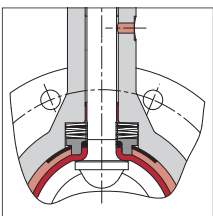


# Richter PFA/PTFE Shut-off and Control Butterfly Valves



Body lining PTFE, modified PTFE,  
PTFE-L, PE-UHMW

Disc/stem unit PFA, PFA-L,  
stainless steel, Hastelloy®,  
titanium, special metals

50-1000 mm (2-40")

# Richter wafer-style and lug-style butterfly valves

## Fields of application

Richter butterfly valves have proved successful in a wide variety of process plants.

- Shut-off, throttling and control of corrosive, hazardous and pure liquids, gases and vapours, e.g.
  - wet Cl<sub>2</sub> gas and NaOH in chlor-alkali electrolysis
  - large flows in the distribution and treatment of H<sub>2</sub>SO<sub>4</sub>, HCl, NaOH, NaOCl, chemical effluent etc.
- FDA-compliant, wetted materials for use in food processing, pharmacy and similar fields.
- Also suitable for free-flowing, low-abrasive bulk materials in the version with a metallic disc/stem unit.
- The compact butterfly valves are advantageous in confined spaces – e.g. under vessels.
- Butterfly valves are economical valves: easy to install and dismantle, attractively priced, compact.

## Operating range

- -40°C to +200°C (-40°F to +400°F)
- 0.1 mbar to 10 bar vacuum (0.0015 psi to 145 psi vacuum)

## Product features

- Soft-sealing and gas-tight, both with lined and metallic disc/stem unit
- Leak-tight against the atmosphere in compliance with the German Clean Air Act (TA-Luft) (series NKS, NKL additionally certified to ISO 15848)
- Optional with safety stuffing box (series NKS, NKL)
- Leakage rate in the seat to DIN EN 12266, leakage rate A (formerly DIN 3230 T3): gas-tight, 0 bubbles
- Almost equal-percentage characteristics
- Face-to-face: ISO 5752 series 20, API 609 Table 1, MSS SP-67 Table 3
- Flanges (with lug-style) for connection to ISO 7005-2 PN10, ASME (ANSI) B16.5 Class 150, JIS R 2210-10K
- Anti-adhesive wetted surfaces thanks to PFA/PTFE
- Identification of the valves: DIN EN 19, ASME (ANSI) B16.34
- Actuation:
  - hand lever, lockable
  - worm gear with handwheel
  - pneumatic/electric actuators

## Type code, wetted linings and available sizes

- see page 10

Depending on the body version, the butterfly valves can be installed

- As a wafer-style valve ("sandwich-type")
  - As a dead-end butterfly valve with lug-style body.
- ① Single-piece disc/stem unit optionally fluoroplastic
- Lined with pure PFA for maximum corrosion resistance and a long service life. Very low friction values and torques during opening and closing due to the combination of a PFA disc/stem unit with a PTFE body
  - Optionally antistatic PFA-L
  - Core made of highly torsion-resistant Duplex stainless steel 1.4517/CD-4MCu (DN 450-1000/18-40": SS 1.4435/316L)
- Alternatively metallic
- Made of precision cast stainless steel
    - DN 50-200 (2-8") Duplex 1.4470, DN 250-1000 (10-40") 1.4404
    - polished sealing surfaces, therefore very low friction values
    - polished disc surfaces on request
  - Other materials on request, e.g. Hastelloy® C22, titanium gr. 2
- ② Thick-walled PTFE lining of the valve body
- As option: modified PTFE, e.g. for strong permeating fluids
  - Optionally antistatic PTFE-L, PE-UHMW
  - Lining thickness 3-3.5 mm (0.12-0.15")
  - Vacuum-proof
- Wide sealing surfaces of body lining for reliable sealing even with mating flanges with large radii, e.g. glass-lined components
- ③ Permanently elastic seal in the valve opening by means of silicone insert under the PTFE body lining.
- Optionally FKM insert (e.g. Viton®) for use with chlorine gas for example

- ④ Double-action, maintenance-free and self-adjusting top and bottom stem sealing, therefore reliable even with many switching cycles and fluctuating temperatures:
- primary: body lining against disc/stem shoulder
  - secondary: O-ring FKM, optionally FFKM

Compliant with the German Clean Air Act even in the standard version without safety stuffing box

- ⑤ Pressure-bearing body made of ductile cast iron EN-JS 1049 (0.7043)/ASTM A395
- Absorbs system and pipe forces
  - Centers the valve in the pipe
  - Optionally body made of stainless steel or carbon-fibre/glass-fibre-reinforced vinyl ester
- ⑥ Long valve neck permits optimal heat insulation without the installation of an elevated lever, additional stem extensions on request.

- ⑦ External corrosion protection Epoxy coating, nuts and bolts made of stainless steel
- ⑧ Centering to ISO 5211

#### Chlorine electrolysis options

Specially for use with wet chlorine gas:

- elastic insert made of Viton® instead of silicone
- body lining made of particularly permeation-proof, modified PTFE instead of standard PTFE
- body nuts and bolts made of steel, for example, instead of stainless steel
- tantalum-coated ductile iron body



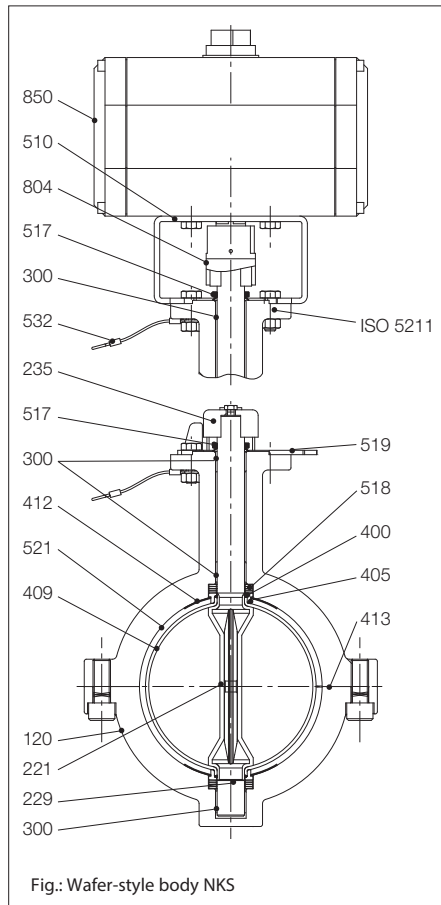
Wafer-style body  
NKS, NKS-C

Lug-style body  
NKL, NKL-C

## Components, materials and options for valves with a PFA-lined disc

### Components and materials

Item	Designation	Standard design DN 50-400 (2-16")	Standard design DN 65,125,450-750 (2 1/2", 5", 18-30")	Special design
120	Body (shell)	Ductile cast iron EN-JS 1049 (0.7043)/ ASTM A395	Ductile cast iron EN-JS 1049/ ASTM A395	Stainless steel, CF/GF-reinforced vinyl ester
221	Disc/stem unit, one-piece	Disc/stem core Duplex stainless steel 1.4517 (CD-4 MCu), PFA-lined	Disc/stem core stainless steel 1.4435, PFA-lined	Lining PFA-L antistatic
229	Guide pin	Stainless steel (DN ≤ 150/6")	-	
235	Hand lever (DN 50-200/2-8")	Stainless steel	Stainless Steel	
300	Plain bearing	PTFE-coated (triple bearing)		
400	O-ring	FKM (Viton <sup>®</sup> or equivalent), top and bottom		FFKM (Kalrez <sup>®</sup> or equivalent)
402/1	Packing rings (see Fig. above)	PTFE (only with safety stuffing box)	-	
405	Thrust rings	Stainless steel (top and bottom)		
409	Body lining	PTFE, optionally modified PTFE		PTFE-L antistatic, UHMW-PE
412	Pressure gasket	Aramide	-	
413	Sealing foils	PTFE (only with safety stuffing box)	-	
503	Packing gland follower (see Fig. above)	Stainless steel (only with safety stuffing box)	-	
510	Bracket	Stainless steel, connection ISO 5211 + Namur		Special design on request
517	Scraper ring	Fluororubber – no need if safety stuffing box installed	-	
518	Cup spring assembly	Stainless steel (top and bottom)		
519	Throttling plate	Stainless steel, 15° scaling	Stainless steel, 10° scaling	
521	Flexible insert	Silicone		FKM (Viton <sup>®</sup> or equivalent)
532	Grounding cable	Stainless steel	-	
550	Packing rings, disc (see Fig. above)	PTFE, stainless steel (only with safety stuffing box)	-	
w/o No.	Monitoring connection (see Fig. above)	Only in conn. with safety stuffing box	-	
804	Coupling	Stainless steel		Special materials on request
850	Actuator	Pneumatic quarter-turn actuators e.g. Richter RA, Norbro, El-o-matic, AMG, AirTorque etc.		electric actuators of various makes
857	Worm gear with handwheel (not illustrated, see page 7)	Body EN-GJL 25 (GG-25) with epoxy coating		Body ductile cast iron, aluminium. Stem with O-ring sealing, stem and bolts of stainless steel
w/o No.	Stem extension, not illustrated			Design on request
w/o No.	Screws, nuts, washers	Stainless steel		Steel, B7M to US standard



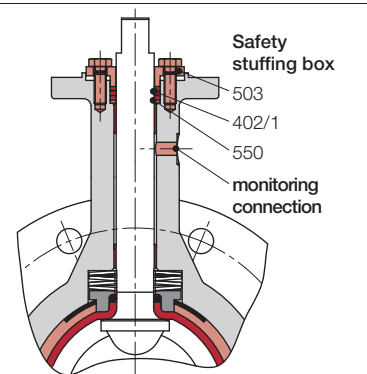
### Options for PTFE-lined valves

DN 50-400 (2-16") with a PFA-lined disc/stem unit

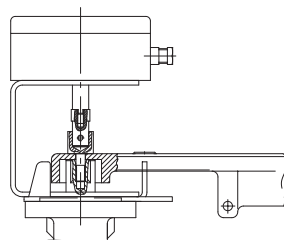
#### Safety stuffing box

for use with environmentally hazardous media, independent action, can be adjusted manually from outside, on request with **monitoring connection**.

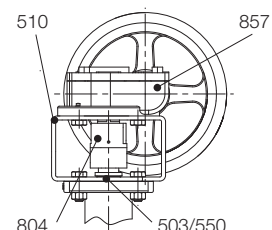
Available for series NKL, NKS  
DN 50-400 (2-16")  
except DN 65+125 (2 1/2" + 5")



Manual actuation with limit switch  
Inductive or mechanical, connection in acc. with VDI/VDE 3845,  
alternatively freely mounted sensors



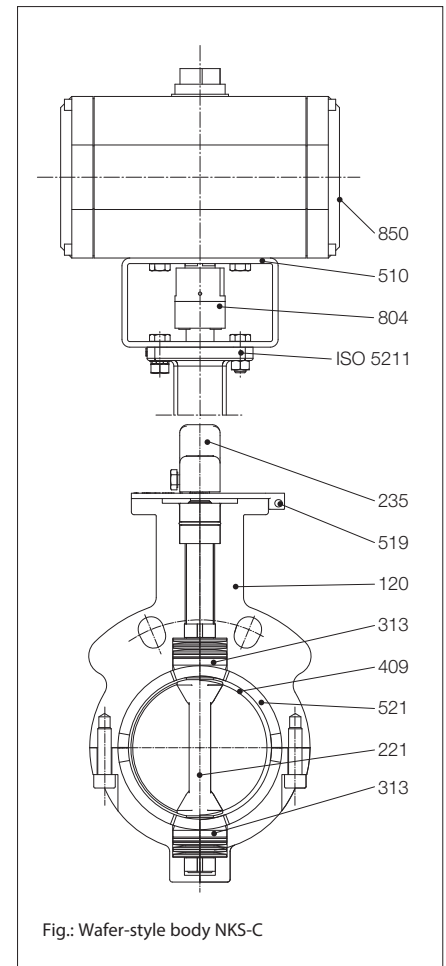
Connection handwheel to worm gear in the version  
"with safety stuffing box"



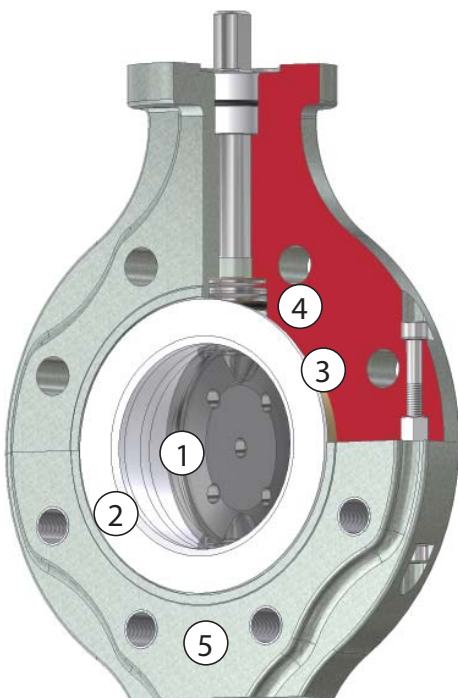
## Components, materials and options for valves with stainless steel/Hastelloy® C/titanium disc

### Components and materials

Item	Designation	Standard design DN 50-1000 (2-40")	Special design
120	Body (shell)	Ductile cast iron EN-JS 1049/ASTM A395	Stainless steel, CF-/GF-reinforced vinyl ester
221	Disc/stem unit, one-piece	DN 50-200 (2-8"): Duplex stainless steel 1.4470/ ASTM A890 4A DN 250-1000 (10-40"): Stainless steel 1.4404/316L	Hastelloy® C22, titanium gr. 2
235	Hand lever (DN 50-200, 2-8")	Stainless steel, from DN 200 (8") worm gear with handwheel	
313	Complete bearing and pressure set	on request	
409	Body lining	PTFE	modified PTFE, PTFE antistatic, UHMW-PE
510	Bracket	Stainless steel, Connection to ISO 5211 + Namur	Special design on request
519	Throttling plate	Stainless steel, Scaling 10°	
521	Flexible insert	Silicone	FKM (Viton® or equivalent), FDA-FKM
804	Coupling	Stainless steel	Special design on request
850	Actuator	Pneumatic quarter-turn actuators e.g. Richter RA, Norbro, El-o-matic, AMG, AirTorque etc.	Pneumatic or electric actuators of various makes
857	Worm gear with handwheel (not illustrated, see page 4)	Body cast iron EN-GJL 25 (GG-25) with epoxy coating	Body ductile cast iron, aluminium stem with O-ring sealing, stem and bolts stainless steel
w/o. No.	Stem extension, not illustrated		Design on request
w/o. No.	Screws, nuts, washers	Stainless steel	on request





### Option: Butterfly valve with CF/GF-reinforced vinyl ester body



- ① Disc/stem unit plastic-lined or metallic
    - PFA-lined, PFA antistatic, stainless steel, Hastelloy® C22, titanium gr. 2
  - ② Body lining PTFE
    - Highly corrosion-resistant, vacuum-proof
    - Optionally modified PTFE, PTFE antistatic, PE-UHMW
  - ③ Permanently elastic seal in the valve passage by means of silicone insert
    - Optionally FKM insert (e.g. Viton®)
  - ④ Self-adjusting, maintenance-free stem sealing
    - Leak-tight against atmosphere, German Clean Air Act (TA Luft)
    - Double-acting with secondary O-ring
  - ⑤ Shell made of vinyl ester thermosetting plastic with 20% carbon-fibre/glass-fibre reinforcement
    - Wafer-style or lug-style body
    - High dimensional stability, low weight, antistatic
    - High resistance to atmospheric corrosion
    - DN 50-300 (2-12"), operating pressure up to 10 bar
    - -30 to +130 °C (-20 to +265 °F) with PTFE and modified PTFE
    - -30 to +90 °C (-20 to +195 °F) with PE-UHMW
    - Face-to-face ISO 5752 series 20, API 609 Table 1, MSS-SP 67 Table 3
    - Seat leakage rate to DIN EN 12266, leakage rate A: gas-tight, 0 bubbles
- Connecting dimensions, pressure/temperature range, flow rates and torques: details on request

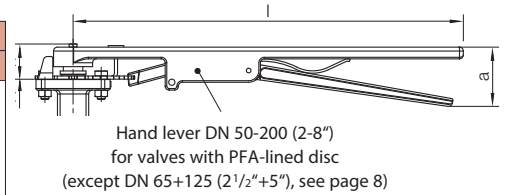
## Connection dimensions, flow rates, torques

### PTFE butterfly valves with PFA-lined disc

Series	NKS, NKSP		NKS-C, NKSP-C		NKL, NKLP		NKL-C, NKLP-C	
Actuation	Lever	Gear/Actuator	Lever	Gear/Actuator	Lever	Gear/Actuator	Lever	Gear/Actuator
/F Lining standard	DN 50, 80, 100, 150, 200 2", 3", 4", 6", 8"	DN 50, 80, 100, 150-400 2", 3", 4", 6"-16"	DN 65, 125 2 1/2", 5"	DN 65, 125 2 1/2", 5"	DN 50, 80, 100, 150, 200 2", 3", 4", 6", 8"	DN 50, 80, 100, 150-400 2", 3", 4", 6"-16"	DN 65, 125 2 1/2", 5"	DN 65, 125, 450-750 2 1/2", 5", 18"-30"
/F-L Lining antistatic		DN 50, 80, 100, 150-300 2", 3", 4", 6"-12"		DN 65, 125 350-400 2 1/2", 5", 14"-16"		DN 50, 80, 100, 150-300 2", 3", 4", 6"-12"		DN 65, 125, 350-600 2 1/2", 5", 14"-24"
Body design	 Wafer-style body				 Lug-style body			

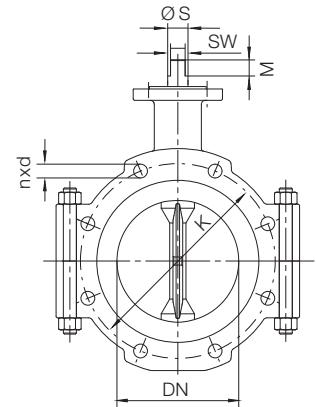
### Hand lever dimensions (mm) and approx. weights (kg)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750		
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"		
a	65	36	65	60	45	70	70	Worm gear, see page 7										
l	300	230	300	300	270	500	500											
h	40	46	40	40	55	48	48											
Weight	0.7	0.7	0.7	0.7	1.1	3.7	3.7											



### Pipeline connections and approx. weights (kg)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30" <sup>3)</sup>
K (ISO)	125	145	160	180	210	240	295	350	400	460	515	565	620	725	840	-
nxd (ISO) <sup>1)</sup>	4x19	8x18	8x19	8x19	8x18	8x23	8x23	12x23	12x23	16x23	16x28	20x26	20x26	20x30	24x30	-
n <sup>2)</sup>	4xM16	8xM16	8xM16	8xM16	8xM16	8xM20	8xM20	12xM20	12xM20	16xM20	16xM24	20xM24	20xM24	20xM27	24xM27	-
K (ASME)	121	140	153	191	216	242	299	362	432	476	540	578	635	749	864	914
nxd (ASME) <sup>1)</sup>	4x19	4x19	4x19	8x19	8x22	8x23	8x22	12x26	12x26	13x29.5	16x29.5	16x32	20x32	20x35	28x35	28x35
n <sup>2)</sup>	4x5/8"	4x5/8"	4x5/8"	8x5/8"	8x3/4"	8x3/4"	8x3/4"	12x7/8"	12x7/8"	12x1"	16x1"	16x1 1/8"	20x1 1/8"	20x1 1/4"	28x1 1/4"	28x1 1/4"
NKS, NKS-C (kg)	3.5	4	4.5	6	7.7	11	15	25	33	47	69	152	185	254	280	300
NKL, NKL-C (kg)	4.5	7	7.5	9.5	14.5	16	23	35	54	68	97	152	185	254	280	300



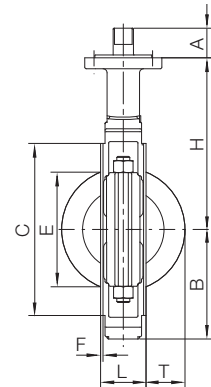
Flange connecting dimensions to ISO 7005-2 PN 10 and ASME (ANSI) 16.5 Cl. 150, weight (kg) with bare shaft (without lever, bracket etc.)

<sup>1)</sup> Flange through holes on request <sup>2)</sup> Tapped holes metric or UNC <sup>3)</sup> DN 750 (30") only to ASME/ANSI B16.5 Cl. 150

### Connection dimensions (mm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"
L	43	46	46	52	56	56	60	68	78	92	102	114	127	154	154	154
H	135	146	160	175	202	212	232	272	297	335	360	400	435	510	581	608
B (NKS, NKS-C)	72	67	89	100	110	128	165	195	225	258	282	like NKL/NKL-C but through holes				
B (NKL, NKL-C)	72	65	89	100	116	128	165	195	225	258	282	311	340	398	581	608
B (NK)	66	-	93	106	-	135	165	195	230	-	-	-	-	-	-	-
E	28	48	67	87	118	142	193	243	292	343	389	424	477	561	665	717
T	4	11	17.5	24.5	38	48	71	92	112	137	150	164	184	215	264	289
C	90	106	128	150	166	212	265	315	365	430	480	515	570	672	787	851
F	3	0.5	3	3	0.5	3	3	4	4	4	4	0.5	0.5	0.5	1	1
A	30	19	30	30	25	36	36	42	43	50	50	50	50	64	64	56
Ø S	14	14	16	20	18	25	25	30	32	35	40	48	48	60	60	72
SW	10	11	11	12	14	18	18	22	22	25	30	-	-	-	-	-
SW square-end	-	-	-	-	-	-	-	-	-	-	-	36	36	46	46	55
M	15	19	15	16	25	20	20	25	25	35	35	-	-	-	-	-

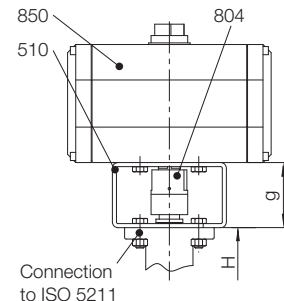
Lug-style and wafer-style body



### Connection dimensions (mm) for remotely actuated version

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"
g	60	60	60	60	60	80	80	80	80	100	100	80	80	100	100	200
Conn. dim.*	F07	F07	F07	F07	F07	F10	F10	F12	F12	F14	F14	F14	F14	F16	F16	F25

\* to ISO 5211



# PTFE butterfly valves with PFA-lined disc

Worm gear dimensions (mm) and approx. weights (kg)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"
b	73	68	73	73	68	73	73	105	105	126	126	123	123	186	186	186
c	51	46	51	51	46	63	63	69	69	100	100	83	83	140	140	140
e	45	44	45	45	44	45	45	70	70	86	86	84	84	138	138	138
g*	60	60	60	60	60	80	80	80	80	100	100	80	80	100	100	200
k*	100	125	150	150	125	150	150	250	250	250	250	300	300	400	400	500
m	87	89	87	87	89	107	107	120	120	142	142	125	125	155	155	255
p	27	29	27	27	29	27	27	40	40	42	42	45	45	55	55	55
r	181	128	181	181	128	181	181	206	206	226	226	289	289	387	387	408
s	62	64	62	62	64	62	62	89	89	90	90	97	97	128	128	128
t	102	84	102	102	84	125	125	130	130	200	200	156	156	282	282	282
u*	122	124	122	122	124	142	142	169	169	190	190	177	177	228	228	328
Weight	4	4	4	4	4	5	5	10	10	15	15	14	14	32	32	32

\* for valves with safety stuffing box

## Torques (Nm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"
Md	20	35	46	63	80	128	185	287	410	550	650	600	650	890	1500	2000
Md <sub>adm</sub>	100	61	180	360	179	725	775	1435	1775	3000	3500	1950	2400	3200	3200	8000

Md<sub>adm</sub> = max. admissible torque (Nm) with the disc/stem unit blocked

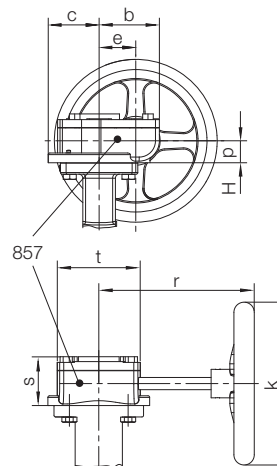
## Flow rates (m<sup>3</sup>/h) and z-values

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"
20°	1	4	5	11	24	37	62	85	159	230	295	528	647	843	1050	1181
30°	6	14	22	27	72	84	170	285	421	610	780	1148	1434	1861	2347	2675
40°	13	27	47	52	127	164	354	512	835	1210	1550	2173	2418	3473	4324	4864
50°	24	49	82	93	209	276	532	882	1378	2000	2560	3414	3980	5706	7104	7991
60°	41	80	126	155	332	431	912	1451	2282	3300	4240	5742	6490	9427	11737	13203
70°	67	118	197	247	477	702	1371	2256	3633	5270	6250	8535	10268	14140	17606	19804
80°	104	158	264	412	643	1136	2212	3692	5735	8320	10650	12043	14983	19349	24246	27274
90°	120	211	282	456	836	1254	2503	4083	6512	9450	12100	15519	19308	24807	30887	34744

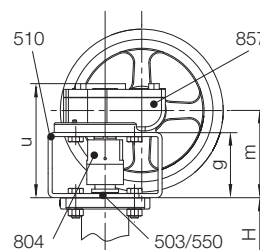
Conversion to Cv = k<sub>v</sub> x 1.165 (USgpm) = k<sub>v</sub> x 0.971 (Imp gpm)

z-values at 75% flow																
0.32	0.46	0.63	0.29	0.40	0.26	0.23	0.19	0.16	0.14	0.12	0.20	0.19	0.24	0.29	0.30	

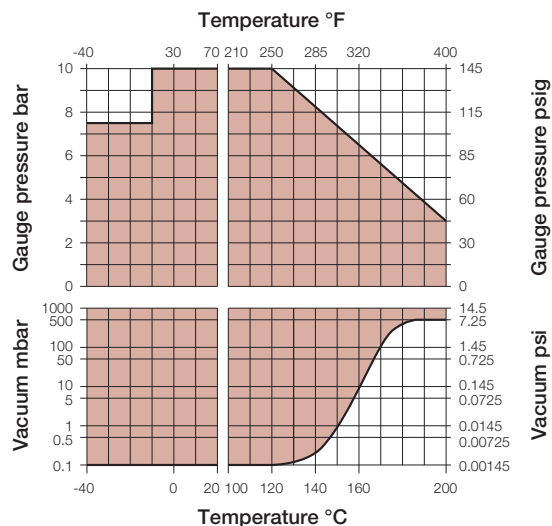
Standard design worm gear



Construction worm gear for butterfly valve with safety stuffing box

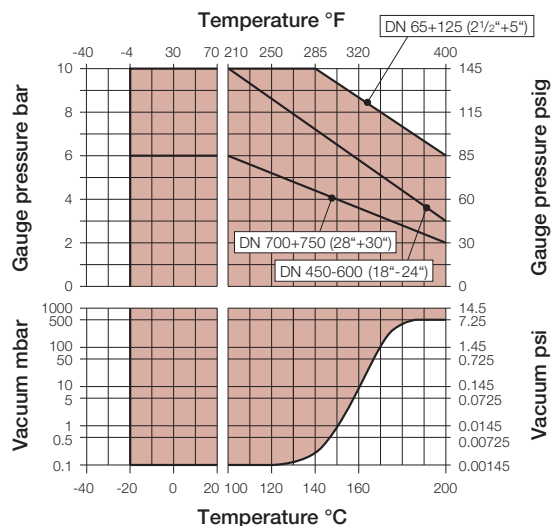


Pressure/temperature range\*  
NKS, NKL with PFA-lined disc  
Body lining PTFE



For low temperature applications please observe local regulations!

Pressure/temperature range  
NKS-C, NKL-C with PFA-lined disc  
Body lining modified PTFE



For low temperature applications please observe local regulations!





# PTFE butterfly valves with stainless steel/Hastelloy® C/titanium disc

Worm gear dimensions (mm) and approx. weights (kg)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	1000	1050
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"	42"
b	67.5	67.5	67.5	67.5	67.5	81.5	81.5	81.5	115	115	115	123	123	186	186	186	186	186	186	186
c	45.7	45.7	45.7	45.7	45.7	55	55	55	72.5	72.5	72.5	83	83	140	140	140	140	140	140	140
e	43.5	43.5	43.5	43.5	43.5	52.5	52.5	52.5	68.8	68.8	68.8	84	84	137.5	137.5	137.5	137.5	137.5	137.5	137.5
k	125	125	125	125	125	200	200	200	250	250	250	300	300	400	400	500	600	600	400	400
p	28.5	28.5	28.5	28.5	28.5	34	34	34	42.5	42.5	42.5	45	45	54.5	54.5	54.5	54.5	54.5	54.5	54.5
r	128	128	128	128	128	211	211	211	270	270	270	289	289	387	387	408	424	424	434	434
s	64	64	64	64	64	75	75	75	91	91	91	97	97	128	128	128	128	128	128	128
t	84	84	84	84	84	112	112	112	135	135	135	156	156	282	282	282	282	282	282	282
Weight	2	2	2	2	2	3.9	3.9	3.9	7.7	7.7	7.7	13.5	13.5	31.5	31.5	31.5	31.5	31.5	37.5	37.5

Torques (Nm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	1000	1050
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"	42"
Md	26	36	46	60	80	110	167	278	333	450	500	600	650	890	1500	2000	2300	2700	3400	3600
Mamax																				
Stainless steel stem	89	89	89	183	183	327	456	664	664	1227	1227	2909	2909	6069	6069	10374	10374	10374	10374	10374
Hastelloy stem	57	57	57	118	118	211	295	457	457	845	845	2004	2004	4181	4181	7147	7147	7147	7147	7147
Titan stem	59	59	59	121	121	216	302	469	469	866	866	2053	2053	4283	4283	7321	7321	7321	7321	7321

Md<sub>adm</sub> = max. admissible torque (Nm) with the disc/stem unit blocked

Flow rates (m³/h) and z-values

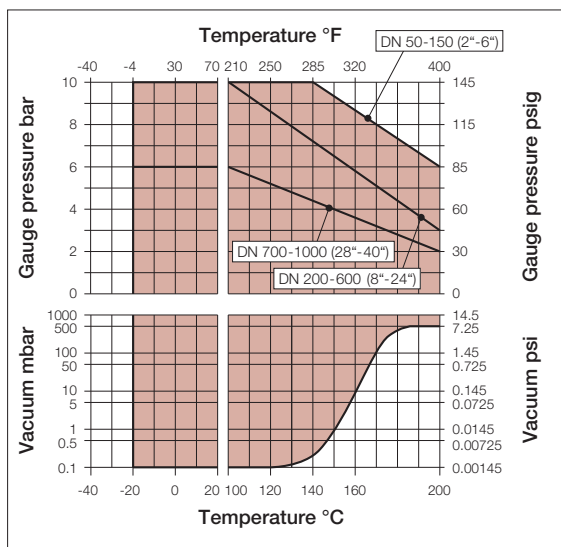
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	1000	1050	
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"	42"	
disk opening angle	20°	2	4	8	17	28	39	85	119	181	277	393	528	647	843	1050	1181	1353	1861	2131	2398
	30°	7	14	22	48	74	97	202	274	404	602	856	1148	1434	1861	2347	2675	3064	4394	4827	5431
	40°	14	27	41	91	145	194	415	527	771	1139	1620	2173	2418	3473	4324	4864	5570	7621	8777	9874
	50°	28	49	75	160	244	316	658	949	1329	2034	2893	3414	3980	5706	7104	7991	9207	11817	13792	15516
	60°	46	80	123	259	392	503	1036	1484	2179	3335	4628	5742	6490	9427	11737	13203	15120	19791	23195	26095
	70°	69	118	179	375	563	717	1463	2038	3083	4718	6711	8535	10268	14140	17606	19804	22282	30783	34480	38790
	80°	92	158	240	502	754	958	1956	2727	4124	6312	8979	12043	14983	19349	24246	27274	31433	44252	50152	56422
	90°	124	211	318	660	985	1244	2523	3514	5315	8134	11571	15519	19308	24807	30887	34744	39789	55653	62690	70528

Conversion to Cv = k<sub>v</sub> x 1.165 (USgpm) = k<sub>v</sub> x 0.971 (Imp gpm)

Z-values at 75% flow

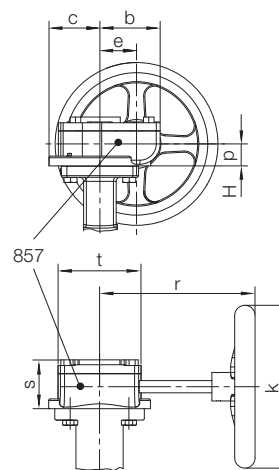
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	1000	1050
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"	42"
	0.47	0.46	0.47	0.27	0.29	0.38	0.29	0.37	0.33	0.26	0.22	0.2	0.19	0.24	0.29	0.3	0.3	0.25	0.29	0.28

Pressure/temperature range NKS-C, NKL-C with disc made of stainless steel, Hastelloy® C, titanium



For low temperature applications please observe local regulations!


Standard design worm gear




## Overview of Richter butterfly valves with wafer-style and lug-style

Body/Shell: Ductile cast iron<sup>1)</sup>


### Wafer-style body DN 50-400 (2"-16")

Design	Material Body lining/disc	Manually actuated		Pneumatically actuated		Size (mm, inch)										
		Lining standard	Lining antistatic	Lining standard	Lining antistatic	50	65	80	100	125	150	200	250	300	350	400
						2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"
	PTFE*/PFA	NKS/F	NKS/F-L <sup>2)</sup>	NKSP/F	NKSP/F-L <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/PFA	NKS/F	n.a.	NKSP/F	n.a.	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/PFA	NKS-C/F	NKS-C/F-L	NKSP-C/F	NKSP-C/F-L	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/stainl. steel	NKS-C/F-S	NKS-C/F-L-S	NKSP-C/F-S	NKSP-C/F-L-S	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/Hastelloy® C22	NKS-C/F-H	NKS-C/F-L-H	NKSP-C/F-H	NKSP-C/F-L-H	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/titanium gr. 2	NKS-C/F-T	NKS-C/F-L-T	NKSP-C/F-T	NKSP-C/F-L-T	•	•	•	•	•	•	•	•	•	•	•
PE-UHMW/stainl. steel	NKS-C/E-S	n.a.	NKSP-C/E-S	n.a.	•	•	•	•	•	•	•	•	•	•	•	

### Lug-style body DN 50-400 (2"-16")

Design	Material Body lining/disc	Manually actuated		Pneumatically actuated		Size (mm, inch)										
		Lining standard	Lining antistatic	Lining standard	Lining antistatic	50	65	80	100	125	150	200	250	300	350	400
						2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"
	PTFE*/PFA	NKL/F	NKL/F-L <sup>2)</sup>	NKLP/F	NKLP/F-L <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/PFA	NKL/F	n.a.	NKLP/F	n.a.	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/PFA	NKL-C/F	NKL-C/F-L <sup>2)</sup>	NKLP-C/F	NKLP-C/F-L <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/stainl. steel	NKL-C/F-S	NKL-C/F-L-S <sup>2)</sup>	NKLP-C/F-S	NKLP-C/F-L-S <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/Hastelloy® C22	NKL-C/F-H	NKL-C/F-L-H <sup>2)</sup>	NKLP-C/F-H	NKLP-C/F-L-H <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/titanium gr. 2	NKL-C/F-T	NKL-C/F-L-T <sup>2)</sup>	NKLP-C/F-T	NKLP-C/F-L-T <sup>2)</sup>	•	•	•	•	•	•	•	•	•	•	•
PE-UHMW/stainl. steel	NKL-C/E-S	n.a.	NKLP-C/E-S	n.a.	•	•	•	•	•	•	•	•	•	•	•	

### Lug-style body DN 450-1000 (18"-40")

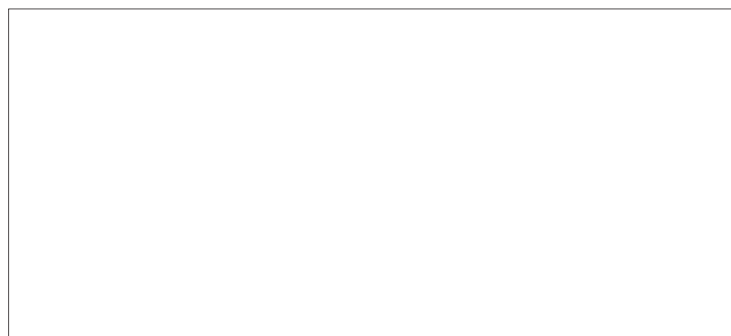
Design	Material Body lining/disc	Manually actuated		Pneumatically actuated		Size (mm, inch)							
		Lining standard	Lining antistatic	Lining standard	Lining antistatic	450	500	600	700	750	800	900	1000
						18"	20"	24"	28"	30"	32"	36"	40"
	PTFE*/PFA	NKL-C/F	NKL-C/F-L <sup>2)</sup>	NKLP-C/F	NKLP-C/F-L <sup>2)</sup>	•	•	•	•	•	•	•	•
	PTFE*/stainl. steel	NKL-C/F-S	NKL-C/F-L-S <sup>2)</sup>	NKLP-C/F-S	NKLP-C/F-L-S <sup>2)</sup>	•	•	•	•	•	•	•	•
	PTFE*/Hastelloy® C22	NKL-C/F-H	NKL-C/F-L-H <sup>2)</sup>	NKLP-C/F-H	NKLP-C/F-L-H <sup>2)</sup>	•	•	•	•	•	•	•	•
	PTFE*/titanium gr. 2	NKL-C/F-T	NKL-C/F-L-T <sup>2)</sup>	NKLP-C/F-T	NKLP-C/F-L-T <sup>2)</sup>	•	•	•	•	•	•	•	•
	PE-UHMW/stainl. steel	NKL-C/E-S	n.a.	NKLP-C/E-S	n.a.	•	•	•	•	•	•	•	•

<sup>1)</sup> optionally shell made of stainless steel and fibre-reinforced vinyl ester, available sizes on request

<sup>2)</sup> DN ≥ 350 (14") antistatic: Availability on request

\* Body lining PTFE, optional modified PTFE

Presented by:



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