V&A

RICHTER
Process Pumps & Valves

RICHTER PFA/PTFE SHUT-OFF AND CONTROL BUTTERFLY VALVES

NKS, NKL, NKS-I, NKL-I

RICHTER-INFO@IDEXCORP.COM

RICHTER WAFER-STYLE AND LUG-STYLE BUTTERFLY VALVES

FIELDS OF APPLICATION

Richter butterfly valves have proven 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_2 gas and NaOH in chlor-alkali electrolysis
- large flows in the distribution and treatment of H_2SO_4, 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 when provided with a metallic disc/stem unit.
_ The compact butterfly valves are ideal for use in confined spaces – e.g. under vessels.
_ Butterfly valves are economical valves: easy to install and dismantle, attractively priced, compact.
_ Alternative design available for sizes above 16“ or when metal discs are required. (NKL-I, NKS-I, or NKU-I)

OPERATING RANGE

_ -40 °F to +400 °F operating temperature (-40 °C to +200 °C) (NKS, NKL)
_ -4 °F to +400 °F operating temperature (-20 °C to +200 °C) (NKS-I, NKL-I)
_ 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 EN ISO 15848-1)
_ Optional with safety stuffing box and Alarm connection (series NKS, NKL)
_ Leakage rate in the seat to DIN EN 12266, leakage rate A (formerly DIN 3230 T3): gas-tight, 0 bubbles
_ Control characteristics similar to traditional control valves.
_ 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 B16.5 Class 150
_ Anti-adhesive wetted surfaces thanks to PFA/PTFE
_ Identification of the valves: DIN EN 19, ASME 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 lugstyle body.

SINGLE-PIECE DISC/STEM UNIT ①

With fluoroplastic options

_ 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
_ Optional antistatic PFA-L
_ Optional antistatic PFA-L, FDA compliant (Product series indicates material options)
_ Core made of highly torsion-resistant Duplex stainless steel 1.4517/CD-4MCu (DN 450-1000/18-40“: SS 1.4435/316L)

Metal material options

_ Made of precision cast stainless steel
- DN 50-400 (2“-16“) Duplex 1.4469
  DN 350-900 (14“-35“) 1.4404
- polished sealing surfaces, providing very low friction values
- polished disc surfaces on request

_ Other materials on request, e.g. Hastelloy® C22, titanium gr. 2

THICK-WALLED PTFE LINING OF THE VALVE BODY ②

_ Optional: modified PTFE, for strong permeating fluids
_ Optional antistatic PTFE-L, PE-UHMW for selected DN sizes
_ Standard 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

PERMANENTLY ELASTIC SEAL IN THE VALVE OPENING ③

by means of silicone insert under the PTFE body lining.

_ Optional FKM insert (e.g. Viton®) for use with permeating media, such as moist chlorine gas

DOUBLE-ACTION, MAINTENANCE-FREE AND SELF-ADJUSTING TOP AND BOTTOM STEM SEALING, ④

Reliable through the life of the valve even under high cycle rate 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

PRESSURE-RETAINING BODY (5)

made of ductile cast iron 5.3103 (EN-GJS-400-18-LT) / ASTM A 395

_ Absorbs system and pipe forces
_ Centers the valve in the pipe
_ Optional body made of stainless steel or carbon fiber/ glass fiber reinforced vinyl ester

LONG VALVE NECK (6)

permits optimal heat insulation without the installation of an elevated lever, additional stem extensions on request.

CHLORINE ELECTROLYSIS OPTIONS

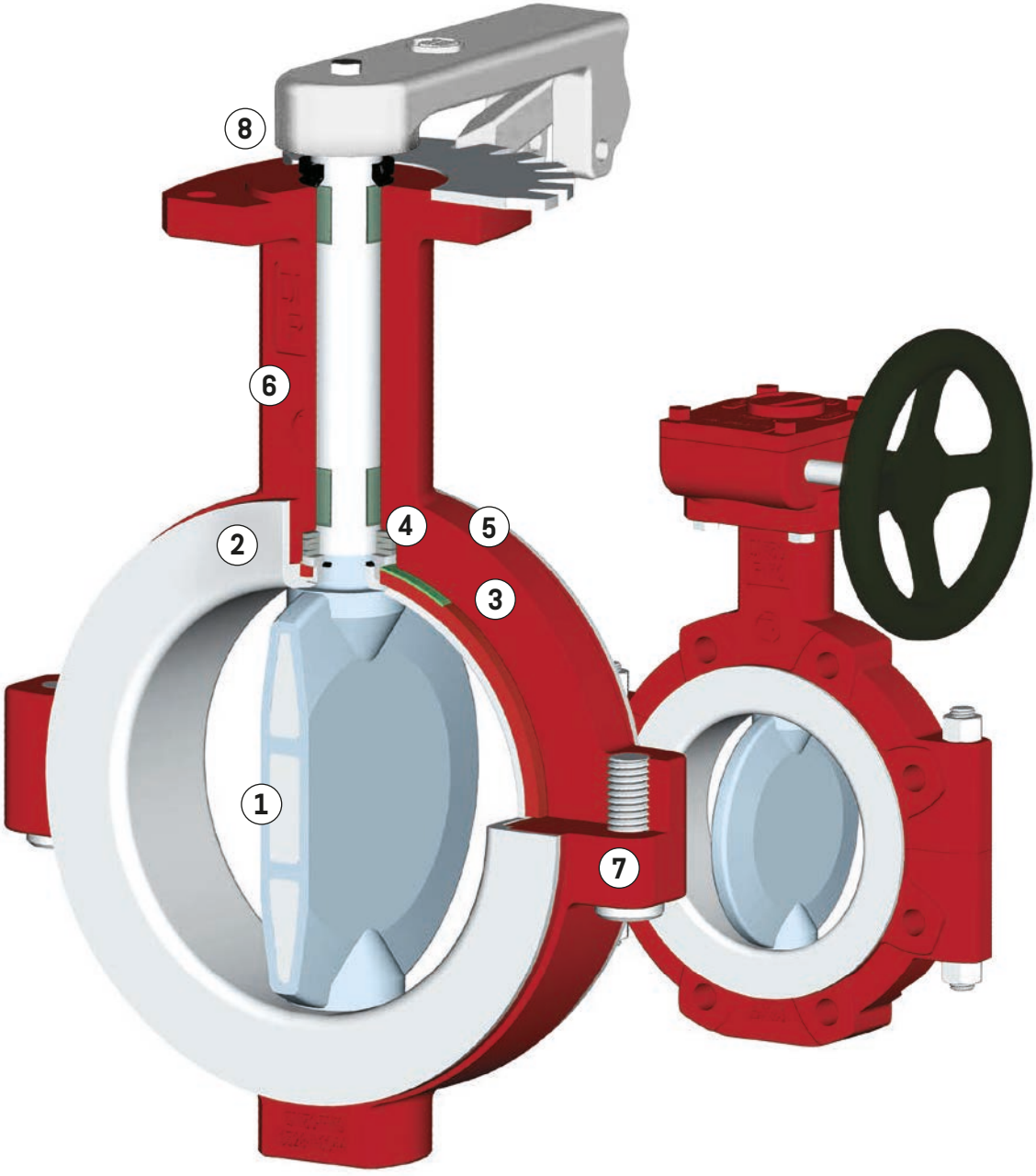
Specially for use with wet chlorine gas:

_ elastic insert made of Viton® instead of silicone
_ body lining made of permeation resistant modified PTFE instead of standard PTFE
_ body nuts and bolts made of high strength carbon steel

EXTERNAL CORROSION PROTECTION (7)

Epoxy coated body, nuts and bolts made of stainless steel

CENTERING TO ISO 5211 (8)



Wafer-style body NKS, NKS-I

Lug-style body NKL, NKL-I

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 (2½“, 5“, 18-30“)	OPTION
120	Body (shell)	Ductile cast iron 5.3103 (EN-GJS-400-18-LT) / ASTM A 395	Ductile cast iron EN-JS 1025	Stainless steel
221	Disc/stem unit, one-piece	Disc/stem core Duplex stainless steel 1.4517 (CD-4 MCu), PFA-lined	Disc/stem core stainless steel PFA-lined	PFA-L antistatic lining
229	Guide pin	Stainless steel (DN ≤ 150/6“)	–	
235	Hand lever (DN 50-200/2-8“)	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, optional 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° increments	Stainless steel, 10° increments	
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 available 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		5.6, zinc-plated to US standard

OPTIONS FOR PTFE-LINED VALVES DN 50-400 (2-16“) WITH A PFA-LINED DISC/STEM UNIT

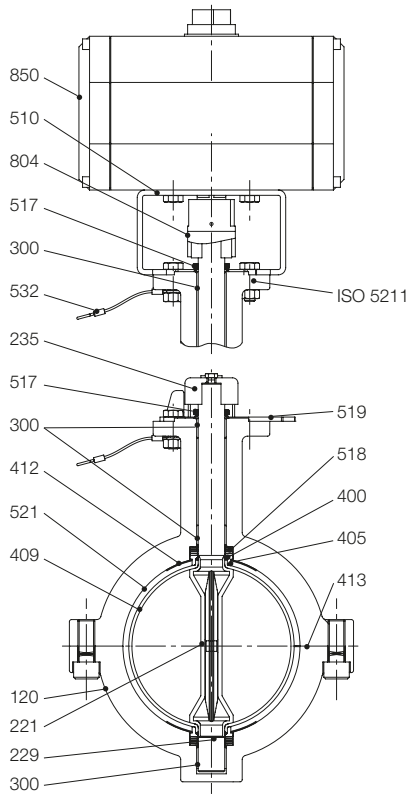
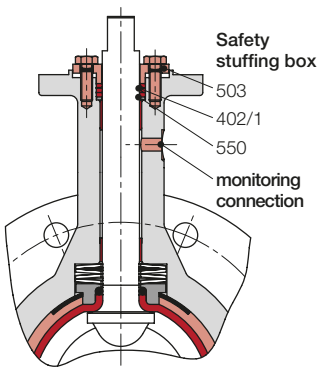


Fig.: Wafer-style body NKS

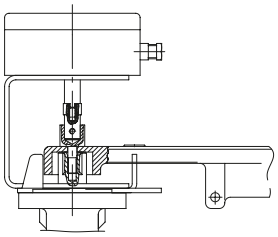
SAFETY STUFFING BOX

for use with environmentally hazardous media, in addition to the standard seal and can be adjusted/tightened from the outside with monitoring connection.

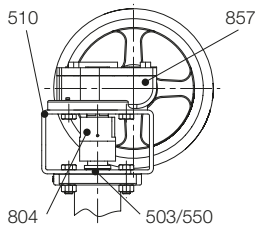
Available for series NKL, NKS
DN 50-400 (2-16“)



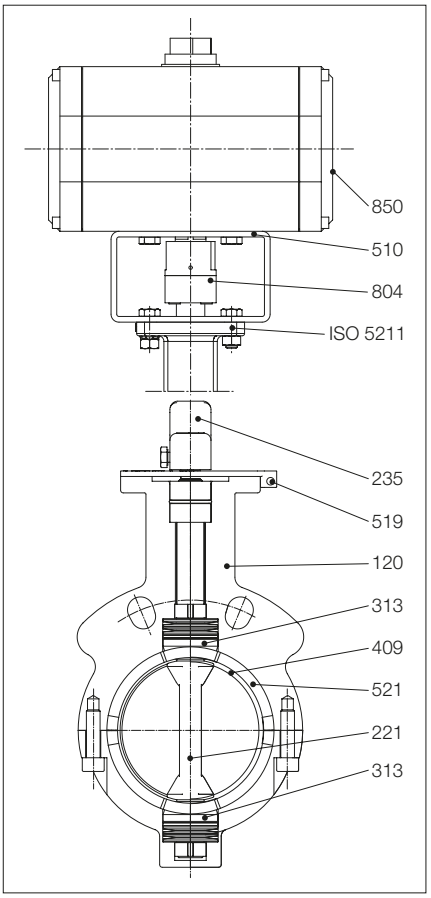
Manual actuation with limit switch Inductive or mechanical, connection in acc. with VDI/VDE 3845. Optional sensor mounting upon request.



Optional version with hand-wheel to worm gear 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 40-900 (1½"-36")	SPECIAL DESIGN
120	Body (shell)	Ductile cast iron EN-JS 1025	Stainless steel, CF-/GF-reinforced vinyl ester
221	Disc/stem unit, one-piece	DN 50-400 (2"-16"): Duplex stainless steel 1.4469 DN 350-900 (14"-36"): Stainless steel 1.4404	Hastelloy® C276, titanium gr. 2
235	Hand lever DN 50-150 (2"-6")	Stainless steel, DN 50-900 (2"-36") worm gear with handwheel	
313	Complete bearing and pressure set	on request	
409	Body lining	PTFE	modified PTFE, PTFE antistatic, DN 80, 100, 150 and 200: UHMW-PE
510	Bracket	Stainless steel, Connection to ISO 5211 + Namur	Special design on request
519	Throttling plate	Stainless steel, 10° increments	
521	Flexible insert	Silicone	FKM (Viton® or equivalent), EPDM
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 polyurethane coating	
w/o. No.	Stem extension, not illustrated		Design on request
w/o. No.	Screws, nuts, washers	Stainless steel	Other material upon request

OPTION: VALVES WITH CONDUCTIVE LINING (FDA COMPLIANT)

For highest standards in safety, purity, and chemical resistance

FEATURES:

_ Valve disc with homogeneous, conductive PFA-L (transfer-molded coating)
_ Antistatic: prevents electrostatic charging and spark formation
_ FDA compliant according to 21 CFR §177.1550 – suitable for pharmaceutical, biotech, and food industries
_ Temperature range: -40 °C to +200 °C
_ Pressure range: vacuum to 10 bar
_ Available with wafer-type or lug-type housing

APPLICATIONS:

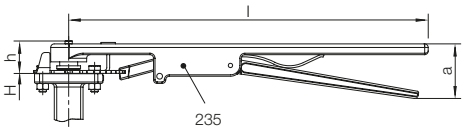
_ Chemical industry (e.g. chlor-alkali electrolysis, acid production)
_ Pharmaceutical active ingredient manufacturing
_ Biotechnology and food processing (CIP/SIP capable)
_ Semiconductor industry (ultrapure water)
_ Hazardous media transport (ATEX zones)

CONNECTION DIMENSIONS, FLOW RATES, TORQUES PTFE BUTTERFLY VALVES WITH PFA-LINED DISC

SERIES	NKS, NKSP		NKS-I, NKSP-I		NKL, NKLP		NKL-I, NKLP-I, NKU-I, NKUP-I	
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 350-600 2 1/2", 5", 14"-24"		DN 50, 80, 100, 150-300 2", 3", 4", 6"-12"		DN 65, 125, 350-900 2 1/2", 5", 14"-36"
Body design	 Wafer-style body				 Lug-style body NKL		 Double-flange body NKU	

HAND LEVER DIMENSIONS (mm) AND APPROX. WEIGHTS (kg)

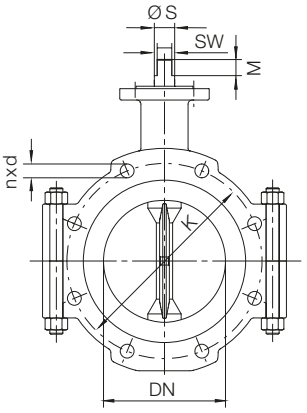
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"
a	65	36	65	60	45	70	70	Worm gear, see page 7								
l	300	230	300	300	270	500	500									
h	40	46	40	40	55	48	48									
Weight	0,7	0,7	0,7	0,7	1,1	3,7	3,7									



(Hand lever DN 65, 125
for valves with PFA-lined disc siehe S. 8)

PIPELINE CONNECTIONS AND APPROX. WEIGHTS (kg)

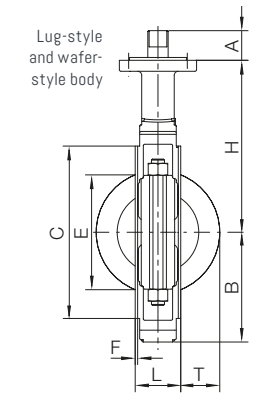
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750 3)	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
K (ISO)	125	145	160	180	210	240	295	350	400	460	515	565	620	725	840	–	950	1050
n x d (ISO) 1)	4x19	8x18	8x19	8x19	8x18	8x23	8x23	12x23	12x23	16x23	16x28	20x28	20x28	20x31	24x31	–	24x34	28x34
n 2)	4xM16	4xM16	8xM16	8xM16	8xM16	8xM20	8xM20	12xM20	12xM20	16xM20	16xM24	20xM24	20xM24	20xM27	24xM27	–	24xM30	28xM30
K (ASME)	120,5	139,7	152,5	190,5	215,9	241,5	298,5	362	432	476	540	577,8	635	749,3	863,6	914,4	977,9	1085,8
n x d (ASME)	4x19	4x19	4x19	8x19	8x23	8x23	8x23	12x26	12x26	12x29,5	16x29,5	16x32	20x32	20x35	28x35	28x35	28x42	32x42
	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"
NKS, NKS-I (kg)	3,5	2,5	4,5	6	7	11	15	25	33	47	69	100	122	180	–	–	–	–
NKL, NKL-I, NKU-I (kg) 4)	4,5	3,5	7,5	9,5	11	16	23	35	54	68	97	140	175	275	367	383	670	880



Flange connection dimensions to ISO 7002-2 PN10 and ASME B 16.5 Cl. 150, weight (kg) with bare shaft (without lever, bracket etc.),
1) Flange through holes on request, 2) Tapped holes metric or UNC, 3) DN 750 (30") only to ASME B 16.5 Cl. 150, 4) Double-flange housing NKU-I from DN 450 onwards

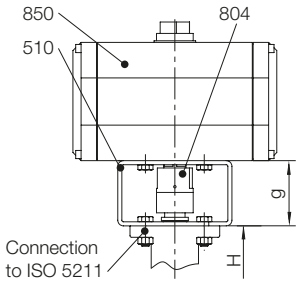
CONNECTION DIMENSIONS (mm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
L	43	46	46	52	56	56	60	68	78	78	102	114	127	154	165	190	190	203
H	135	145	160	175	194	212	232	272	297	335	360	426	451	555	605	629	658	710
B	72	78	89	100	120	128	165	195	225	258	282	320	360	415	482	489	550	602
E	28	39	67	87	112	142	193	243	292	343	389	436	484	580	684	726	781	877
T	4	7	17,5	24,5	35	48	71	92	112	137	150	168	187	223	269	280	307	349
C	90	105	128	150	169	212	365	315	365	430	480	524	570	670	780	840	887	1000
F	3	1	3	3	1	3	3	4	4	4	4	1,5	1,5	1,5	1,5	1,5	1,5	1,5
A	30	12	30	30	16	36	36	42	43	50	50	65	65	90	80	91	108	128
ØS	14	–	16	20	–	25	25	30	32	35	40	45	45	60	72	60	80	98
SW two-flat	10	–	11	12	–	18	18	22	22	25	30	–	–	–	–	–	–	–
SW square-end	–	11	–	–	14	–	–	–	–	–	–	–	–	–	–	–	–	–
key width	–	–	–	–	–	–	–	–	–	–	–	14	14	18	20	18	22	28
M	15	12	15	16	16	20	20	25	25	35	35	65	65	90	80	91	108	128



CONNECTION DIMENSIONS (mm) FOR REMOTELY ACTUATED VERSION

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
g	60	60	60	60	60	80	80	80	80	100	100							
Conn. dim.*	F07	F05	F07	F07	F05/ 07	F10	F10	F12	F12	F14	F14	F14	F14	F16	F16	F16	F25	F30



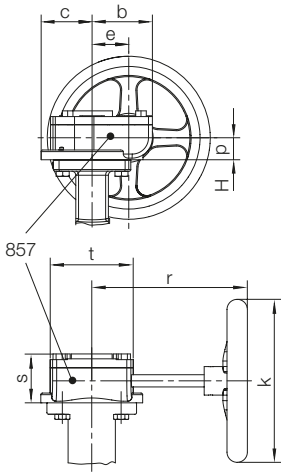
* to DIN EN ISO 5211

WORM GEAR DIMENSIONS (mm) AND APPROX. WEIGHTS (kg)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
b	73	66	73	73	66	73	73	105	105	126	126	126	126	148	180	180	158	238
c	51	48	51	51	48	63	63	69	69	100	100	101	101	110	142	142	142	170
e	45	43	45	45	43	45	45	70	70	86	86	86	86	104	130	130	53	182
g*	60	–	60	60	–	80	80	80	80	100	100	–	–	–	–	–	–	–
k	150	100	150	150	100	200	200	250	250	250	250	500	500	500	600	700	500	400
m*	87	–	87	87	–	107	107	120	120	142	142	–	–	–	–	–	–	–
p	27	27	27	27	27	27	27	40	40	42	42	46	46	51	63	63	60	79
r	181	126	181	181	126	181	181	206	206	226	226	305	305	346	387	387	348	470
s	62	53	62	62	53	62	62	89	89	90	90	92	92	102	126	126	120	159
t	102	80	102	102	80	125	125	130	130	200	200	200	200	220	285	285	285	370
u*	122	–	122	122	–	142	142	169	169	190	190	–	–	–	–	–	–	–
Weight	4	0,8	4	4	0,8	5	5	10	10	15	15	14	14	22	32	32	27	63

* for valves with safety stuffing box

Standard design worm gear

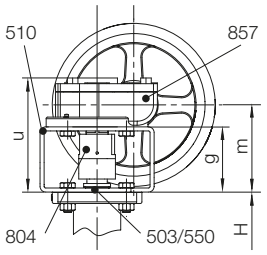


TORQUES (Nm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
Md	20	39	46	63	87	128	185	287	410	550	650	1320	1560	2100	2100	2800	3100	4000
Md_{adm}	100	83	180	360	171	725	775	1435	1775	3000	3500	1978	1978	5233	7281	5233	13686	19841

Md_{adm} = max. admissible torque (Nm) with the disc/stem unit blocked

Worm gear for butterfly valve with safety stuffing box

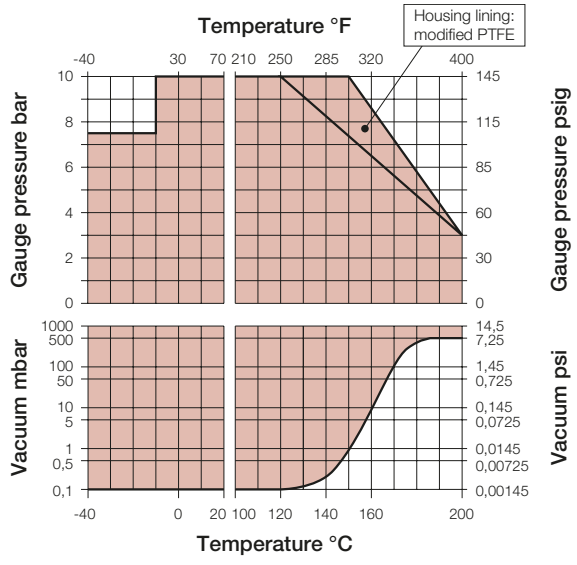


FLOW RATES (m^3/h) AND Z-VALUES

DN		50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch		2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
Angle of opening	20°	1	8	5	11	38	37	62	85	159	230	295	665	890	970	1060	1217	1402	1915
	30°	6	19	22	27	82	84	170	285	421	610	780	1255	1620	2150	2560	2939	3328	4259
	40°	13	41	47	52	165	164	354	512	835	1210	1550	2230	2980	4180	4868	5588	6351	7897
	50°	24	70	82	93	255	276	532	882	1378	200	2560	3850	5350	7420	8412	9675	11169	13849
	60°	41	108	126	155	455	431	912	1451	2282	3300	4240	6250	8150	11350	14359	16484	19073	23887
	70°	67	155	197	247	645	702	1371	2256	3633	5270	6250	9200	11800	16450	23901	27437	32074	41112
	80°	104	200	264	412	815	1136	2212	3692	5735	8320	10650	12250	15560	21200	37638	43207	51820	66771
	90°	120	227	282	456	1015	1254	2503	4083	6512	9450	12100	14900	18000	24500	48633	55829	63905	81016

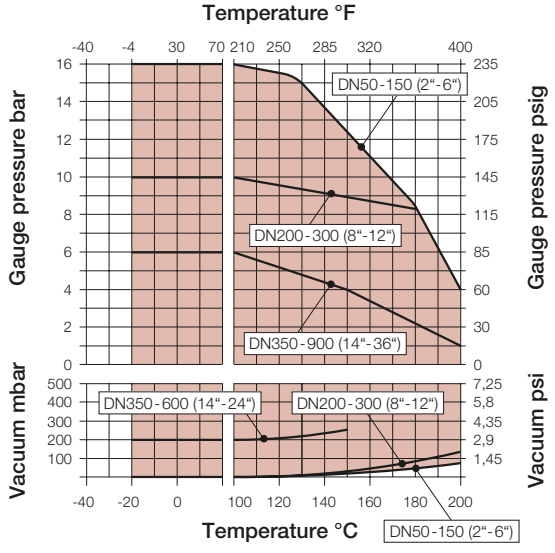
	Z-VALUES AT 75% UTILIZATION																	
	0,32	–	0,3	0,29	–	0,26	0,23	0,19	0,15	0,14	0,12	–	–	–	–	–	–	–

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



For low temperature applications please observe local regulations

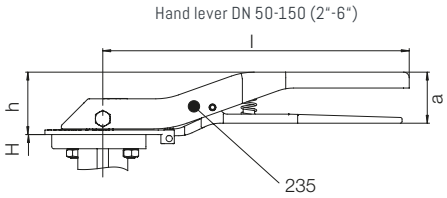
Pressure/temperature range
NKS-I, NKL-I, NKU-I with PFA-lined disc,
Body lining modified PTFE



For low temperature applications please observe local regulations

CONNECTION DIMENSIONS, FLOW RATES, TORQUES PTFE BUTTERFLY VALVES WITH STAINLESS STEEL / HASTELLOY® C / TITANIUM DISC

SERIES	NKS-I, NKSP-I		NKL-I, NKLP-I, NKU-I, NKUP-I	
ACTUATION	LEVER	GEAR/ ACTUATOR	LEVER	GEAR/ ACTUATOR
/F Lining antistatic	DN 50-150 2"-6"	DN 50-600 2"-24"	DN 50-150 2"-6"	DN 50-900 2"-36"
/F-L Lining antistatic		DN 50-600 2"-24"		DN 50-900 2"-36"
Body design	 Wafer-style body		 Lug-style body	 Double-flange body

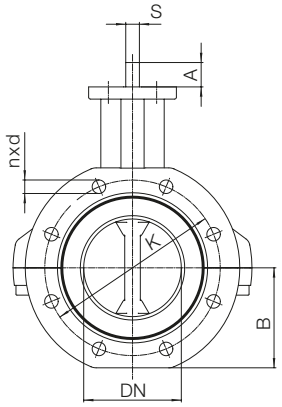


HAND LEVER DIMENSIONS (mm) AND APPROX. WEIGHTS (kg)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
l	240	240	240	340	340	340	Worm gear, see page 9											
h	43	43	43	51	51	51												
Weight	0,4	0,4	0,4	0,7	0,7	0,7												

PIPELINE CONNECTIONS AND APPROX. WEIGHTS (kg)

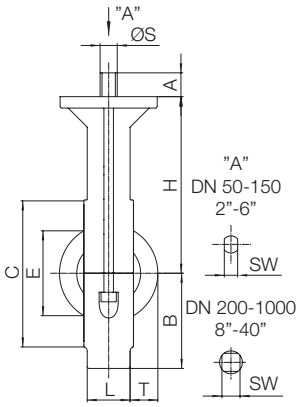
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750 [3]	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
K (ISO)	125	145	160	180	210	240	295	350	400	460	515	565	620	725	840	–	950	1050
n x d (ISO) [1]	4x18	8x18	8x18	8x18	8x18	8x22	8x22	12x22	12x22	16x22	16x26	20x26	20x26	20x30	24x30	–	24x33	28x33
n [2]	4xM16	4xM16	8xM16	8xM16	8xM16	8xM20	8xM20	12xM20	12xM20	16xM20	16xM24	20xM24	20xM24	20xM27	24xM27	–	24xM30	28xM30
K (ASME)	120,5	139,7	152,5	190,5	215,9	241,5	298,5	362	432	476	540	577,8	635	749,3	863,6	914,4	977,9	1085,8
n x d (ASME)	4x19	4x19	4x19	8x19	8x23	8x23	8x23	12x26	12x26	12x29,5	16x29,5	16x32	20x32	20x35	28x35	28x35	28x42	32x42
	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"
NKS-I (kg)	2,5	3	3,5	5,5	7	10	15	23	33	50	68	100	122	180	–	–	–	–
NKL-I, NKU-I (kg) [4]	3,5	4,5	6,5	9,5	11	13	23	32	47	87	98	140	175	275	367	383	670	880



Flange connection dimensions to ISO 7002-2 PN10 and ASME B 16.5 Cl. 150, weight (kg) with bare shaft (without lever, bracket etc.)
[1] Flange through holes on request, [2] Tapped holes metric or UNC, [3] DN 750 (30") only to ASME B 16.5 Cl. 150, [4] Double-flange housing NKU-I from DN 450 onwards

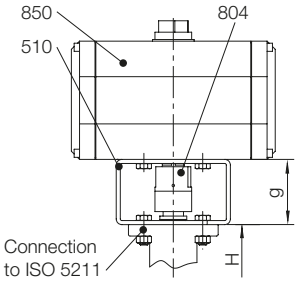
CONNECTION DIMENSIONS (mm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
L	43	46	46	52	56	56	60	68	78	78	102	114	127	154	165	190	190	203
H	134	145	160	175	194	210	239	275	310	349	379	426	451	555	605	629	658	710
B	68	78	92	107	120	134	162	199	230	257	287	320	360	415	482	489	550	602
E	26	39	66	86	112	140	191	241	290	330	387	436	484	580	684	726	781	877
T	9	7	17	24	35	47	70	91	111	131	149	168	187	223	269	280	307	349
C	90	105	128	150	169	212	365	315	365	430	480	524	570	670	780	840	887	1000
F	1	1	1	1	1	1	1	1	1	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
A	12	12	12	16	16	19	19	24	24	40	40	65	65	90	80	91	108	128
ØS	–	–	–	–	–	–	–	–	–	–	–	45	45	60	72	60	80	98
SW square-end	11	11	11	14	14	17	17	22	22	27	27	–	–	–	–	–	–	–
key width	–	–	–	–	–	–	–	–	–	–	–	14	14	18	20	18	22	28



CONNECTION DIMENSIONS (mm) FOR REMOTELY ACTUATED VERSION

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
g	60	60	60	60	60	80	80	80	80	80	80	80	80	100	100	100	200	200
Conn. dim.*	F07	F05	F07	F07	F05/ 07	F10	F10	F12	F12	F14	F14	F14	F14	F16	F16	F16	F25	F30

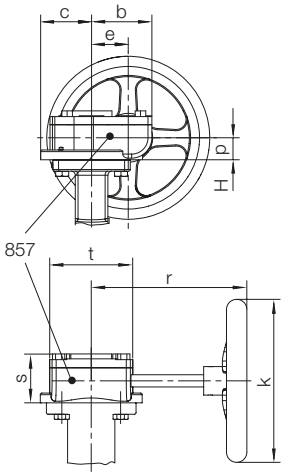


* to DIN EN ISO 5211

WORM GEAR DIMENSIONS (mm) AND APPROX. WEIGHTS (kg)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
b	66	66	66	66	66	66	66	75	75	126	126	126	126	148	180	180	158	238
c	48	48	48	48	48	48	48	56	56	83	83	101	101	110	142	142	142	170
e	43	43	43	43	43	43	43	50	50	80	80	86	86	104	130	130	53	182
k	100	100	100	100	100	160	160	250	250	300	300	500	500	500	600	700	500	400
p	27	27	27	27	27	27	27	33	33	42	42	46	46	51	63	63	60	79
r	126	126	126	126	126	189	189	219	219	371	371	305	305	346	387	387	348	470
s	62	53	62	62	53	62	62	89	89	90	90	92	92	102	126	126	120	159
t	80	80	80	80	80	80	80	100	100	175	175	200	200	220	285	285	285	370
Weight	0,8	0,8	0,8	0,8	0,8	0,9	0,9	1,6	1,6	5,4	5,4	14	14	22	32	32	27	63

Standard design
worm gear



TORQUES (Nm)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
Md	25	39	43	73	87	146	189	330	476	675	900	1320	1560	2100	2100	2800	3100	4000
Md_{adm}	83	83	83	171	171	306	306	664	664	962	962	1978	1978	5233	7281	5233	13686	19841

Md_{adm} = max. admissible torque (Nm) with the disc/stem unit blocked

FLOW RATES (m^3/h) AND Z-VALUES

DN		50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
inch		2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"
disk opening angle	20°	5	8	15	20	38	60	95	175	265	350	510	665	890	970	1060	1217	1402	1915
	30°	11	19	33	48	82	130	230	350	522	660	985	1255	1620	2150	2560	2939	3328	4259
	40°	24	41	72	95	165	235	465	710	995	1180	1480	2230	2980	4180	4868	5588	6351	7897
	50°	42	70	125	162	255	395	795	1160	1720	1800	2450	3850	5350	7420	8412	9675	11169	13849
	60°	64	108	190	255	455	645	1180	1610	2665	2880	4230	6250	8150	11350	14359	16484	19073	23887
	70°	92	155	270	385	645	955	1815	2420	3965	4550	6550	9200	11800	16450	23901	27437	32074	41112
	80°	118	200	335	485	815	1220	2410	3650	5960	7180	9250	12250	15560	21200	37638	43207	51820	66771
	90°	134	227	392	585	1015	1495	3050	4510	7210	8760	11350	14900	18000	24500	48633	55829	63905	81016

VALVE MODEL NOMENCLATURE. VALVE SIZE, OPTIONS AND MATERIAL AVAILABILITY. WAFER AND LUG CONFIGURATIONS.

Body/Shell: Ductile cast iron

WAFER-STYLE BODY DN 50-400 (12"-16")

		MANUALLY ACTUATED		PNEUMATICALLY ACTUATED		SIZE (mm, inch)													
DESIGN	MATERIAL BODY LINING/ DISC	LINING STANDARD	LINING ANTISTATIC	LINING STANDARD	LINING ANTISTATIC	50	65	80	100	125	150	200	250	300	350	400	450	500	600
						2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	PTFE*/PFA	NKS/F	NKS/F-L[2]	NKSP/F	NKSP/F-L[2]	•		•	•		•	•	•	•	•	•			
	PTFE*/PFA	NKS-I/F	NKS-I/F-L	NKSP-I/F	NKSP-I/F-L		•			•							•	•	•
	PTFE*/stainl. steel	NKS-I/F-S	NKS-I/F-L-S	NKSP-I/F-S	NKSP-I/F-L-S	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/Hastelloy®	NKS-I/F-H	NKS-I/F-L-H	NKSP-I/F-H	NKSP-I/F-L-H	•	•	•	•	•	•	•	•	•	1)	1)	1)	1)	1)
	PTFE*/titanium gr. 2[1]	NKS-I/F-T	NKS-I/F-L-T	NKSP-I/F-T	NKSP-I/F-L-T														
	PE-UHMW/stainl. steel	NKS-I/E-S	n.a	NKSP-I/E-S	n.a			•	•		•	•							

LUG-STYLE BODY DN 50-400 (2"-16")

		MANUALLY ACTUATED		PNEUMATICALLY ACTUATED		SIZE (mm, inch)										
DESIGN	MATERIAL BODY LINING/ DISC	LINING STANDARD	LINING ANTISTATIC	LINING STANDARD	LINING ANTISTATIC	50	65	80	100	125	150	200	250	300	350	400
						2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"	16"
	PTFE*/PFA	NKL/F	NKL/F-L[2]	NKLP/F	NKLP/F-L[2]	•		•	•		•	•	•	•	•	•
	PTFE*/PFA	NKL-I/F	NKL-I/F-L	NKLP-I/F	NKLP-I/F-L		•			•						
	PTFE*/stainl. steel	NKL-I/F-S	NKL-I/F-L-S	NKLP-I/F-S	NKLP-I/F-L-S	•	•	•	•	•	•	•	•	•	•	•
	PTFE*/Hastelloy®	NKL-I/F-H	NKL-I/F-L-H	NKLP-I/F-H	NKLP-I/F-L-H	•	•	•	•	•	•	•	•	•	1)	1)
		NKL-I/F-T	NKL-I/F-L-T	NKLP-I/F-T	NKLP-I/F-L-T											
	PE-UHMW/stainl. steel	NKL-I/E-S	n.a	NKLP-I/E-S	n.a			•	•		•	•				

DOUBLE-FLANGE BODY DN 450-900 (18"-36")

		MANUALLY ACTUATED		PNEUMATICALLY ACTUATED		SIZE (mm, inch)							
DESIGN	MATERIAL BODY LINING/ DISC	LINING STANDARD	LINING ANTISTATIC	LINING STANDARD	LINING ANTISTATIC	400	450	500	600	700	750	800	900
						16"	18"	20"	24"	28"	30"	32"	36"
	PTFE*/PFA	NKU-I/F	NKU-I/F-L	NKSP-I/F	NKSP-I/F-L	•	•	•	•	•	•	•	•
	PTFE*/stainl. steel	NKU-I/F-S	NKU-I/F-L-S	NKUP-I/F-S	NKUP-I/F-L-S	•	•	•	•	•	•	•	•
	PTFE*/Hastelloy® 1)	NKU-I/F-H	NKU-I/F-L-H	NKUP-I/F-H	NKUP-I/F-L-H								
	PTFE*/Titan[1]	NKU-I/F-T	NKU-I/F-L-T	NKUP-I/F-T	NKUP-I/F-L-T								
	PE-UHMW/stainl. steel[1]	NKU-I/E-S	n.a	NKUP-I/E-S	n.a								

[1] Availability on request
[2] DN ≥ 350 (14") antistatic: Availability on request
* Body lining PTFE, optional modified PTFE