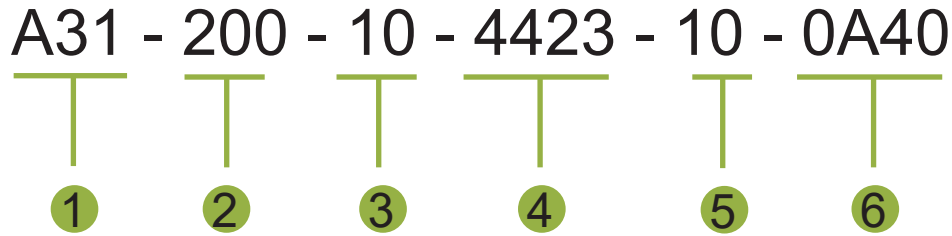


Figure 5

# A31 & A32 Ordering Guidelines



## 1 Valve Model

A31=Wafer type

A32=lug type

## 2 Size

DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600
DN700	DN750	DN800	DN900	DN1000	DN1200	DN1400	DN1600						

## 3 Connection Pressure

PN10 , PN16 , ASME Class150

## 5 Sealing Pressure

6bar                      10bar                      16bar

## 4 Corresponding Materials

Code Name	Body Material	Disc Material	Seat Material	Shaft Material
1	GGG40		EPDM	
2			NBR	
3			FKM	SS431
4	CF8(SS304)	CF8(SS304)	F260	
5	CF8M(SS316)	CF8M(SS316)		2507
6	CF3(SS304L)			
7	CF3M(SS316L)			
8		2205		
9	2507	2507		
A	904L	904L		
B	Aluminum alloy			
C	Nylon			
F			PU	
G			XNBR	
H			HNBR	

## 6

Code Name	Body Material	Disc Material	Seat Material	Shaft Material
0	"Ontology"	"Original"	"Spray ceramic"	"Original"
3			Copper and zinc ban	
4		"Spray ceramic"	WRAS	
5		Spray tungsten carbide	white	
6		Spray ECTFE	white FDA	
A		Wrapped with PTFE		

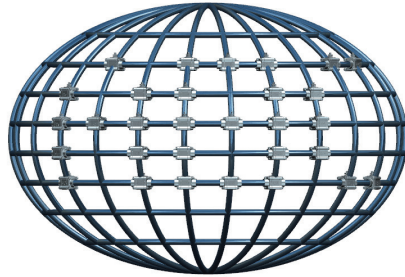
# Process and Applications





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