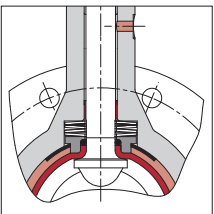


# Richter PFA/PTFE Shut-off and Control Butterfly Valves



**New:**

- Sizes to 1000 mm (40")
- Titanium, PE-UHMW



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

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

Clean Air Act Conformity



**RICHTER**  
Process Pumps & Valves



## Richter wafer-style, lug-style and double-flange 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)
- Optional with safety stuffing box (series NK, 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 and double-flange bodies) 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”) with all three body versions or
- **as a flange-mounted or dead-end butterfly valve** with lug-style and double-flange 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
- disc/stem core made of highly torsion-resistant Duplex stainless steel 1.4517/CD4MCU (DN 450-1000/18“-40“: SS 1.4435/316L)

#### Alternatively metallic

- **made of precision cast stainless steel**
  - polished sealing surfaces, therefore very low friction values
  - polished disc surfaces on request
- **other materials on request, e.g. Hastelloy® C, titanium**

#### ② Thick-walled PTFE and TFM-PTFE lining of the valve body

- TFM-PTFE lining (DN 50-400/2“-16“ with PFA-lined disc: PTFE as standard, optionally TFM-PTFE)
- Lining thickness 3-3.5 mm (0.12-0.15“)
- High permeation resistance
- Vacuum-proof
- Optionally antistatic PTFE-L, PE-UHMW

#### 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**

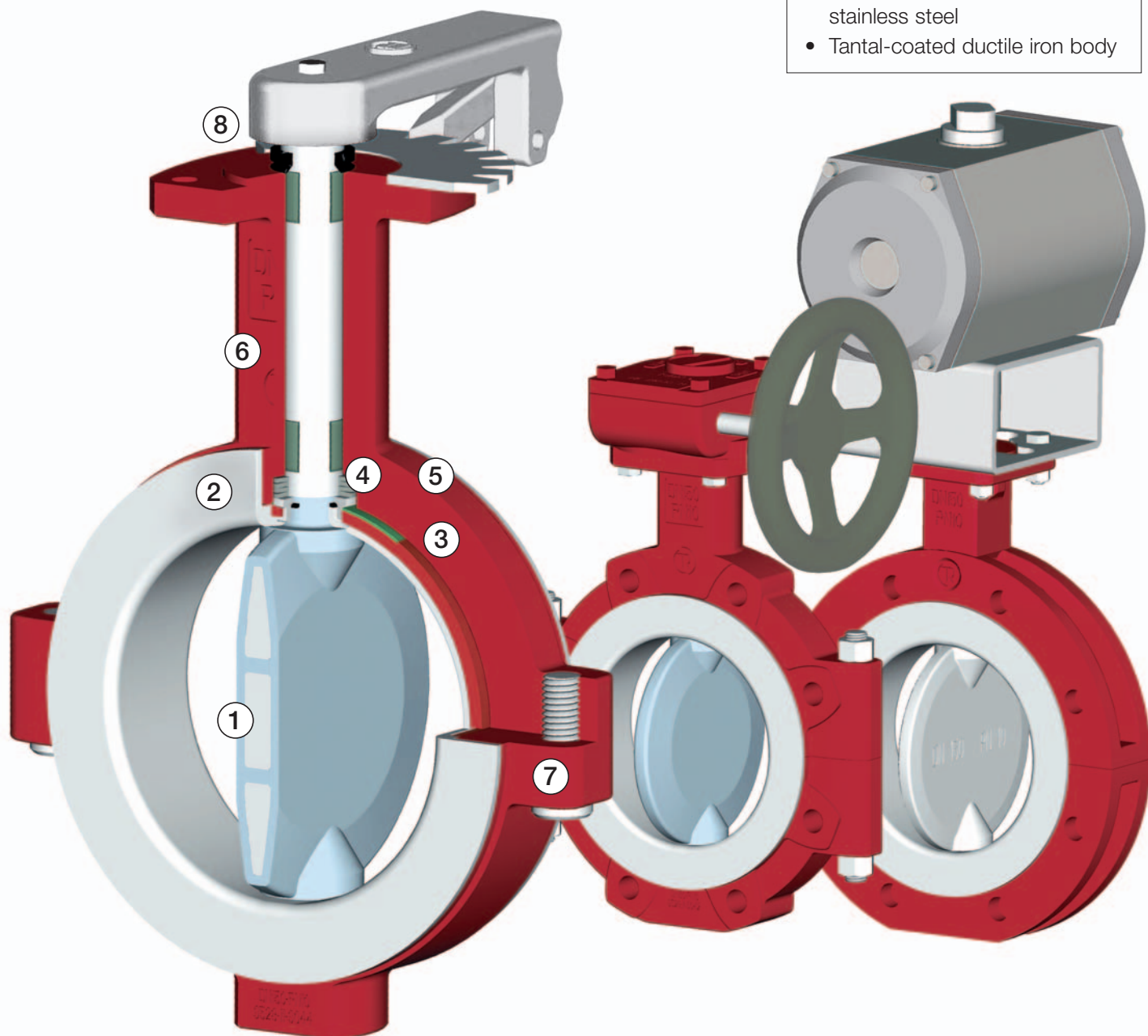
Epoxy coating, nuts and bolts made of stainless steel

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 TFM-PTFE instead of standard PTFE
- Body nuts and bolts made of steel, for example, instead of stainless steel
- Tantal-coated ductile iron body



Wafer-style body  
NKS, NKS-C

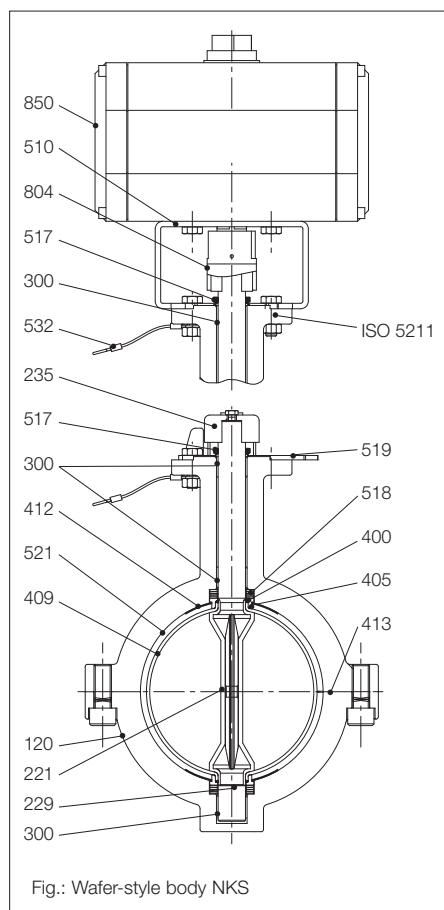
Lug-style body  
NKL, NKL-C

Double-flange body  
NK

## 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 (0.7043)	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® or equivalent), top and bottom		FFKM (Kalrez® 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 TFM-PTFE	TFM-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® 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



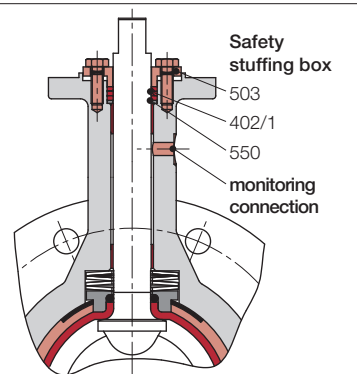
### Options for PTFE-lined valves

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

##### Safety stuffing box

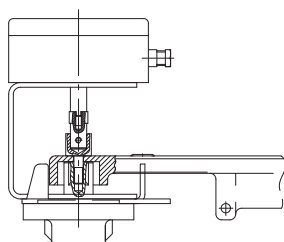
for use with **environmentally hazardous media**, independent action, can be adjusted manually from outside, on request with **monitoring connection**.

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

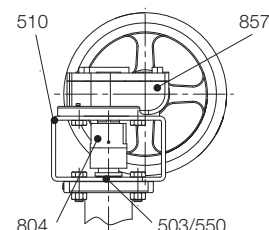


##### Manual actuation with limit switch

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



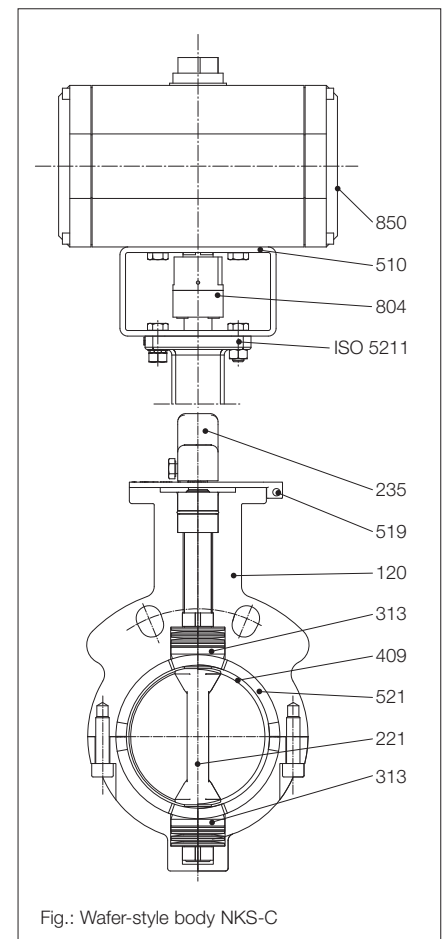
##### Connection handwheel to worm gear in the version "with safety stuffing box"



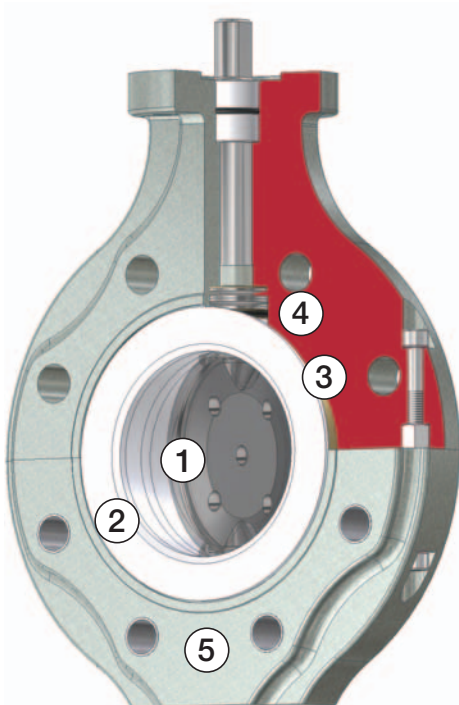
## Components, materials and options for valves with stainless steel/Hastelloy® C/titanium disc

### Components and materials

Item	Designation	Standard design DN 50-1000 (2"-40")	Special design
120	Body (Shell)	Ductile cast iron EN-JS 1049 (0.7043)	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	TFM-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 TFM-PTFE**
    - Highly corrosion-resistant, vacuum-proof
    - Optionally TFM-PTFE antistatic, PE-UHMW highly abrasion-resistant
  - 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 TFM-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

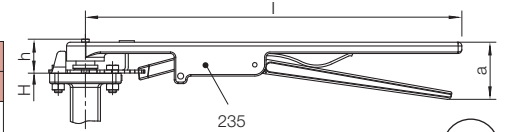
Connection dimensions, flow rates, torques

PTFE and TFM-PTFE butterfly valves with **PFA-lined disc**

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



Hand lever DN 50-200 (2"-8") for valves with PFA-lined disc (except DN 65+125 (2 1/2"+5"), see page 8)

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

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-
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	8x22	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
NK (kg)	4	-	5	7.5	-	12	19.5	29	47.5	-	-	-	-	-	-	-

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)

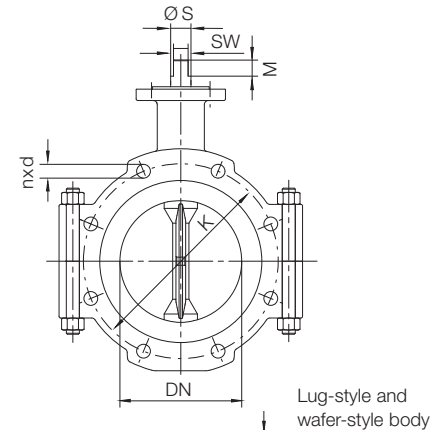
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"
L	43	46	46	52	56	56	60	68	78	78	102	114	127	154	165	190
H	135	146	160	175	202	212	232	272	297	335	360	400	435	510	581	608
B (NKS, NKS-C)	72	67	89	100	110	128	165	195	225	258	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	417	477	560	665	716
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
G <sup>1)</sup>	9	-	10	13	-	14	16	16	20	-	-	-	-	-	-	-
A	30	19	30	30	25	36	36	42	43	50	50	50	50	64	64	55
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	50	50	64	64	55

<sup>1)</sup> Dimension G only applies to double-flange bodies

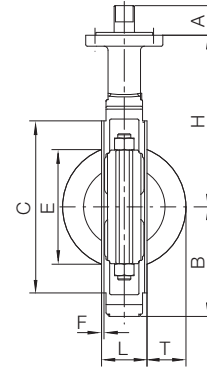
### Connection dimensions (mm) for remotely actuated version

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-
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

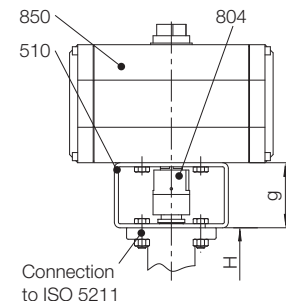
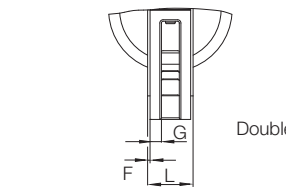
\* to ISO 5211



Lug-style and wafer-style body



Double-flange body



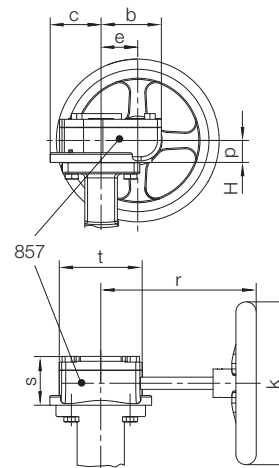
Connection to ISO 5211

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

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-
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	389	389	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

Standard design worm gear

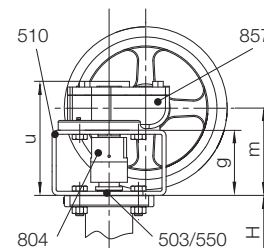


## Torques (Nm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-
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	750	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

Construction worm gear for butterfly valve with safety stuffing box



## 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	-	
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	
Angle of opening	20°	1	4	5	11	24	37	62	85	159	230	295	440	573	796	1315	1402
	30°	6	14	22	27	72	84	170	285	421	610	780	1249	1613	2257	3752	4025
	40°	13	27	47	52	127	164	354	512	835	1210	1550	1993	2558	3601	6025	6509
	50°	24	49	82	93	209	276	532	882	1378	2000	2560	3032	3865	5478	9231	10049
	60°	41	80	126	155	332	431	912	1451	2282	3300	4240	4572	5786	8260	14027	15394
	70°	67	118	197	247	477	702	1371	2256	3633	5270	6250	6172	7749	11149	19092	21134
	80°	104	158	264	412	643	1136	2212	3692	5735	8320	10650	7871	9795	14218	24568	27448
	90°	120	211	282	456	836	1254	2503	4083	6512	9450	12100	9828	12148	17754	30887	34744

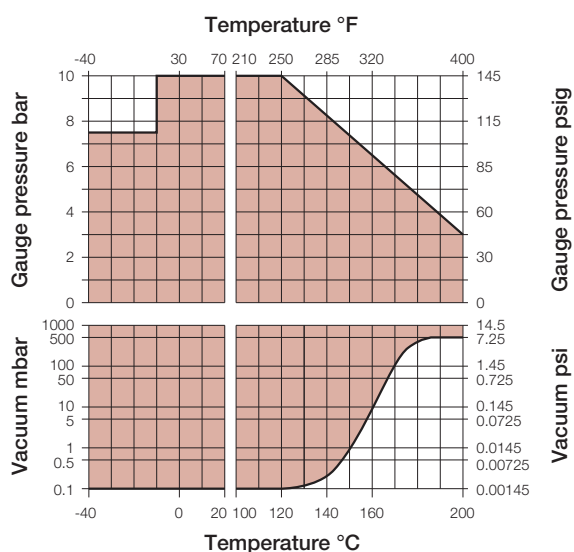
Conversion to Cv = k<sub>v</sub> x 1.165 (USgpm) = k<sub>v</sub> x 0.971 (Imp gpm)

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	0.49	0.49	0.48	0.29	0.30

### Pressure/temperature range\*

NK, NKS, NKL with PFA-lined disc

Body lining PTFE



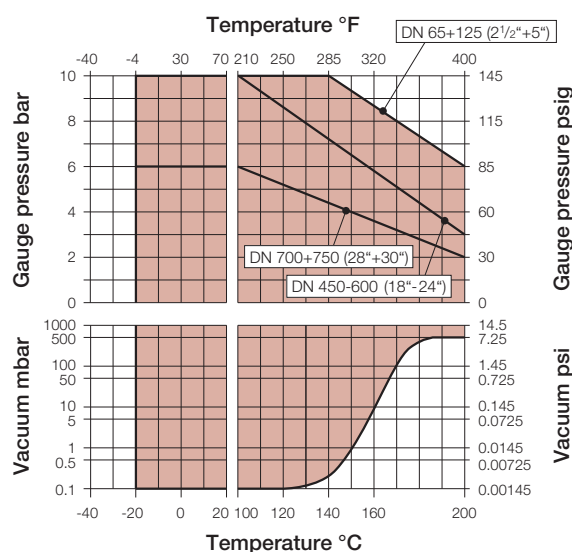
\* A special material is used for the disc/stem core in case of operating temperatures below -20 °C (-4 °F).

For low temperature applications please observe local regulations!

### Pressure/temperature range

NKS-C, NKL-C with PFA-lined disc



Body lining TFM-PTFE



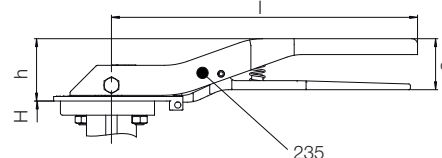
For low temperature applications please observe local regulations!

Connection dimensions, flow rates, torques

TFM-PTFE butterfly valves with **stainless steel/Hastelloy® C/titanium disc**

Series	NKS-C, NKSP-C		NKL-C, NKLP-C	
	Lever	Gear/Actuator	Lever	Gear/Actuator
/F Lining standard	DN 50-200 2"-8"	DN 50-300 2"-12"	DN 50-200 2"-8"	DN 50-1000 2"-40"
/F-L Lining antistatic		DN 50-300 2"-12"		DN 50-600 2"-24"
Body design	 Wafer-style body		 Lug-style body	

Hand lever DN 50-200 (2"-8")  
for valves with metal disc and DN 65+125 (2 1/2"+5")  
for valves with PFA-lined disc



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

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-	800	900	1000
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30" <sup>3)</sup>	32"	36"	40"
a	36	36	36	45	45	45	45	Worm gear, see page 9											
l	230	230	230	270	270	325	349												
h	46	46	46	55	55	55	55												
Weight	0.8	0.8	0.8	1.1	1.1	1.4	1.9												

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

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-	800	900	1000
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30" <sup>3)</sup>	32"	36"	40"
K (ISO)	125	145	160	180	210	240	295	350	400	460	515	565	620	725	840	-	950	1050	1160
nxd (ISO) <sup>1)</sup>	4x18	8x18	8x18	8x18	8x18	8x22	8x22	12x22	12x22	16x22	16x26	20x26	20x26	20x30	24x30	-	24x33	28x33	28x36
n <sup>2)</sup>	4xM16	8xM16	8xM16	8xM16	8xM16	8xM20	8xM20	12xM20	12xM20	16xM20	16xM24	20xM24	20xM24	20xM27	24xM27	-	24xM30	28xM30	28xM33
K (ASME)	121	140	152	191	216	241	298	362	432	476	540	578	635	749	864	914	978	1086	1200
nxd (ASME) <sup>1)</sup>	4x19	4x19	4x19	8x19	8x22	8x22	8x22	12x26	12x26	12x29	16x29	16x32	20x32	20x35	28x35	28x35	28x42	32x42	36x42
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"	28x1 1/2"	32x1 1/2"	36x1 1/2"
NKS-C (kg)	3	4	5	6.3	7.7	10	16.5	24.5	37	87	107	152	185	254	280	300	410	460	480
NKL-C (kg)	5	7	8.1	10.8	14.5	15.8	24.6	33.3	57	87	107	152	185	254	280	300	410	460	480

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)

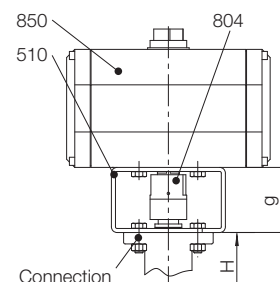
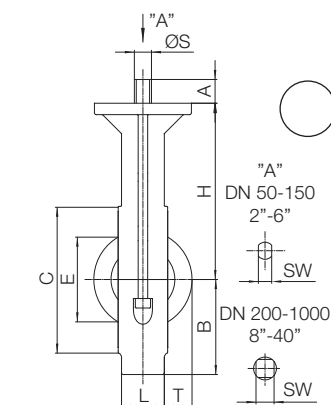
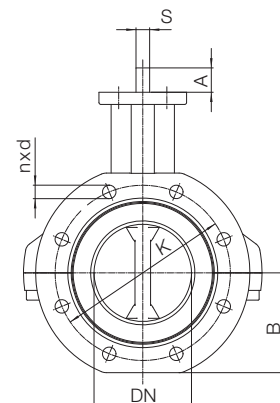
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-	800	900	1000
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"
L*	43	46	46	52	56	56	60	68	78	78	102	114	127	154	165	190	190	203	216
H	130	146	165	185	202	217	245	270	308	330	365	400	435	510	581	608	630	684	771
B (für NKS-C)	56	67	84	100	110	125	158	190	225	like NKL-C, but through holes									
B (für NKL-C)	58	65	88	102	116	127	160	193	227	256	292	311	340	398	581	608	630	684	771
E	31	48	63	90	118	137	189	239	290	328	377	417	477	560	665	716	767	860	970
T	6	11	17	27	38	47	71	92	112	125	146	164	184	215	264	289	314	360	414
C	85	106	122	143	166	193	251	301	349	414	460	515	570	672	787	851	894	1016	1101
F	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1
A	19	19	19	25	25	30	26	30	30	37	37	50	50	64	64	56	56	56	76
Ø S	14	14	14	18	18	22	24	28	28	36	36	48	48	60	60	72	72	72	98
SW	11	11	11	14	14	17	-	-	-	-	-	-	-	-	-	-	-	-	-
SW square-end	-	-	-	-	-	-	19	22	22	27	27	36	36	46	46	55	55	55	75

\* DN 300, 700-1000 not to ISO 5752 series 20, DIN EN 558-1 series 20

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

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-	800	900	1000
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"
g	60	60	60	60	60	60	80	80	80	80	80	80	80	100	100	200	200	200	200
Conn. dim.*	F07	F07	F07	F07	F07	F07	F10	F10	F10	F12	F12	F14	F14	F16	F16	F16	F25	F25	F30

\* to ISO 5211



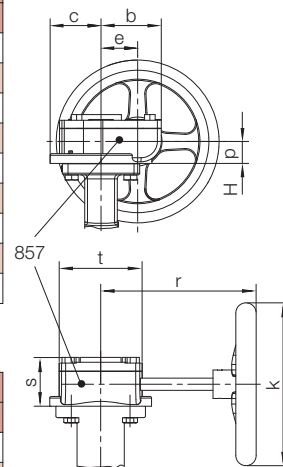
Connection to ISO 5211



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

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-	800	900	1000
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"
b	68	68	68	68	68	82	82	82	115	115	115	123	123	186	186	186	186	186	186
c	46	46	46	46	46	55	55	55	73	73	73	83	83	140	140	140	140	140	140
e	44	44	44	44	44	53	53	53	69	69	69	84	84	138	138	138	138	138	138
k	125	125	125	125	125	200	200	200	250	250	250	300	300	400	400	500	600	600	400
p	29	29	29	29	29	34	34	34	43	43	43	45	45	55	55	55	55	55	55
r	128	128	128	128	128	215	215	215	266	266	266	289	289	389	389	408	424	424	436
s	64	64	64	64	64	75	75	75	91	91	91	97	97	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
Weight	2	2.2			4.3			8.5			11.5			34.5			41.5		

Standard design worm gear



## Torques (Nm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-	800	900	1000
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"
Md	30	35	45	60	80	110	190	300	400	450	500	600	650	750	1500	2000	2300	2700	3400
Md <sub>adm</sub>	61	61	61	179	179	309	309	604	604	1200	1600	1950	2400	3200	3200	8000	8000	8000	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

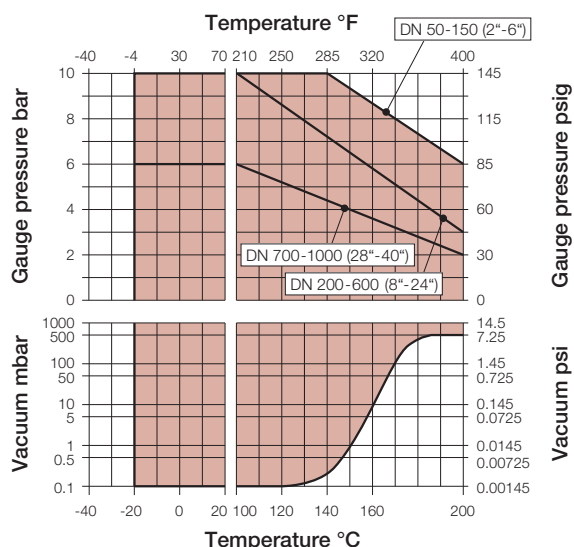
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	-	800	900	1000	
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"	
Angle of opening	20°	1.9	4.4	7.4	16.9	23.7	38.6	85	110	175	243	311	440	573	796	1315	1402	1517	1788	1943
	30°	6.6	14	23.2	52.4	72	115	250	320	506	698	887	1249	1613	2257	3752	4025	4384	5204	5656
	40°	13.6	27.4	43.9	96	127	196	415	527	824	1129	1424	1993	2558	3601	6025	6509	7147	8556	9299
	50°	25.2	49.4	76	162	209	318	658	827	1283	1742	2182	3032	3865	5478	9231	10049	11124	13437	14603
	60°	40.8	80	122	258	332	503	1036	1290	1982	2669	3315	4572	5786	8260	14027	15394	17188	20951	22770
	70°	61	118	178	374	477	716	1463	1803	2746	3664	4512	6172	7749	11149	19092	21134	23811	29297	31841
	80°	83	158	243	506	643	961	1956	2387	3600	4759	5807	7871	9795	14218	24568	27448	31217	38784	42152
	90°	110	211	318	660	836	1244	2523	3064	4588	6024	7300	9828	12148	17754	30887	34744	39789	49778	54100

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																			
	0.60	0.46	0.47	0.27	0.40	0.38	0.29	0.48	0.45	0.48	0.56	0.49	0.49	0.48	0.29	0.30	0.30	0.31	0.40

## Pressure/temperature range

NKS-C, NKL-C with disc made of stainless steel, Hastelloy® C, titanium




For low temperature applications please observe local regulations!


## Overview of Richter butterfly valves with wafer-style, lug-style, double-flange-body

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>	•		•	•		•	•	•	•	•	•	
	TFM-PTFE/PFA	NKS/F	n.a.	NKSP/F	n.a.	•		•	•		•	•	•	•	•	•	
	TFM-PTFE/PFA	NKS-C/F	NKS-C/F-L	NKSP-C/F	NKSP-C/F-L		•			•							
	TFM-PTFE/stainl. steel	NKS-C/F-S	NKS-C/F-L-S	NKSP-C/F-S	NKSP-C/F-L-S	•	•	•	•	•	•	•	•	•	•	•	
	TFM-PTFE/Hastelloy® C22	NKS-C/F-H	NKS-C/F-L-H	NKSP-C/F-H	NKSP-C/F-L-H	•	•	•	•	•	•	•	•	•	•	•	
	TFM-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>	•		•	•		•	•	•	•	•	•	
	TFM-PTFE/PFA	NKL/F	n.a.	NKLP/F	n.a.	•		•	•		•	•	•	•	•	•	
	TFM-PTFE/PFA	NKL-C/F	NKL-C/F-L <sup>2)</sup>	NKLP-C/F	NKLP-C/F-L <sup>2)</sup>		•			•							
	TFM-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>	•	•	•	•	•	•	•	•	•	•	•	
	TFM-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>	•	•	•	•	•	•	•	•	•	•	•	
	TFM-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")

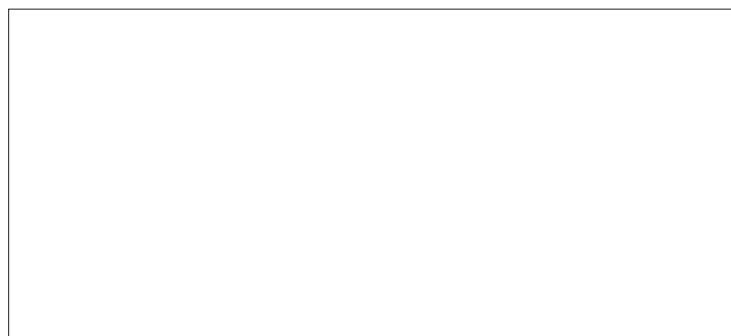
Design	Material Body lining/disc	Manually actuated		Pneumatically actuated		Size (mm, inch)										
		Lining standard	Lining antistatic	Lining standard	Lining antistatic	450	500	600	700	750	800	900	1000			
						18"	20"	24"	28"	30"	32"	36"	40"			
	TFM-PTFE/PFA	NKL-C/F	NKL-C/F-L <sup>2)</sup>	NKLP-C/F	NKLP-C/F-L <sup>2)</sup>	•	•	•	•	•						
	TFM-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>	•	•	•	•	•	•	•	•	•	•	
	TFM-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>	•	•	•	•	•	•	•	•	•	•	
	TFM-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

### Double-flange body DN 50-300 (2"-12")

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
						2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
	PTFE/PFA	NK/F	NK/F-L	NKP/F	NKP/F-L	•		•	•		•	•	•	•
	TFM-PTFE/PFA	NK/F	n.a.	NKP/F	n.a.	•		•	•		•	•	•	•

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