

Technical manual

Tilis

Butterfly valves

DN32 to 300 mm

Summary



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Applications and main characteristics

Food processing industry and carrying of mildly corrosive media

Applications :

- Industrial applications such as :
Food fluids, mineral water, cosmetic process, detergents, fertilisers and weed-killers.
- On request, we can supply butterfly valves type TILIS conformed to the directive 94/9/CE (products or systems used in a explosive atmosphere).

Main characteristics :

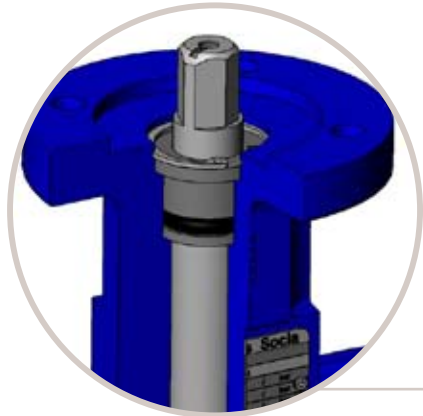
- For processes where hygiene is of the utmost importance, TILIS with PTFE coating (FDA approved), and EPDM liner, together with stainless steel 316 disc is highly recommended.
- Vertical and horizontal operating position.
- Two part body for easy dismounting and replacement of the liner.
- Easy maintenance by removing the circlips
- Interchangeable disc and liner.
- Body in ductile iron JS1030 and stainless steel
- Body epoxy coated 80 μ m colour blue RAL 5017 (a lot of other coatings on option, please ask our sales department)
- Wide choice of actuators.

An **instruction notice** specifying the installation characteristics and the commission of the *Tilis* is added to every product when the ATEX version is specified; It is available on our web site www.danfoss-socla.com or on request by our sales department.

Sale leaflet

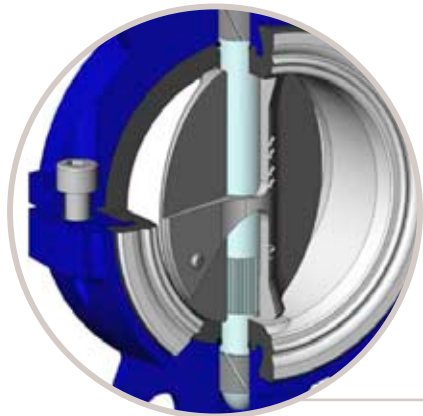
By concentrating the technologies and by integrating technical solutions of the highest levels, **Danfoss Socla** fulfils its ambition :

- competitiveness of a standard range,
- reliability,
- comprehensive range thanks to a multiplicity of solutions.

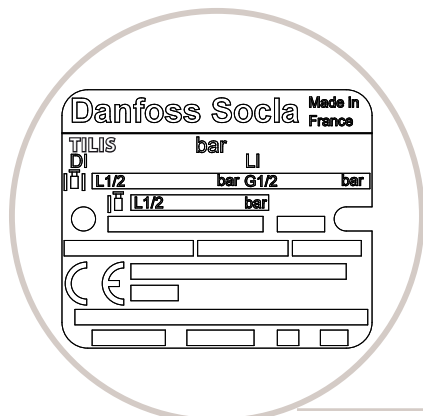


- Safety anti-ejection circlip keeps shaft in place and allows easy maintenance
- Safety reinforced by a secondary water tightness.
- Spline driven one piece shaft connected to floating disc :

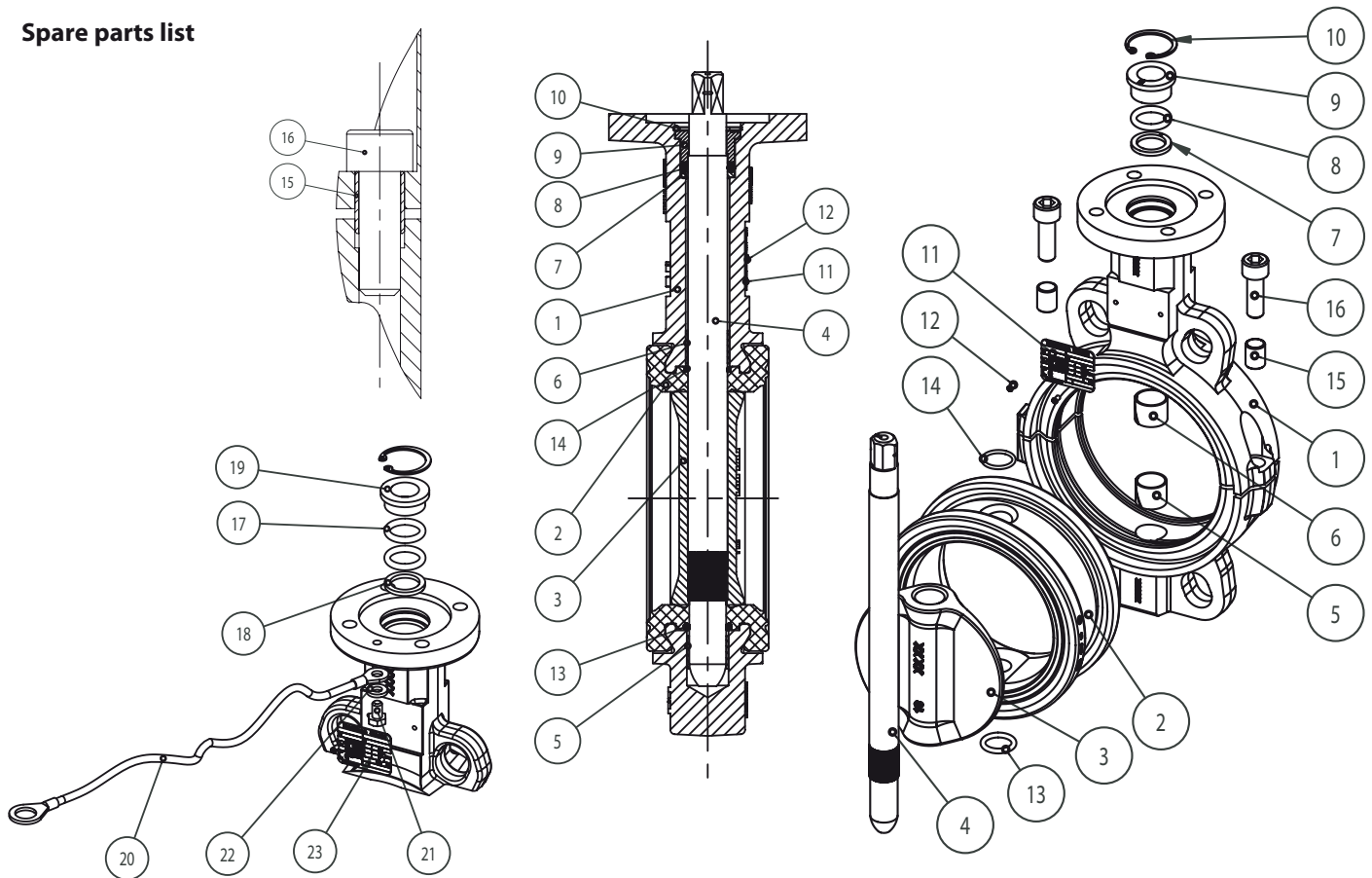
. high reliability of tightness and torque transmission in the long term.



- High power transmission with robust grooved connection between the shaft and the disc.
- Complete protection of the shaft and valve body from fluids.
- Reliability of movements with self-lubricating bearings.



- Identification and traceability ensured by riveted metal tag : see on page 12.

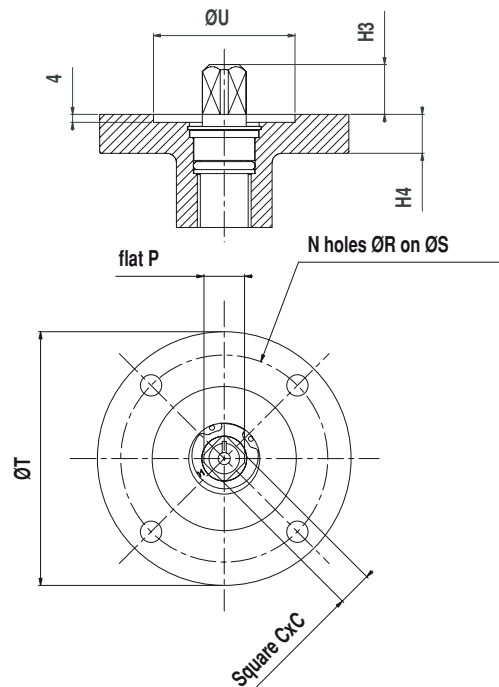
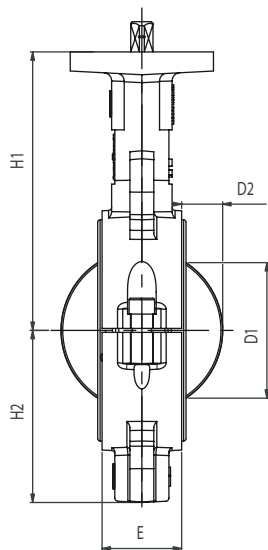
Spare parts list


Nb	DESCRIPTION	Qty	MATERIALS ACCORDING TO NORMS			
			Materials	EN	ASTM	JIS
1	Body	1	Ductile iron	EN GJS 400-15 (JS 1030)	-	FCD40
			Stainless steel	GX5 CrNiMo 19-11-2 (1.4408)	316	SUS 316
2	Liner	1	EPDM / PTFE	-	-	-
			Silicone / PTFE	-	-	-
3	Disc	1	Stainless steel/ Stainless steel mirror polished	X2 CrNiMo 17-12-2 (1.4404)	316L	SUS 316L
4	Stem	1	Stainless steel	X2 CrNiMo 17-12-2 (1.4404)	316L	SUS 316L
5	Lower anti-friction bearing	1	Zinc coated steel + PTFE	-	-	-
6	Upper anti-friction bearing	1	Zinc coated steel + PTFE	-	-	-
7	Anti-extrusion bush	1	Plastic	IXEF 50 FV	-	-
8	O-ring	1	FKM	-	-	-
9	Sealing washer	1	Plastic	IXEF 50 FV	-	-
10	Circlips	1	Stainless steel	X30 Cr13 (1.4028)	420	SUS 420 J2
11	Identification plate	1	Aluminium	EN AW - AL995 (EN AW - 1050A)	-	-
12	Rivet	2	Alu / stainless steel	-	-	-
13	Lower O-ring	1	FKM	-	-	-
14	Upper O-ring	1	FKM	-	-	-
15	Bearing	2	Stainless steel	X5 CrNi18-10 (1.4301)	304	SUS 304
16	Screw	2	Stainless steel	A2-70	304	SUS 304

ATEX special spare parts list

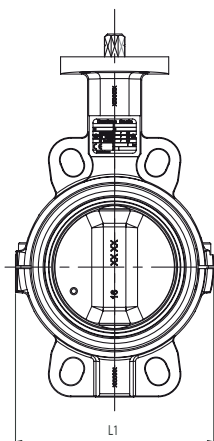
17	Braid	1	Tinned copper	-	-	-
18	Anti-extrusion bush	1	Stainless steel	X5 CrNi18-10 (1.4301)	304	SUS 304
19	Sealing washer	1	Stainless steel	X5 CrNi18-10 (1.4301)	304	SUS 304
20	Discharge anti-static braid	1	Tinned copper	-	-	-
21	Screw	1	Stainless steel	A2 - 70	304	SUS 304
22	Stop washer	1	Stainless steel	X5 CrNi 18-10 (1.4301)	304	SUS 304
23	ATEX identification plate	1	Aluminium	EN AW - AL995 (EN AW - 1050A)	-	-

Overall dimensions



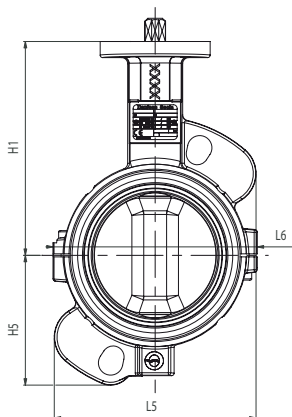
• 4 Centering lugs

Diameter		Face to face	Overall dimensions				Iso top according to ISO 5211					Square drive outlet			Travel of the disc		Weight Kg	
DN	NPS	E	L1	H1	H2	H4	N	Ø R	Ø S	Ø T	Ø U	N°	□C	H3	Flat P	D1	D2	kg
32	1 1/4	32	144	129	56	12	4	6,5	50	65	36	F05	11	16	11	31	6,5	2,2
40	1 1/2	32	144	129	56	12	4	6,5	50	65	36	F05	11	16	11	31	6,5	2,2
50	2	41	158	135	61	12	4	6,5	50	65	36	F05	11	16	11	32	5,5	3
65	2 1/2	44	174	144	69	12	4	6,5	50	65	36	F05	11	16	11	49,5	11,5	3,4
80	3	44	136	150	88	12	4	6,5	50	65	36	F05	11	16	11	68,5	19	4
100	4	50	165	174	105	12	4	8,5	70	90	56	F07	14	19	14	88,5	26	5,6
125	5	54	193	189	119	12	4	8,5	70	90	56	F07	14	19	14	114,5	36,5	6,6
150	6	54	224	202	130	12	4	8,5	70	90	56	F07	14	19	14	141,5	49	8,5
200	8	58	279	244,5	163	16	4	10,5	102	125	71	F10	17	24	20	193	72	16
250	10	66	331	270	199	16	4	10,5	102	125	71	F10	22	24	26	242,5	92,5	19,8
300	12	76	381	295	234	16	4	12,5	125	150	87	F12	22	29	26	292	113	31,3



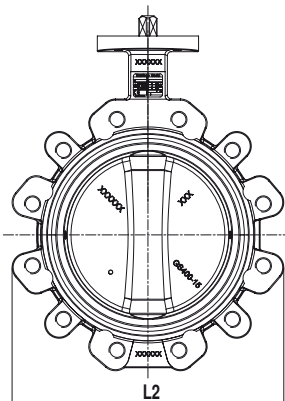
• 2 Centering lugs

Diameter		Face to face		Overall dimensions				Iso top according to ISO 5211					Square drive outlet			Travel of the disc		Weight Kg	
DN	NPS	E	L5	L6	H1	H5	H4	N	Ø R	Ø S	Ø T	Ø U	N°	□C	H3	Flat P	D1	D2	kg
32	1 1/4	32	106	82	129	55	12	4	6,5	50	65	36	F05	11	16	11	31	6,5	1,7
40	1 1/2	32	106	82	129	55	12	4	6,5	50	65	36	F05	11	16	11	31	6,5	1,7
50	2	41	121	99	135	72	12	4	6,5	50	65	36	F05	11	16	11	32	5,5	2,6
65	2 1/2	44	136	117	144	81	12	4	6,5	50	65	36	F05	11	16	11	49,5	11,5	3,1
80	3	44	150	136	150	92	12	4	6,5	50	65	36	F05	11	16	11	68,5	19	3,3
100	4	50	166	167	174	105	12	4	8,5	70	90	56	F07	14	19	14	88,5	26	5,3
125	5	54	132	194	189	126	12	4	8,5	70	90	56	F07	14	19	14	114,5	36,5	6,4
150	6	54	139	225	202	146	12	4	8,5	70	90	56	F07	14	19	14	141,5	49	7,5
200	8	58	164	279	244,5	173	16	4	10,5	102	125	71	F10	17	24	20	193	72	13,5
250	10	66	187	332	270	209	16	4	10,5	102	125	71	F10	22	24	26	242,5	92,5	17,6
300	12	76	166	382	295	238	16	4	12,5	125	150	87	F12	22	29	26	292	113	29,2

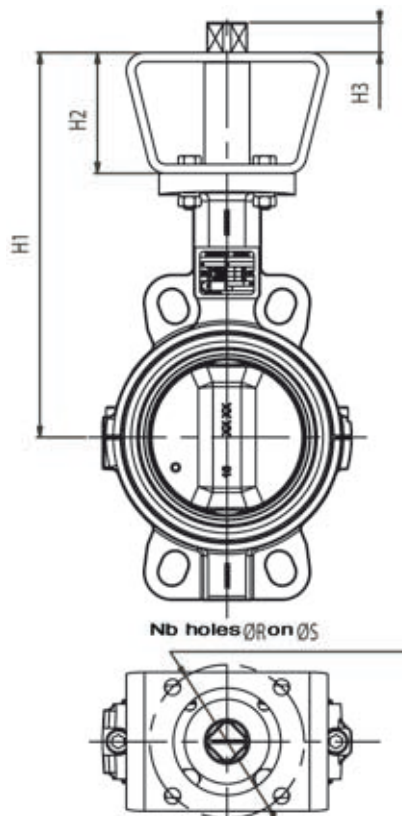


• Tapped lugs

Diameter		Face to face	Overall dimensions				Iso top according to ISO 5211					Square drive outlet			Travel of the disc		Weight Kg	
DN	NPS	E	L2	H1	H2	H4	N	Ø R	Ø S	Ø T	Ø U	N°	□C	H3	Flat P	D1	D2	kg
32	1 1/4	32	146	129	56	12	4	6,5	50	65	36	F05	11	16	11	31	6,5	2,7
40	1 1/2	32	146	129	56	12	4	6,5	50	65	36	F05	11	16	11	31	6,5	2,7
50	2	41	121	135	61	12	4	6,5	50	65	36	F05	11	16	11	32	5,5	3,3
65	2 1/2	44	165	144	69	12	4	6,5	50	65	36	F05	11	16	11	49,5	11,5	3,9
80	3	44	179	150	88	12	4	6,5	50	65	36	F05	11	16	11	68,5	19	4,8
100	4	50	206	174	106	12	4	8,5	70	90	56	F07	14	19	14	88,5	26	7,2
125	5	54	238	189	123	12	4	8,5	70	90	56	F07	14	19	14	114,5	36,5	9,7
150	6	54	265	202	149	12	4	8,5	70	90	56	F07	14	19	14	141,5	49	11,2
200	8	58	336	244,5	178	16	4	10,5	102	125	71	F10	17	24	20	193	72	21,6
250	10	66	396	270	211	16	4	10,5	102	125	71	F10	22	24	26	242,5	92,5	28,1
300	12	76	462	295	243	16	4	12,5	125	150	87	F12	22	29	26	292	113	38,2



Connecting kit for actuations



We recommend direct mounting of the actuation, otherwise see table below.

DN	NPS	Iso top of the valve	Iso top of the actuation															
			F03		F04		F05		F07		F10		F12		F14		F16	
			H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
32	1 1/4	F05/□11	189		189		189		189		209							
40	1 1/2		189		189		189		189		209							
50	2		195	60	195		195	60	195	60	215							
65	2 1/2		204		204	60	204		204		224							
80	3		210		210		210		210		230	80						
100	4	F07/□14			234		234		234		254		254					
125	5				249		249	60	249	60	269		269	80				
150	6				262		262		262		282		282	80				
200	8	F10/□17					324,5		324,5		324,5		324,5		334,5		334,5	
250	10	F10/□22					350	80	350	80	350	80	350		360	90	360	
300	12	F12/□22							375		385	90	385	90	385		385	

DN	NPS	Iso top of the valve	Exceeding length of the shaft H3								
			Kit	□9	□11	□14	□17	□22	□27	□36	□46
32	1 1/4	F05/□11									
40	1 1/2		F03								
50	2		F04	7	9	12	15	20	25		
65	2 1/2		F05								
80	3		F07								
100	4	F07/□14									
125	5		F10								
			F04								
150	6	F05		9	12	15	20	25	34		
		F07									
		F10									
		F12									
200	8	F14									
		F05									
		F07		9	12	15	20	25	34		
		F10									
250	10	F12									
		F14									
		F05									
		F07			12	15	20	25	34		
300	12	F10									
		F12									
		F14			12	15	20	25	34	44	
		F16									

N°	N	øR	øS
F03	4	5,5	36
F04	4	5,5	42
F05	4	6,5	50
F07	4	8,5	70
F10	4	10,5	102
F12	4	12,5	125
F14	4	17	140
F16	4	22	165

Reminder of the iso top dimensions EN ISO 5211 (see also the overall dimensions).

Other special executions on request : actuated by par square drive and flat according to EN ISO 5211 , subjected to technical feasibility.

Actuations

Find below the different standard assembly combinations.
For any other information, please ask our technical Department.

<p>ASSEMBLY LEVEL 2</p>	<ul style="list-style-type: none"> • 1 or 2 mechanical limit switch • Switchbox : <ul style="list-style-type: none"> . mechanical . inductive • Inductive+ solenoid valve mécánica + solenoid valve • Inductive limit switch • Positioners (1) 	<p><i>For other options, please consult us.</i></p>
<p>ASSEMBLY LEVEL 1</p>	<ul style="list-style-type: none"> • Adjustable ductile iron hand lever (PRF) • Notched ductile iron hand lever (PCF) • Notched hand lever polyamide (PCX) • Manual gearbox in cast iron • Danfoss hydraulic actuation • Remote control + emergency hand wheel • GT • Actubar 	<ul style="list-style-type: none"> • Rotork • Valpes • Auma • Belimo • Bernard
	<p>HAND LEVER GEAR BOX HYDRAULIC ACTUATOR PNEUMATIC ACTUATOR</p>	<p>ELECTRIC ACTUATOR</p>



(1) Pneumatic actuator only

Connecting flanges

The Tilis butterfly valve can be mounted with the following connections (other types on request) :

- ✓ : possible mounting
- : possible mounting with re-machining
- : impossible mounting

• 4 Centering lugs ductile iron EN GJS 400-15 (JS1030)

DN	NPS	EN 1092-1 & EN 1092-2					ASME/ANSI B16.1 Class 125	ASME/ANSI B16.5 Class 150	ASME/ANSI B16.5 Class 300	BS10		JIS B2238 & JIS B2239		
		PN6	PN10	PN16	PN25	PN40				Table D	Table E	5K	10K	16K
32	1 1/4	✓	✓	✓	✓	✓	✓	✓	●	✓	✓	✓	✓	✓
40	1 1/2	✓	✓	✓	✓	✓	✓	✓	●	✓	✓	✓	✓	✓
50	2	✓	✓	✓	✓	✓	✓	✓	●	✓	✓	●	✓	●
65	2 1/2	✓	✓	✓	●	●	✓	✓	●	●	●	✓	✓	●
80	3	✓	✓	✓	✓	✓	●	●	●	✓	✓	●	●	●
100	4	✓	✓	✓	●	●	✓	✓	●	✓	✓	●	●	●
125	5	✓	✓	✓	●	●	✓	✓	●	✓	✓	✓	✓	●
150	6	✓	✓	✓	●	●	✓	✓	●	✓	●	✓	●	■
200	8	✓	✓	✓	●	●	✓	✓	■	✓	✓	✓	●	●
250	10	✓	✓	✓	●	●	✓	✓	■	●	✓	✓	✓	●
300	12	✓	✓	✓	●	●	✓	✓	■	✓	✓	✓	■	■

• 2 Centering lugs, stainless steel GX5 CrNi 19-11-2 (1.4408)

DN	NPS	EN 1092-1 & EN 1092-2					ASME/ANSI B16.1 Class 125	ASME/ANSI B16.5 Class 150	ASME/ANSI B16.5 Class 300	BS10		JIS B2238 & JIS B2239		
		PN6	PN10	PN16	PN25	PN40				Table D	Table E	5K	10K	16K
32	1 1/4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
40	1 1/2	✓	✓	✓	✓	✓	✓	✓	●	✓	✓	✓	✓	✓
50	2	✓	✓	✓	✓	✓	✓	✓	●	✓	✓	✓	✓	■
65	2 1/2	✓	✓	✓	●	●	✓	✓	●	✓	✓	✓	✓	●
80	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	●	✓
100	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	●	✓	✓
125	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
150	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	●
200	8	✓	✓	✓	✓	✓	✓	✓	■	✓	✓	✓	✓	✓
250	10	✓	✓	✓	✓	✓	✓	✓	■	✓	✓	✓	✓	✓
300	12	✓	✓	✓	✓	✓	✓	✓	■	✓	✓	✓	■	■

• Tapped lugs, ductile iron EN GJS 400-15 (JS1030) and stainless steel GX5 CrNi 19-11-2 (1.4408)

DN	NPS	EN 1092-1 & EN 1092-2					ASME/ANSI B16.1 Class 125	ASME/ANSI B16.5 Class 150	ASME/ANSI B16.5 Class 300	BS10		JIS B2238 & JIS B2239		
		PN6	PN10	PN16	PN25	PN40				Table D	Table E	5K	10K	16K
32	1 1/4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
40	1 1/2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
50	2	✓	✓	✓	✓	✓	✓	✓	■	✓	✓	✓	✓	■
65	2 1/2	✓	✓	✓	■	■	✓	✓	■	✓	✓	✓	✓	■
80	3	✓	✓	✓	✓	✓	✓	✓	■	✓	✓	✓	✓	■
100	4	■	✓	✓	✓	✓	✓	✓	■	(1)	✓	■	✓	✓
125	5	✓	✓	✓	■	■	✓	✓	■	✓	✓	✓	✓	■
150	6	✓	✓	✓	■	■	✓	✓	■	✓	✓	✓	✓	■
200	8	✓	✓	✓	✓	■	✓	✓	■	✓	✓	✓	✓	✓
250	10	✓	✓	✓	✓	■	✓	✓	■	✓	✓	✓	✓	■
300	12	✓	✓	✓	■	■	✓	✓	■	✓	✓	✓	■	■

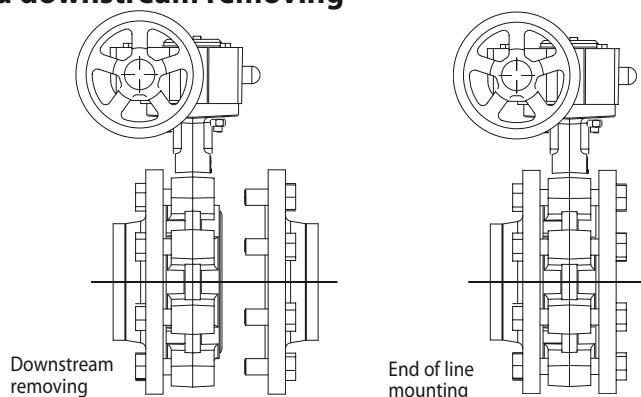
(1) Possible mounting if the butterfly valve is inclined at 22,5°

Attention : the body of the Tilis butterfly valve is not a multi-connection body (connection to many flanges of different sizes). Generally, every connection relates to a different reference of finished products.

• End of line mounting and downstream removing

The end of line mounting and the downstream removing, at ambient temperature, of the Tilis butterfly valve is limited to the pressure mentioned on page 9 according to the PED directive 97/23/CE .

These mountings are only possible on bodies with tapped lugs.



Normalisation

- **Design :**
According to EN 593 and marking according to EN 19
 - **Iso top connection for actuations :**
According to EN ISO 5211
 - **Face to face :**
According to 558-1 series 20
ISO 5752 series 20
API 609 table 2
 - **Connecting flanges :** see on page 7
According to EN1092-1 and EN1092-2
ASME/ANSI B16.5
BS10-d and BS10-e
JIS B2238 and JIS B2239
 - **Tests :**
According to EN12266-1
Resistance and tightness of the body : test P11(1,5 x allowable operating pressure)
Tightness of the seat : test P12 rate A (1,1 x allowable operating pressure)
- According to EN12266-2
Anti-static design : test F21

• European Directives :

Our butterfly valves Tilis are in accordance to the safety requirements of the following directives. :

Directive 97/23/CE : Equipements sous pression PED (Pressure Equipment Directive)

Applies to the design, manufacturing and the assessment of the conformity of pressure equipment, the maximum allowable pressure of which is 0.5 bar.

Pressure equipment for water supply, distribution, and disposal of water is excluded. Depending on the type of pressure equipment, maximum allowable temperature (PS), DN, physical nature of the fluid (liquid, gas or vapour) and the degree of danger of the fluid (group1/2), the directive classifies this same equipment into different categories (article 3.3, I, II, III, IV), required for the assessment of conformity with CE marking. The equipment defined in article 3.3 of the directive must not bear the CE marking.*

() Group 1 : hazardous fluids (directive 67/548/EEC) / explosive / highly flammable / easily flammable / flammable / very toxic / toxic / combustion agents.*

Group 2 : all other fluids

Important notice : *the indicated pressure for the different categories of fluids (L1/L2/G1/G2) is under no condition a guarantee of use. Therefore, it is essential to validate the use of products under given operating conditions. Danfoss Socla is not responsible for alteration of the products to working conditions not previously specified by the customer. In order to facilitate your choice regarding these new regulatory requirements, Danfoss Socla has put the necessary information concerning products with CE marking, specification sheets and product identification plates at your disposal in the price list (+ see additional explanations on the detachable slip).*


In addition, the operating instructions are available on our web site www.danfoss-socla.com or by simple request from our sales department.

Directive 94/9/CE : ATEX (EXplosive ATmospheres) - OPTIONAL FOR TILIS BUTTERFLY VALVE

This directive is only applicable for the following atmospheric conditions : -20°C < T < +60°C ; 0,8 bar ≤ P ≤ 1,2 bar.

In this risk analysis, the fluid which passes through the valve is not taken into account. It is under the responsibility of the user to take into consideration the risks generated by the fluid like : heating of the surface of the valve, internal chocks generated by granulates, wave of chocks due to the installation (water hammering), or the risks due to foreign bodies which are inside the installation.

Classification of the bare shaft valve :

The marking of the bare shaft valve is :  II 2 DG.

Classification of the set valve + actuation :

- Valve with a hand lever :

The use of hand levers produced by Danfoss Socla within an ATEX area do not represent additional risks. The valve with a hand lever is in conformity to the marking :  II 2 DG.

- Valve with other actuations :

The classification of the valve + actuation supplied by Danfoss Socla is similar to the lowest classification of the components which composed the assembly.

No additional marking will be used to indicate the classification of the assembly.

If only one component of the assembly set is not market with ATEX label, therefore the complete assembly set is not conformed to ATEX directive.

The classification of the equipment allows its use in a determinate area; a use in another area is under the responsibility of the user.

Machinery Directive 2006/42/CE : Machinery Directive

In its Appendix I it sets a certain number of Essential Health and Safety Requirements which must be met. It applies to motorised butterfly valves, (with electric, pneumatic or hydraulic actuators). According to this Directive, these sets are "Partly Completed Machineries" designed for being integrated into a machine.

"Partly Completed Machinery" means an assembly which is almost machinery but which cannot in itself perform a specific application. A drive system is partly completed machinery. Partly completed machinery is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment, thereby forming machinery to which this Directive applies.

An **instruction notice** specifying the installation characteristics and the commission of the *Tilis* is added to every product when the ATEX version is specified; It is available on our web site www.danfoss-socla.com or on request by our sales department.

Technical manual **Tilis**

Pressure

DIRECTIVE 97/23/CE Equipments under pressure.

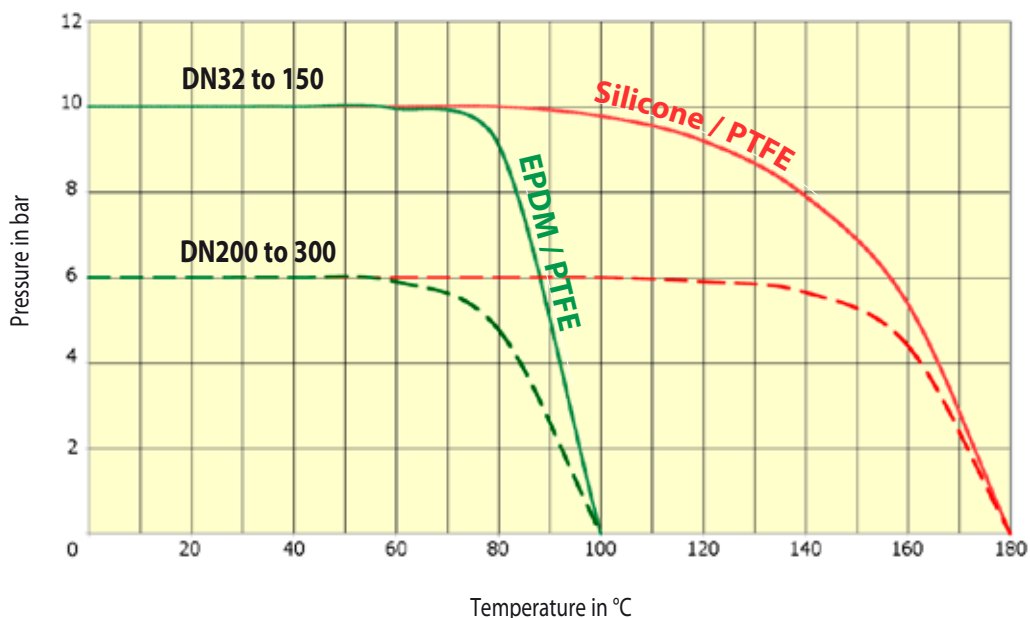
Products manufactured in conformity with the requirements of the directive, according to pressure, DN and fluid (see on the precedent page).

LINERS	DN mm	Cat.	MONTAGE	PFA	PS			
					L1	L2	G1	G2
EPDM/PTFE, Silicone/PTFE	32 to 100	I	Flanges	10	10	10	10	10
			End of line	6	6	6	6	
	125 & 150	II	Flanges	10	10	10	10	10
			End of line	6	6	6	6	
	200 to 300	II	Flanges	6	6	6	6	6
			End of line	4	4	4	4	

PS : Maximum allowable pressure (in bar) according to Directive 97/23/CE

PFA : Allowable operating pressure (in bar) for supply, distribution and disposal of water.

Pressure/temperature diagram



Torque values

DN	32/40	50	65	80	100	125	150	200	250	300
Torques for water - Nm	23	50	61	70	120	130	165	350	410	650

NOTE :
 Applications: liquids
 One actuation per month.
 Torque value after 10 actuations
 PS 10 up to DN150,
 PS 6 for DN200 to 300,

Flow rate (Kv)

OPENING STAGE - Stainless steel disc

DN	10°	20°	30°	40°	50°	60°	70°	80°	90°
32/40	-	-	-	5	12	25	40	56	62
50	-	-	1	8	18	33	54	71	79
65	-	-	6	19	41	76	118	158	174
80	-	3	18	43	79	138	211	252	275
100	-	15	38	83	154	253	368	458	496
125	-	20	61	134	249	399	599	792	883
150	5	37	100	200	374	600	863	1109	1212
200	15	76	200	399	680	1099	1666	2196	2500
250	40	150	333	621	1084	1765	2652	3517	3948
300	60	219	500	989	1736	2770	4097	5118	5635

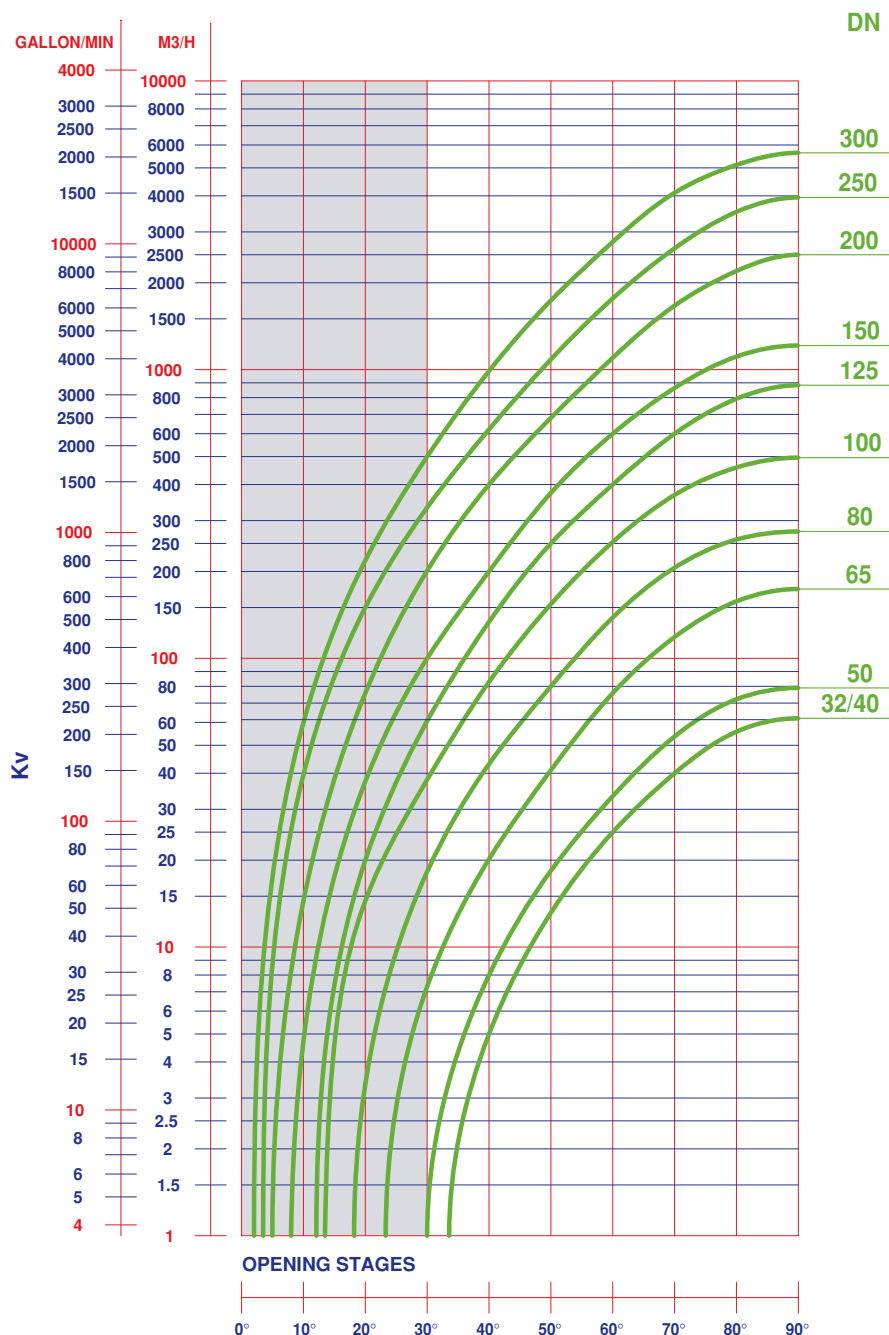
The butterfly valve is not the best product for regulating. Nevertheless, the Tilis butterfly valve can be used to regulate by an opening stage between 30° and 90°.

A regulation in the opening stage lower than 30° is not advisable because of over speed, cavitation effect, which could damage prematurely the valve.

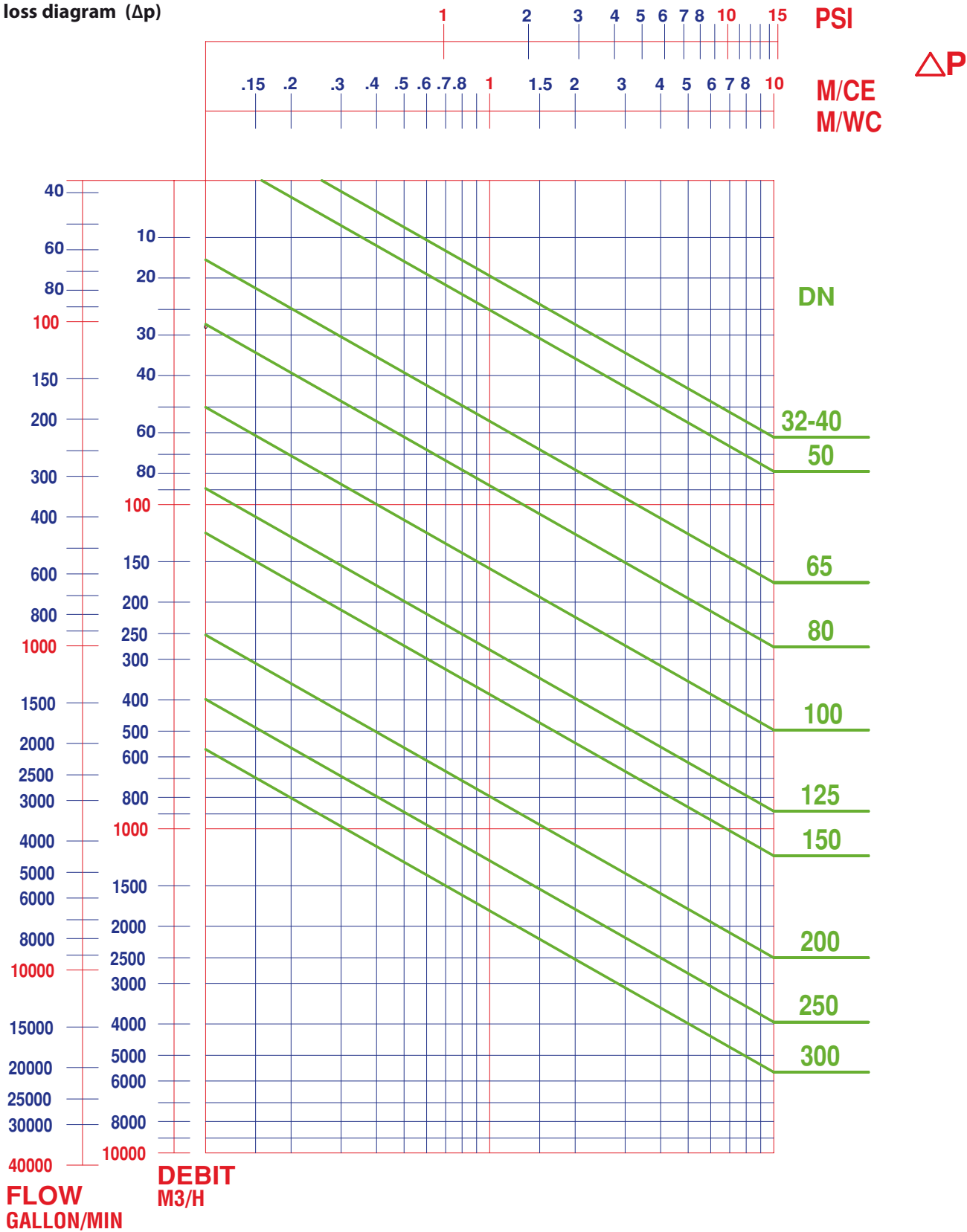
Kv = volume of water in m³/h through a valve at a preset opening stage and under a head loss of 1 bar.

The maximum flow velocity of the fluid through the valve must not exceed :

- 3 m/s for liquid fluids. Between 3 and 5m/s, the use of the Tilis butterfly valve is possible, but the phenomena of cavitation, noise, vibration and water hammering increase.
- 20m/s for gas. Between 20 and 25m/s, the use of the Tilis butterfly valve is possible, but the phenomena of cavitation, noise, vibration and water hammering increase.
- 2 m/s for DN 900 to 1200
- for gas and pulverulent or paste fluids : please consult us.



Head loss diagram (Δp)

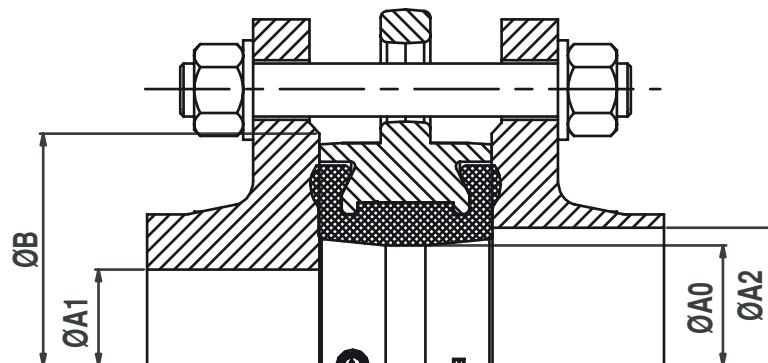


Type of flange

The Tilis butterfly valve has been designed to be mounted on normal standard flanges. Only standard flanges type 11, 21 and 34 according to EN 1092 are quite compatible.

For other types of flanges, refer to the table below.

Non appropriate connections will cancel our guarantee.



DN		Ø A0	Ø A1 mini	Ø A2 maxi	Ø B mini
32	1 1/4	43	33	51	80
40	1 1/2	43	33	51	80
50	2	50	36	59	90
65	2 1/2	65	54	74	110
80	3	80	73	88	128
100	4	100	93	116	148
125	5	125	119	143	178
150	6	150	146	166	202
200	8	200	196	224	258
250	10	250	246	280	312
300	12	300	296	329	365

NOTE :

The use of expansion seals, as well as the use of elastomer coated flanges, between the flange and the valve are strictly forbidden.

Tag / traceability

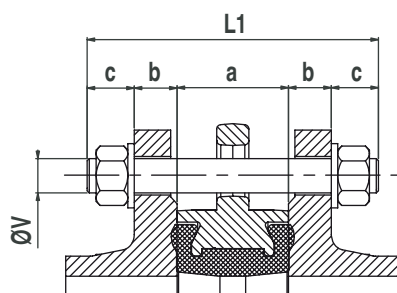

Rep	Description
1	Name of the valve
2	Reference
3	Material of the disc
4	Material of the liner
5	Pressure PS between flanges L1/L2 (liquid)
6	Pressure PS between flanges G1/G2 (gas)
7	Pressure PS end flange L1/L2 (liquid)
8	Pressure PFA water 20°C
9	Number of manufacturing order
10	Notified Body Number for the Directive PED 97/23/CE
11	Manufacturing date
12	Connecting flanges
13	Limit of use
14	Approval information zone
15	Marking relating to the Directive ATEX 94/9/CE

Bolts and nuts
Note : We do not supply bolts and nuts.

DN	NPS	a	e	EN 1092 PN6			EN 1092 PN10			EN 1092 PN16			EN 1092 PN25			ASME / ANSI B16.5 Class 150		
				*Nb rods or Nb screw	ØV	c	*Nb rods or Nb screw	ØV	c	*Nb rods or Nb screw	ØV	c	*Nb rods or Nb screw	ØV	c	*Nb rods or Nb screw	ØV UNC**	c
32/40	1 1/2	32	14	4	M12	18	4	M16	24	4	M16	24	4	M16	24	4	1/2»	18
50	2	41	18	4	M12	18	4	M16	24	4	M16	24	4	M16	24	4	5/8»	24
65	2 1/2	44	20	4	M12	18	4	M16	24	4	M16	24	8	M16	24	4	5/8»	24
80	3	44	20	4	M16	24	8	M16	24	8	M16	24	8	M16	24	4	5/8»	24
100	4	50	24	4	M16	24	8	M16	24	8	M16	24	8	M20	26	8	5/8»	24
125	5	54	26	8	M16	24	8	M16	24	8	M16	24	8	M24	32	8	3/4»	26
150	6	54	26	8	M16	24	8	M16	24	8	M20	26	8	M24	32	8	3/4»	26
200	8	58	28	8	M16	24	8	M20	26	12	M20	26	12	M24	32	8	3/4»	26
250	10	66	32	12	M16	24	12	M20	26	12	M24	32	12	M27	32	12	7/8»	26
300	12	76	36	12	M20	26	12	M20	26	12	M24	32	16	M27	32	12	7/8»	26

DN	NPS	a	e	BS10-d			BS10-e			JIS2238 & JIS2239 5K			JIS2238 & JIS2239 10K			JIS2238 & JIS2239 16K		
				*Nb rods or Nb screw	ØV UNC	c	*Nb rods or Nb screw	ØV UNC	c	*Nb rods or Nb screw	ØV	c	*Nb rods or Nb screw	ØV	c	*Nb rods or Nb screw	ØV	c
32/40	1 1/2	32	14	4	1/2»	18	4	1/2»	18	4	M12	18	4	M16	24	4	M16	24
50	2	41	18	4	5/8»	24	4	5/8»	24	4	M12	18	4	M16	24	8	M16	24
65	2 1/2	44	20	4	5/8»	24	4	5/8»	24	4	M12	18	4	M16	24	8	M16	24
80	3	44	20	4	5/8»	24	4	5/8»	24	4	M16	24	8	M16	24	8	M20	26
100	4	50	24	4	5/8»	24	8	5/8»	24	8	M16	24	8	M16	24	8	M20	26
125	5	54	26	8	5/8»	24	8	5/8»	24	8	M16	24	8	M20	26	8	M22	26
150	6	54	26	8	5/8»	24	8	3/4»	26	8	M16	24	8	M20	26	12	M22	26
200	8	58	28	8	5/8»	24	8	3/4»	26	8	M20	26	12	M20	26	12	M22	26
250	10	66	32	8	3/4»	26	12	3/4»	26	12	M20	26	12	M22	26	12	M24	32
300	12	76	36	12	3/4»	26	12	7/8»	26	12	M20	26	16	M22	26	16	M24	32

*** WAFER TYPE BODY:**
Assembly by rods : number of nuts and washer = 2 x Number of rods (above)
Assembly by bolts : Number of nuts = Number of screws (above) and number of washer = 2 x Number of nuts
*** LUG TYPE BODY :**
Assembly by screws : Number of screw per face (above) and number of washer is the same
**** ASME / ANSI B16.5 Class 150 : ØV UNC threading in inch ; for metric threading, please consult us.**

Bolts and nuts

For wafer type body ; assembly by rods :

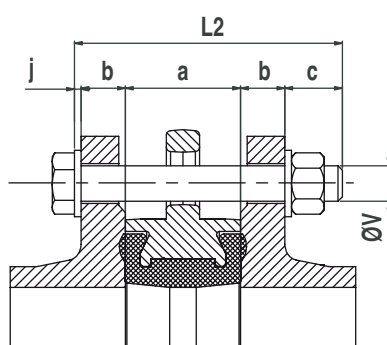
$$L1 = a + 2(b+c)$$

L1 = minimum length of rods

a = width of the butterfly valve

b = thickness of the flange (customer)

c = thickness of washer + thickness of nut + exceeding length of the rod.


For wafer type body ; assembly by bolts :

$$L2 = a + 2b + c + j$$

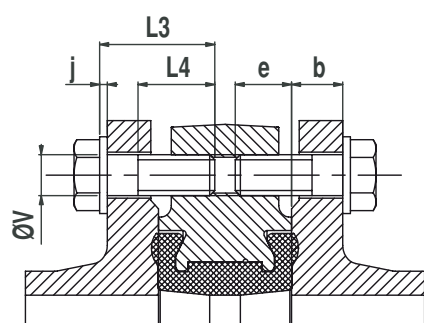
L2 = minimum length of rods

a = width of the butterfly valve

b = thickness of the flange (customer)

c = thickness of washer + thickness of nut + exceeding length of the rod

j = thickness of washer


For lug type body ; assembly by screws :

$$L3 \leq b + e + j \text{ avec } L4 \geq L3 - (b + j)$$

L3 = maximum length under head of screw

L4 = minimum length of the threading of the screw

a = width of the butterfly valve

b = thickness of the flange (customer)

e = maxi depth of screw

j = thickness of washer

Installation
• General remarks :

For safety reasons, the installation must take place under the supervision of authorised people taking account of local safety instructions and advice.

The handling of butterfly valves and their controls must be done by staff trained in all technical aspects of their operation.

Before installation the pipes must be depressurised and purged (empty of its fluid) in order to avoid any danger to the operator.

The pipe work must be correctly aligned so that no extra stress is exerted on the valve casing.

In ATEX zone, check that the pipes are connected to the earth. Do not use insulating pipes (PVC....)

Check the compatibility of the connection flanges against the operating pressure : the PN number of the flanges must be greater or equal to the operating pressure.

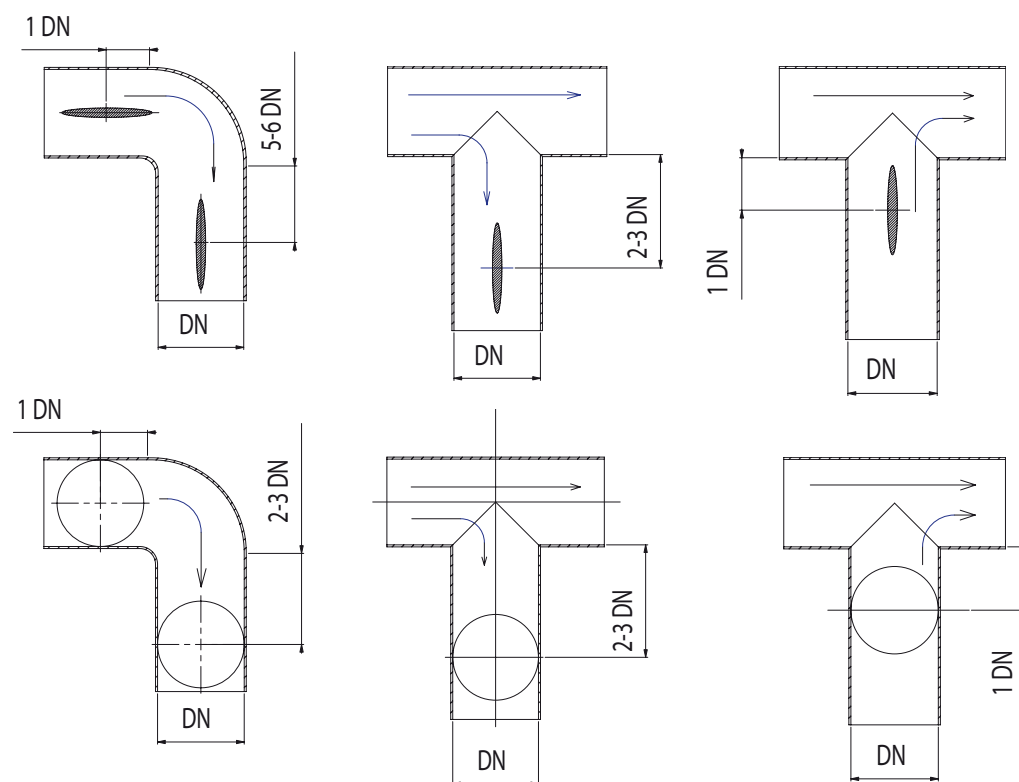
The valve is a machined piece of equipment and must not be used to prise apart the flanges.

An **instruction notice** specifying the installation characteristics and the commission of the Tilis is added to every product when the ATEX version is specified; it is available on our web site www.danfoss-socla.com or on request by our sales department.

• Installation conditions :

It is recommended that the distances mentioned below be respected in order to prolong the life time of the valve.

Mounting the valve close to pipe work junctions places it in turbulent zones which increase its wear.



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