

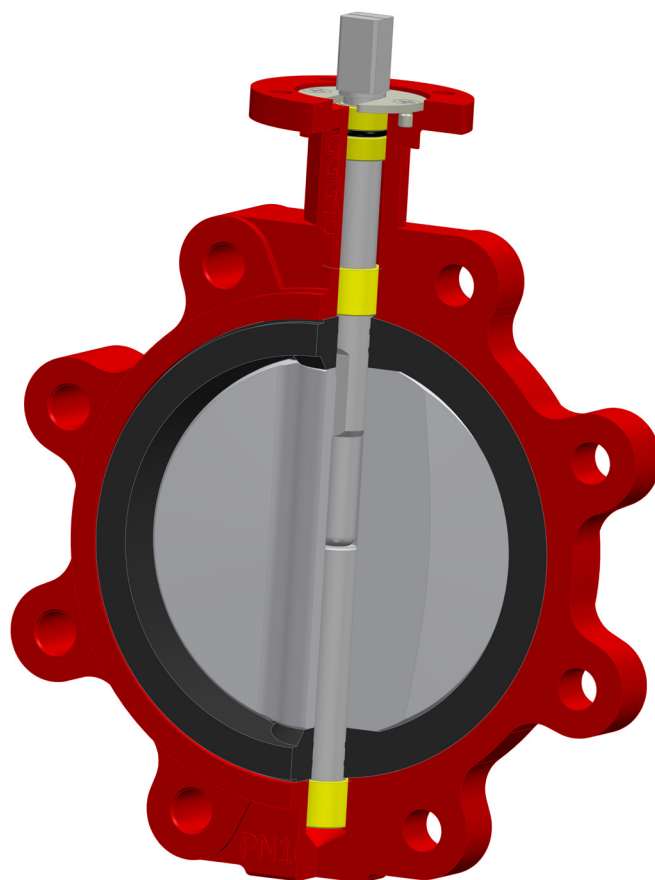


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I-FLOW BUTTERFLY VALVE

USER MANUAL

Installation, use and maintenance



MER ENN 120 ÅRS ERFARING SOM LEVERANDØR AV VENTILER OG INSTRUMENTERING

Oslo | Bergen | Arendal | Larvik | Trondheim

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INTRODUCTION

Type: Lug & Wafer

DN40 – DN1000

Series:

- QIF-110-001
- QIF-110-002
- QIF-110-003
- QIF-110-011
- QIF-110-012
- QIF-110-021
- QIF-110-022

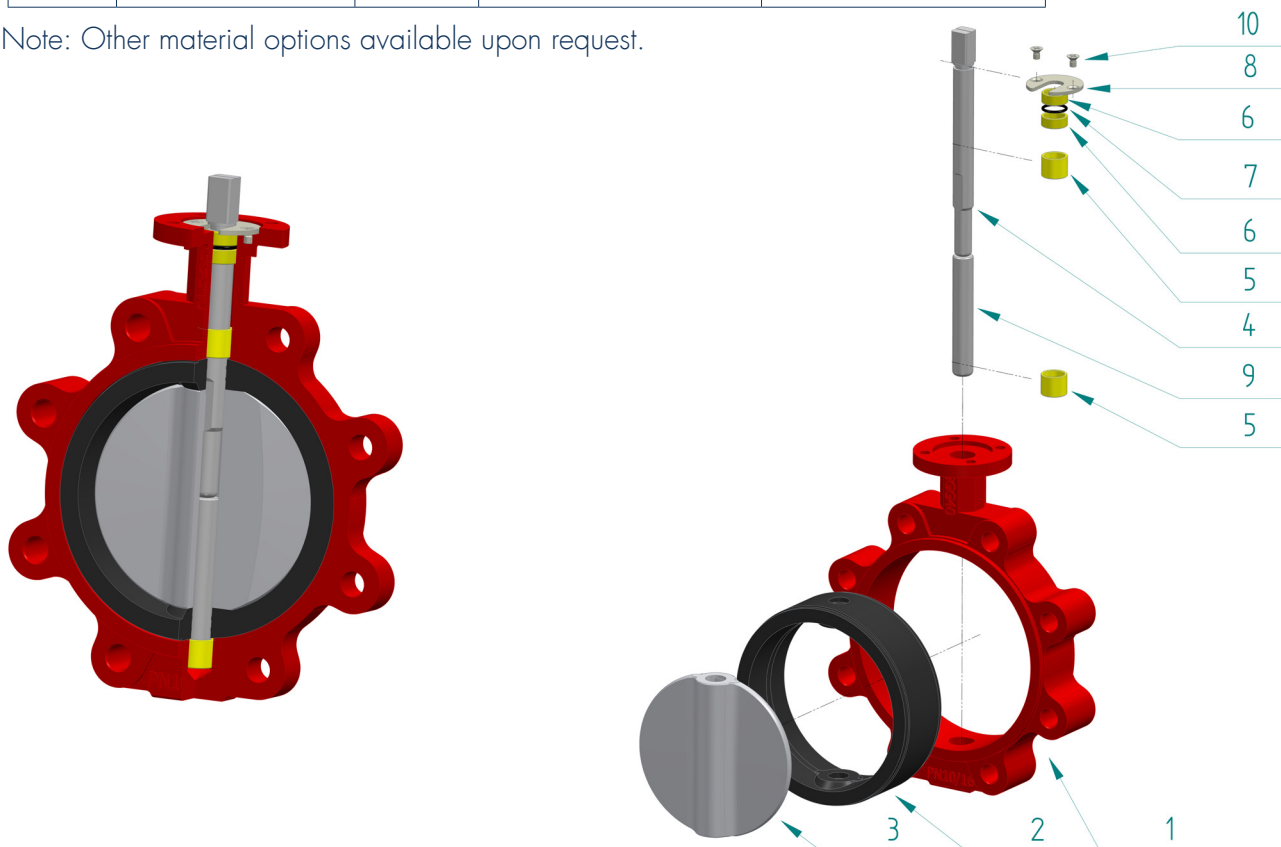
FEATURES

- Small and lightweight, easy to install and maintain, suitable for any position in a pipeline
- Simple and compact construction, space-efficient
- Quick quarter-turn action, minimized operational torque
- Extensive life cycle testing to ensure long service life
- Zero leakage during bubble-tight testing
- Available in a wide range of materials to suit most media and industries

BILL OF MATERIALS DN40 - DN350

PN	Part Name	Qty.	Material	
			Duplex Disc Valve	Nylon Disc Valve
1	Body	1	DI GGG40	DI GGG40
2	Seat	1	EPDM	EPDM
3	Disc	1	Duplex 2205	GGG40+Nylon
4	Upper Shaft	1	Duplex 2205	SS416
5	Long Bushing	2	PTFE	PTFE
6	Short Bushing	2	PTFE	PTFE
7	O-Ring	1	NBR	NBR
8	Stop Cover	1	Galvanized Steel	Galvanized Steel
9	Lower Shaft	1	Duplex 2205	Duplex 2205
10	Screw	2	Galvanized Steel	Galvanized Steel

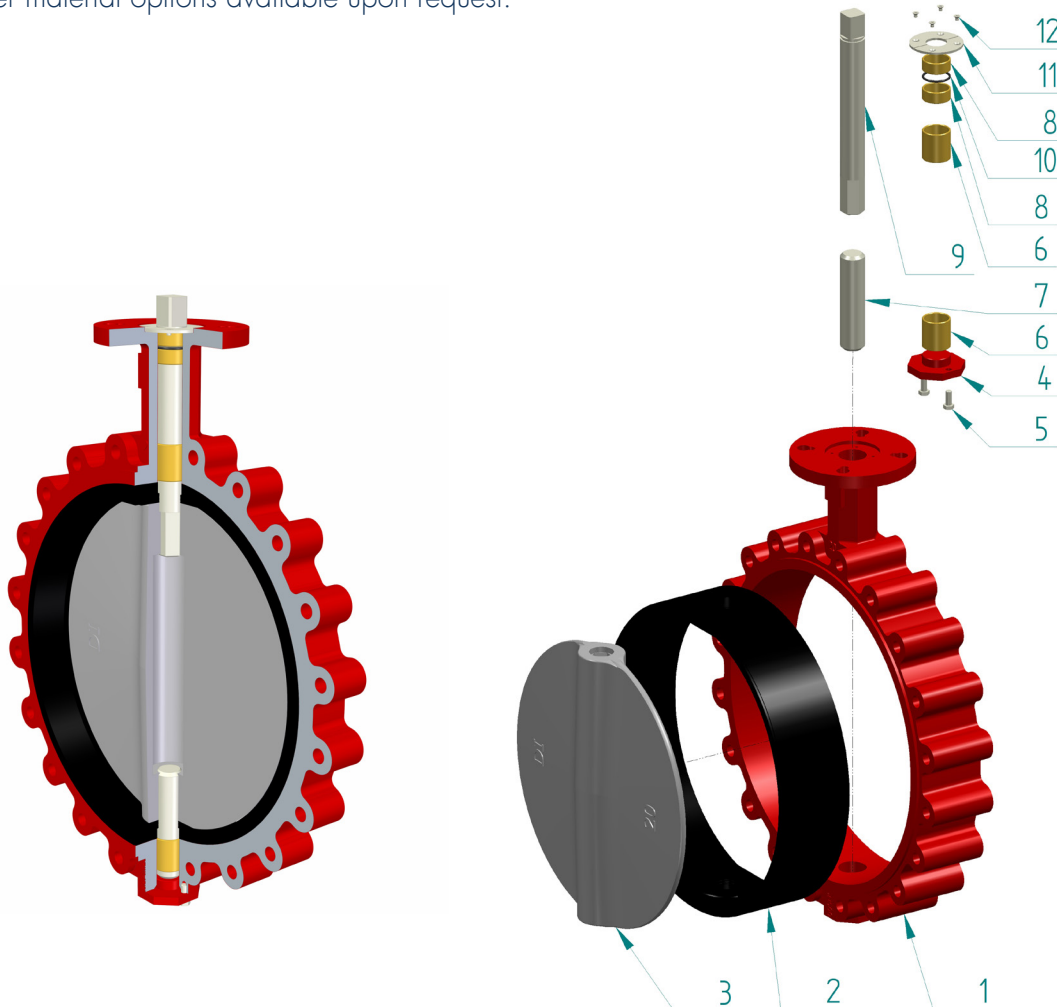
Note: Other material options available upon request.



BILL OF MATERIALS DN400 - DN1000

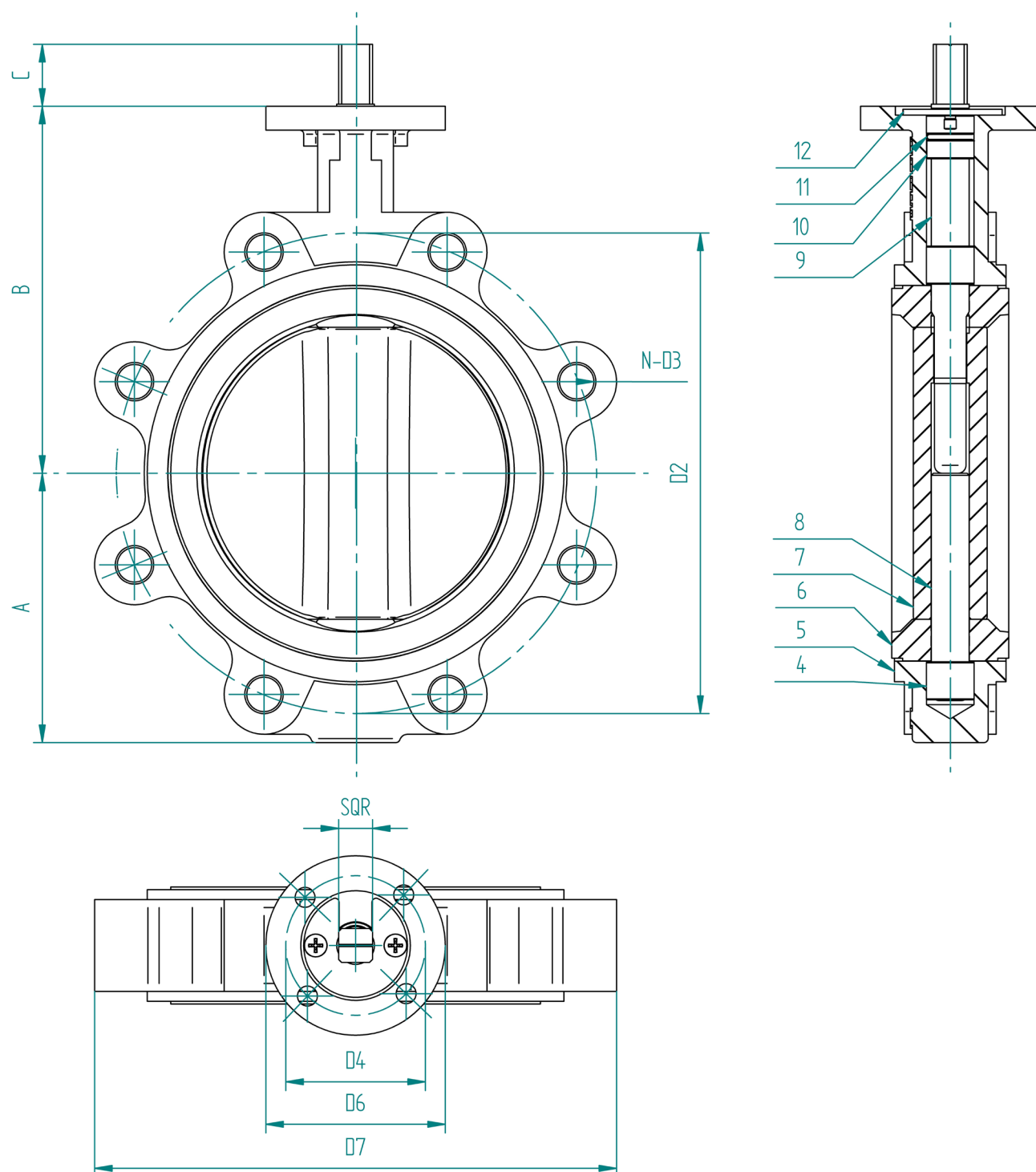
PN	Part Name	Qty.	Material	
			Duplex Disc Valve	Nylon Disc Valve
1	Body	1	DI GGG40	DI GGG40
2	Seat	1	EPDM	EPDM
3	Disc	1	Duplex 2205	GGG40+Nylon
4	End Cap	1	DI GGG40	DI GGG40
5	End Cap Screw	2	Galvanized Steel	Galvanized Steel
6	Long Bushing	2	PTFE	PTFE </td
7	Bottom Shaft	1	Duplex 2205	SS416
8	Short Bushing	2	Galvanized Steel	Galvanized Steel
9	Top Shaft	1	Duplex 2205	SS416
10	O-Ring	1	NBR	NBR
11	Stop Cover	2	Galvanized Steel	Galvanized Steel
12	Stop Cover Screw	4	Galvanized Steel	Galvanized Steel

Note: Other material options available upon request.

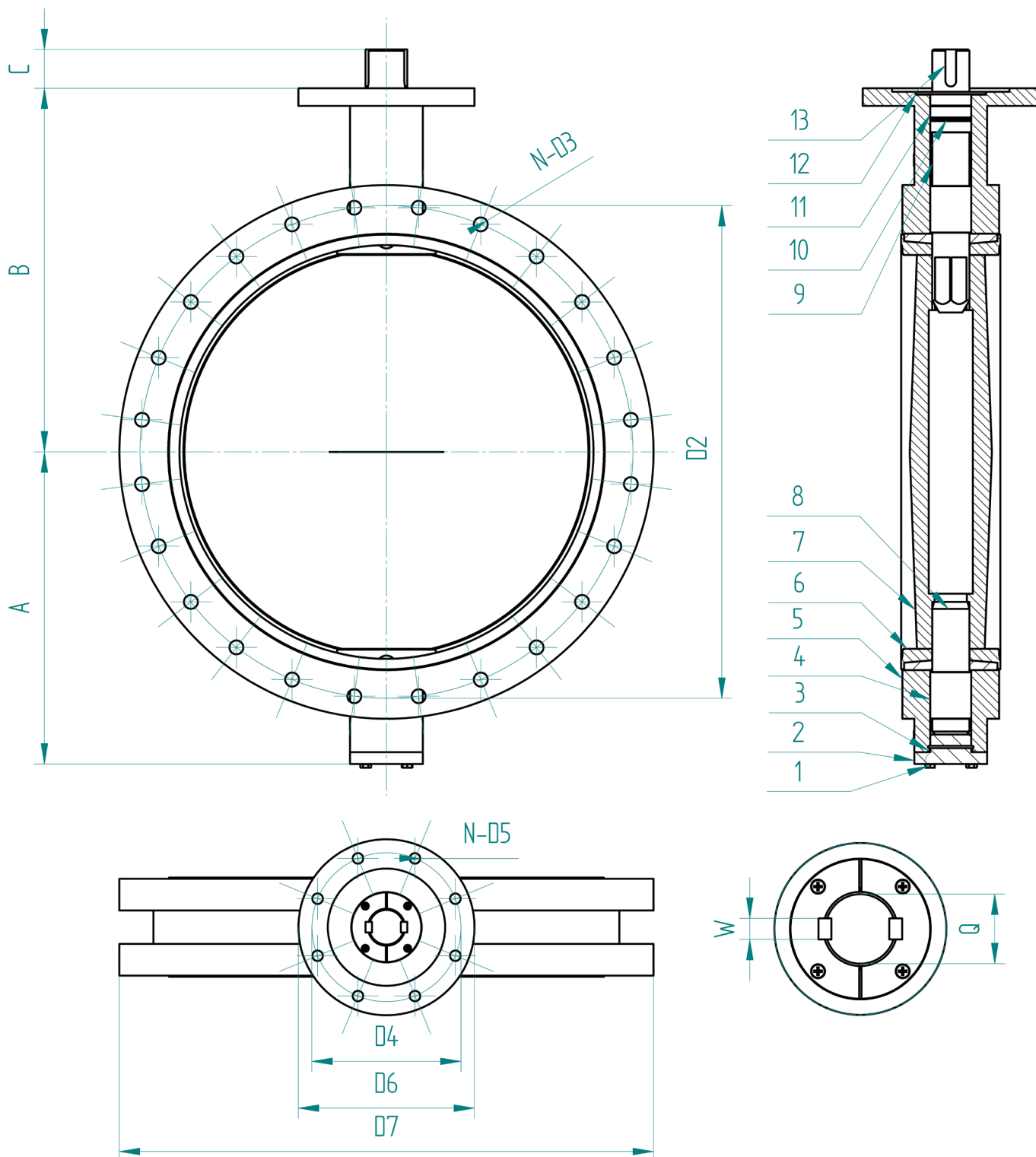


ASSEMBLY DRAWING

DN40 - DN600



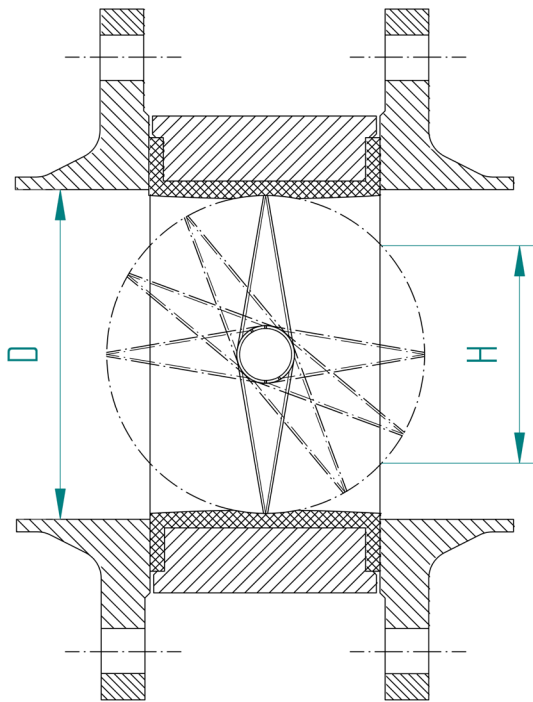
DN700 - DN1000



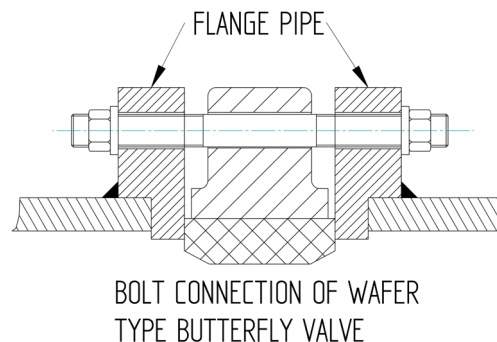
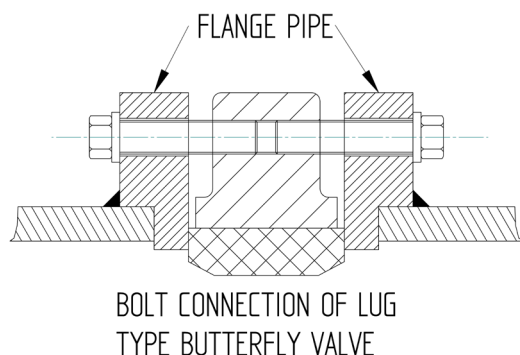
INSTALLATION

Preparations

- Make sure the valve is installed in a position suitable for operation, maintenance and replacement.
 - This is a general installation manual not taking into account the flow direction in your specific pipeline system.
 - For best performance, install a filter in front of the valve.
 - Do not install the valve in a pipeline with a nominal pressure exceeding the specifications given in this manual!
1. Select a valve matching the size and pressure specifications of the system.
 2. Unpack the valve and check the following:
 - Confirm that the valve meets the working conditions specified on the nameplate and documentation.
 - Inspect the seat, connection surfaces and the disc sealing. There should be no damage or particles inside.
 3. When fully open, the disc must not touch the rest of the line. As shown in the figure below, dimension H must be less than dimension D.



4. Particles lodged between the sealing surface of the seat and disc will damage the sealing surface, disc and seat if the disc is operated. Any such damage will lead to leakage.
5. Verify that the actuator/gear is firmly mounted on the valve.
6. Open and close the valve to check that it operates smoothly and accurately.
7. Confirm that the mounting flange matches the pipe flange.
8. Based on the weight and intended positioning of the installed valve, choose suitable tools to install the valve based on below assembly illustrations, information on dimensions of mounting flanges as well as installation instructions, size and quantity of installation bolts.



Installation of Butterfly Valve

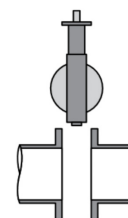
1. Before installation, check that the pipe and pipe flanges are clean. Contamination such as mill scale, metal shavings, welding slag, etc. will obstruct disc movement and damage both disc and seat.
2. When using coated disc valves, ensure that the media flowing through is particle-free.
3. When using valves with coated discs in seawater, carefully inspect the valve for damage before installation, and ensure the disc remains undamaged during installation.
4. Do not use additional packings. The valve has integrated packings, which will ensure sealing if installed correctly.
5. Adjust the pipes and press the pipe flanges apart to make room for the valve. Insert the valve while making sure that the valve body and disc do not touch the pipe flanges (cf. figure 1). Make sure that the disc is partly open without protruding beyond the valve body. The angle is approximately 10°.
6. Install the valve between the pipe flanges (cf. figure 1). Make sure you do not damage the sealing surfaces on either valve or pipe.
7. Always lift the valve according to instructions. If you are installing valves with mounted actuators, do NOT

Figure 1



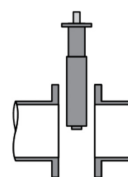
INCORRECT

There is not enough space between the flanges. The disc is opened too much. Result: Disc will be damaged when it hits the flanges.



CORRECT

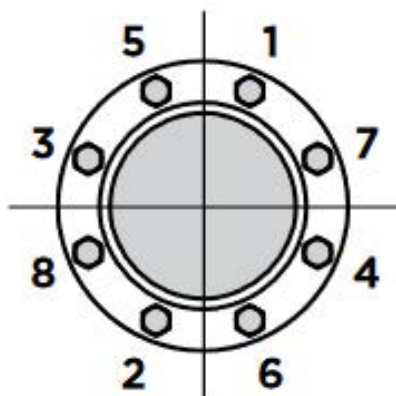
Enough space between flanges. Result: No undesired contact between flanges and disc.



attach lifting gear to the actuator! Unless specifically permitted by the manufacturer, lifting gear must be attached to the valve.

8. Place the valve between the flanges, center it and lock into position with bolts without fastening the bolts.
9. Open the disc carefully until fully open. Make sure the disc does not touch the inside of the pipe.
10. Systematically remove all temporary installation bolts and fasten the remaining flange bolts in the order shown in figure 2. Fasten them by hand for now, no tools.
11. Slowly close the valve to ensure that the disc movement is still unobstructed, not touching the pipe or pipe flange.
12. Open the valve again to fully open and fasten all flange bolts according to figure 2 and the recommended tightening torque in the table below.
13. When done, open and close the valve to ensure it moves smoothly. Cf. figure 3 and 4 for troubleshooting.

Figure 2: Bolt tightening – Correct order



Recommended Bolt Tightening Torques

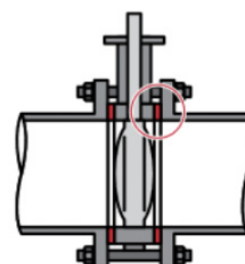
Range Size	Bolt Size	Min. Bolt Torque (Nm)	Max. Bolt Torque (Nm)
1½"-5"	M16	30	100
6"-14"	M20	50	200
16"-20"	M24	100	350
24"-28"	M27	150	510
32"-36"	M30	200	700
40"	M33	250	900

Figure 3: Temporary centering of the valve



INCORRECT

The valve is closed, so the disc presses against the seat. The seat will be permanently deformed and lock the disc. The seat will be damaged when the valve is operated, which will cause leakage.



CORRECT

The bolts are inserted, but not fastened. The disc is partly open and not pressing against the seat.

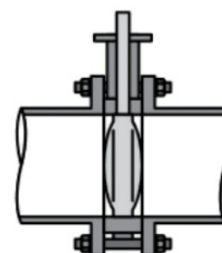
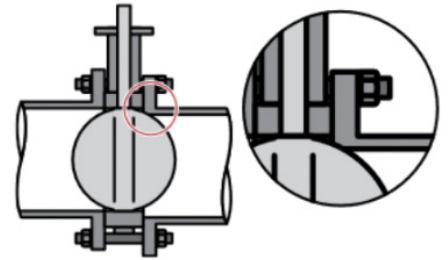


Figure 3: Permanent installation with fastening of bolts



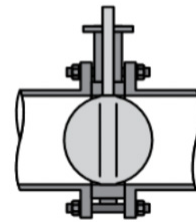
INCORRECT

The pipes are not aligned. Result: The outside of the disc will come in contact with the inside of the pipe. This will damage the disc, increase the operation torque and cause leakages. The seat sealing surfaces will not be able to create a leak-tight seal if the pipes are misaligned.



CORRECT

The pipes are aligned, and bolts are fastened while the disc is in open position.



TECHNICAL PERFORMANCE

Nominal Pressure		1.6MPa (DN40 - DN150)	1.0MPa (DN200 - DN1000)
Testing Pressure	Shell	2.4MPa	1.5MPa
	Seat	1.76MPa	1.1MPa
Service Temperature	NBR	-20°C~+90°C	Service Temperature
	PDM	-20°C~+110°C	PDM
Service Medium	Liquid and gas: Fresh Water, Sea Water, Sewage, Air, Steam, Oil, etc.		

DIMENSIONS

DN	A	B	C (short/ long)	D2	N-D3	F-F	SQR/ Ø(W)	D4	N-D5	D6	D7
DN40	67	120	12/29	110	4- M16	33	11	F05	4-7	65	108
DN50	70	124	15/29	125	4- M16	43	11	F07	4-10	90	119
DN65	77	134	15/29	145	4- M16	46	11	F07	4-10	90	135
DN80	90	141	15/29	160	8- M16	46	11	F07	4-10	90	180
DN100	104	156	15/29	180	8- M16	52	14	F07	4-10	90	208
DN125	118	168	20/29	210	8- M16	56	14	F07	4-10	90	236
DN150	135	184	20/31	240	8- M20	56	17	F07	4-10	90	262
DN200	166	213	25	295	8- M20	60	22	F10/ F12	4-12/ 4-14	150	316
DN250	202	244	25	350	12- M20	68	22	F10/ F12 or F10/ F14	4-12/ 4-14 or 4-12/ 4-18	175	378
DN300	232	283	25	400	12- M20	78	22	F10/ F12	4-12/ 4-14	150	429
DN350	248	368	30	460	16- M20	78	27	F12/ F14	4-14/ 4-18	175	495
DN400	309	400	30	515	16- M24	102	27	F12/ F14	4-14/ 4-18	175	554
DN450	328	422	30	565	20- M24	114	27	F14/ F16	4-18/ 4-22	210	608
DN500	361	480	39	620	20- M24	127	32	F14/ F16	4-18/ 4-22	210	662
DN600	435	562	39	725	20- M27	154	36	F14/ F16	4-18/ 4-22	210	770
DN700	532	620	66	840	24- M27	165	46	F25	8-18	300	910
DN800	595	672	66	950	24- M30	190	46	F25	8-18	300	1010
DN900	635	720	118	1050	28- M30	203	75(20)	F25	8-18	300	1130
DN1000	721	815	142	1160	28- M33	216	85(22)	F25	8-18	300	1255

Note: The lug type butterfly valve (replaceable seat) can be installed as a dead-end service valve with common bolts, other forms are not acceptable.

TORQUE

Size	PN6	PN16	Size	PN6	PN10
1.5"	11	17	14"		480
2"	11	17	16"		750
2.5"	21	24	18"		1050
3"	24	27	20"		1283
4"	44	50	24"		2209
5"	62	72	28"		3483
6"	86	98	32"		4443
8"	155	150	36"		7885
10"	213	248	40"		13388
12"	295	345			

Note: The data without safety factor! Recommended safety factor: 30%.

All torque values shown are for wet (water and other non-lubricating media) on-off service.

For dry service (non-lubricating, dry gas media), multiply values by 1.6.

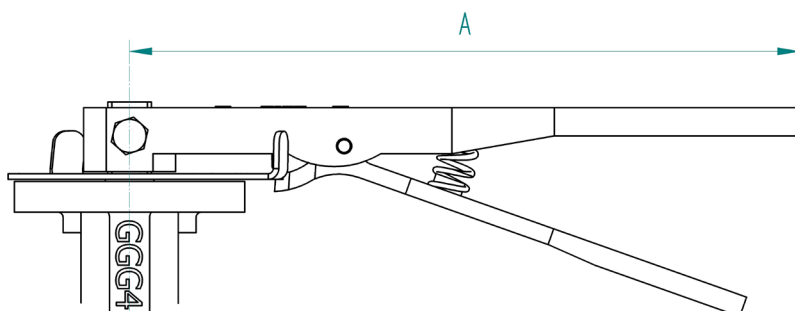
For lubricating medium service (clean, non-abrasive lubricating media), multiply values by 0.85.

WEIGHT

Size	LUG TYPE (kg)
DN40 (1.5")	2.1
DN50 (2")	3.1
DN65 (2.5")	3.8
DN80 (3")	4.8
DN100 (4")	6.3
DN125 (5")	8.6
DN150 (6")	10
DN200 (8")	16.5
DN250 (10")	24
DN300 (12")	34
DN350 (14")	55
DN400 (16")	80
DN450 (18")	100
DN500 (20")	116
DN600 (24")	190
DN700 (28")	320
DN800 (32")	400
DN900 (36")	660
DN1000 (40")	1070

Note: The weight in the table does not include the gear.

WEIGHT & DIMENSIONS LEVER HANDLE

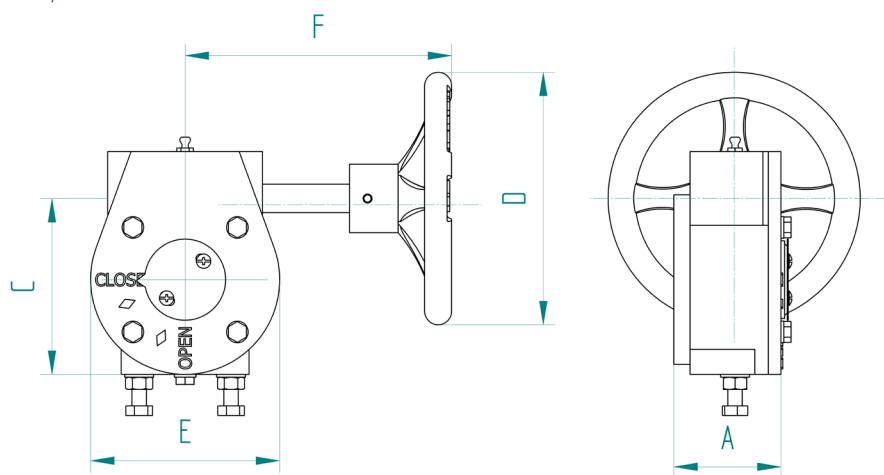


Valve Size	A	Weight (kg)
DN40 - DN150	262	0.8
DN200	360	1.5

ONE-STAGE WORM GEAR ACTUATOR

Features

- Small and lightweight, high output torque
- Easy to operate, accurate

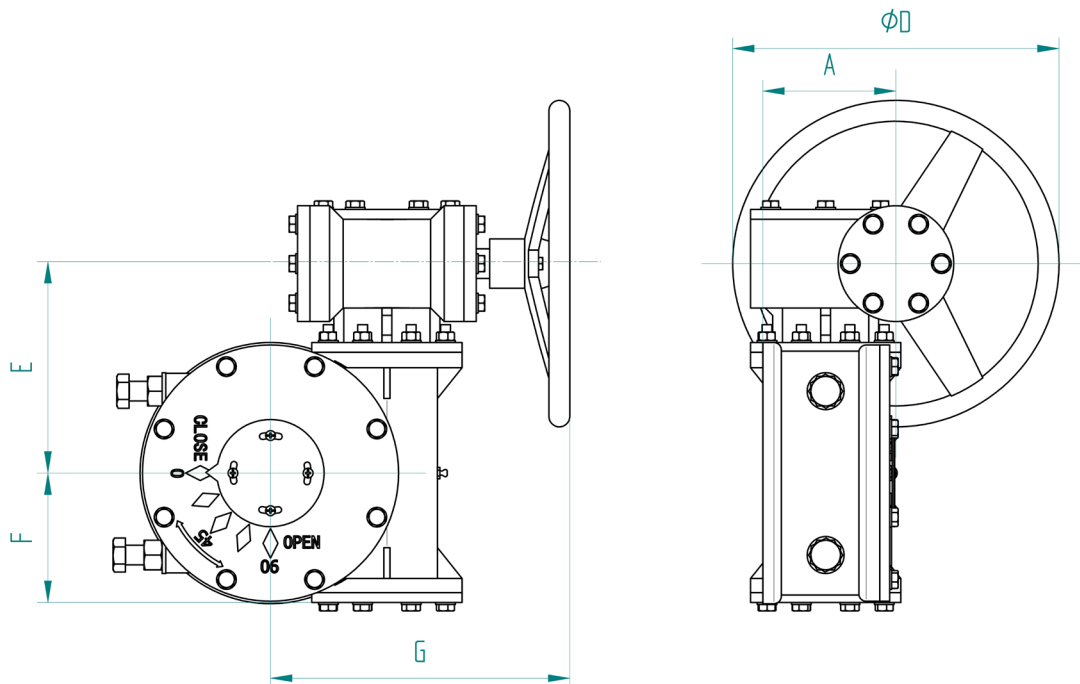


Model	Suitable Valves	C	D	E	F	G	Output Torque Nm	Weight (kg)
24:1	DN40- DN150	97	150	104	160	64	150	4.95
30:1	DN200- DN250	142	300	144	230	75	500	12
50:1	DN300- DN350	156	300	156	230	80	1200	14
80:1	DN400- DN450	248	300	256	282	115	2500	42

DOUBLE-STAGE PLANETARY WORM GEAR ACTUATOR

Features

- Compact structure: The planetary structure follows the axis of the worm gear
- Improves overall mechanic efficiency of the actuator
- Easy to operate, quick action



Model	Suitable Valves	A	E	F	D	G	Output Torque Nm	Weight (kg)
532:1	DN500	107	170	105	300	246	2500	31
640:1	DN600	130	194	132	385	294	4000	48
704:1	DN700- DN800	157	228	146	385	355	8000	80
832:1	DN900- DN1000	170	243	170	425	377	15000	96

STORAGE AND OPERATION

- Store valves in a dry and clean location. Open the valves to a disc position of 5-10°.
- When operating installed valves that are not in regular, short-interval use, check the state of the valves first before operating them.

Caution: When a valve starts requiring more force to operate, it should be checked and serviced. Do not operate the valve using more force than indicated in the user manual. This will damage the valve or actuator.

INSTRUCTIONS FOR USE OF ACTUATORS

- Before mounting an actuator, confirm the valve's "open" and "close" indicator and position.
- The handwheel of the actuator is designed for a specific torque. Do not use an actuator for torque values exceeding its specifications or it will get damaged.

Troubleshooting:

- If the disc moves normally, but the open or close positions are incorrect, loosen the adjustment screw, use the handwheel to move the disc to the correct close position, and retighten the adjustment screw. Repeat for open position.
- If the disc is in the correct open or close position, but the indicator shows an incorrect position, loosen the indicator screw, adjust the indicator to the correct position, and retighten the screw.

MAINTENANCE AND REPAIR

1. Bushings for the valves mentioned in this manual are all self-lubricating. No additional lubricant is needed.
2. The lubrication level of the worm gear should be checked annually. If the grease in the gear box is dirty or black, remove and clean the worm gear with gasoline or kerosene. Refill the gear box with appropriate lithic grease and turn the worm gear 2-3 full turns to spread the lubricant. Close the gear box, tighten the bolts, and re-install the actuator on the valve.
3. Check and clean the position indicator regularly.
4. Check the connecting flange regularly. If you detect small leakages, check the connecting bolt and re-tighten if necessary. If this does not stop the leakage, the valve should be removed from the line and repaired.
5. Frequently check the end of stem. In case of leakage, the valve needs to be removed from the line and repaired. If the valve leaks, remove it from the line, analyze cause of failure and repair.

ISSUES AND SOLUTIONS

ISSUE	CAUSE	SOLUTION
Valve does not seal	1. Seat sealing surface is damaged (scratches)	Replace seat
	2. Sealing surface is dirty/contaminated	Clean sealing surface
	3. Disc sealing surface is damaged	Repair or replace disc.
	4. Disc does not move to the correct closing position	Check and adjust or repair actuator
	5. Seat is corroded and/or deformed	Verify that the valve/seat material tolerates the medium in the system. Replace the valve with a suitable one.
	6. Wear and tear on seat	Replace valve
Leak from end of stem	1. The sealing at stem hole of seat is damaged	Replace seat
	2. The "O"-ring is damaged	Replace the "O"-ring
	3. The taper pin connecting disc and stem is loose	Check and repair/replace the taper pin
	4. Wear and tear on seat or "O"-ring	Replace seat or "O"-ring
Leak between liner and connecting flange	1. The connecting bolts are loose or unevenly tightened	Tighten the connecting bolts evenly
	2. Dirt/contamination between liner surface and flange.	Clean entire area
	3. Seat sealing surface is scratched	Replace seat
	4. Flange surface is damaged	Check and repair fange
	5. Seat is corroded and/or deformed	Verify that the valve/seat material tolerates the medium in the system. Replace the valve with a suitable one.
	6. Wear and tear on seat	Replace seat
Leak from body	1. Body is corroded or damaged	Replace valve

Caution:

- Removing and replacing a valve must be done by professional maintenance personnel.
- If the seat is vulcanized on the body and the valve leaks due to seat damage or corrosion, please replace the valve.

Oslo



Trondheim



Bergen



Larvik



Arendal



CONTACT INFO

Oslo

+47 22 21 51 00
Nedre Rommen 3
0988 Oslo

Trondheim

+47 90 75 72 91
Klæbuveien 196 A
7037 Trondheim

Bergen

+47 55 39 32 00
Hylkjefflaten 10
5109 Hylkje

Arendal

+47 37 06 11 40
Kystveien 40
4841 Arendal

Larvik

+47 33 19 29 15
Skreppstadveien 24
3261 Larvik

post@jsc.no
www.jsc.no



RIKTIG FØRSTE GANGEN