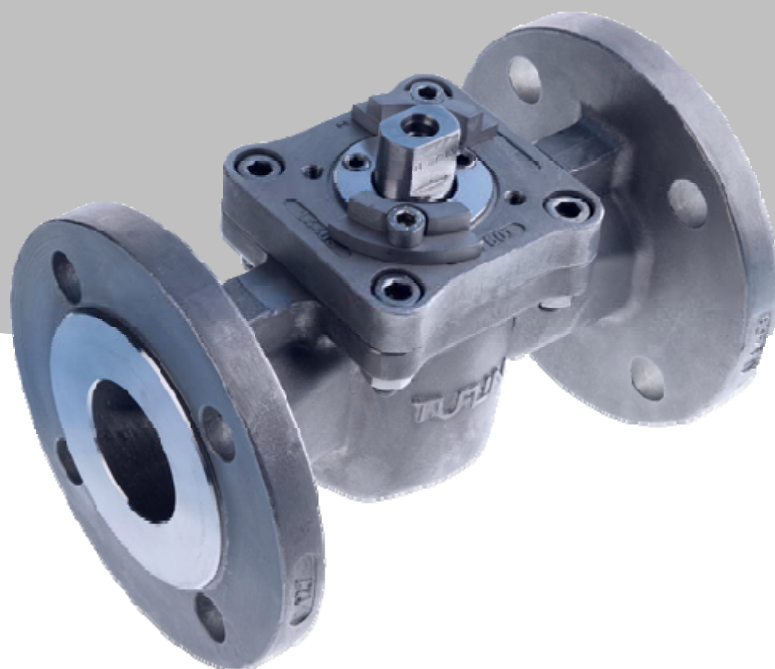


Technische Dokumentation Technical Documentation



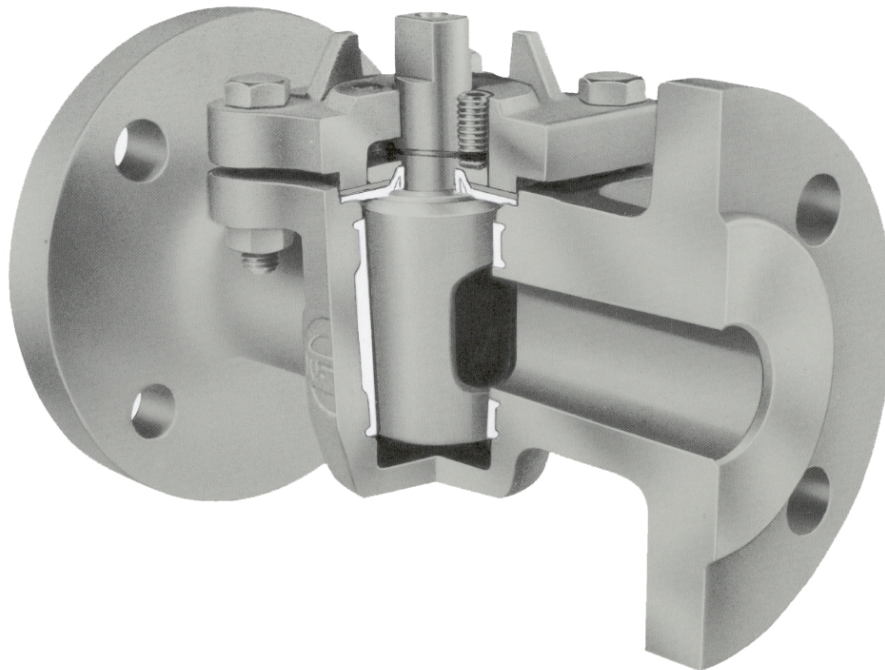
TUFLIN® **Two Way Plug Valves**



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Design Features of TUFLIN® Plug Valves



TUFLIN® Valves incorporate a plug rotating in a Teflon®-sleeve locked in the body. The Teflon®-sleeve serves as a self-lubricating seal against leakage through ports and to the atmosphere.

TUFLIN® Valves provide tight shut-off for liquids, gases or slurries, plus corrosion resistance with the absence of product contamination. The special TUFLIN® design accommodates specified changes in temperature, high vacuum as well as rated pressures, while still maintaining complete shut off.

The low friction Teflon®-sleeve surrounding the plug permits quick and easy operation. Costly lubrication and maintenance are eliminated.

The seats are not exposed to the media in either the open or closed position.

The cold flow properties of Teflon® and the tendency to expand under heat are prevented by the special design of the body interior. The sleeve is locked into the body by means of metal lips surrounding the port areas and by the shoulders at the top and bottom in the body, thus restrained from rotation and movement. The ribs provided around the ports, at the top and bottom establish a very high compression of the Teflon®-sleeve against the plug.

Features	No lubrication, no seizing of plug
	Teflon®-sleeve fully retained at top, bottom and around ports
	No maintenance cost
	Minimized body cavities for residuals or contamination
	Complete shut off

Available Materials for Two Way Valves:

* Ductile Iron EN-JS1049 (0.7043, GGG 40.3),
as per EN 1563, 0.7659 (Ni Resist) as per DIN 1694
* Carbon Steel EN10213-2 (1.0619, GS-C25),
A216-WCB, A352-LCB
Stainless Steel 1.4408, 1.4552, 1.4309 as per EN10213-4,
CF8M, CF8C, CF8, CF3M, CF3,
Argonit 1 (1.4361 casting), CN7M (A 20), A494-M-35-1
(Alloy 400, Monel), A494-CZ100 (Alloy 200, Nickel),
A494-N7M (Alloy B2), A494-CW2M (Alloy C4),
B367-C2 (Titanium), Zirconium R60702, A494-CY-40 (Alloy 600)

Other materials upon request.

*Available with fluorocarbon lining in PFA
(see technical data sheet: tdb-lpv-gb).

Combinations of different materials for body and plug are
available. Body and plug are of the same material unless
otherwise requested.

Standard plug material is stainless steel 1.4408.

Seals and sleeves are pure Teflon® (no regenerate).
Teflon®-fiberglass reinforced sleeves available on request.
Other sleeve materials depending on pressure and temperature.
Other fluorocarbon seals for special applications on request.
All Two Way Valves are available in FIRESAFE – design acc. to
API 607 4th edition, also with electrostatic eliminator or free of
oil and grease.

Available Flange Standards:

PN 10-40 (EN 1092-1)

PN 63-100 (EN 1092-1)

CLASS 150, 300, 600 (ASME B16.5)

JIS (JIS B2210)

British Standard (BS1560)

Screwed Ends: Whitworth R (DIN 2999-1)
or NPT (ASME B1.20.1)

Welded Ends: EN12760 (SW)
EN12627 (BW)

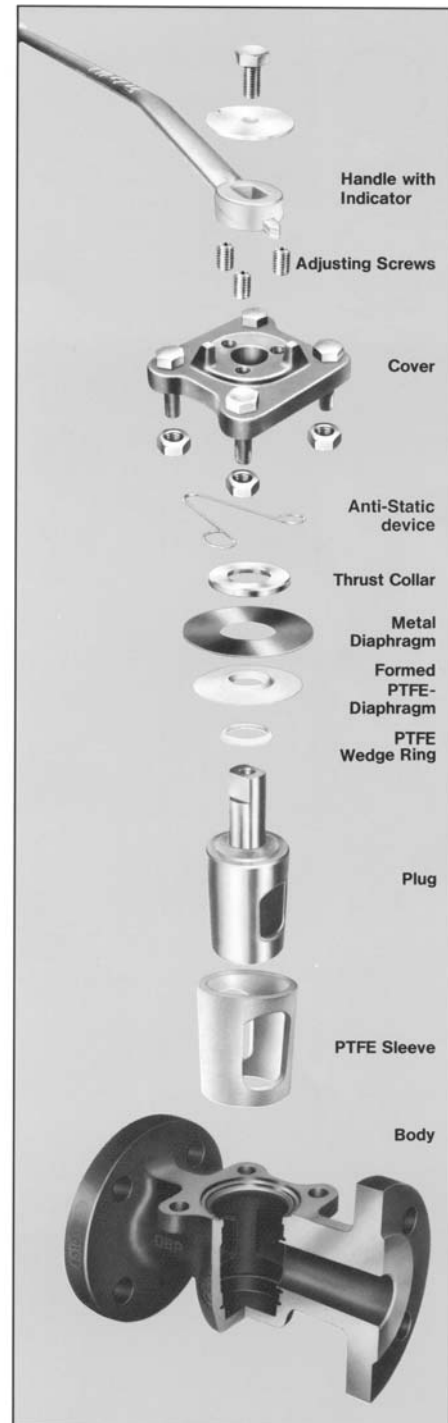
Temperature range: 173 K to 553 K (-100° C to +280° C)
(more details see page 14)

Suitable for vacuum services

(Vacuum range: $1.33 \cdot 10^3$ to $1.33 \cdot 10^{-2}$ mbar)

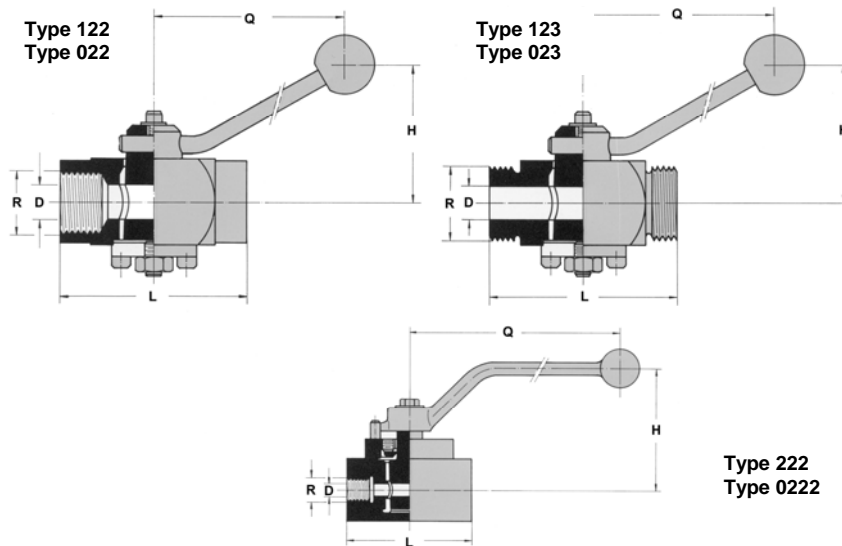
Strength calculation method against internal pressure:
The calculation procedure for pressure retaining valve
components has been performed acc. to DIN 3840 (EN12516).

Subject to technical modifications.



Type 122 DIN PN 10 - 25
 Type 022 ASME Class 150
 Type 123 DIN PN 10 - 25
 Type 023 ASME Class 150
 Type 222 DIN PN 63 - 100
 Type 0222 ASME Class 300

Whitworth R*
 NPT
 Whitworth R*
 NPT
 Whitworth R*
 NPT



Dimensions in mm

NPS 122	NPS 022	R		D	L 122/022	L 123/023	H	Q	Approx. Weight / kg 122/022	Approx. Weight / kg 123/023
		NPS 123	NPS 023							
R ¼*	¼ NPT *	R1/4 *	1/4NPT	8	64	70	64	130	0.54	0.43
R 3/8*	3/8 NPT *	R 3/8 *	3/8 NPT	8	64	70	64	130	0.49	0.45
R ½*	½ NPT *	R1/2 *	1/2 NPT	8	64	70	64	130	0.46	0.46
		R3/4 *	3/4 NPT							
R ¾*	¾ NPT *	R1 *	1 NPT	14	83	85	80	170	0.87	0.91
R 1 *	1 NPT *	R11/4 *	11/4 NPT	19	98	100	84	170	1.22	1.38

*Whitworth R = BSPT

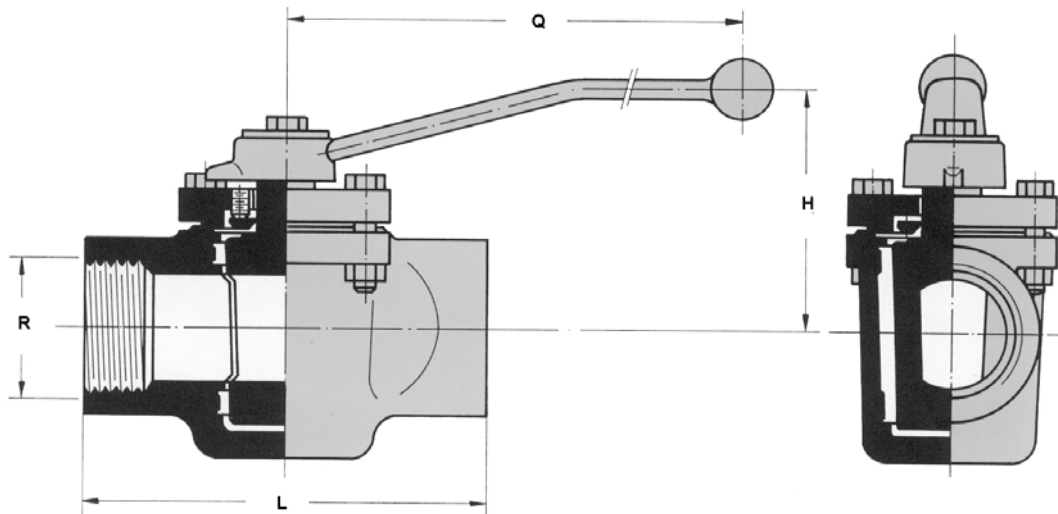
R NPS 222	R NPS 0222	D	L	H	Q	Approx. Weight in kg
R ¼	R1/4	8	64	77	180	0.98
R 3/8	R 3/8	8	64	77	180	0.94
R ½	R1/2	10	64	77	180	0.91

Other sizes on request.

Subject to technical modifications.

TUFLIN® Two Way Valves with Screwed Ends

Type 126 DIN PN 10 - 40 Whitworth R* (PN 63 - 100 on request)
 Type 066 ASME Class 150 NPT
 Type 0366 ASME Class 300 NPT
 Type 0666 ASME Class 600 NPT



Dimensions in mm

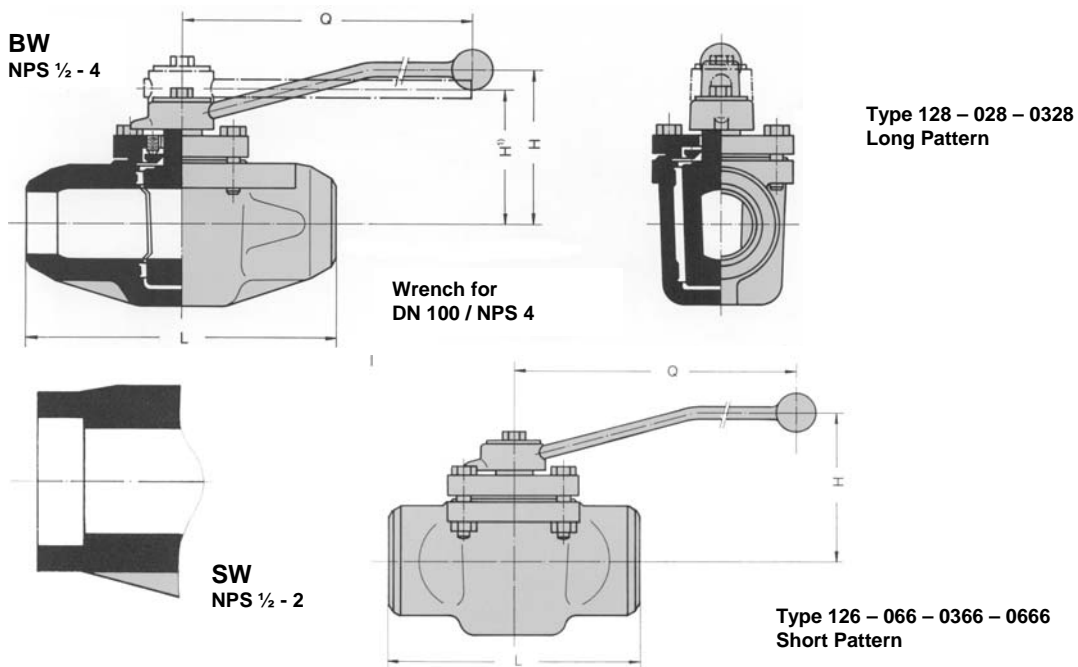
DN	R		NPS 066-0366-0666	L	H	Q	Approx. Weight in kg
	NPS	NPS 126					
15	½	R ½ *	½ NPT	85	76	180	1.1
20	¾	R ¾ *	¾ NPT	85	76	180	1.0
25	1	R 1 *	1 NPT	118	96	260	2.5
40	1 ½	R 1 ½ *	1 ½ NPT	140	106	362	3.9
50	2	R 2 *	2 NPT	165	118	435	6.1
80	3	R 3 *	3 NPT	220	132	435	9.5

* Whitworth R = BSPT

TUFLIN® Two Way Valves with Weld Ends

Type 128 BW or SW	DIN PN 10 - 40 (PN 63 - 100 on request)
Type 028 BW or SW	ASME Class 150
Type 0328 BW or SW	ASME Class 300 (Class 600 on request)
Type 126 BW or SW	DIN PN 10 - 40 (PN 63 - 100 on request)
Type 066 BW or SW	ASME Class 150
Type 0366 BW or SW	ASME Class 300
Type 0666 BW or SW	ASME Class 600

Above DN 100 / NPS 4 please see page 8



Dimensions in mm

Type 128-028-0328-BW or SW						
DN	NPS	L	H	Q	Approx. Weight in kg BW	Approx. Weight in kg SW
15	1/2	165	76	180	1.9	1.8
20	3/4	165	76	180	1.9	1.8
25	1	165	96	260	3.8	3.6
40	1 1/2	190	106	362	5.8	5.6
50	2	216	118	435	10.4	9.3
65	2 1/2	216	132	435	10.1	
80	3	305	132	435	15.7	
100	4	356	151	600	29.2	

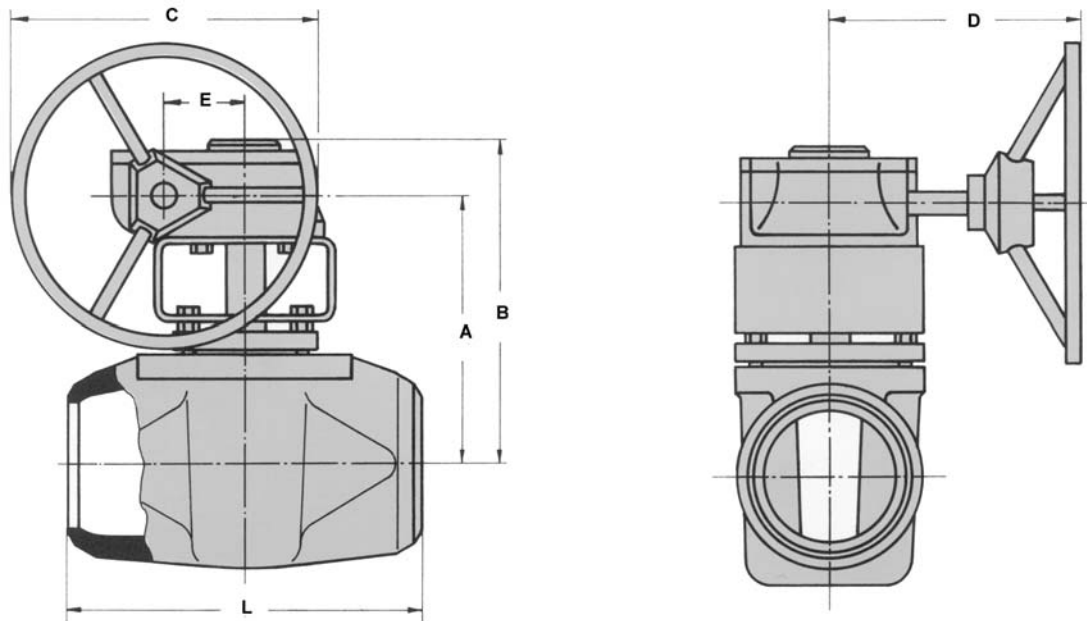
Type 126-066-0366-0666-BW or SW						
DN	NPS	L	H	Q	Approx. Weight in kg BW	Approx. Weight in kg SW
15	1/2	85	76	180	1.1	1.0
20	3/4	85	76	180	1.1	1.0
25	1	118	96	260	2.8	2.6
40	1 1/2	140	106	362	4.0	3.8
50	2	165	118	435	6.7	6.5
80	3	220	132	435	9.5	9.5

Give details of end connection and pipe dimensions when ordering.
Subject to technical modifications.

TUFLIN® Two Way Valves with Weld Ends

Type 128 G BW or SW **DIN PN 10 - 40 (PN 63 - 100 on request)**
Type 028 G BW or SW **ASME Class 150**
Type 0328 G BW or SW **ASME Class 300 (Class 600 on request)**

Below DN 80 / NPS 3 see page 7 "G" indicates gear operated.



Dimensions in mm

DN	NPS	L	A	B	C	D	E	Approx. Weight in kg
80	3	305	204	236	200	169	52	31.0
100	4	356	235	267	200	169	52	42.0
150	6	432	308	347	300	223	67	63.0
200	8	508	345	384	300	223	67	121.0
250	10	584	360	404	457	279	90	155.0

DN 300 / NPS 12 on request.

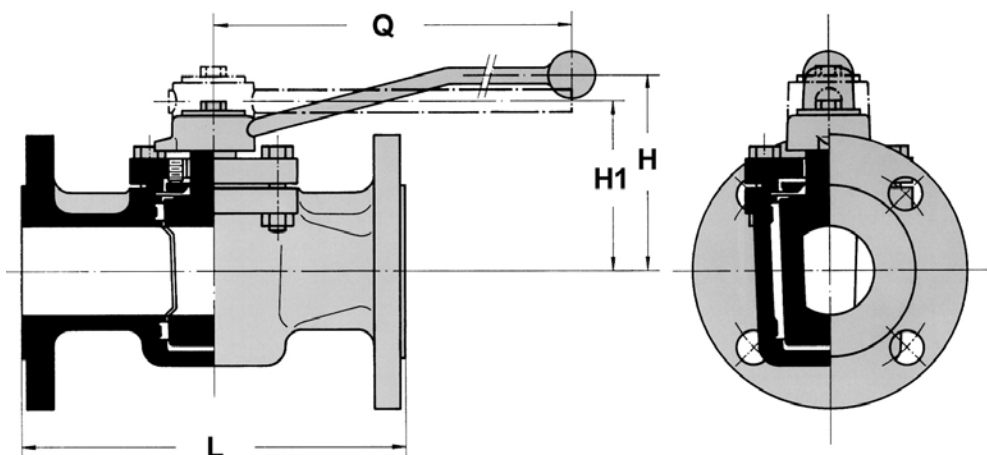
Give details of end connection and pipe dimensions when ordering.

Subject to technical modifications.

TUFLIN® Two Way Valves with Flanged Ends

Type 127	DIN PN 10 - 40	DN 15 - 100 (PN 63 - 100 on request)
Type 067	ASME Class 150	NPS ½ - 4
Type 0367	ASME Class 300	NPS ½ - 4
Type 0667	ASME Class 600	NPS ½ - 4

Above DN 100 / NPS 4 please see page 10



^{*)} Wrench for DN 100 / NPS 4

Dimensions in mm

DN	NPS	L				H	Q	ca. Gewicht in kg			
		127	067	0367	0667			127	067	0367	0667
15	½	130	108	150	162	76	180	2.5	1.9	2.6	2.8
20	¾	150	117	152	165	76	180	3.1	2.3	3.4	3.5
25	1	160	127	159	216	96	260	4.6	3.5	5.0	6.6
32		180				96	260	6.5			
40	1 ½	200	165	190	241	106	362	7.5	5.6	8.8	11.0
50	2	230	178	216	292	118	435	10.5	9.6	12.4	13.8
65		290				112	435	13.4			
80	3	310	203	283	356	132	435	17.8	14.0	21.4	26.3
100	4	350	229	305	432	151	600	30.7	27.2	38.4	50.8

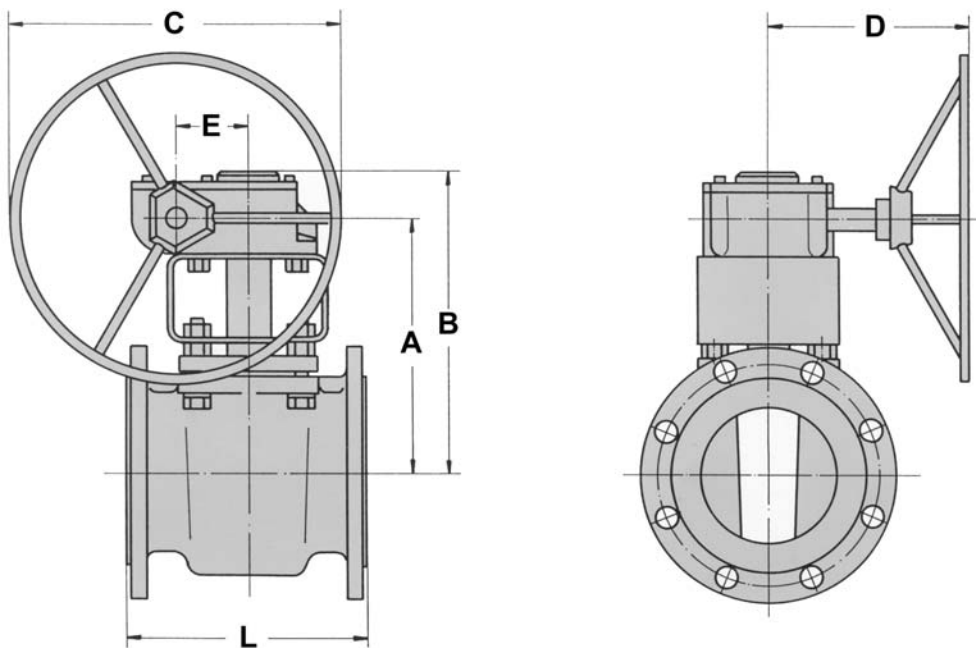
Dimensions of flanges in accordance with standards.

Subject to technical modifications.

TUFLIN® Two Way Valves with Flanged Ends

Type 127 G	DIN PN 10 - 40	DN 80 - 400
Type 067 G	ASME Class 150	NPS 3 - 16
Type 0367 G	ASME Class 300	NPS 3 - 14
Type 0667 G	ASME Class 600	NPS 3 - 14

"G" indicates gear operated.



Dimensions in mm

DN	NPS	L				A	B	C	D	E	Approx. Weight in kg			
		127	067	0367	0667						127	067	0367	0667
80	3	310	203	283	356	204	236	200	169	52	34.6	30.8	38.2	43.1
100	4	350	229	305	432	235	267	200	169	52	45.5	42.0	53.2	65.6
125	5	267	267			308	347	300	223	67	55.0	55.0	84.0	
150	6	**267	267	403	559	308	347	300	223	67	55.2	55.2	104.0	
200	8	292	292	419	660	345	384	300	223	67	89.0	89.0	175.0	191.0
250	10	*330	330	457	787	360	404	457	279	90	146.0	146.0		330.0
300	12	*356	356	502	838	478	522	457	279	90	186.0	186.0		415.0
350	14	*550	550	762	889	517	594	762	427	154	380.0	380.0		625.0
400	16	***600	600			517	594	762	427	154	400.0	400.0		

* PN 10 – 25 only

** Also available with face to face according to DIN EN 558-1 –DN 350 = PN 10-16

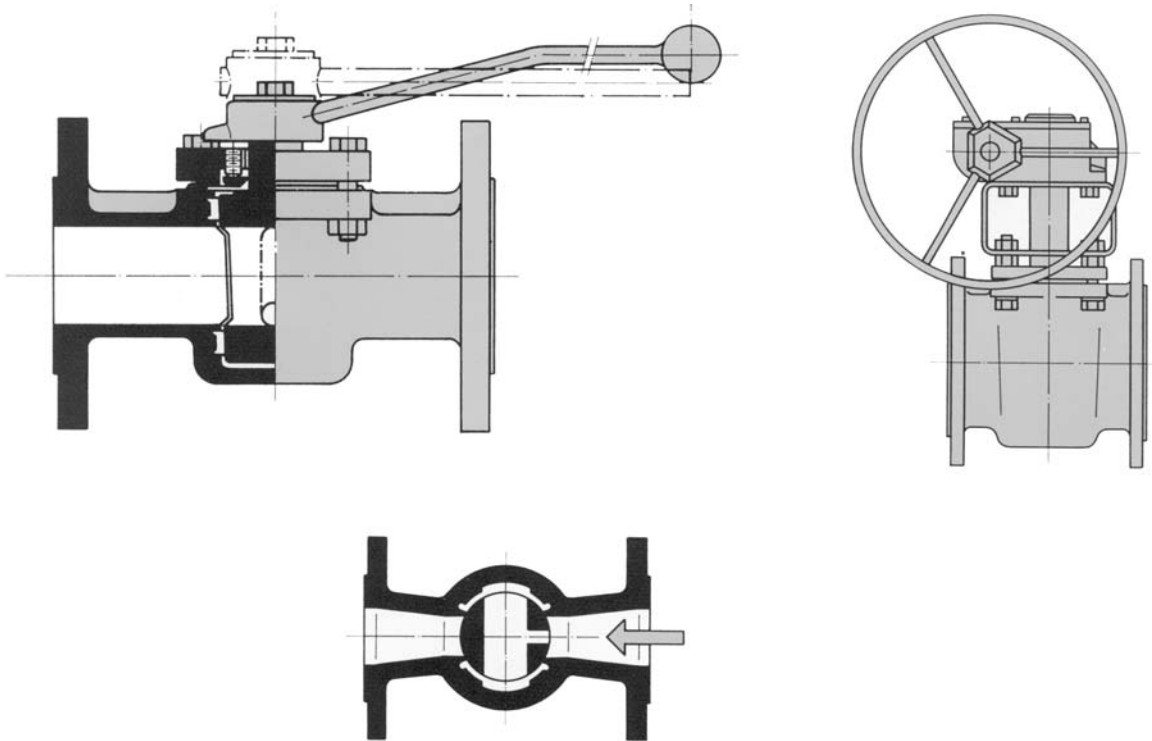
*** PN 10 - 16 only

Dimensions of flanges in accordance with standards.

Subject to technical modifications.

TUFLIN® Two Way Valves with Relief Port

Applicable for Two Way Valves with Flanged, Screwed or Weld Ends DN 15 - 400 / NPS ½ - 16



Two Way Valves with relief hole or slot in the plug are for products which tend to polymerize or substantial pressure builds up when in a confined state.

Effect: In closed position the interior of the plug is unidirectional open to the piping system through the relief port.

This assures the necessary pressure balance.

Mounting position: Relief port on pressure respectively product side.

Application: Hydrocyanic acid and products containing hydrocyanic acid, Chlorine, Oleum etc.

Dimensions please see page 10 and 11

Subject to technical modifications.

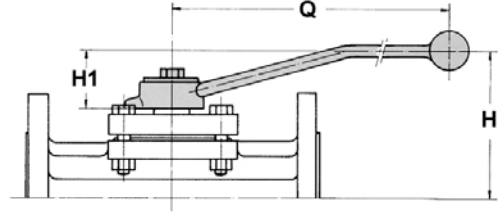
Design and Dimensions of Wrenches (with flow direction indicator)

- Figure 1 Standard Wrench** **Material: Aluminium**
Figure 2 Wrench with hub cap **Material: Steel**
 (Special design for DN 15 - 80 / NPS ½ - 3)
Figure 3 T-Wrench **Material: Steel**
Figure 4 Ball handle for small size valves **Material: Steel, plastic ball**

Dimensions in mm

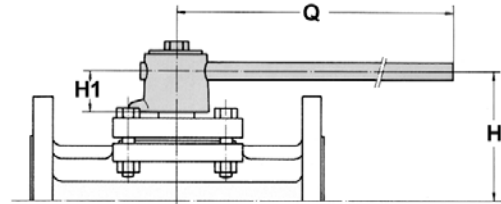
DN	NPS	H	H1	Q	Weight
15	½	76	45	180	0.1 kg
20	¾	76	45	180	0.1 kg
25	1	96	46	260	0.2 kg
32		96	46	260	0.2 kg
40	1 ½	106	45	362	0.3 kg
50	2	118	47	435	0.4 kg
65		112	47	435	0.4 kg
80	3	132	47	435	0.4 kg

Standard wrench for DN 100 / NPS 4 see fig. 2



Dimensions in mm

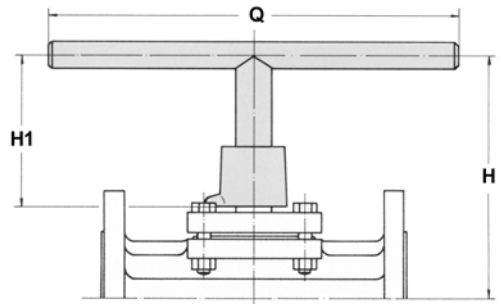
DN	NPS	H	H1	Q	Weight
15	½	68	36	190	0.3 kg
20	¾	68	36	190	0.3 kg
25	1	80	30	250	0.7 kg
32		80	30	250	0.7 kg
40	1 ½	91	30	300	1.1 kg
50	2	108	37	450	1.6 kg
65		102	37	450	1.6 kg
80	3	122	37	450	1.6 kg
100	4	151	45	600	3.2 kg



Dimensions in mm

DN	NPS	H	H1	Q	Weight
15	½	132	100	300	0.3 kg
20	¾	132	100	300	0.3 kg
25	1	195	145	300	0.6 kg
32		195	145	300	0.6 kg
40	1 ½	206	145	400	0.9 kg
50	2	216	145	500	1.3 kg
65		210	145	500	1.3 kg
80	3	230	145	500	1.3 kg
100	4	256	150	600	2.8 kg

Recommended wrench for isolated piping systems.
Standard wrench for oversized valves.



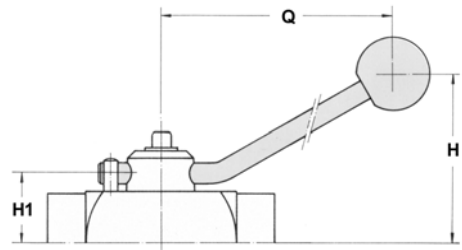
Dimensions in mm

Screwed ends NPS				H	H1	Q	Weight
122	022	123	023				
R ¼	¼ NPT	R ¼	¼ NPT	64	42	130	0.04 kg
R 3/8	3/8 NPT	R 3/8	3/8 NPT	64	42	130	0.04 kg
R ½	½ NPT	R ½	½ NPT	64	42	130	0.04 kg
		R ¾	¾ NPT	64	42	130	0.04 kg
R ¾	¾ NPT	R 1	1 NPT	80	42	170	0.14 kg
R 1	1 NPT	R 1 ¼	1 ¼ NPT	84	54	170	0.14 kg

Other dimensions on request.

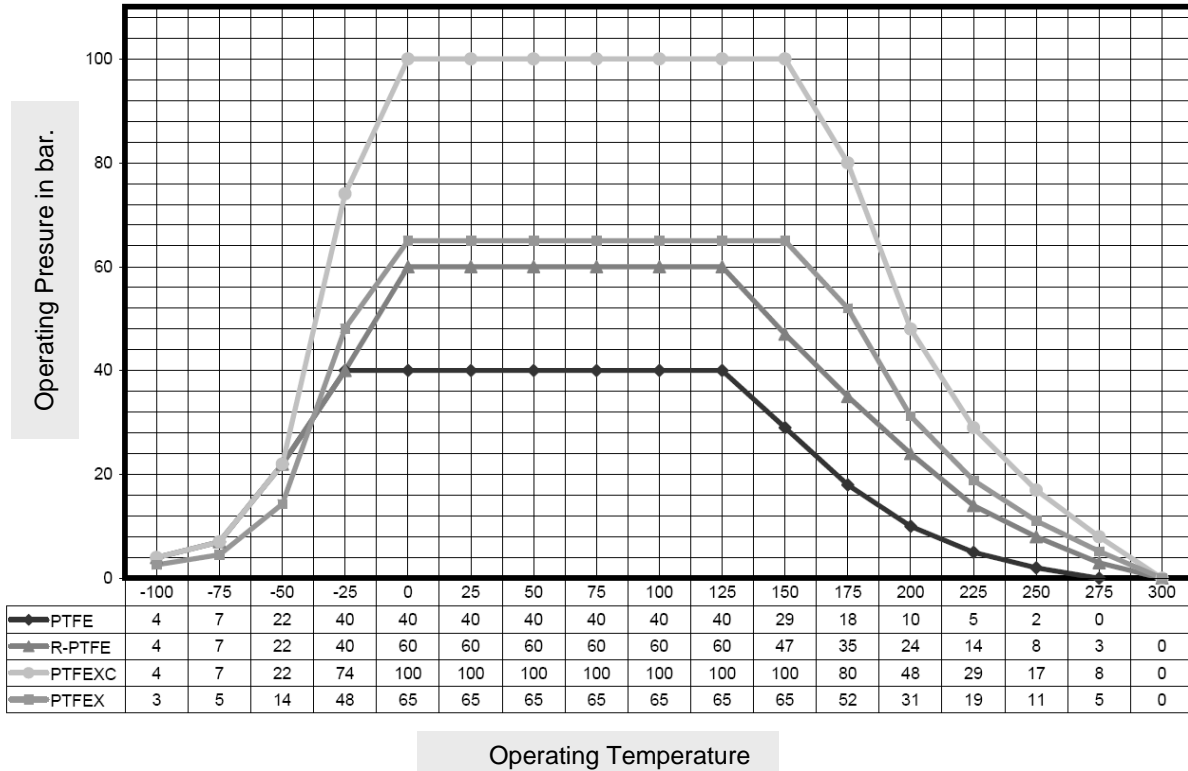
Sizes DN 125-400 / NPS 5-16 supplied with gear (see page 10) as standard.

Subject to technical modifications

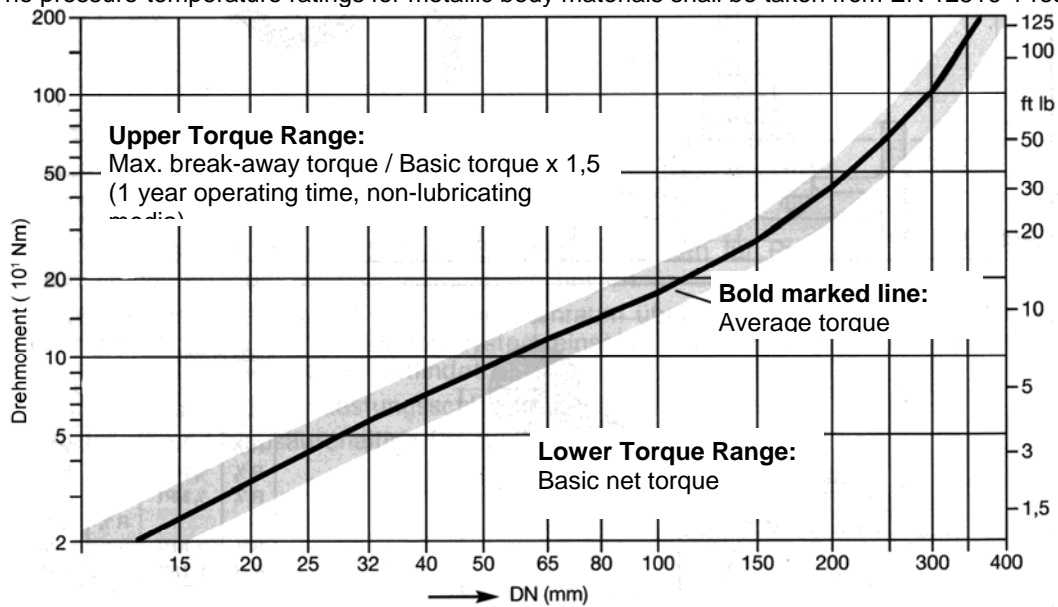


Engineering Data Mechanical Properties and Characteristics

Pressure-Temperature Ratings



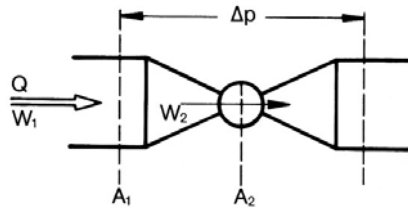
Maximum allowable continuous operating temperature for sleeve materials 260°C
 The pressure-temperature ratings for metallic body materials shall be taken from EN 12516-1 resp. EN 1092-1



Engineering Data Flow Characteristics

Cross Section, kvs / cv - Value, Resistance Factor

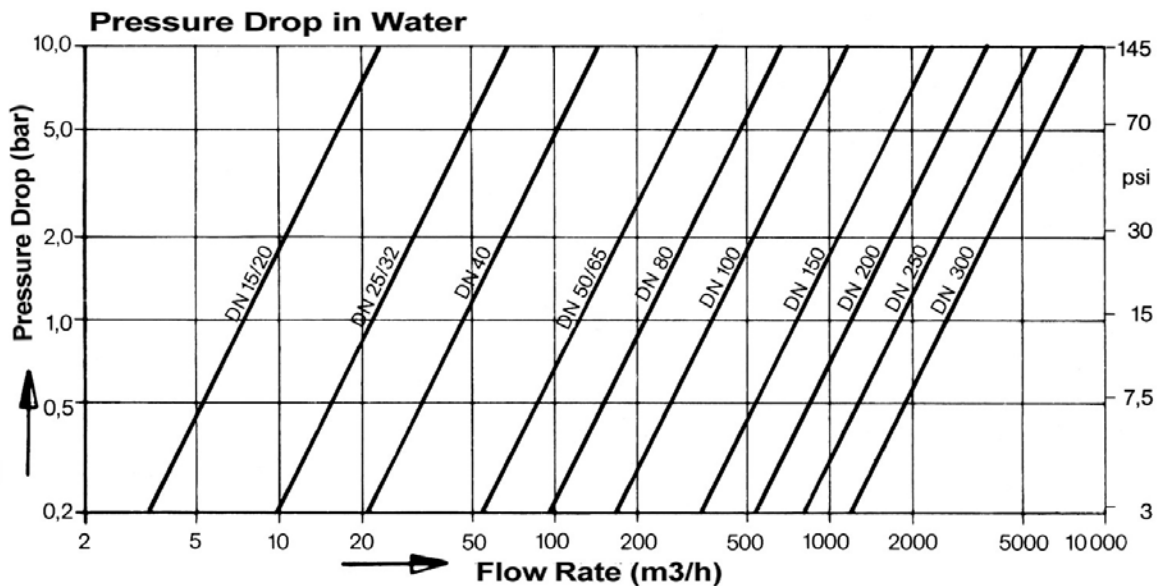
DN mm	NPS	A1 cm ²	ζ 1	k _{vs} m ³ /h	c _v Gpm
15	½	1.7	1.32	8	9.25
20	¾	3.1	4.20	8	9.25
25	1	4.9	0.70	30	34.68
32	1 ¼	8.0	1.84	30	34.68
40	1 ½	12.5	1.04	63	72.83
50	2	19.6	0.63	125	144.50
65	2 ½	33.2	1.79	125	144.50
80	3	50.2	1.34	220	254.32
100	4	78.5	1.00	400	462.40
150	6	176.6	1.26	800	924.80
200	8	314.0	1.73	1196	1382.58
250	10	491.0	1.90	1795	2075.02
300	12	706.0	1.80	2650	3063.40
350	14	962.1	1.20	4466	5162.70
400	18	1256.6	2.05	4466	5162.70



Speed $w_1 = Q / A_1$

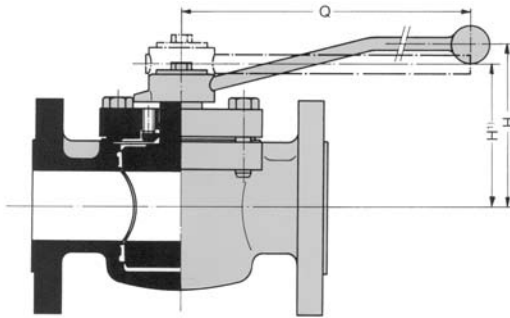
Pressure Drop $\Delta_p = \frac{\zeta_1 \cdot \gamma \cdot W_1^2}{2 \cdot g}$

- A₁ = Cross sectional area
- ζ 1 = Resistance factor, related to cross section
- w₁ = Speed in pipe
- Q = Flow rate
- γ = Specific gravity of medium
- Δ_p = Pressure drop
- g = Acceleration due to gravity

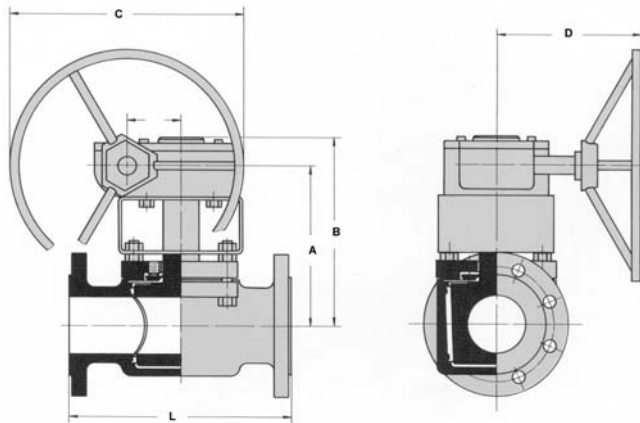


XOMOX® TUFLIN® Two Way Valves with Flanged Ends (Full Bore)

Type 227 G DIN PN 10 - 40
 Type 2067 G ASME Class 150
 Type 20367 G ASME Class 300
 "G" indicates gear operated



Available sizes and pressure classes								
DN	NPS	GGG 40.3	Carbon steel and stainless steel					
		PN 10-16	PN 10	PN 16	PN 25	PN 40	Class 150	Class 300
25	1							
40	1 1/2							
50	2							
80	3	X	X	X	X	X	X	
100	4	X	X	X	X	X	X	X
150	6	X	X	X	X	X	X	X
200	8	X	X	X	X		X	
250	10		X	X	X		X	X



1) Wrench for DN 50 / NPS 2

* DN 150 / NPS 6 in material 0.7043 (GGG 40.3) L=400

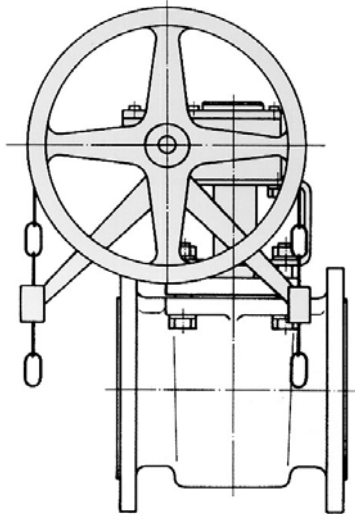
Dimensions in mm

DN	NPS	L	H	Q	A	B	C	D	E	Approx. Weight in kg
25	1	160	103	362						
40	1 1/2	200	113	435						
50	2	230	128	600						
80	3	310			237	269	203	117	52	55
100	4	350			282	321	305	223	67	85
150	6	480*			327	371	457	278	90	170
200	8	600			336	393	610	420	59	285
250	10	730			416	474	610	420	59	480

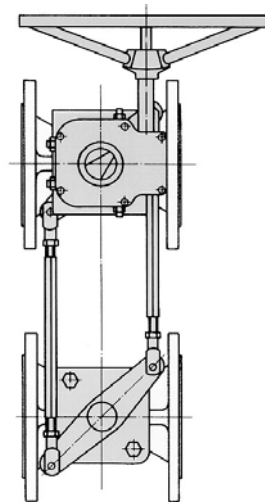
Subject to technical modifications.

Manual Operators

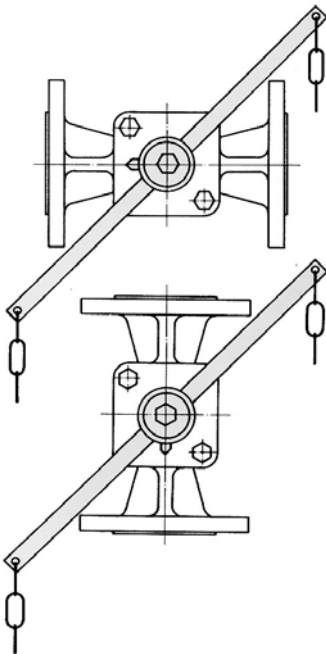
Chain wheel with gear



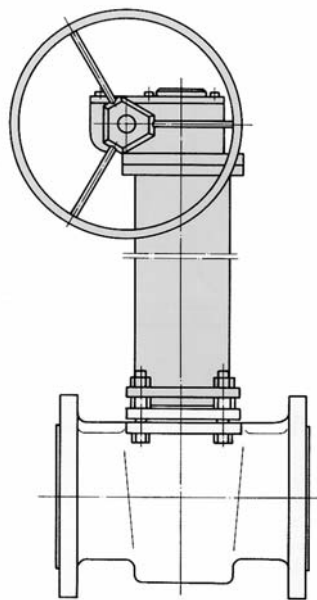
Tandem adaptor with parallelogram



Chain wrench for 0-90 operation
For horizontal or vertical installation



Extension with tube and gear protective



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