

# **VTB 400 Butterfly valves**



**VAPO**

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### TRADEMARKS

Following brand names are Dupont registered trademarks:

- Kalrez®
- Viton®
- Teflon®
- Hypalon®
- BUNA-N®

### DISCLAIMER

Vapo Techniek BV has done its utmost to ensure that all data in this documentation is correct. However, Vapo Techniek BV accepts no responsibility for possible problems caused by mistakes in this documentation.

# General Features

**1.**  
The 1-piece body guarantees a high stability with a low weight. The body is made with 4 centring ears for easy mounting. Standard materials are ductile iron, carbon and stainless steel. Exotic materials upon request. Face to face standards: Wafer Type DIN 3202/K2.

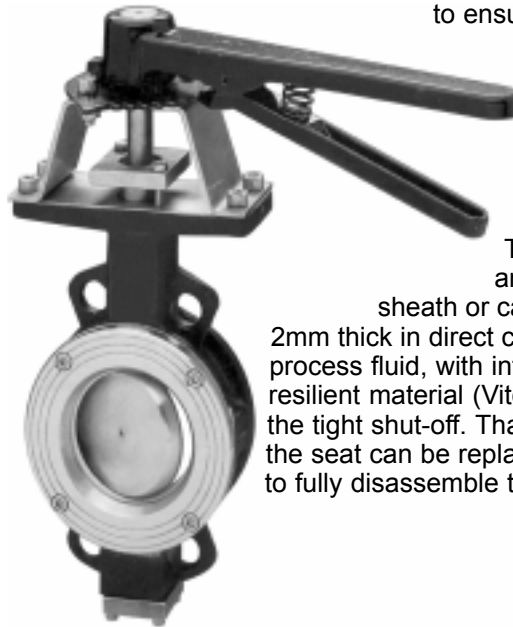
**2.**  
The butterfly disc is of the double excentric type. This design feature ensures a particular favourable effect both in flow as in the opening/closing movement. In fact, the disc has two surfaces unequally different from the valve opening angle. This results in a moment of rotation reducing possible turbulence within the valve.

**3.**  
The stem is accurately machined and besides being guides by lubricated PTFE bushings, it guarantees perfect tight shut-off on the stuffing box. The stem is integral with the disc through pinning. A plug with PTFE O-ring ensures tight shut-off on the lower stem.

**4.**  
The seal on the upper stem is of the adjustable type and contains Chevron pack made of PTFE on which a stuffing box presses. When the stem seal requires replacement, you can do this without having to remove the valve from the pipeline.

**5.**  
The seat retaining ring merely serves to keep the valve seat in place. A phonographic groove is machined on the outside of the ring to ensure tight shut-off between the valve and flange through a common seal.

**6.**  
The seat consists of an external PTFE sheath or casing from 1.6 to 2mm thick in direct contact with the process fluid, with internal core of resilient material (Viton) which provides the tight shut-off. Thanks to this solution, the seat can be replaced without having to fully disassemble the valve.



## Applications

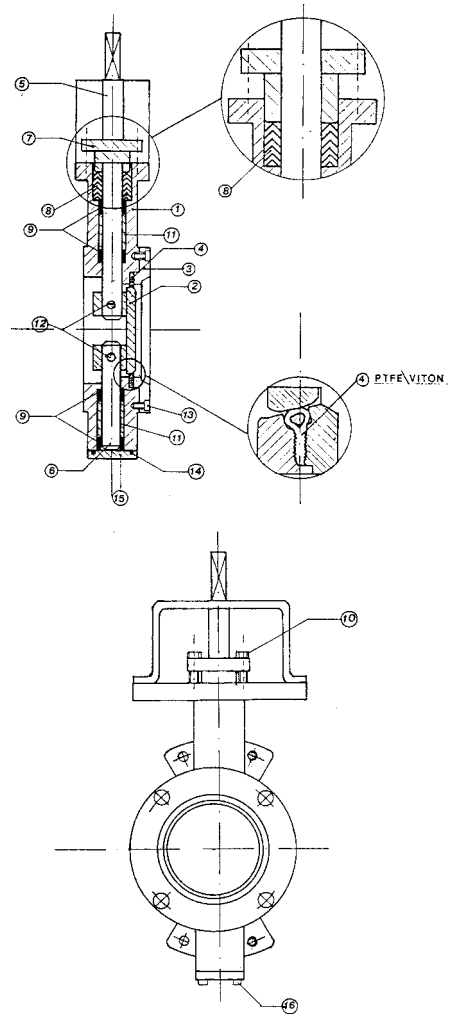
- Pharmaceutical industries
- Chemical industries
- Food industries
- Breweries
- Distilleries
- Paper Mills

## Misc

Sizes from DN 80 to DN 1000  
Operating Temperature from  $-50^{\circ}$  to  $+280^{\circ}$ C  
Mounting between flanges ISO-DIN PN6/10/16/25/40 – ANSI 150  
Perfectly tight shut-off with differential pressure 17.5 barg and under vacuum.  
Outer valve parts protected against corrosion (epoxy or polyurethane paint)  
Low static torque  
Operation through lever-gear-pneumatic/electric actuators.

# Construction

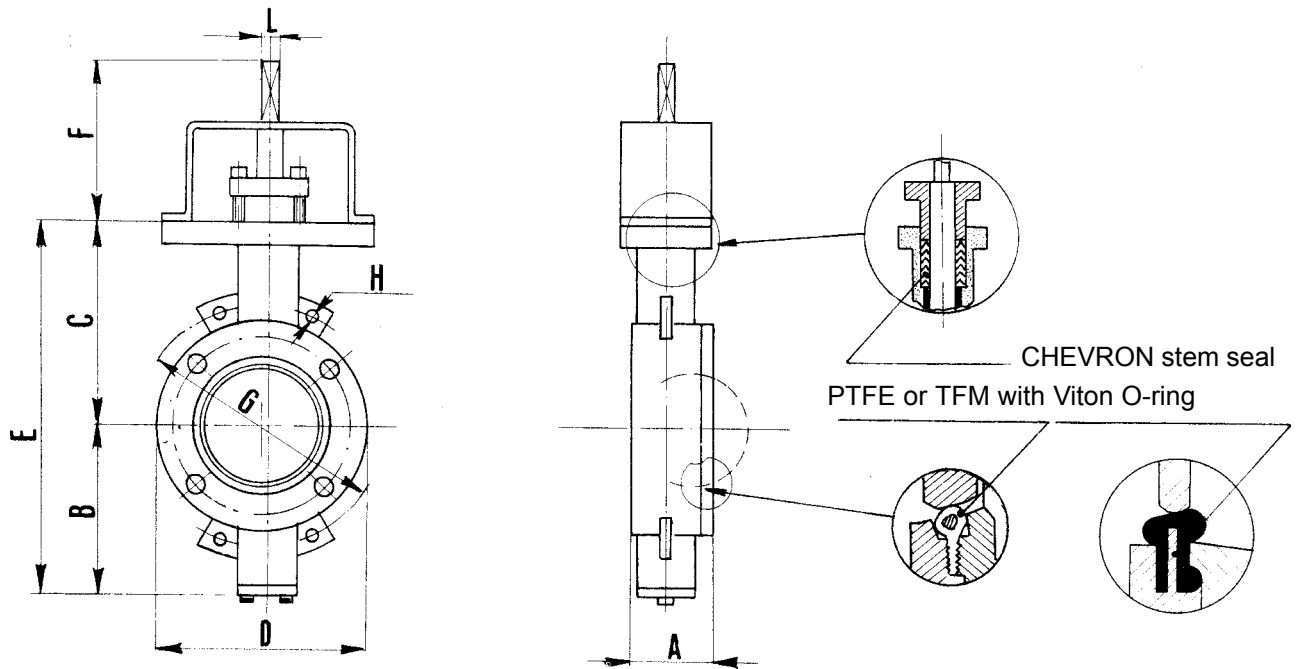
Item	Description
1	Body
2	Disc
3	Ring
4	Seat
5	Upper stem
6	Lower stem
7	Press ring
8	Stem seal
9	Seal
10	Bolts
11	Bushing
12	Pins
13	Bolts
14	Seal
15	Cap
16	Bolts



## Materials

Item	Description	Material	DIN Standard	ASTM
1	Body	Ductile iron Carbon steel Stainless steel Aluminium-bronze	GGG 40 GS-C-25 or C22.8 X5 CrNiMo 1713 G-CU Al 11 Fe 4 Ni 4	A 536 Gr. 65-45-12 A216WCB or A105 A 351 CF 8M B148-955
2	Disc	Ductile iron ENP Carbon steel Stainless steel Stainless steel Aluminium-bronze Monel-K	GGG 40 GS-C-25 or C22.8 1.4408 1.4401 G-CU Al 11 Fe 4 Ni 4	A 536 Gr. 65-45-12 A 216 WCB A 351 CF 8M A 182 F316 B 148-955
3	Ring	Carbon steel Stainless steel	C22.8 1.4408	A 105 A 182 F316
4	Seat	PTFE with viton O-ring TFM with viton O-ring PEEK TFM-Ekonol with Viton O-ring		
5+6	Stems	Stainless steel Hastelloy Monel	1.4401 C K	A 182 F316 B 574 B 164
7	Press ring	Carbon steel Stainless steel	C22.8 1.4408	A105 A 182 F316
8	Stem seal	PTFE Chevron		
9	Seal	PTFE		
10	Bolts	Stainless steel	V2A	SS304
11	Bushing	Stainless steel	hardened	hardened
12	Pins	Stainless steel	V2A	SS304
13	Bolts	Stainless steel	V2A	SS304
14	Seal	PTFE		
15	Cap	Stainless steel	V2A	SS304
16	Bolts	Stainless steel	V2A	SS304

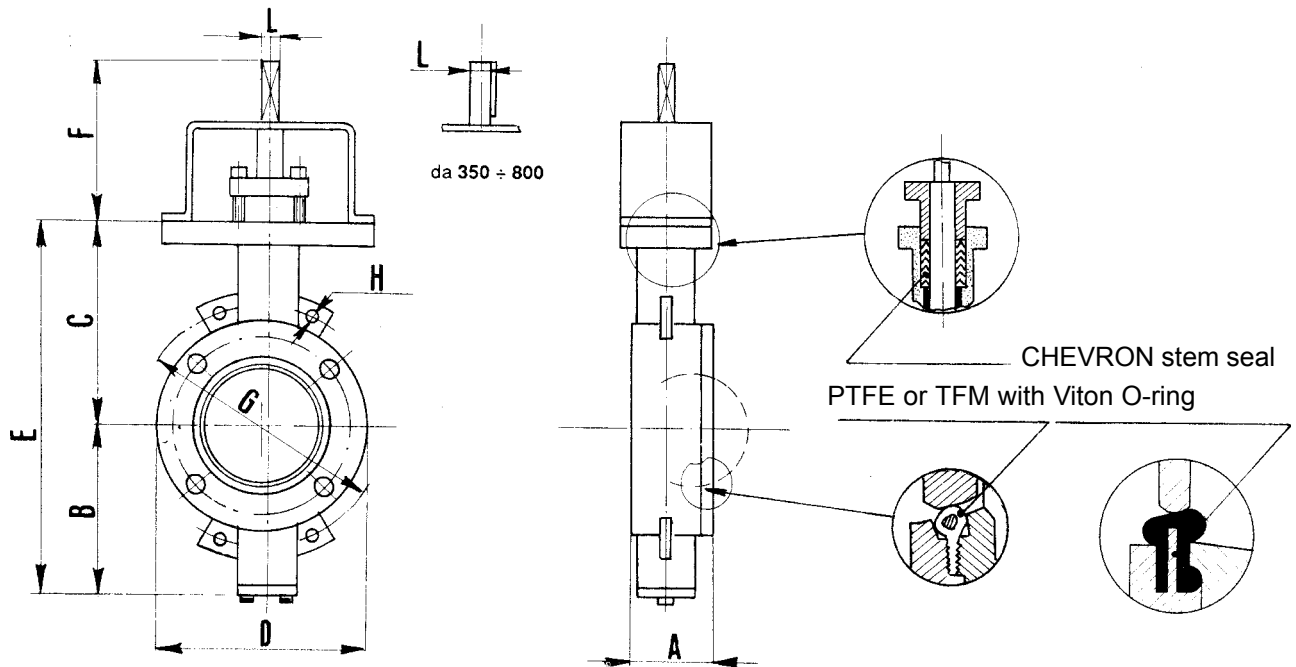
# Dimensions: Wafer Type DN 80 - DN 300



DN mm inch	A	B	C	ØD	E	F	L	ØH PN16	ØH PN40	ØH 150#
80 3"	49 1.9	105 4.1	135 5.3	132 5.2	240 9.4	100 3.9	12 0.5	M16 8x	M16 8x	5/8" 4x
100 4"	56 2.2	120 4.7	145 5.7	158 6.2	265 10.4	100 3.9	12 0.5	M16 8x	M20 8x	5/8" 8x
125 5"	64 2.5	135 5.3	168 6.6	185 7.3	305 12	100 3.9	12 0.5	M16 8x	M24 8x	3/4" 8x
150 6"	70 2.8	150 5.9	180 7.1	212 8.3	330 13	100 3.9	16 0.6	M20 8x	M24 8x	3/4" 8x
200 8"	71 2.8	180 7.1	200 7.9	268 10.6	380 15	100 3.9	16 0.6	M20 12x	M27 12x	3/4" 8x
250 10"	76 3	215 8.5	240 9.4	318 12.5	455 17.9	100 3.9	16 0.6	M24 12x	M27 12x	7/8" 12x
300 12"	83 3.3	255 10	280 11	370 14.6	535 21.1	100 3.9	18 0.7	M24 12x	M30 12x	7/8" 12x

Weight	Size	80	100	125	150	200	250	300
Wafer	kg	6	11	14	17	26	40	54

# Dimensions: Wafer Type DN 350 - DN 800



DN mm inch	A	B	C	ØD	E	F	L	ØH PN16	ØH 150#
350 14"	92 3.6	280 11	290 11.4	438 17.2	570 22.4	120 4.7	44.5 1.8	M24 X16	1" X12
400 16"	102 4	300 11.9	317 12.5	489 19.3	617 24.3	120 4.7	44.5 1.8	M27 X16	1" 16
450 18"	114 4.5	315 12.4	326 12.8	533 21	641 25.2	120 4.7	44.5 1.8	M27 X20	6/4" X20
500 20"	127 5	359 14.1	365 14.4	590 23.2	724 28.5	120 4.7	44.5 1.8	M30 X20	6/4" X20
600 24"	154 6.1	420 16.5	451 17.8	692 27.2	871 34.3	230 9	55 2.1	M33 X20	6/4" X20
700 28"	165 6.5	470 18.5	530 20.9	800 31.5	1000 39.4	230 9	55 2.1	M33 X24	-
800 36"	190 7.5	566 22.3	541 21.3	905 35.6	1107 43.6	230 9	55 2.1	M36 X24	-

Weight	Size	350	400	450	500	600	700	800
Wafer	kg	71	90	123	192	274	341	540

# Technical data

## Torque figures - Nm

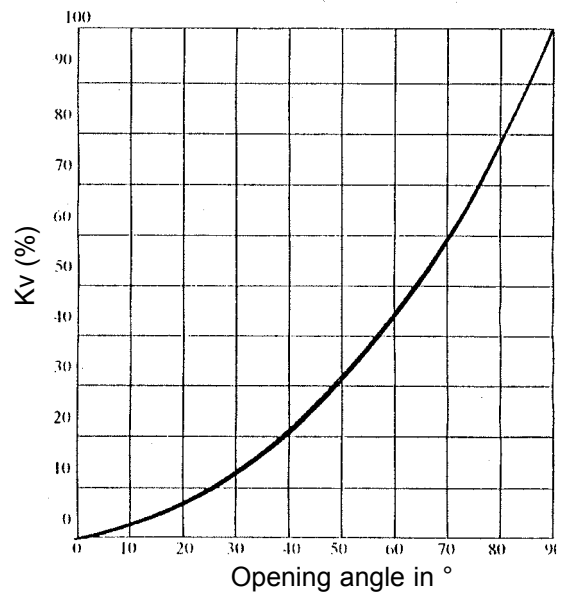
Druk	DN	80	100	125	150	200	250	300	350	400	450	500	600	700	800
Δp 7bar	Nm	24	39	61	82	148	232	339	451	613	780	985	1511	2340	3120
Δp 14bar	Nm	31	51	84	117	218	348	513	693	955	1210	1552	2429	3385	6980
Δp 20bar	Nm	37	61	103	145	277	443	601	899	1246	1590	2037	3210	4340	9175
Δp 28bar	Nm	44	74	132	186	350	575	861	1350	2250	2695	3780	5785	-	-

Note: The above mentioned torques are averages. To select the correct actuator you should always contact Vapo Techniek BV

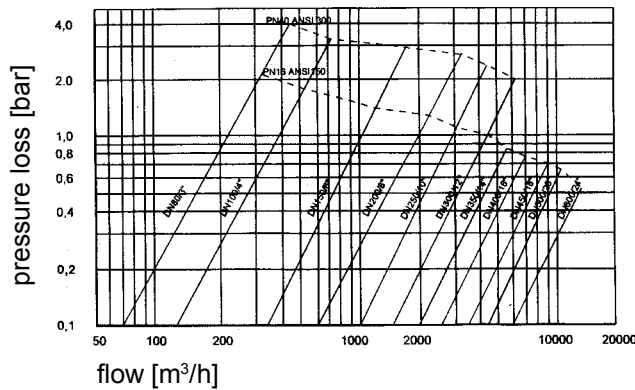
## Kv-values

DN	10°	18°	36°	54°	72°	90°
80	5.1	13	37	79	144	222
100	9.4	24	66	144	264	406
125	14	35	97	204	368	552
150	26	64	178	376	689	1060
200	46	115	322	681	1247	1919
250	72	181	505	1068	1955	3006
300	104	262	732	1547	2833	4359
350	152	380	1063	2245	4111	6325
400	193	482	1350	2852	5222	8034
450	265	662	1852	3914	7167	11026
500	330	826	2312	4865	8944	13760
600	466	1164	3260	6888	12611	19402
	Kvr	Kvs	Kvs	Kvs	Kvs	Kva

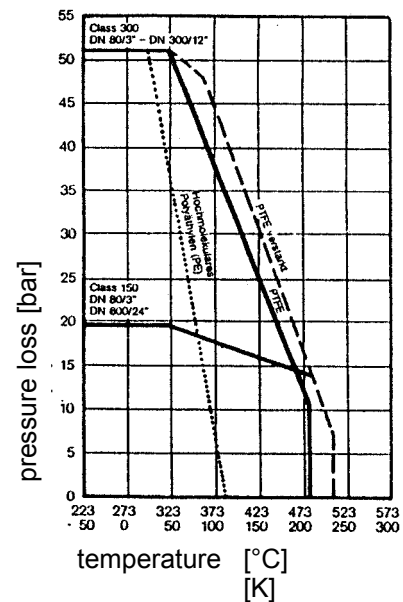
## Flow



## Pressure-loss table (water)



## Pressure/Temperature table



# Maintenance instructions

## Maintenance

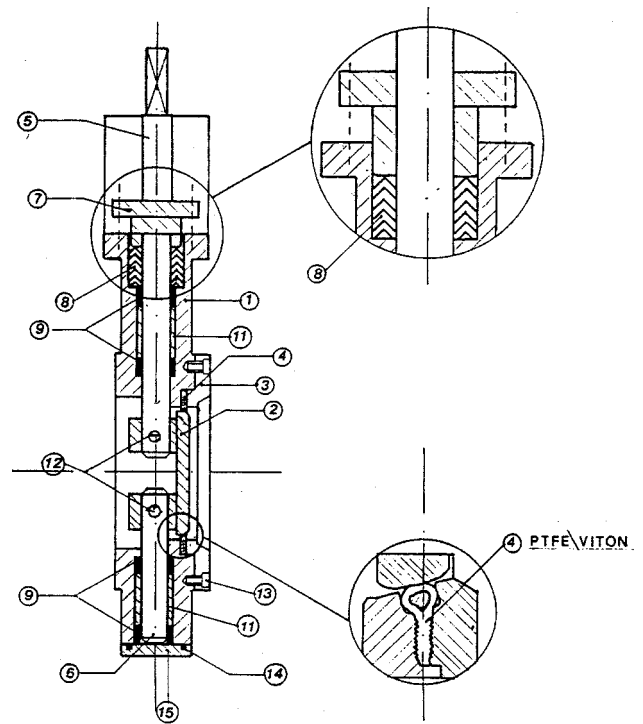
VTB 400 butterfly valves do not require regular or periodical maintenance.  
If any replacement of stem seals or seats is required please proceed as follows:

### Replacement of stem seals

1. The valve can remain in the pipeline.
2. The lever, gear box or actuator are to be removed.
3. Remove bolts (10) and press ring (7)
4. Remove PTFE Chevron rings (8)
5. Check if stem (5) is not damaged at the sealing surface.
6. Clean carefully stem (5) and press ring (7).
7. Replace carefully PTFE Chevron rings (8).
8. Replace press ring (7) and bolts (10) and gently tighten the bolts until leaking stops. **DO NOT OVERTIGHTEN !!**

### Replacement of seat

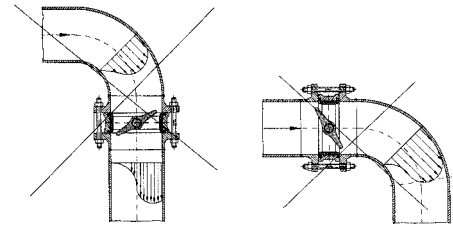
1. Check if valve is in closed position.
2. Remove valve from pipeline.
3. Remove bolts (13) and ring (3).
4. Open the valve.
5. Remove seat (4).
6. Clean disc (2), inside of valve and seat retainer.
7. Replace seat (4) and assemble valve following the above procedures in reversed order.



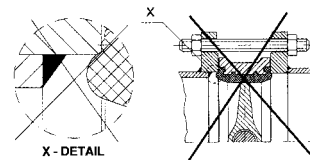


## Additional installation information

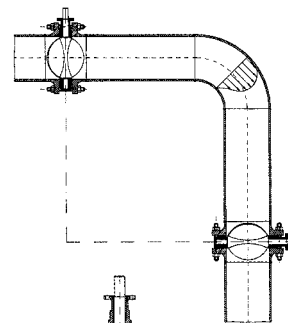
Installing the valves near the curves (see diagram) shall cause turbulence and should be avoided.



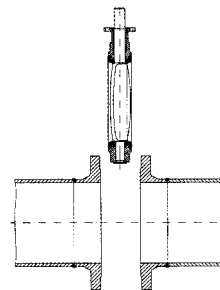
Welded neck type flanges are advised. Otherwise the valves must be centred between the flanges.



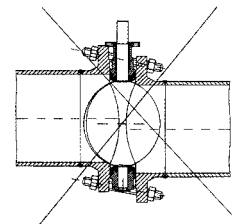
Always install the valves further from the curve equally 3 to 5 times the diameter of the line. The axis of the stem should be parallel to the line extended from the opposite side of the curve.



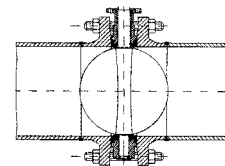
Surrounding space must be provided between the flanges to insert the valve. The disc must be at 95% closed position prior to installing the valve.



Using scrap pipes is not recommended. The pipes must not be welded to each other at short intervals. The lines connected to the two sides of the valve must be on the same axis to prevent leakage.



- lines connected to the valves must be centred with each other
- the disc must be completely open
- line and stem axis must be centred
- the bolts must be tightened until the flanges touch the valve body



If the stem must be installed parallel to the ground to accommodate dense flowing materials, lower part of the disc should open in the same direction of the flow.

