

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

Double offset butterfly valve wafer for steam, heating, geothermics, industrial cold, shipbuilding and petrochemical.
PTFE filled with 15% graphite packing and seat for a temperature up to +210°C.

Valve with firesafe certificate ISO 10497 to reduce risks in case of fire (excepted Ref.1110 and 1110L).

Compatible with explosive atmosphere, ATEX Zone 1&21 and Zone 2&22.

Handle up to DN150, gearbox over.

Thanks to the ISO 5211 plate, an actuator can be installed directly on the valve.



Certificate
3.1



RANGE AND SPECIFICATIONS :

Ref.	Materials	Type	Connection	Temperatures	Max Pressure	Size	Fire Safe
1113	Carbon steel A216WCB	Wafer	PN16 or PN25	-29°C to +210°C	16 or 25 Bars	DN50 to DN600	Yes
1115			Class 150 PN20		20 Bars	DN50 to DN300	
1117		Lug	PN16 or Class150		16 or 20 Bars	DN50 to DN300	
1114	Stainless steel A351CF8M	Wafer	PN25	-50°C to +210°C	25 Bars	DN50 to DN600	
1116			Class 150		20 Bars	DN50 to DN600	
1110	Carbon steel A216WCB	Lug	PN25	-29°C to +210°C	25 Bars	DN50 to DN300	No
1110L			PN25		25 Bars	DN50 to DN450	

USE : Heating, geothermics, industrial cold, shipbuilding, petrochemical

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

General installation instructions

1. Storage

Before installation, please store the valves and fittings in a dry place to protect them from harsh weather conditions, wind and sand. Please leave the goods in their original packing and do not remove the flange or end protections. Please handle the products with care. Do not drop or drag them on the floor.



3. Deviations of pipes

Before installing the valves and fittings, please check the pipe dimensions with the equipment already in place. Please also verify the correct alignment of the upstream and downstream pipes. Do not count on the valves and fittings to make up for pipe deviations. This might result in sealing leakages, blockings or mechanical ruptures.



5. Mounting direction

A certain number of devices do not necessarily have a symmetrical functioning. It is essential to comply with the mounting direction indicated by the engraved or stamped arrow on the body and adapt it to the direction of the fluid flow.



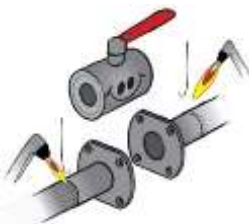
7. Support

For valves representing a significant weight in comparison with the pipes' solidity, it is essential to provide an additional support independently from the pipes. Likewise, the valves cannot serve as support for pipes since they have to be supported themselves. The failure to respect these rules can lead to leakages, blockages and breakages.



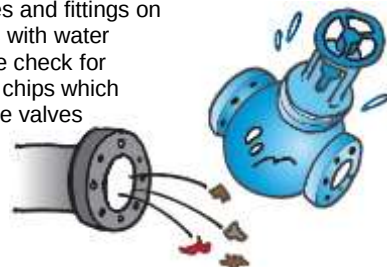
9. Welding of valves

When welding steel or stainless steel valves, make sure they are in the open position. Extreme care must be taken with small valves to cause no damage to the critical valve components, which may be close to the weld area. Great caution must be taken when welding soft-seated ball valves.



2. Cleaning of pipes

Before installing the valves and fittings on the pipes, clean the pipes with water or compressed air. Please check for welding spatters or metal chips which could possibly damage the valves sealing surface.



4. Expansion joints

For pipes carrying heat transfer fluids, please anticipate the compensation of dilatations with the help of adapted equipment (loops and/or expansion joints). Their absence may lead to mechanical ruptures and a blocking of the valves.



6. Slinging

When installing the valves on the pipes, please use adapted lifting devices (bridge crane, forklift, hoist). It is necessary to align the valve correctly while installing it.



8. Tightening

For threaded and flanged valves and fittings, please use a suitable tightening torque. Insufficient tightening can result in leakages. Overtightening can lead to blocking the valve or mechanical ruptures. The coupling torques are indicated on every product manual.



10. Water hammers

A water hammer, by generating a sudden rise in pressure, can cause considerable damage: slotted valve closure member, deformed stem etc. The causes of water hammers are varied. The non-progressive start of a pump and the sudden closing of a valve are the most frequently found causes.



INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

TORQUE VALUE (in Nm with safety coefficient of 30 % included) :

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
Torque (Nm) at 0 Bar	29	37	50	76	118	147	176	255	333	461	657	843	1078	1274
Torque (Nm) at 5 Bar	32	46	61	88	137	196	235	323	470	725	960	1058	1382	1617
Torque (Nm) at 10 Bar	39	61	76	103	170	225	294	421	549	833	1264	1362	1803	2225
Torque (Nm) at 15 Bar	43	69	92	118	194	265	353	480	686	990	1509	1705	2166	2783
Torque (Nm) at 20 Bar	49	83	107	140	223	294	421	568	862	1196	1686	2087	2920	3783
Torque (Nm) at 25 Bar	59	97	127	162	242	333	480	647	1009	1421	1882	2646	3410	4704

FLOW COEFFICIENT Kv (m3 / h) :

DN	Percent of Rated Travel									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
50	3,5	11,2	22,5	33,7	62,3	109,0	132,3	176,4	201,5	138,4
65	6,1	19,9	38,9	57,1	105,5	185,1	223,1	298,4	339,9	224,0
80	8,6	29,4	58,8	87,4	160,0	280,2	338,2	452,3	515,5	344,2
100	9,5	35,5	62,3	95,1	185,1	324,3	359,8	467,9	497,3	530,2
125	14,7	45,8	91,7	135,8	250,8	437,6	528,4	705,7	805,2	847,6
150	20,8	66,6	131,5	195,5	360,7	629,6	761,1	1017,1	1158,9	1189,2
200	36,3	118,5	234,4	347,7	472,2	661,6	851,0	1126,9	1254,1	1513,5
250	108,1	263,8	425,5	504,2	798,3	1089,7	1427,1	1781,7	2110,3	2306,6
300	147,0	358,9	578,6	834,6	1124,3	1517,9	2645,7	2987,3	3328,9	3776,1
350	192,0	437,6	688,4	1007,6	1395,9	1938,2	2700,2	3658,4	4635,8	5158,1
400	272,4	464,4	780,1	1145,1	1646,7	2149,2	3202,7	4666,0	5956,4	6713,2
450	339,0	818,2	1259,3	1764,4	2435,5	3388,6	4684,2	6106,9	7381,8	8090,1
500	443,7	1035,3	1586,2	2212,4	3031,4	4275,1	6216,8	7867,8	9523,2	10226,3
600	730,8	1609,5	2380,1	3382,5	4757,7	6628,4	9375,3	12475,0	15868,0	17178,2

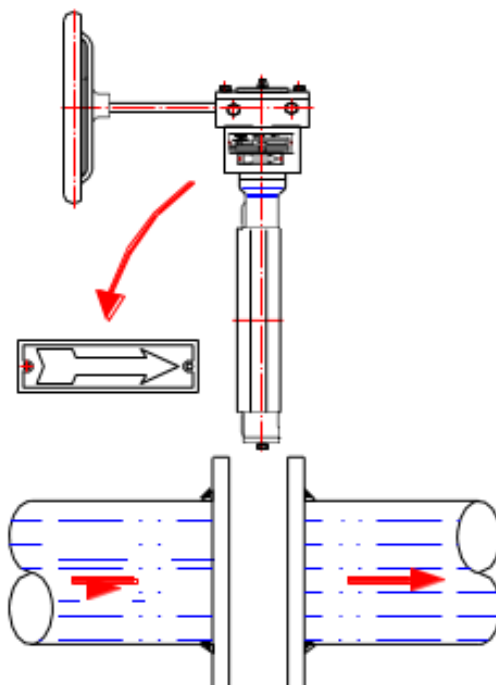
INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

GENERAL GUIDELINES :

- Ensure that the valves to be used are appropriate for the conditions of the installation (type of fluid, pressure and temperature).
- Be sure to have enough valves to be able to isolate the sections of piping as well as the appropriate equipment for maintenance and repair.
- Ensure that the valves to be installed are of correct strength to be able to support the capacity of their usage.
- **Installation of all circuits should ensure that their function can be automatically tested on a regular basis (at least two times a year).**

INSTALLATION INSTRUCTIONS :

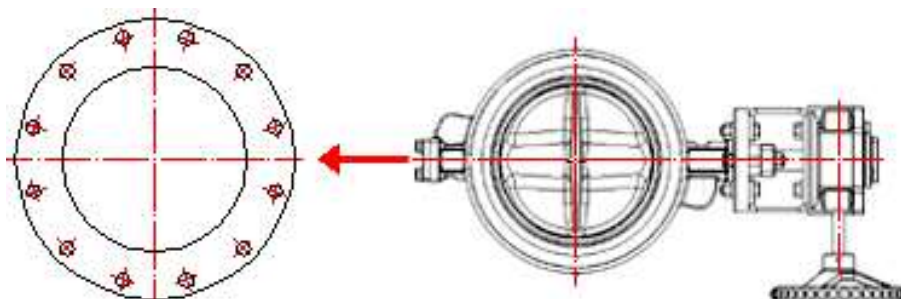
- **Before installing the valves, clean and remove any objects from the pipes** (in particular bits of sealing and metal) which could obstruct and block the valves.
- **Ensure that both connecting pipes either side of the valve (upstream and downstream) are aligned** (if they're not, the valves may not work correctly).
- **Make sure that the two sections of the pipe (upstream and downstream) match, the valve unit will not absorb any gaps.** Any distortions in the pipes may affect the tightness of the connection, the working of the valve and can even cause a rupture. To be sure, place the kit in position to ensure the assembling will work.
- **If sections of piping do not have their final support in place, they should be temporarily fixed.** This is to avoid unnecessary strain on the valve.
- **The valve should be inserted between flanges in closed position to avoid damages on the disc:**



The shaft side of the disc is considered the high-pressure side of the valve, (as indicated on the drawings by a flow arrow) meaning the best closure performance is obtained on this side of the valve, and a determination as to the best installation should be made, to utilize this feature. This may not necessarily be the normal flow direction of the system.

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

Please install the valve stem horizontally as figure below, thus could prevent sand and some chips collect around bottom bushing and seat and damage the valve.



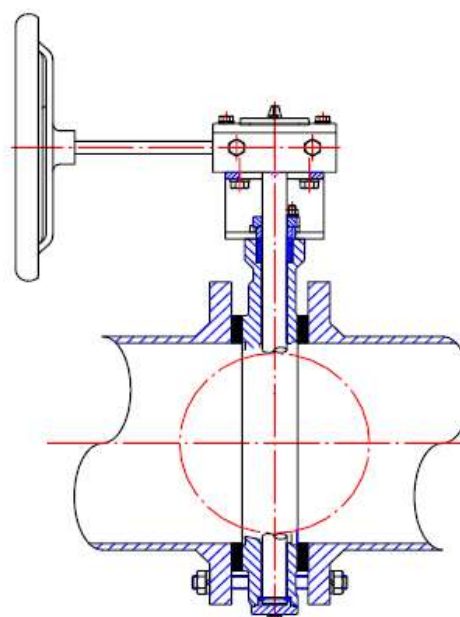
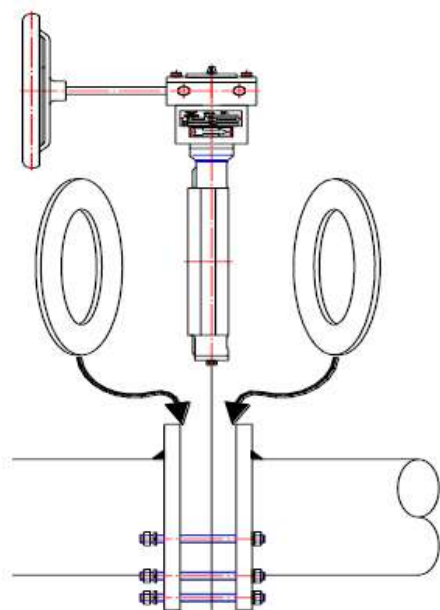
RECOMMENDED

ACCEPTABLE

NO



Insert flange gaskets compatible with the use, each side of the valve as below :

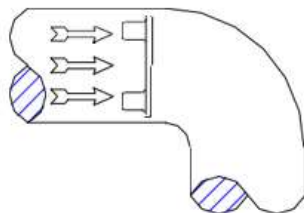


Make sure the valve is installed between flanges and concentrically with flanges, thus could prevent the disc damaged by the interfering with flange and pipeline

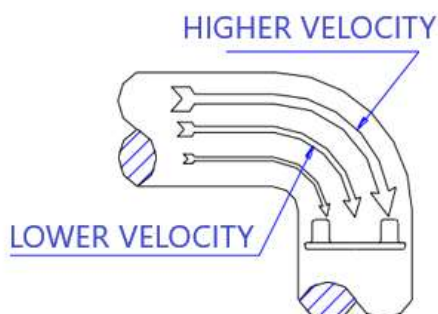
INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

The typical installation for the butterfly valve connected to an elbow would be to align the shaft axis to allow equal flow on each side of the shaft, minimizing dynamic torque requirements for the valve.

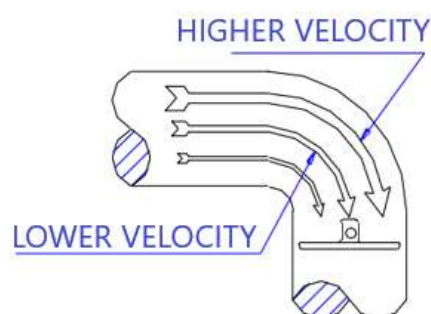
RECOMMENDED



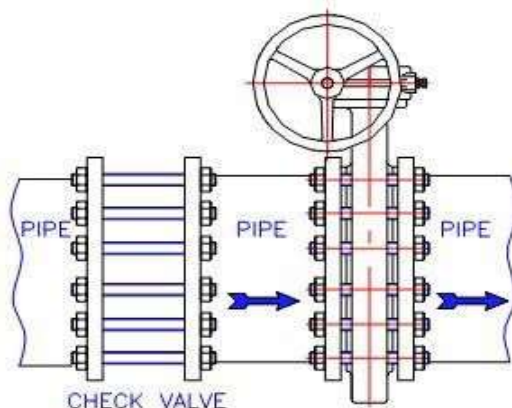
ACCEPTABLE



NO



Using an extension tube between wafer check valve and butterfly valve, never connect them directly

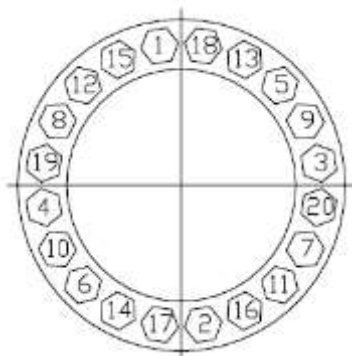


FLANGE CONNECTING AND BOLTING :

- Keep valve protection boards until installation.
- Make sure the material and size of gaskets could be suitable for the service, check the faces of flange and valve are smooth and flat. Sandpaper the faces if there was any harm.
- Check all the bolts and nuts shall be in good condition.
- Apply lubricant such as Molybdenum to all the bolts and nuts before fix them.
- The pipe support(s) may now be required to be partially disengaged. A determination as to pipe flange alignment and space between the pipe flange and the valve face must be made at this time. The optimum spacing would be such as to only allow the flange gasket to be installed, at the maximum, and the flange bolt holes would be concentric.
- The opposite connecting pipe flange face may not be more than 1/4 inch away from the valve flange face. Alternate methods of alignment, other than using the flange bolts, must be utilized to conform with this requirement.
- Install all studs, maintaining uniform clearance between the studs and the mating bolt holes. Additionally the studs spanning the valve assembly should not contact the valve body.
- Seat the flange by alternate tightening of four equally-spaced flange bolts no more than 1/4 turn per bolt, until the flange faces seat. During this operation, it is advisable to continually check the relative distance between the flange faces. Torque the bolts to approximately 25% of the final torque value (see table next page).
- Inspect the remaining bolts and assure correct alignment. Tighten to the same level as the first 4 bolts.

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- Complete the tightening of all flange bolting in a minimum of four increments to the final determined torque value.
- Test cycle the valve to be sure that there is no interference or binding.



Bolting size	Max torque (Nm)
M16 (5/8")	150
M20 (3/4")	270
M22 (7/8")	434
M24	450
M26 (1")	650
M27	700
M28 (1"1/8)	815
M30	950
M32 (1"1/4)	1140
M33	1300
M36	1700

REMOVAL PROCEDURE :

To remove your valve from the pipeline, please follow these simple steps:

- Ensure the valve is in the closed position.
- Ensure the line is depressurized.
- Use protective clothing and equipment to prevent injury.
- If your valve is equipped with a fail-open actuator, manual to close the valve or disconnect the actuator then close the valve before removal.
- Attach nylon slings to the body shoulders of the valve and around the body of the actuator.
- Remove the bolts holding the valve to the pipeline flanges.

LUBRICATION SCHEDULE :

We recommend your valve to be inspected at least every three months to determine lubrication and other maintenance requirements under your specific service conditions.

STUFFING BOX MAINTENANCE PROCEDURE :

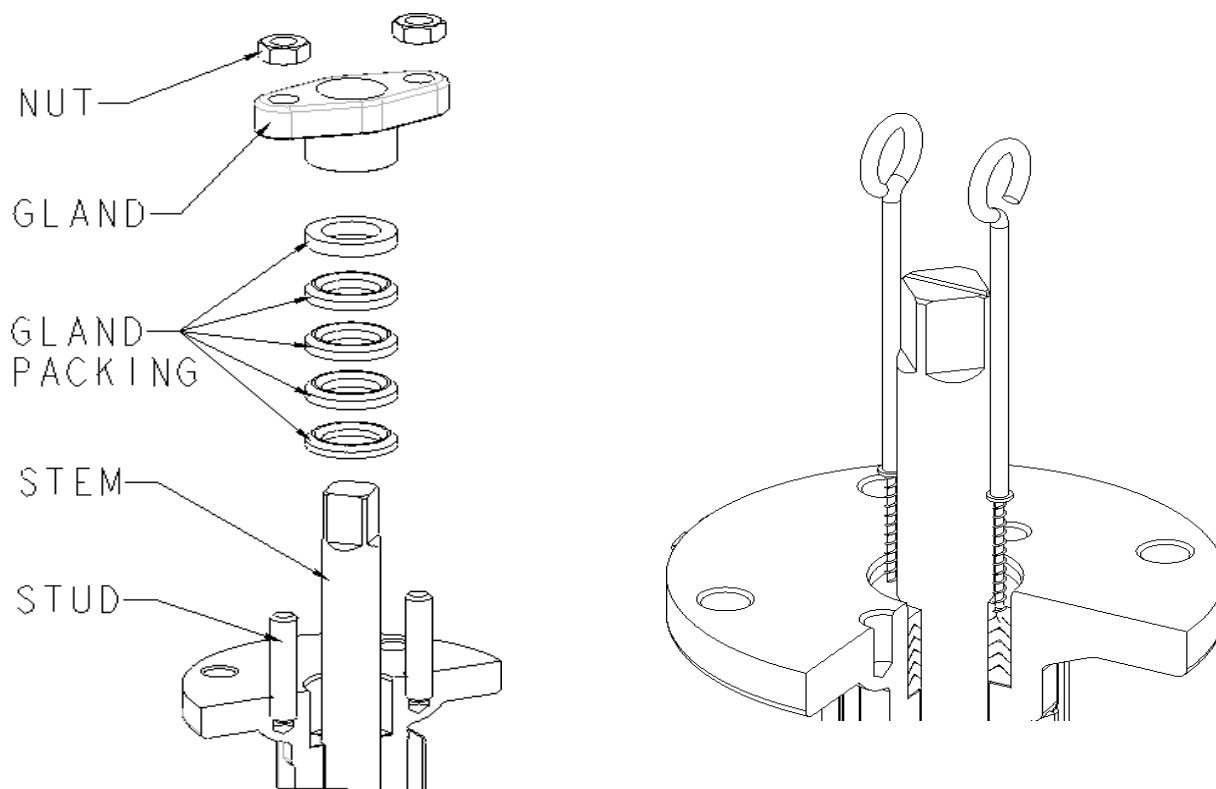
Routine maintenance of the stuffing box consists of tightening the packing gland periodically. If leakage around the stuffing box is discovered, first tighten the hex-nuts on the gland follower (more than 2/3 compression) as this may reduce packing life. If the leakage still persists, replace the packing according to the following procedure. (For clarity, the actuator and bracket are not shown in the following diagrams. It is not necessary to remove the actuator or bracket before performing this procedure).

In order to gain access to the packing, remove the gland follower and slide it up to the actuator. See the diagram below:

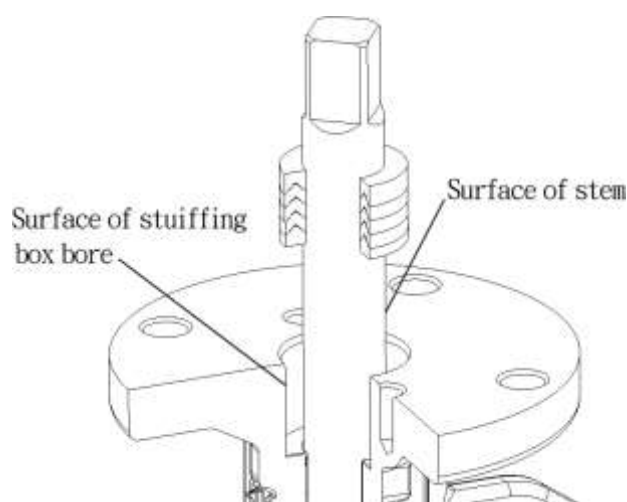
Sferaco 90 rue du Ruisseau 38297 St Quentin Fallavier Tel: + 33 (0) 474.94.15.90 Fax: + 33 (0) 474.95.62.08 Internet: www.sferaco.com E-mail: info@sferaco.fr

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Remove all of the packing in the stuffing box using a flexible screw hook. For stuffing boxes that contain a lantern ring, use a puller with 10-32 threads to remove the lantern ring. Save the lantern ring for reuse, but discard the other packing material. Please replace all the gland packing no matter the gland packing is made of Graphite.

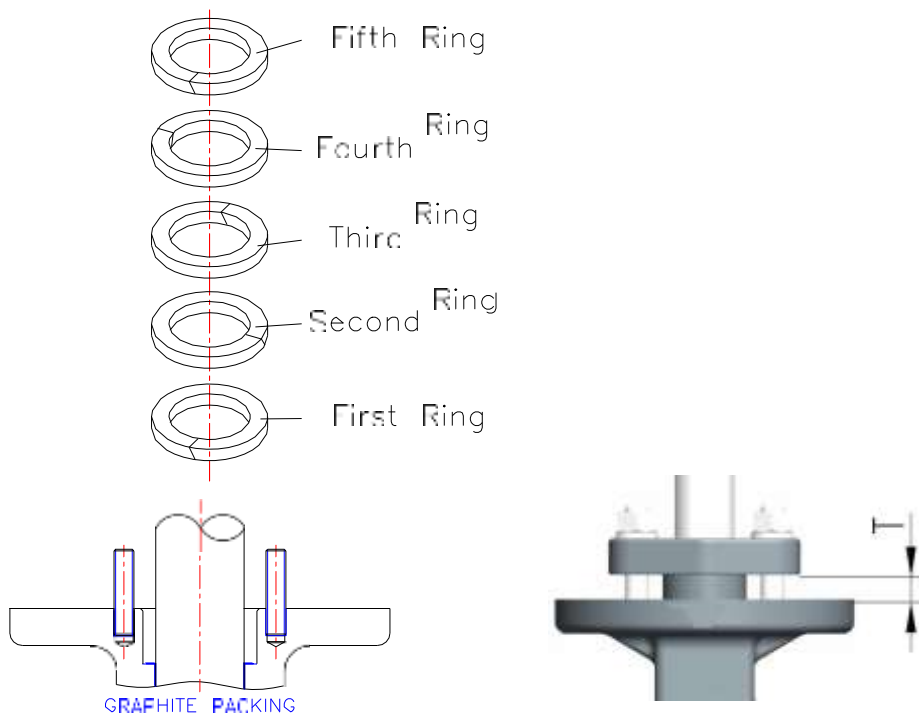


Inspect the drive shaft, bore of the stuffing box, and the gland follower. These surfaces should be relatively scratch free. If there is any damage, polish the surface to 32 rms finish. If any part has severe damage, contact us.



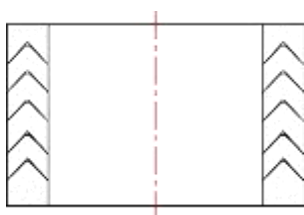
INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

Install each new ring of packing, use the gland follower to push each ring of packing evenly into position after starting it in the stuffing box bore. Stagger the splice-joints of each packing ring so they are as far as possible from each other (see example above). Usually, rotating each ring until the splice is at 90° from the previous splice is sufficient.

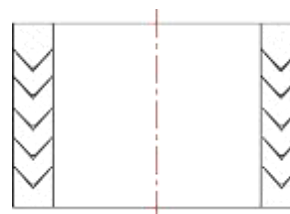


With V packing type, respect the direction below :

With a fluide under pressure



With vacuum :



Install the gland follower and tighten it to firmly seat the packing. DO NOT compress the gland follower too much. Over-tightening may dramatically reduce the life of the packing and may make it more difficult to operate the valve. The maximum torque of the gland screw as below

Packing :	Graphite	V type
Size	Max torque (Nm)	Max torque (Nm)
M8	10.8	10.8
M10	11.8	11.8
M12	13.7	13.7
M16	44.1	21.6
M20	63.7	27

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

ASSEMBLY AND DISASSEMBLY :

Assembly

Clean all valve components and free from oil, grease and dust.

Inspect all components for damage before starting to assemble. Look especially for damage to the disc edge and body seat surface.

Confirm that the valve disc of the valve is in the fully closed position. If not, operate the actuator so that the valve disc comes to the fully closed position.

Insert the seat to the seat-mounting groove. The seat is somewhat floating because there is an interference of the seat. (Fig.16)

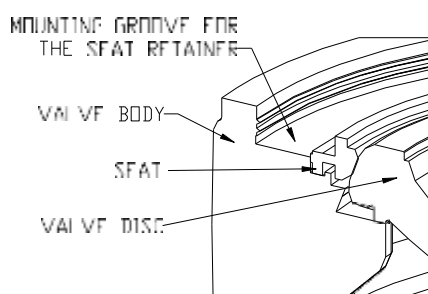


Fig.16

Insert the seat retainer to the mounting groove for the seat retainer. Due to the same reason as 12.1.4, the seat and the seat retainer is somewhat floating. (Fig.17)

Fig.17-1 (DN50~DN600)

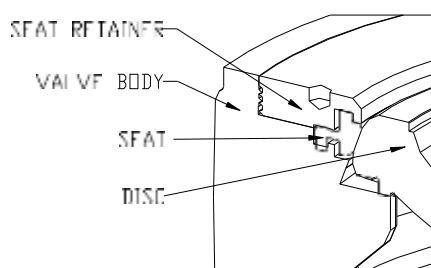
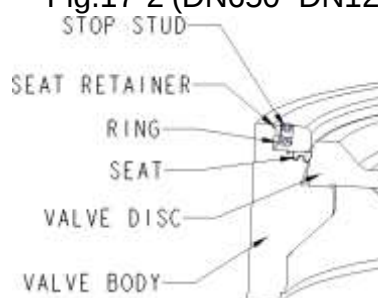
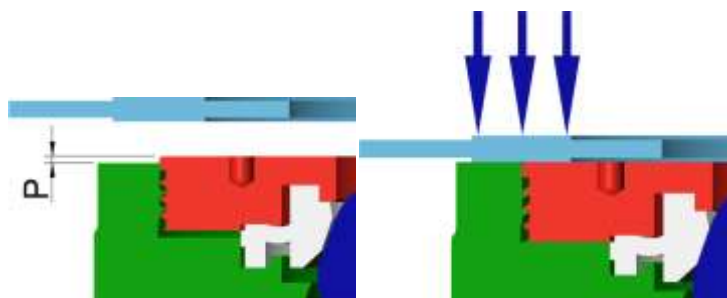


Fig.17-2 (DN650~DN1200)



Turn and tighten the retainer clockwise.

Since our new design of fixing the retainer, it's a normal condition when the retainer was tightened, and there is a gap less than 1mm between valve face and retainer face.



INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

Slightly open the valve to 10 degrees then tighten the retainer ring again. (When changing a valve with metal seat, please keep disc fully closed.)

Operate the actuator again to bring the disc to the fully closed position before mounting to the piping.

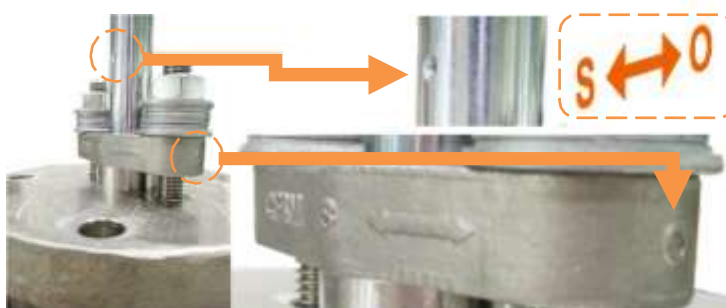
Insert the studs into the threaded holes in the drive side packing gland.

Install the packing follower and tighten it into position with the hex nuts. Do not tighten on hex nut further than the other.

Install the bottom cover with gasket and tighten it into position with the hex- socket cap screws.

The valve is now ready for actuator mounting. The disc is held quite securely in position, so the actuator may be pushed onto the shaft then moved to the desired fail position. Please consult the actuator's literature for further details.

When installing the stem, set the mounting surface up. The disc indication is set on the let hand side of the retainer side, and the indicator groove or KEY WAY has to be paralleled to the disc.(Fig.19)

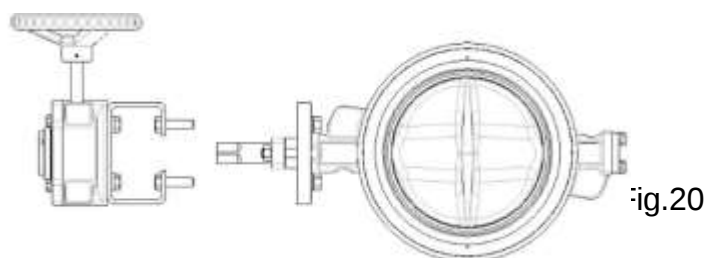


(Fig.19)

Disassembly

Place the valve on a bench or other suitable working surface with the drive shaft side of the valve up.

Remove the actuator and actuator bracket from the valve. (Fig.20)



Separate the packing follower by removing the hex-nuts from the studs, then remove the studs.

Remove the packing using a flexible screw-hook.

Remove the packing retainer, being careful not to damage the finish of the packing gland bore or the drive shaft.

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

DN24" and below: Please turn on the disc slightly by counterclockwise at firstly, remove the retainer(Fig.21-1) by counterclockwise rotation, and then remove the seat. (Fig.21-2).

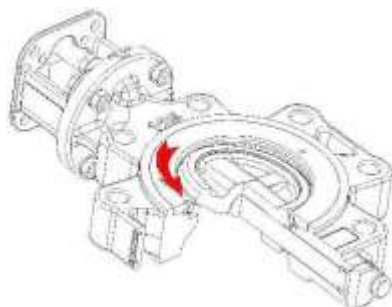


Fig.21-1

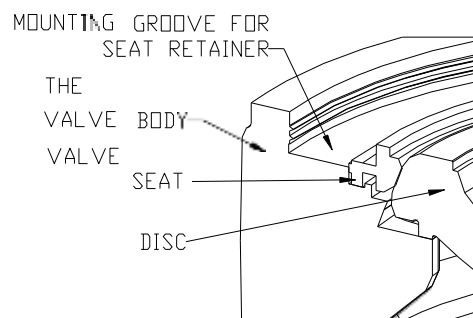


Fig.21-2

For the size 26" or above, turn the disc to the position as shown in Fig 22-1. To loose the stop stud on the seat retainer (Fig 22-2), and remove the retainer and seat (Fig 22-3).

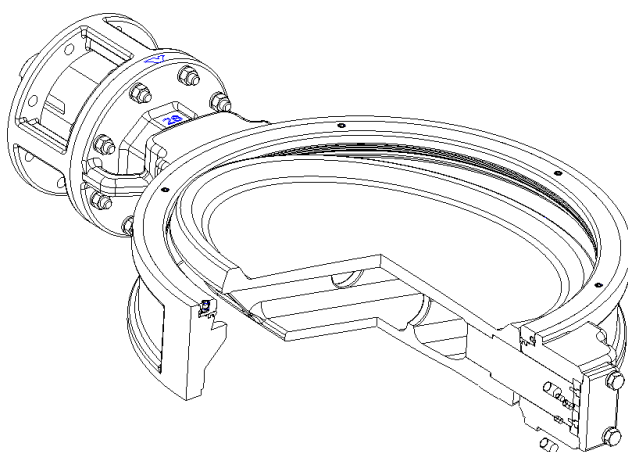


Fig.22-1

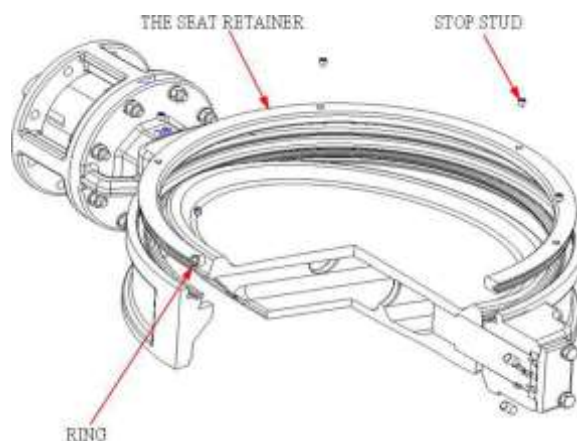


Fig.22-2

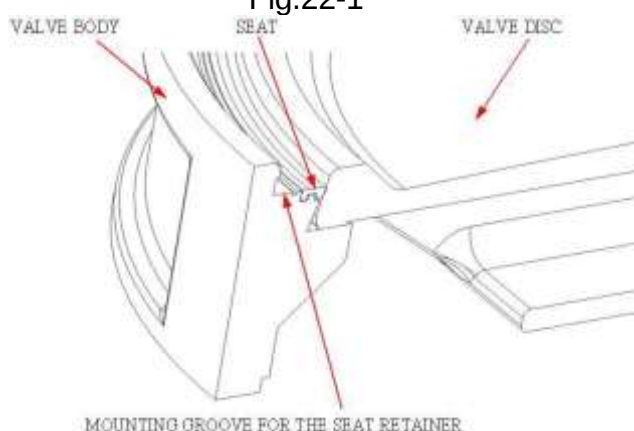
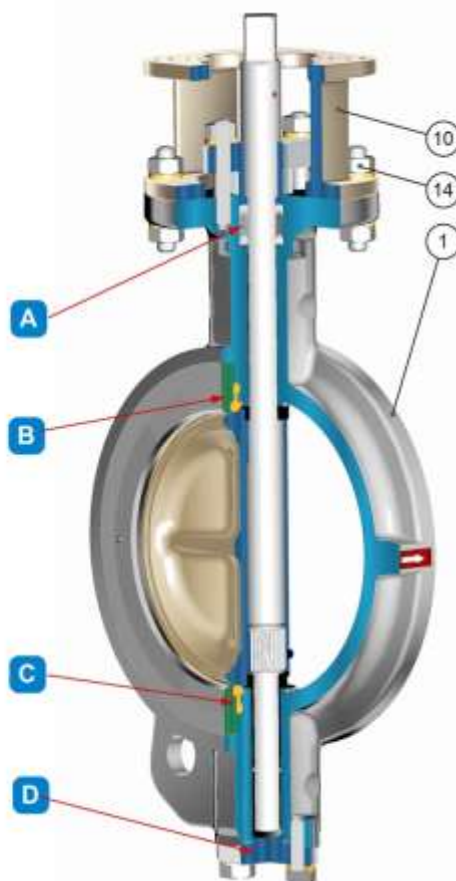
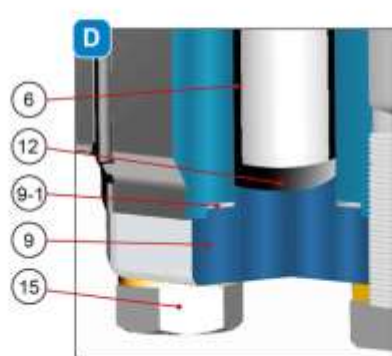
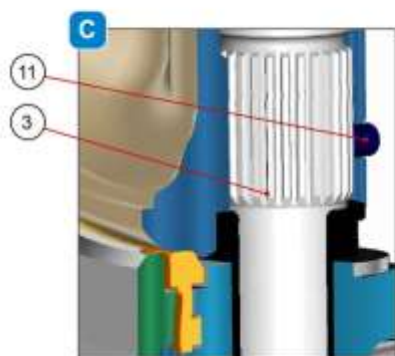
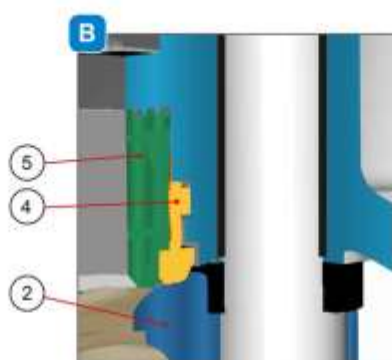
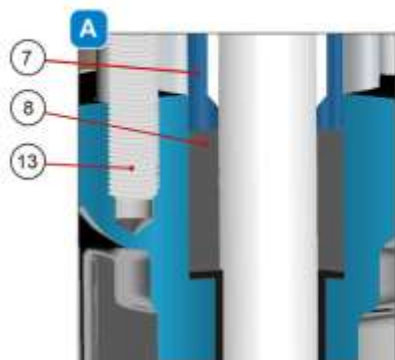


Fig.22-3

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

SPARE PARTS REF.1110 and 1110L :

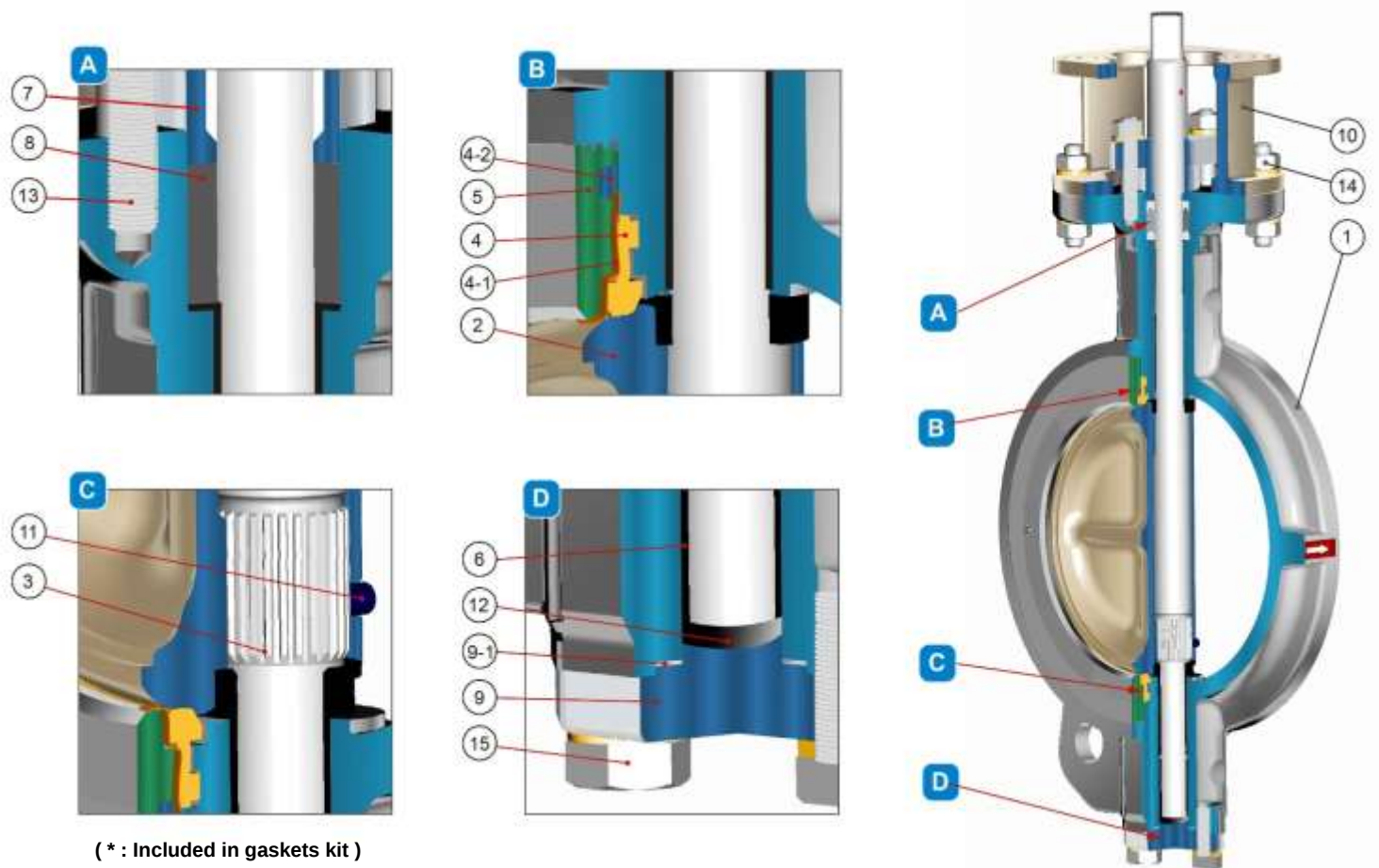


Item	Designation	Materials
1	Body	
2	Disc	
3	Shaft	
4*	Seat	PTFE filled with 15% graphite
5	Retainer	
6*	Bushing	PTFE + AISI 316
7	Gland	
8*	Gland packing	PTFE filled with 15% graphite
9	Bottom cover	
9-1*	Bottom cover gasket	PTFE filled with 15% graphite
10	Yoke	
11*	Stop stud	ASTM A193 Gr. B8M
12*	Lock plate	PTFE filled with 15% graphite + AISI 316
13	Stud	
14	Nut	
15	Bolt	

(* : Included in gaskets kit)

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

SPARE PARTS REF.1113-1114-1115-1116 and 1117 :



(* : Included in gaskets kit)

Repairability :



Item	Designation	Materials
1	Body	
2	Disc	
3	Shaft	
4*	Seat	PTFE filled with 15% graphite
4-1	Metal seat	
4-2*	Gasket	Graphite
5	Retainer	
6*	Bushing	PTFE + AISI 316
7	Gland	
8*	Gland packing	Graphite
9	Bottom cover	
9-1*	Bottom cover gasket	Graphite
10	Yoke	
11*	Stop stud	ASTM A193 Gr. B8M
12*	Lock plate	PTFE filled with 15% graphite + AISI 316
13	Stud	
14	Nut	
15	Bolt	

*Gaskets Kit (Item 4, 4-2, 6, 8, 9-1, 11 et 12)	
DN50	9865290
DN65	9865291
DN80	9865292
DN100	9865293
DN125	9865294
DN150	9865295
DN200	9865296
DN250	9865297
DN300	9865298
DN350	9865299

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

TROUBLESHOOTING GUIDE :

Please try the following procedures before contacting us.

LEAKAGE FROM STUFFING BOX

If leakage around the stuffing box is discovered, first tighten the nuts on the gland follower to stop the leakage. Do not over tighten the gland follower (more than 2/3 compression) as this may reduce packing life. If the leakage still persists, replace the packing according to the procedure in the " Stuffing Box Maintenance Procedure" section. (For tightening torque, please see Table 2 page 9.)

LEAKAGE BETWEEN SEAL AND DISC

Inspect disc edge and seat for damage or excessive wear. If necessary, the disc edge may be lightly hand polished using wet 400 grit sandpaper. If leakage persists, or if not damage is evident, replacement of the seat.
Re-check for leakage. If leakage still preexists, contact us for repair.

On Service :

Do not touch the valve body when it is on service.

Do not loose flange bolts, valve bolts when valve is on service.

The valve must be supported when pipeline vibration, so that pipeline stresses are not transmitted to the valve and actuator.

Do not use a "F" wrench to operate the hand wheel of gear box.

If there are any problems could not be eliminated during service Please contact us and describe damage condition then we could serve you as sooner as we could. (Fig.31)

Maintenance :

Maintenance man should be trained before doing the repair.

Do not replace the gaskets when the pipeline was working or pressured.

Repainting the valve when it rusted.

If finding the parts of valve has been corroded, please replace a new one.

Please measure the thickness of the body when maintaining to realize the body is still workable or not. Please see tab below.

Pay attention the abrasion of stem, disc and seats and realize they are still workable.

Do very clear mark and protection procedure when the flow medium is poison.

Please mark sure the piping no pressure and the temperature must be lower than 37°C before remove the valve.

INSTALLATION OPERATING DOUBLE OFFSET BUTTERFLY VALVES

STANDARDS :

- Manufacturer certified ISO 9001 : 2015
- DIRECTIVE 2014/68/EU : For liquids and gas of Group 1
 - PN16 types :
 - DN50-65 : Risk Category I, CE 0035 marking
 - DN80-200 : Risk Category II, CE 0035 marking
 - DN250-600 : Risk Category III, CE 0035 marking
 - PN25 types :
 - DN50-125 : Risk Category II, CE 0035 marking
 - DN150-600 : Risk Category III, CE 0035 marking
 - Class 150 PN20 types :
 - DN50 (NPS 2") : Risk Category I, CE0035 marking
 - DN65-150 (NPS 2"1/2-6") : Risk Category II, CE0035 marking
 - DN200-600 (NPS 8"-12") : Risk Category III, CE0035 marking
- Designing according to API 609
- Marking according to MSS SP-25
- Tightness tests according to ISO 5208, Rate A
- Between flanges according to EN 1092-1 PN25 or PN16 or ANSI B16-5 Class 150 (PN20)
- ISO 5211 mounting pad
- Length according to EN 558 series 20 (ISO 5752 series 20)
- Fire safe according to ISO 10497 : 2010 (excepted for types 1110 and 1110L)
- ATEX Group II Category 2 G/2D Zone 1 & 21 Zone 2 & 22 according to directive 2014/34/EU (Optional marking)
- SIL2 according to IEC/EN 61508, SIL 3 possible according to installation

ADVICE : Our opinion and our advice are not guaranteed and SFERACO shall not be liable for the consequences of damages.
The customer must check the right choice of the products with the real service conditions.