

V105

BUTTERFLY VALVE

SERIES 13



Product Description

TVN V105 Double Eccentric Resilient Seated Butterfly Valve is one of the main product type preferred in water networks. Through its disc design where the center is shifted in two axis, this leads to a big improvement on decreasing operation torque values, lowering the friction on disc sealing area and extended service life. Series 13 type occupies less space compared to Series 14 type.



Technical Data	
Size range	DN150 - DN3000
Pressure range	PN 10-16-25-40
Temperature	-10°C to +130 °C
Design	EN 593
Face to face	EN 558 Series 13
Connection	EN 1092-2 / ISO 7005-2
Coating	Electrostatic / Thermoplastic Powder Epoxy
Testing	EN 12266-1
Marking	EN 19
Operation	Manual Gearbox with Handweel
	Electrical Actuator Quarter Turn On/Off
	Electrical Actuator Quarter Turn Modulating Type

Application Range

- Potable water applications
- Wastewater & sewage systems
- Heating, ventilation and air conditioning systems
- Water treatment and distribution systems
- Seawater applications
- Mining industry
- Fire extinguishing systems

Related Products

- V202 Tilting Check Valve
- V251 Dismantling Joint
- V151 Gate Valve
- V651 Rubber Expansion Joint
- V351 Flange Adaptor
- V401 Coupling



POTABLE WATER



WASTE WATER



IRRIGATION

V105 BUTTERFLY VALVE SERIES 13



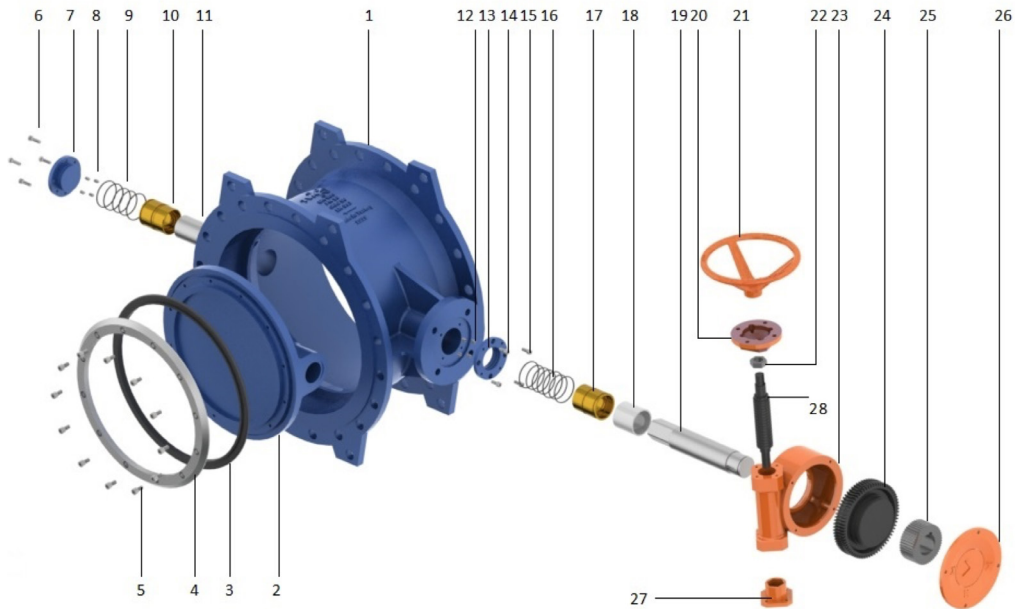
Product Features

- GGG40/50 Ductile Iron Body & Disc allows high impact and stretching resistance
- Double Eccentric / Double Offset Disc Design
- Resilient Seated Type
- Disc sealing ring EPDM as default. NBR or VITON options are available
- Block moulded solid/one-piece T-shaped disc sealing ring extends drop-tight sealing life time
- Easy to replace disc sealing ring without dismantling the valve from the pipeline and without dismantling the disc from the valve itself just by taking out the retaining ring through its bolts. It is easy to replace the disc sealing ring without any additional equipments
- SS308/309/316 grade stainless steel welding seat on the body is manufactured through automatic welding machines and microfinished precise milling operation. When disc is fully closed, disc sealing ring applies equal pressure on every point on the welding seat.
- Drop-tight closure
- Double O-ring feature on both shafts ensures high sealing
- Shafts are equipped with bronze bushings having high corrosion resistance
- Ensures minimized pressure loss and increased energy efficiency with double shaft design
- Easy to operate with self locking gearbox equipped with mechanical indicator
- Low torque requirements during operation
- Easy to install on the line, light weight and occupies less space
- Full coating on the body and disc internally & externally with an average of 250 microns. Higher coating thicknesses are available when required.
- WRAS approved coating available upon request which meets hygienic requirements for potable water applications
- Maintenance free design for the valve and gearbox
- Default operation is gearbox with ISO top flange ready to connect electrical actuator. Pneumatic actuators can be installed directly on the top flange of the valve itself.
- V105 Double Eccentric Butterfly valves are designed bi-directional according to EN1074-2. For proper installation, direction arrow on the body should be considered.
- Operation with extended spindle version is also available
- Balanced positioned lifting holes on the body ease transportation and installation
- Hydrostatic test pressure for seat: PN x 1.1 , for shell: PN x 1.5 according to EN 12266-1.

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Material List



No	Part	Material
1	Body	GGG40/50 Ductile Iron
2	Disc	GGG40/50 Ductile Iron
3	Disc Sealing	EPDM / NBR / VITON / SILICONE
4	Retaining Ring	ST37 / SS304 / SS316
5	Retaining Ring Bolts	A2 / A4
6	Bolts	8.8 / A2 / A4
7	Lower Shaft Cover	GGG40/50 Ductile Iron
8	Bolts	8.8 / A2 / A4
9	O-ring	NBR / EPDM / VITON
10	Bushing	Bronze
11	Lower Shaft	AISI 420 / 304 / 316 Stainless Steel
12	Bolts	8.8 / A2 / A4
13	Main Shaft Cover	ST37 Steel / AISI304 / AISI316 Stainless Steel
14	Bolts	8.8 / A2 / A4
15	Gear Box Shaft	GGG40/50 Ductile Iron / ST37 Steel / AISI 304 Stainless Steel

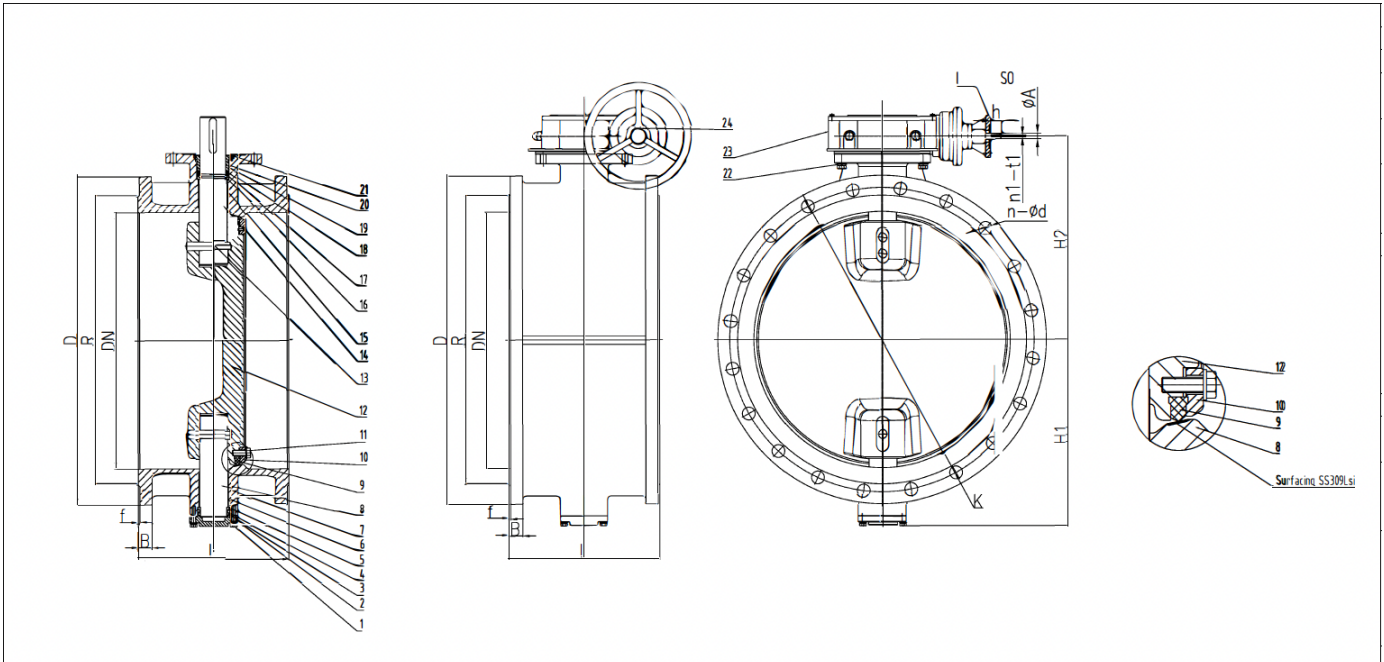
No	Part	Material
16	O-ring	NBR / EPDM / VITON
17	Bushing	Bronze
18	Main Shaft Bearing	Delrin / PP / PE
19	Main Shaft	AISI 420 / 304 / 316 Stainless Steel
20	Gearbox ISO Top Flange	GGG40/50 Ductile Iron / ST37 Steel
21	Hand Wheel	GGG40/50 Ductile Iron
22	Hexagon Nut	ST37 Steel
23	Gearbox Body	GGG40/50 Ductile Iron
24	Gear	GGG40/50/60 Ductile Iron
25	Inner Gear Shaft Connection	GGG40/50 Ductile Iron
26	Gearbox Cover	GGG40/50 Ductile Iron
27	Gearbox Shaft Cover	GGG40/50 Ductile Iron / ST37 Steel
28	Gearbox Shaft	C40 Steel

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Dimensions Table

PN10 DN150 - DN1000



Fusion bonded epoxy coated min. 250 microns RAL5005

1000	410	1230	1160	1112	40	5	28-37	665	1105	F10	20	30	1-6	13500	17550	725	97
900	330	1115	1050	1001	37.5	5	28-34	600	965	F10	20	30	1-6	10500	13650	725	75
800	318	1015	950	901	35	5	24-34	552	900	F10	20	30	1-6	8000	10400	540	77
700	292	895	840	794	32.5	5	24-31	490	825	F10	20	30	1-6	5500	7150	540	53
600	267	780	725	682	30	5	20-31	425	745	F10	20	30	1-6	3900	5070	385	53
500	229	670	620	582	26.5	4	20-28	360	585	F10	20	30	1-6	2600	3380	385	35
450	222	615	565	530	25.5	4	20-28	335	540	F10	20	30	1-6	1900	2470	187	53
400	216	565	515	480	24.5	4	16-28	315	585	F10	20	30	1-6	1480	1924	135	57
350	190	505	460	429	24.5	4	16-23	285	435	F10	20	30	1-6	1050	1365	135	40
300	178	445	400	370	24.5	4	12-23	245	390	F10	20	30	1-6	740	888	54	55
250	165	395	350	319	22	3	12-23	216	345	F10	20	30	1-6	480	576	40	48
200	152	340	295	266	20	3	8-23	196.0	310	F07	18	30	1-6	300	360	40	30
150	140	285	240	211	19	3	8-23	170	285	F07	18	30	1-6	150	180	36	17
DN	L-SB	D	K	R	B	f	n-φd	H1	H2	Flange	φA	h	n1-t1	Bare Torque	Safe Torque	speed ratio	Output torque
	EN558	End Flange EN1092-2 PN10 RF				Unit:mm			Height		ISO Top Flange						

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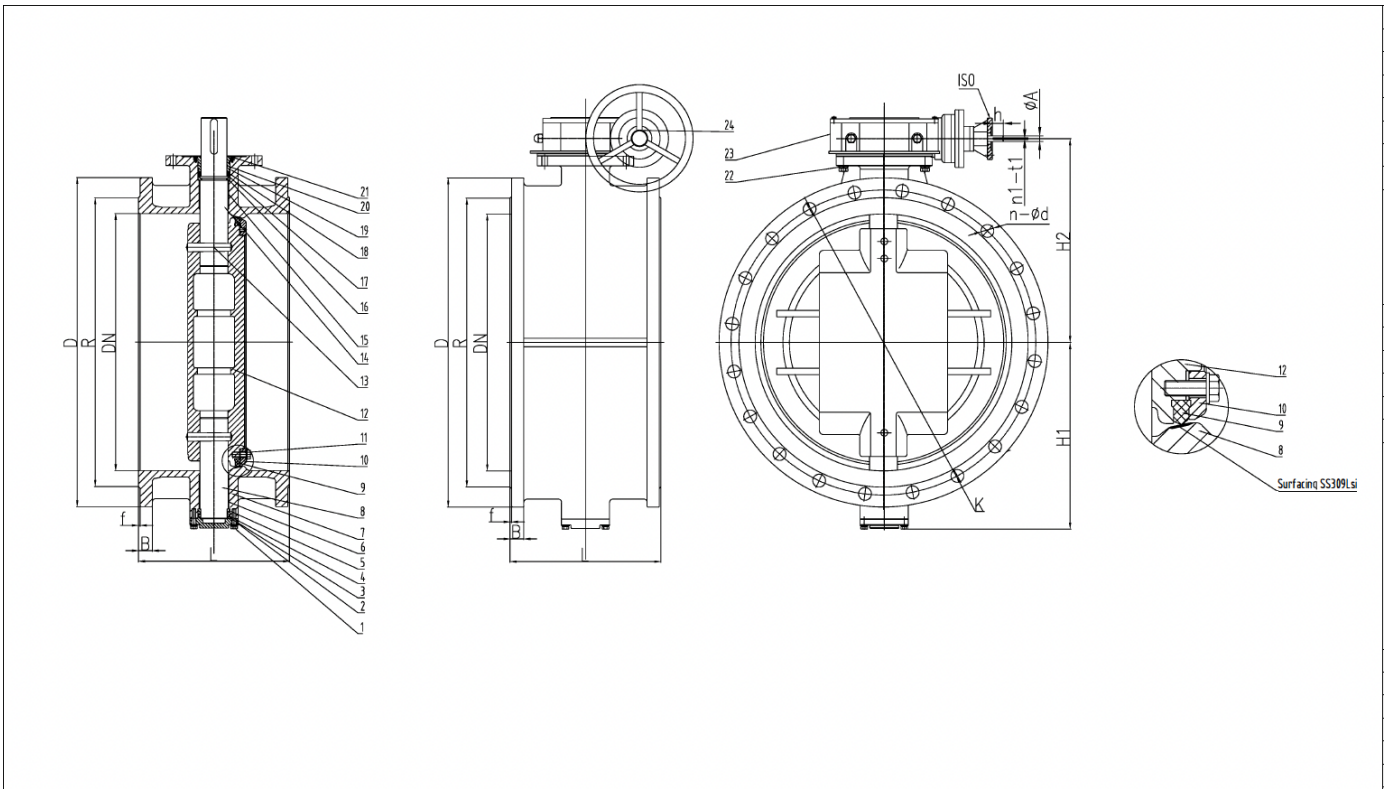
BUTTERFLY VALVE

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Dimensions Table

PN10 DN1100 - DN2200



Fusion bonded epoxy coated min. 250 microns RAL5005

2200	800	2550	2440	2360	58	6	52-57	1385	1810	F12	28	40	1-8	113000	146900	2381	247
2000	760	2325	2230	2150	55	5	48-50	1315	1720	F10	20	30	1-6	87500	113750	4034	113
1800	670	2115	2020	1950	52	5	44-50	1160	1490	F10	20	30	1-6	64000	83200	3003	111
1600	600	1915	1820	1750	49	5	40-50	1045	1390	F10	20	30	1-6	46900	60970	2903	84
1500	600	1785	1700	1640	47.5	5	36-44	1025	1380	F10	20	30	1-6	39500	51350	1810	113
1400	530	1675	1590	1530	46	5	36-44	920	1310	F10	20	30	1-6	32300	41990	1810	93
1300	500	1575	1490	1430	45.0	5	32-44	840	1250	F10	20	30	1-6	26400	32320	1611	85
1200	470	1455	1380	1328	45	5	32-41	790	1090	F10	20	30	1-6	21300	27690	1078	103
1100	440	1340	1270	1218	42.5	5	32-37	735	1050	F10	20	30	1-6	17300	22490	1078	83
DN	L-S13	D	K	R	B	f	n-φd	H1	H2	Flange	φA	h	n1-t1	Bare Torque	Safe Torque	speed ratio	Output torque
	EN558	End Flange EN1092-2 PN10 RF				Unit:mm		Height		ISO Top Flange							

* DN2400 and above size dimensional drawings can be sent upon request

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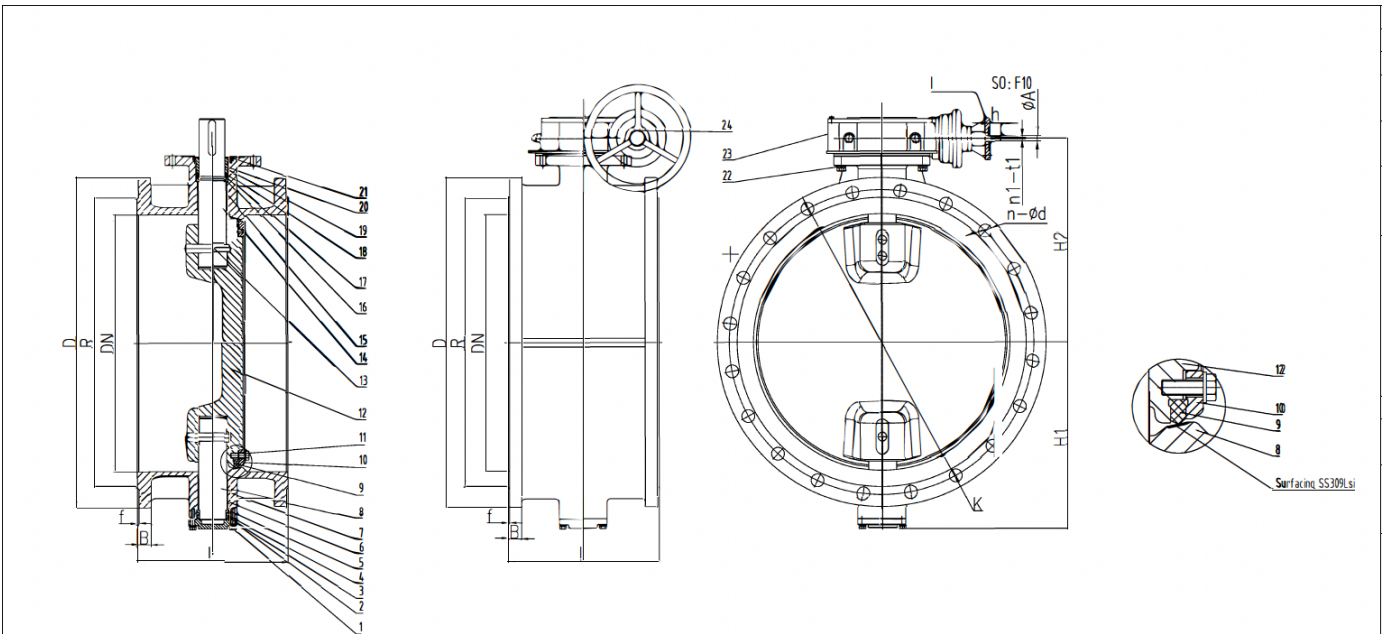
BUTTERFLY VALVE

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Dimensions Table

PN16 DN150 - DN1000



Fusion bonded epoxy coated min. 250 microns RAL5005

1000	410	1255	1170	1112	50	5	28-44	665	1105	F10	20	30	1-6	19500	25350	850	119
900	330	1125	1050	1001	46.5	5	28-41	600	965	F10	20	30	1-6	15000	19500	725	108
800	318	1025	950	901	43	5	24-41	552	900	F10	20	30	1-6	11700	15210	725	84
700	292	910	840	794	39.5	5	24-37	490	825	F10	20	30	1-6	8100	10530	405	104
600	267	840	770	682	36	5	24-37	425	745	F10	20	30	1-6	5800	7540	276	109
500	229	715	650	609	31.5	4	20-34	360	585	F10	20	30	1-6	3800	4940	276	72
450	222	640	585	548	30	4	20-31	335	540	F10	20	30	1-6	2800	3640	276	53
400	216	580	525	480	28	4	16-31	315	585	F10	20	30	1-6	2200	2860	187	61
350	190	520	470	429	26.5	4	16-28	285	435	F10	20	30	1-6	1500	1950	135	58
300	178	460	410	370	24.5	4	12-28	245	390	F10	20	30	1-6	1100	1430	135	42
250	165	405	355	319	22	3	12-28	216	345	F10	20	30	1-6	690	828	54	51
200	152	340	295	266	20	3	12-23	196.0	310	F10	20	30	1-6	420	504	40	42
150	140	285	240	211	19	3	8-23	170	285	F07	18	30	1-6	210	252	36	23
DN	L-S13	D	K	R	B	f	n-φd	H1	H2	Flange	φA	h	n1-t1	Bare Torque	Safe Torque	speed ratio	Output torque
	EN558	End Flange EN1092-2 PN16 RF					Unit:mm		Height		ISO Top Flange						

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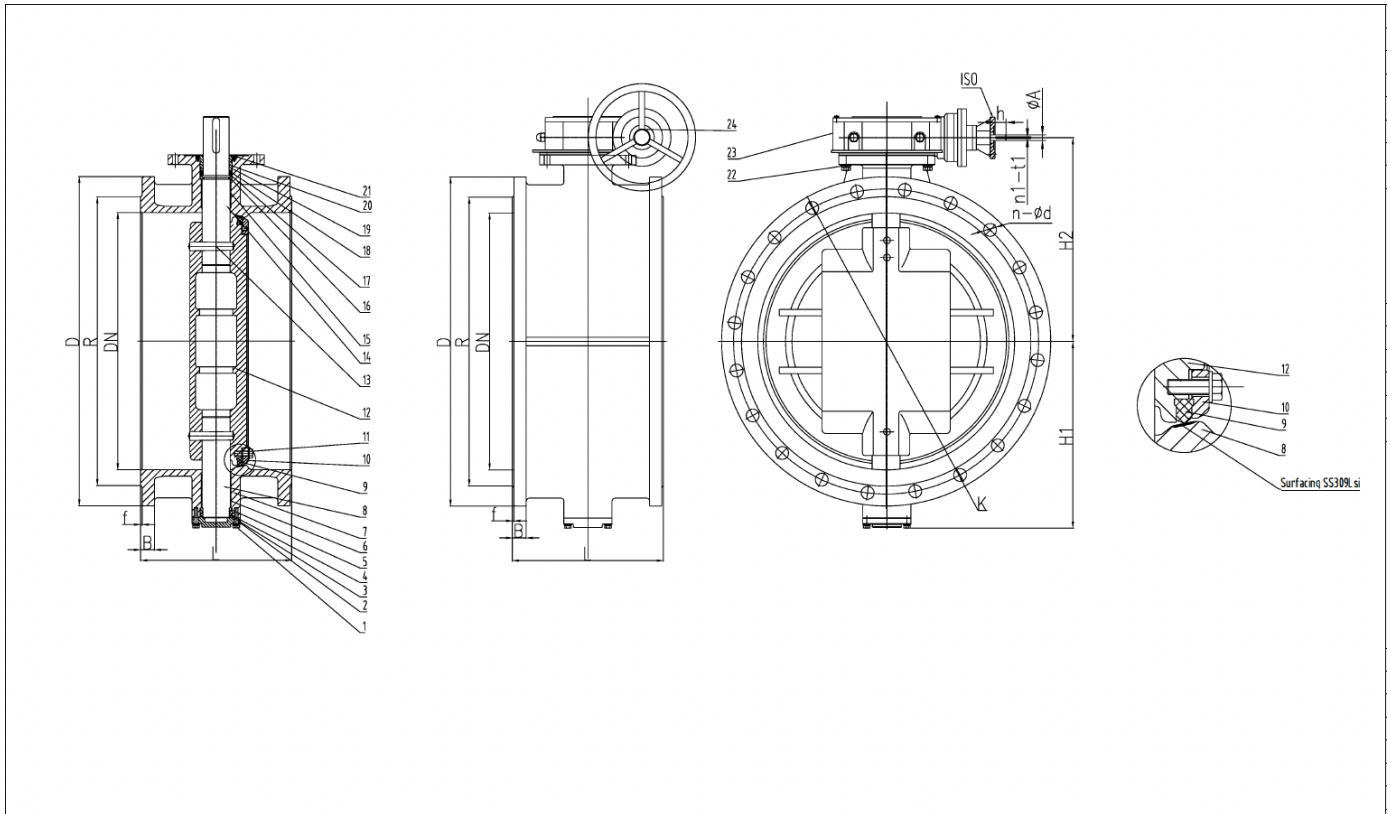
BUTTERFLY VALVE

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Dimensions Table

PN16 DN1100 - DN2200



Fusion bonded epoxy coated min. 250 microns RAL5005

2200	800	2555	2440	2360	75	6	52-62	1385	1810	F12	28	40	1-8	182000	236600	4500	210
2000	760	2345	2230	2150	75	5	48-62	1315	1720	F12	28	40	1-8	140000	182000	3352	217
1800	670	2130	2020	1950	70	5	44-57	1160	1490	F10	20	30	1-6	107000	139100	5200	107
1600	600	1930	1820	1750	65	5	40-57	1045	1390	F10	20	30	1-6	70000	91000	4034	90
1500	600	1820	1710	1640	62.5	5	36-57	1025	1380	F10	20	30	1-6	62000	80600	3003	107
1400	530	1685	1590	1530	60	5	36-50	920	1310	F10	20	30	1-6	48000	62400	3003	83
1300	500	1585	1490	1430	58.5	5	32-50	840	1250	F10	20	30	1-6	41000	53300	1810	118
1200	470	1485	1390	1328	57	5	32-50	790	1090	F10	20	30	1-6	32200	41860	1445	116
1100	440	1355	1270	1218	53.5	5	32-44	735	1050	F10	20	30	1-6	27000	35100	1260	111
DN	L-S13	D	K	R	B	f	n-φd	H1	H2	Flange	φA	h	n1-t1	Bare Torque	Safe Torque	speed ratio	Output torque
	EN558	End Flange EN1092-2 PN16 RF				Unit:mm		Height		ISO Top Flange							

* DN2400 and above size dimensional drawings can be sent upon request

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DOUBLE ECCENTRIC RESILIENT SEATED BUTTERFLY VALVE



Body

The valve body consists basically of a shell of the same interior diameter as the duct where it is installed, with a flange on each side. These flanges have a machined recess throughout the diameter in order to position the O-ring.

There is a ring inside the shell in order to make the seal; this ring is always stainless steel, regardless of the material of the body. This ring is then machined for efficient sealing and minimum disturbances in the flow.

In order to house the shafts, hubs are positioned on the body shell, with reinforcements and ribs on the outside to join the housings for the shafts, shell and flanges. This achieves a highly robust single-piece body which can withstand any level of tension. The standard manufacturing material is EN-GJS-500 (GGG50). However, other alloys and materials are available on request. As standard, ductile iron bodies are painted with an anti-corrosive epoxy protection (WRAS approved coating is available up to request). Other types of anti-corrosive protections are available to order.

Disc

The disc consists basically of a thick, flat circular disc. This disc has two lugs in order to couple the shafts and transmit the movement of the actuator. The clapper is sized in line with working pressure. TVN discs are always moved by cotters and not by pins.

The standard manufacturing material is EN-GJS-500 (GGG50) ductile iron. Other materials or combinations can be supplied to order.

The disc has a machined recess throughout the perimeter of the main disc, housing the seal tight joint which is secured by way of the flange. As standard, ductile iron discs are painted with an anti-corrosive epoxy protection. Other types of anti-corrosive protections are available to order.

Seat

TVN double eccentric butterfly valves make the seal by pressing the special elastomer profile against a stainless steel ring. The special elastomer profile is located in the outer recess of the perimeter of the disc and is secured by way of a flange with stainless steel screws. The stainless steel ring is located inside the body shell, and has been machined in order to ensure correct sealing and minimize disturbances in the flow.

Seal tightness is usually achieved with an EPDM seal, although other types of elastomers are available. The seal can be changed without removing the valve from the pipeline.

Seal tight materials

EPDM This is the standard resilient seal fitted on TVN valves. It can be used in many applications, although it is generally used for water and products diluted in water at temperatures no higher than 90°C. It can also be used with abrasive products and provides the valve with 100% seal-tightness.

NITRILE It is used in fluids containing fats or oils at temperatures no higher than 90°C. It provides the valve with 100% seal-tightness.

VITON Suitable for corrosive applications and high temperatures up to 190°C continuously and peaks of 210°C. It provides the valve with 100% seal-tightness.

SILICONE Used mainly in the food industry and for pharmaceutical products with temperatures no higher than 200°C. It provides the valve with seal-tightness of 100%.

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DOUBLE ECCENTRIC RESILIENT SEATED BUTTERFLY VALVE



Shafts

The shafts of TVN's V105 butterfly valves are made from AISI420, AISI304, AISI316, AISI316L, etc stainless steel, making them highly resistant with excellent properties in preventing corrosion. Parallel cotters are used to transmit the movement of the actuator to the clapper, meaning both the clapper and the shafts have several machined cotter holes. Self-lubricating bronze bushing is placed in the body hubs in order for the shafts to turn easily.

O-Ring Seals

O-rings are used to guarantee seal tightness between the duct and the outside. The only points in which there may be leakages from the body are between the shafts and the hubs, meaning seal tightness is achieved by placing O-rings in a bronze flange. The O-rings used in the TVN valves are usually EPDM, nitrile, although other types of elastomers are available.

Actuators

All types of actuators can be supplied, whether manual or automatic. The most suitable type of actuator will be chosen in each case in accordance with the working conditions and characteristics of the facility. Sometimes it is the customer who specifies what type of actuator is required for the project.

INSPECTION ON RECEIPT AND HANDLING

- a. At receipt of the product, ensure that there are no transit damages to the product received, especially on valve flanges, operating actuators etc.
- b. Also ensure that Parts and Accessories are received as per ordered scope of supply.
- c. Special operators (if any), like Electric Actuators / Pneumatic Actuators / Hydraulic Actuators & their accessories (if any) are sent loose along with the product for their safe transportation. Examine them for freedom from damages. Also ensure that adequate numbers of fasteners for mounting accessories are received.
- d. While unloading the product, please use the provision of lifting made on the valve (e.g. Lifting Lugs, Lifting eye bolts).
- e. Use the safe lifting devices (e.g. slings, hoists, hooks etc.) of dequate capacity.

STORAGE & PRESERVATION

If the valve has to be stored at site before installation,

- a. Store it on horizontal level surface in dry and clean atmosphere.
- b. Store the products in well-covered sheds, protected from sun, rain and dust.
- c. In the instance if the valve is required to be stored for long duration, ensure that rust preventive should be applied on the corroding surfaces.
- d. It is advisable to give a coat of silicone grease on rubber seals during the storage period and keep the valves in partly open position so that the seals remain in un-stressed condition. Keep the seal away from direct sunlight and dusty atmosphere.
- e. Gear Box, Electrical / Hydraulic / Pneumatic actuators & accessories should also be stored away from dust, dirt or any rainfall or water.

CHECKS ON THE VALVE ASSEMBLY BEFORE INSTALLATION

- a. Before taking the Butterfly Valve for pipe installation, make sure that it is cleaned from inside and outside and there are no foreign or metallic objects sticking on to its sealing elements. Also clean the valve interior passages to remove any foreign matter & rust preventive on machined surfaces.
- b. While installing the operating element, make sure that the Butterfly Valve is in fully closed position.
- c. Do not attempt to force Electric actuator assembly on the Gear Box connecting shaft. In case of any difficulty in proper fitment of the key ways, please de-burr the bore, key ways & keys with polish paper. In any case, do not hammer the actuator surface to drive it in. If difficulty persists, contact TVN.
- d. Ensure that the entire rust preventive on the machined surface in the flow area is removed, before the valve is put in pipe-line.
- e. Do not tighten or loosen the rubber seal for any reason. The rubber seal is factory set.
- f. Note the name plate details and arrow flow mark on valve body and install the valve in right orientation with respect to pressure gradient. Arrow on valve body should point from high pressure side to low pressure side of the pipeline. Recheck valve pressure rating adequacy with respect to operating pressure.
- g. Valves should be installed in the pipeline, only after verifying the sealing ability of rubber seal. This can be done by examination of the seals for freedom from surface damages, cracks / dent marks, embedded foreign particles as well as uniform clearance between the seal & body ring. If abnormalities of this type are observed, replace the seal.
- h. Butterfly Valves are designed to operate with Valve Shafts in HORIZONTAL orientation, unless otherwise specified at the time of ordering. In any case, do not install the Butterfly Valve with vertical orientation of the shafts, unless that was originally specified in order and accepted by TVN for such design. Valves required to operate with shafts in vertical orientation have different design.
- i. Operate the Butterfly Valve manually from Full Close to Full Open and Full Open to Full Close, with the operator hand wheel. Ensure that there is no undue resistance / friction in the operation. Ensure that the factory setting of Limiting Stopper Bolts in the Gear Box is not disturbed, for the respective limit positions. If so, adjust the same.
- j. Before connecting valve & pipeline flanges, ensure that they do not have parallel, angular and radial gaps. While fitting the valve in pipeline, ensure that diagonally opposite bolts are simultaneously & uniformly tightened.
- k. Butterfly Valves should not be used at end of pipeline open to atmosphere. In this location, the pressure gets suddenly dropped to atmospheric level and consequently velocities created due to throttling are very high. This further leads to two unfavorable phenomena. Torque requirement of the valve to move the disc becomes unstable and high velocities lead to cavitation and erosion damage of valve interiors.

CHECKS FOR THE PIPE-LINE BEFORE INSTALLATION

- a. Clean the pipeline thoroughly so that it does not contain any solid matters which may damage the valve internals.
- b. Avoid parallel, radial and angular mismatch between connecting flanges of valve and the pipeline.
- c. Upstream and downstream piping should be adequately supported and anchored (if required) in such a way that the piping system does not impose any forces & moments on the valve body and the hydraulic thrust arising due to valve closure is carried & sustained by valve supports. Valve flanges are not designed to carry any external loads and moments arising due to pipe expansions / contractions. It is advisable to use Flange Adapter Assembly, after the valve to facilitate valve dismantling and to prevent any loads being transmitted to valve flange.
- d. For the valves having integral foot, provide suitable concrete block with foundation bolts for supporting the valves.
- e. Where the valve does not have integral foot, it is advisable to install a support for the valve at bottom to prevent any sagging to be caused by weight of the valve.
- f. Ensure that pipeline flanges are parallel and are mating the valve flange without leaving any parallel or oblique gap between the flanges. Do not over-tighten the flange bolts / nuts to make the flanges parallel forcefully. That may develop undue stresses in the valve flanges & body leading their deformation & malfunctioning.
- g. If the Butterfly Valves are supplied with By-pass arrangement (against specific order requirement), mount the by-pass arrangement on the pipe-line, across the valve.
- h. Butterfly should not be located immediately before or after a pipe bend. Due to flow disturbances in a bent pipeline, the flow characteristics of the valve are affected.
- i. Butterfly valve should be located in a straight length pipe, at least 1.5 D to 2 D lengths of the pipe downstream of any fitting and at least 3 D lengths upstream of pipe fitting, where D is the nominal diameter of the valve.
- j. For the valve sizes 900mm and above, it is good engineering practice to provide accessibility to valve interiors for inspection / repairs by installing an expansion joint or pipe piece with oblique joint on clamping ring side of the valve.
- k. Butterfly Valve disc, in fully open position projects beyond the flange faces. It is necessary to ensure that pipe coatings and reducers used, if any, do not interfere with swept volume of the disc.
- l. Maximum flow velocity in the pipe-line should not exceed 4 m/s. m. The valves are mainly designed for handling clear water with maximum impurities of 5000 PPM.

PRE-COMMISSIONING CHECKS

- a. Ensure manually that the valve operates smoothly.
- b. The entire pipe flange bolting is properly tightened.
- c. Direction indicated on the valve matches with the pressure gradient convention.
- e. Counter weight & Lever (in case of Hydraulic operated valve), Cylinder & its linkages (in case of pneumatic operated valves) are properly assembled / duly bolted and protective guard cage is provided for them.
- f. Surge protection devices (if any) are operative.
- g. Butterfly valves should be operated when both upstream & downstream pipes are filled with water. In commissioning stage, filling of water could be done by use of by-pass (if provided) and / or keeping the disc crack opened and venting-off air by suitable devices provided in the pipeline.

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DOUBLE ECCENTRIC RESILIENT SEATED BUTTERFLY VALVE



COMMISSIONING

- a. Open the By-pass Valve across the valve (if provided).
- b. Charge the pipe-line with water.
- c. Ensure that there is no leakage through flange gaskets and shaft seals.
- d. After charging the pipeline, operate the valve gradually from Full Close to Full Open. Allow the flow stabilize for 10 to 15 minutes. Operate the valve from Full Open to Full close. Ensure that there is no any abnormal noise and vibrations during full travel of the disc. Now the valve is commissioned for its Operation.

OPERATION

- a. By-pass valve (if provided) keep it open while every opening / closing cycle of the Butterfly Valve.
- b. Once the Butterfly Valve is closed, the By-pass valve may be kept closed till next operation of the butterfly valve.
- c. In case the manually operated Butterfly Valve demands excessive force to operate, ensure that there is no mechanical obstruction in pipeline or in the operating mechanism.
- d. Do not use means like levers on hand wheel to exert addition force. These hand wheels are designed to be weak links to protect other expensive parts in operators.

TVN V105 Butterfly Valves require very little maintenance if maintenance check point are attended to during periodic inspection & during overhaul. However valves could malfunction in unusual conditions of usage, water contamination and may require maintenance as below:

TROUBLESHOOTING

FAULT	POSSIBLE CAUSE	CORRECTING MEASURES
No Flow - Not enough Flow	Flange covers or protection not removed	Clear valve entrances
	Valve closed or almost closed	Check valve position
	Piping clogged	Check piping system
Valve is impossible or difficult to open or close	Service conditions (e.g. medium, temperature) may be outside the specified limits	Replace the valve Consult the supplier or manufacturer
	Power failure	Check the power supply
	Actuator fault	Overhaul the actuator or replace it
	Wrong direction of rotation	Turn in the correct direction (anti-clockwise for opening)
	Solid matter is blocking the valve disc	Rinse or clean the valve
	The parallel key on the stem has sheered off	Determine the cause and replace the parallel key
	Liquid has solidified between the bearings	If possible, flush the bearings and the stem via the flushing connections
Valve is leaking at closing	The disc is not completely closed	Put the disc into the closed position
	Dirt trapped at closing	Move the disc and flush the valve in the open position
	Mechanical stop of the worm gear at closing not well adjusted.	Adjust the gearbox
	The disc sealing or seat is damaged	Replace the disc sealing or repair the seat
Stem leakage	Stem seals or stem damaged or worn down	Revise and replace if needed
	Excessive pressure or temperature, fluid not compatible	Revise working conditions
Body or flanges break	Assembly bolts with counterflanges has been wrongly tightened or counterflanges are misaligned or with too much gap. Weight not properly supported	Revise installation and tightening according to this Manual
	Working parameters beyond allowable limits	Replace by suitable valve



All these procedures require emptying the upstream and downstream piping and removal of the valve from the pipeline. If the piping system provides access to clamping ring side of the valve (e.g. by dismantling of expansion joint), removal of valve from piping is not necessary.

Re-setting the Disc Seal

After setting the limiting stopper bolts, it is always advisable to check the seal ring for any wear which will impair its sealing function. If the seal ring touches the body seat ring without any discontinuity (checked with feeler gauge of 0.05mm, which should just pass the joint with little force), then its readjustment is not necessary.

If there is more clearance or discontinuity of contact, re-adjust the seal ring as follows. Bring the disc to "Closed" position. Loosen all the setting grub screws on clamping ring. Tighten the bolts on clamping ring to compress and expand the seal ring in the areas where clearances exceed the requirement of passing of 0.05mm feeler with light force.

After the seal ring makes satisfactory contact all over its periphery with body seat rings, tighten all the setting grub screws. This completes re-setting of the disc seal.

Replacement of deformed or damaged Disc Seal

If there are visual cracks, permanent deformations or embedded solids in the disc seal ring, an attempt to re-set it should not be done. The seal ring should be replaced.

Bring the disc to "Closed" position. Remove the clamping ring / clamping ring segments after loosening the setting grub screws and removing bolts on the clamping ring.

The match marking is to be used for re-fitment of clamping ring / clamping ring segments at the same location & with the same orientation as before. After removal of the clamping ring, take out the damaged / deformed disc seal from the disc.

Clean the groove provided on the disc for fitting the disc seal, the periphery of the disc where the new seal is to be fitted.

Recommended Spares for Butterfly Valves

Product Cross Sectional and General Assembly Drawing attached with this manual indicates the components of the respective valves, along with the recommended spares.

We strongly recommend keeping the spares handy all the time to be able to eliminate delays in attending the operation troubles and scheduled replacements / overhauls.

V105

DOUBLE ECCENTRIC RESILIENT SEATED BUTTERFLY VALVE



GENERAL INFORMATION & SAFETY REQUIREMENTS

1. The Products supplied by TVN have been designed with safety in mind. Where hazards cannot be eliminated, the risk has been minimized by the use of guards and other design features. Some hazards can not be guarded against and the instructions below **MUST BE COMPLIED WITH** for safe operations. These instructions can not cover all circumstances; USER of the product is responsible for using safe-working practices at all times.
2. TVN product are designed for installation in designated area, which are to be kept clean and free of obstructions that may restrict safe access to the controls and maintenance access points. 3. Access to the equipment should be kept restricted to the personnel responsible for installation, operation and maintenance and they must be trained, adequately qualified and supplied with adequate tools for their respective tasks.
4. TVN requires that, all personnel that are responsible for installation, operation or maintenance of the equipment, have access to study the product instruction manual **BEFORE** any work is done and they will comply with all local and industry based safety instructions and regulations.
5. Personnel protection safety equipment must be worn where local rules apply.
6. Read the instruction manual before installation, operation and maintenance of the equipment.
7. Note that the limit of product application and permissible use of the product is according to the respective product design & testing standard and product pressure rating. Operation of the equipment beyond these limits will increase risk from hazards and may lead to premature and hazardous failure of the valve / accessories.
8. Clear and easy access to all controls etc. must be maintained at all times. Hazardous or flammable materials must not be stored near valves unless safe areas or racking and suitable containers have been provided.
9. Improper installation, operation or maintenance of the TVN product could result in injury.



SAFETY INSTRUCTIONS WHILE HANDLING, STORAGE AND USAGE

1. For handling / lifting the valves, use devices of adequate capacities certified by competent authorities. Use lifting provisions e.g. lifting eyebolts, lifting lugs etc. wherever provided on the valves.
2. Before fitting the valve in pipeline, ensure that Pressure Rating of the valve is suitable for maximum working pressure / surge pressure that may arise in the pipeline.
3. Non Return Valves / Reflux Valves with Dash-pot arrangement & Counter weight arrangement: Safety Guard for the counter weight & cylinder arrangement shall be provided by the customer to avoid accidents, as the lever with counterweight falls down rapidly during valve closure. It may come down without warning in case of power failure.
4. Electrically Operated Valves! It is to be ensured before operation that proper earthing connection is provided to the actuators. While wiring the actuator in circuit, ensure that direction of actuator rotation which 'Opens' / 'Closes' the valve is according to 'Open' / 'Close' switch.
5. User is solely responsible to refer to and follow Instructions stated in Manuals. This Manual is supplied along with the operator(s), wherever applicable.
6. Open type Gear Arrangement: Due care shall be taken by user while operating valves with Open type Gear Arrangement. The user shall ensure that no part of body or clothing gets caught between pair of Open type gears.
7. In case of manual operated valves, avoid excessive torquing at valve hand wheel / hand lever. Do not use extra leverage to Open / Close the valves.
8. User shall prevent any unauthorized person to mount, dismantle or remount, operate and repair the valves.
9. During using the valve, ensure that approved technical rules & regulations e.g. trading regulations, regulations for prevention of accidents, steam boiler regulations, regulations of gas mains under high pressure, regulations for combustible fluids, local safety regulations etc. are followed.
10. During repairs / maintenance of the valve at site, the user shall take minimum following precautions: a) Provide adequate working platform near the valve. b) Make pipelines pressureless and harmless i.e. switch off the pumps, empty the pipelines, remove and switch-off all electric connections (in case of electric operated valves). c) If work is carried-out in vicinity of the valve, which leads to dusty atmosphere (e.g. concrete work, masonry, painting, sandblasting etc.) the valve / valve components must be covered effectively.