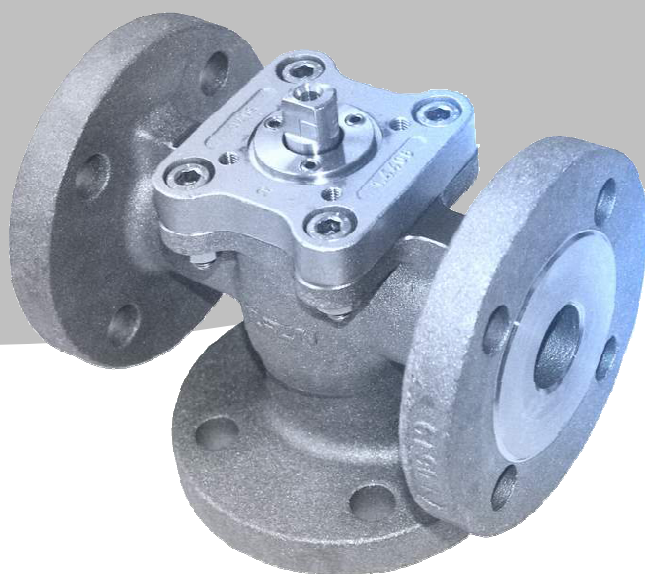


Technische Dokumentation Technical Documentation



TUFLIN® Multiport Plug Valves

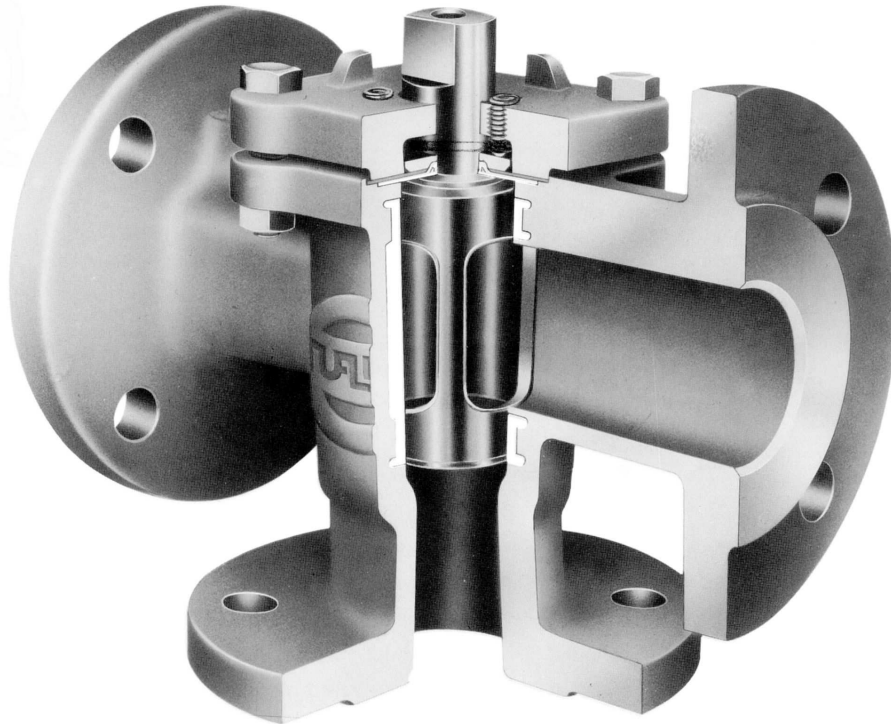


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Design Features of TUFLIN® Multiport Plug Valves with Teflon® Sleeves



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

Components and Material Availability

Available Materials for Multiport 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 Multiport Valves are available in FIRESAFE – design acc. to API 607 4th edition, also with electrostatic eliminator or free of oil and grease.

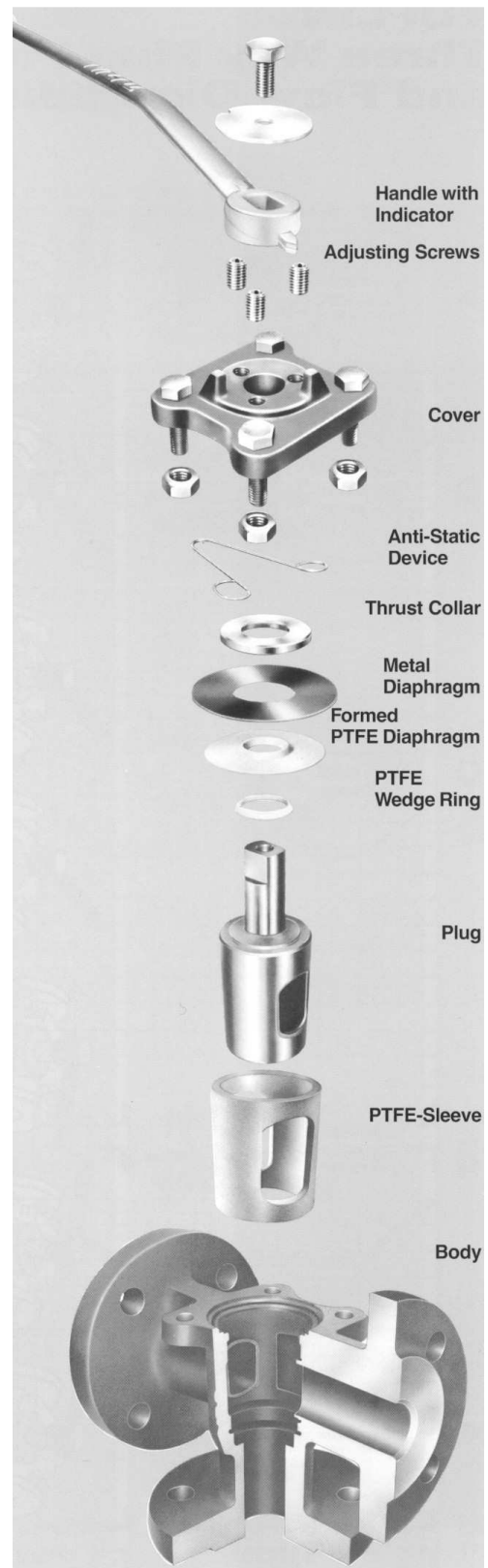
Available Flange Standards:

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)

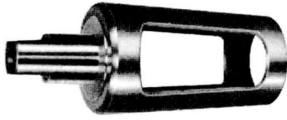


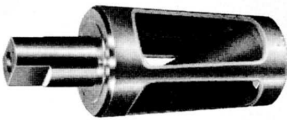



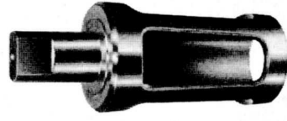






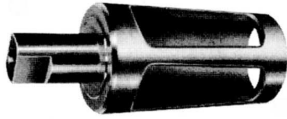




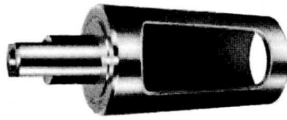

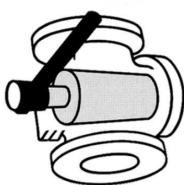

Temperature range: 173 K to 553 K (-100°C to +280° C)
(more details see page 14)
Suitable for vacuum services
(Vacuum range: $1.33 \cdot 10^3$ to $1.33 \cdot 10^{-2}$ mbar)

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.



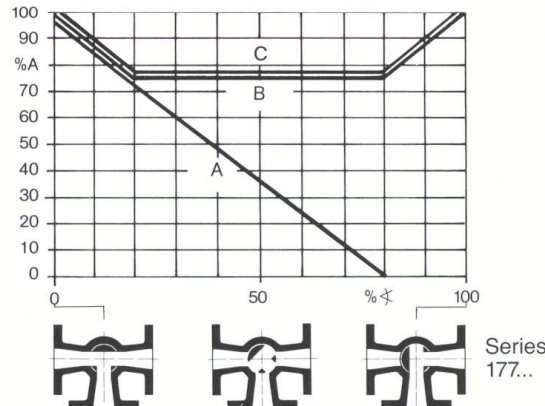
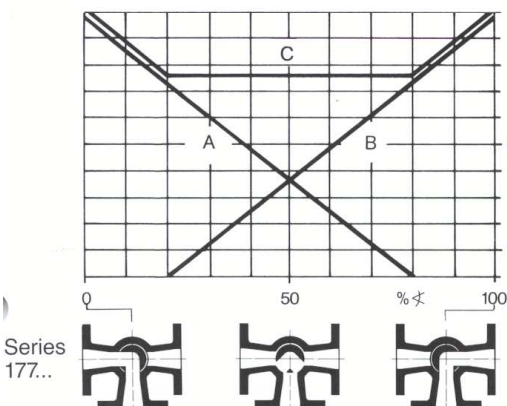
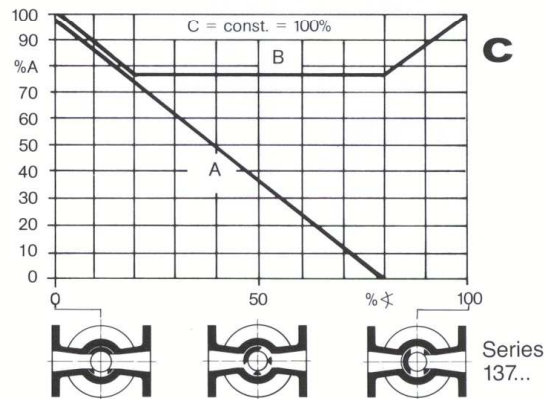
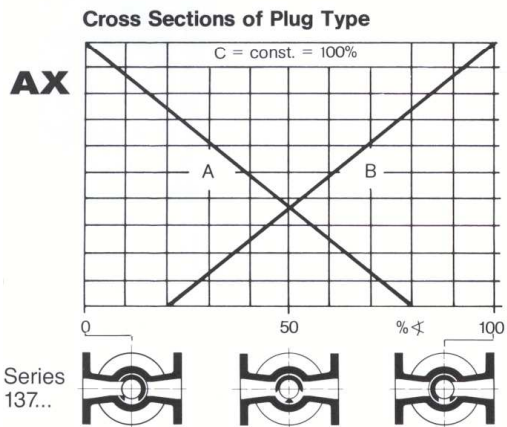
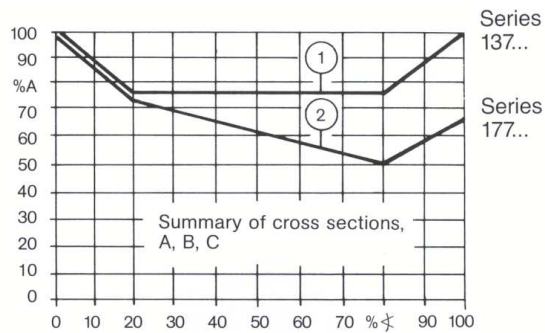
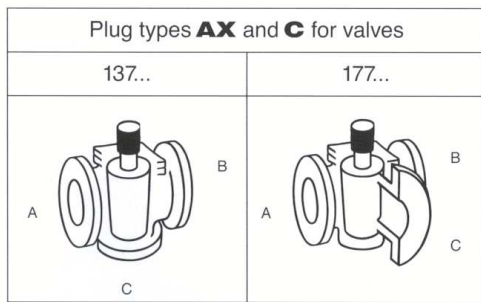
TUFLIN® Three Way Plug Port Arrangements and Flow Directions

Type		Position 1	Position 2	Position 3
I				
D				
C				
				
AX				
				
A				

Handle and position indicator can be refitted 180° from orientation shown.

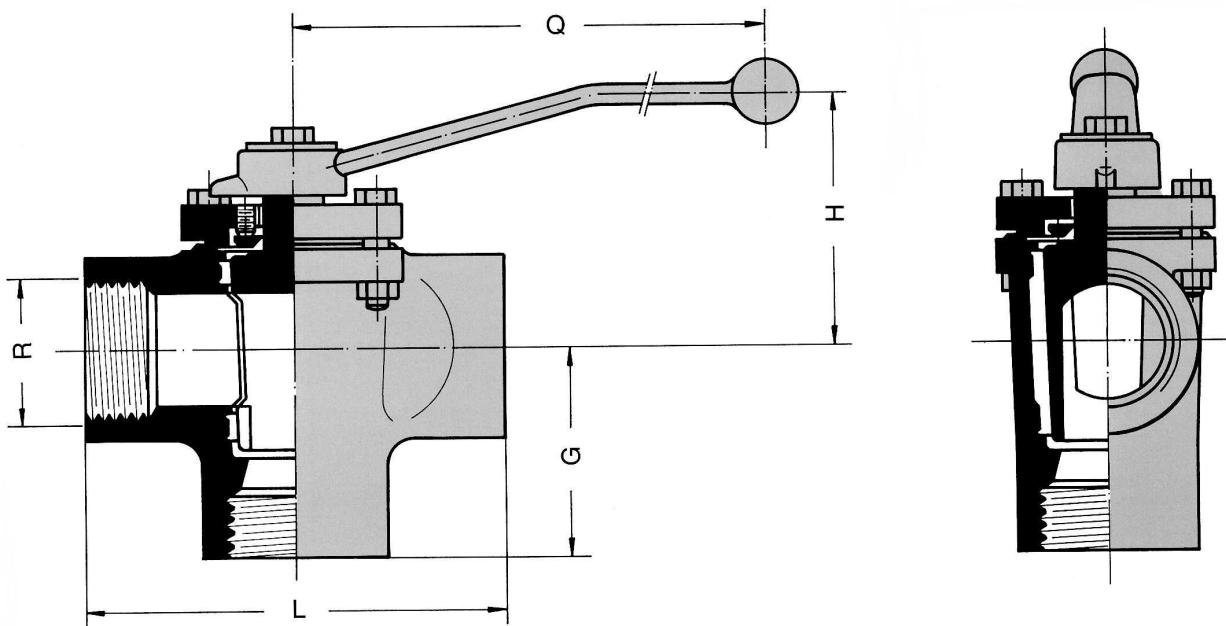
- 1 - Summary of cross sections A+B+C of plug type AX and C (valve series 137...)
- 2 - Summary of cross sections A+B+C of plug type AX and C (valve series 177...)
- A - Cross section of view A
- B - Cross section of view B
- C - Cross section of view C

% A = Cross section in %; < % = Angel in %



TUFLIN® Three Way Valves with Screwed Ends

Type 136 DIN PN 10-40 Whitworth R ½ - 2
 Type 036 ASME Class 150 NPT R ½ - 2
 Type 0336 ASME Class 300 NPT R ½ - 2
 Type 0636 ASME Class 600 NPT R ½ - 2



Dimensions in mm

DN	NPS	R NPS 136	R NPS 036-0336-0636	L	G	H	Q	Approx. Weight in kg
15	½	R ½ *	½ NPT	85	43	76	180	0.8
20	¾	R ¾ *	¾ NPT	85	43	76	180	0.7
25	1	R 1 *	1 NPT	118	59	96	260	2.2
40	1 ½	R 1 ½ *	1 ½ NPT	140	70	106	362	3.8
50	2	R 2 *	2 NPT	165	83	118	435	6.5

Please indicate type of plug when ordering.

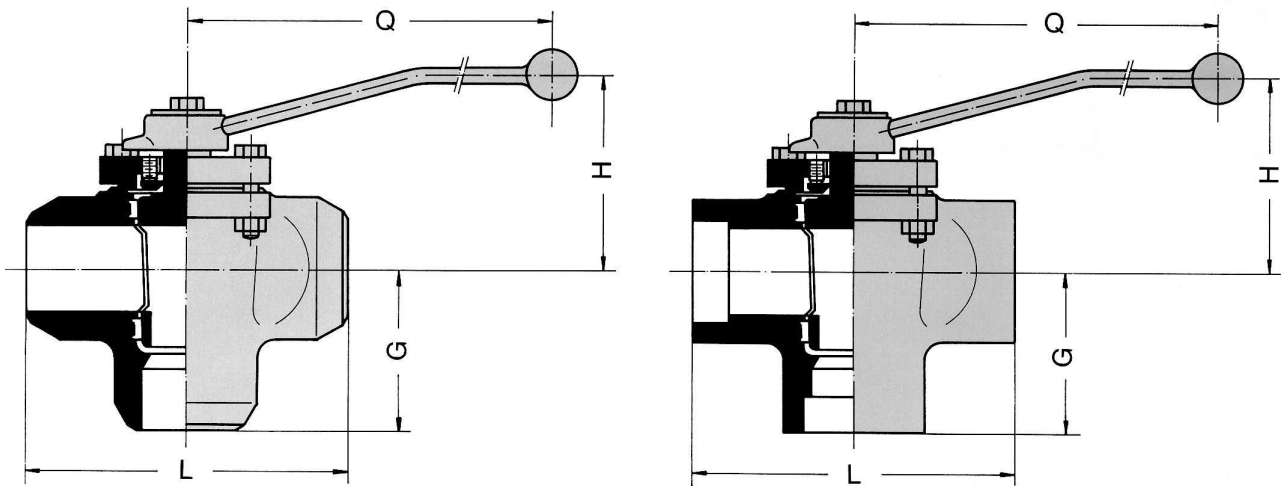
TUFLIN® Three Way Valves with Weld Ends

Type 136 BW or SW
 Type 036 BW or SW
 Type 0336 BW or SW
 Type 0636 BW or SW

DIN PN 10 - 40
 ASME Class 150
 ASME Class 300
 ASME Class 600

DN 15 - 50
 NPS ½ - 2
 NPS ½ - 2
 NPS ½ - 2

Other sizes on request.



Dimensions in mm

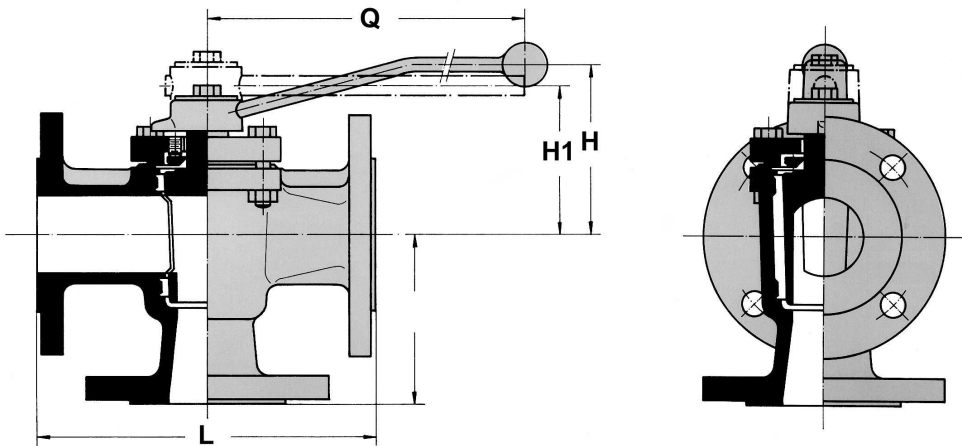
DN	NPS	L	G	H	Q	Approx. Weight in kg (BW)	Approx. Weight in kg (SW)
15	½	85	43	76	180	0.8	0.7
20	¾	85	43	76	180	0.8	0.6
25	1	118	59	96	260	2.1	2.3
40	1 ½	140	70	106	362	3.7	4.0
50	2	165	83	118	435	6.4	6.5

Please give pipe details, indicate type of plug and dimensions when ordering.

TUFLIN® Three Way Valves with Flanged Ends

Type 137	DIN PN 10 - 40	DN 15 - 100
Type 037	ASME Class 150	NPS ¼ - 4
Type 0337	ASME Class 300	NPS ½ - 4
Type 0637	ASME Class 600	NPS ½ - 4

Above DN 100 / NPS 4 please see page 10.



H1 Hebelausführung DN 100 / NPS 4

Dimensions in mm

DN	NPS	L			G			H	Q	Approx. Weight in kg		
		137	037	0337	137	037	0337			137	037	0337
15	½	130	108	150	65	70	73	76	180	3.3	2.6	4.5
20	¾	150	118	152	75	73	76	76	180	4.0	3.0	4.7
25	1	160	127	159	80	89	95	96	260	6.0	5.0	7.1
32		180			90			96	260	8.3		
40	1 ½	200	165	190	100	105	111	106	362	10.0	7.5	12.0
50	2	230	178	216	115	114	121	118	435	14.2	12.0	15.2
65		290			145			112	435	18.0		
80	3	310	203	283	155	130	141	132	435	23.0	20.0	28.0
100	4	350	229	305	175	152	171	151	600	33.0	34.5	48.5

Please indicate type of plug when ordering.

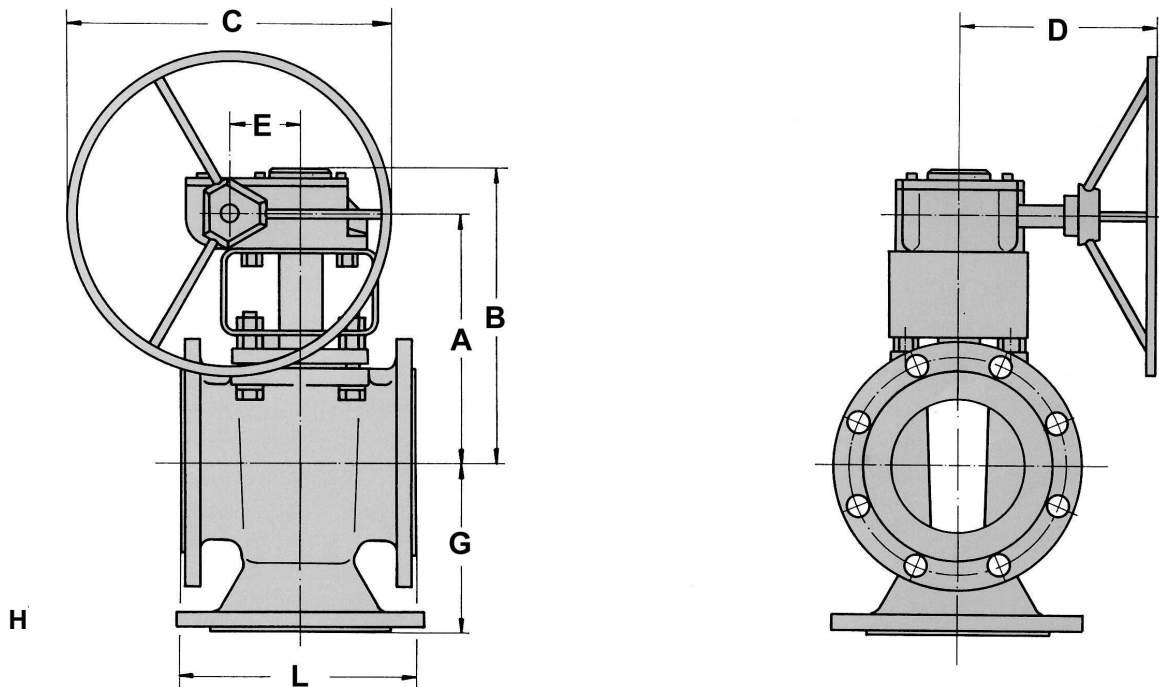
Dimensions of flanges in accordance with standards.

TUFLIN® Three Way Valves with Flanged Ends

Type 137 G	DIN PN 10 - 40	DN 80 - 300
Type 037 G	ASME Class 150	NPS 3 - 12
Type 0337 G	ASME Class 300	NPS 3 - 8
Type 0637 G	ASME Class 600	on request

Below DN 80 / NPS 3 please see page 9

“G” indicates gear operated



Dimensions in mm

DN	NPS	L			G			A	B	C	D	E	Approx. Weight in kg		
		137	037	0337	137	037	0337						137	037	0337
80	3	310	203	283	155	130	141	204	236	200	169	52			
100	4	350	229	305	175	152	171	235	267	200	169	52			
125	5	267	267		190	190		308	347	300	223	67	60.9	60.9	
150	6	267	267	403	190	190	216	308	347	300	223	67	63.8	63.8	104.8
200	8	292	292	419	229	229	254	345	384	300	223	67	103.0	103.0	142.0
*250	10	330	330		290	280		450	494	457	279	90	118.5	118.5	
*300	12	356	356		350	350		478	522	457	279	90	180.0	180.0	

*PN 10 - 16 only (higher pressure classes on request).

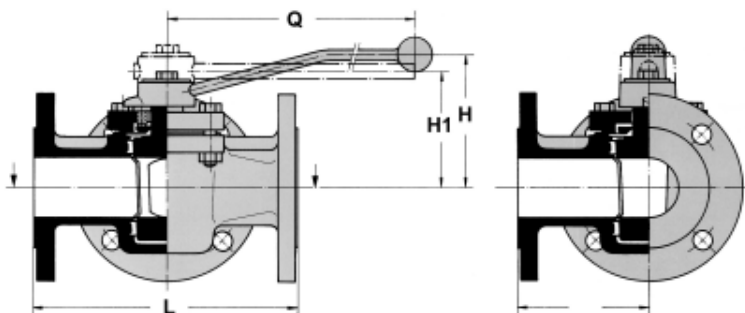
Please indicate type of plug when ordering.

Dimensions of flanges in accordance with standards.

TUFLIN® Three Way Valves with Flanged Ends

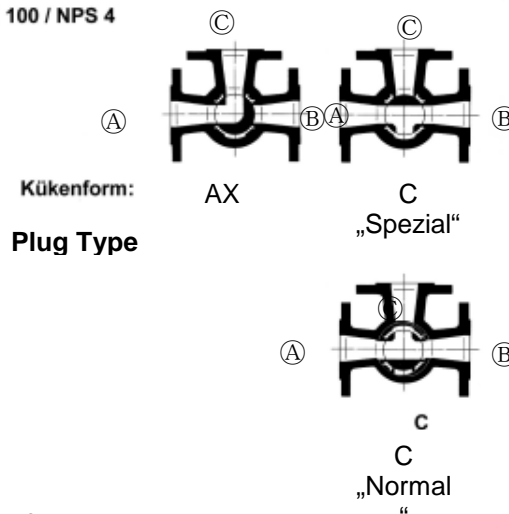
Type 177	DIN PN 10 - 40	DN 15 - 100
Type 077	ASME Class 150	on request
Type 0377	ASME Class 300	on request
Type 0677	ASME Class 600	on request

Above DN 100 / NPS 4 please see page 12



H1: Hebelausführung DN 100 / NPS 4

Lever design DN 10/NPS 4



Kükenform:
Plug Type

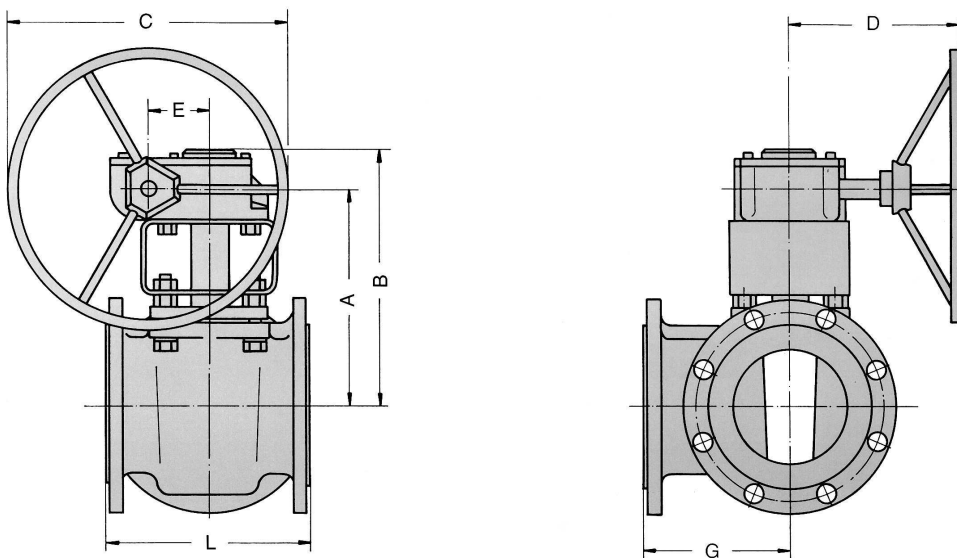
Dimensions in mm for Type 177

DN	NPS	L	G	H	Q	Approx. Weight in kg
15	½	130	65	76	180	3.3
20	¾	150	75	76	180	4.2
25	1	160	80	96	260	6.0
32	1 ¼	180	90	96	260	8.0
40	1 ½	200	100	106	362	10.5
50	2	230	115	118	435	15.0
65	2 ½	290	145	112	435	18.5
80	3	310	155	132	435	19.0
100	4	350	175	151	600	34.5

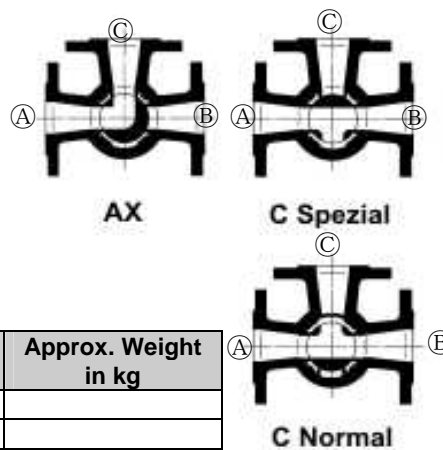
Please indicate type of plug when ordering.
Dimensions of flanges in accordance with standards.

Type 177 G	DIN PN 10 - 40	DN 80 - 200
Type 077 G	ASME Class 150	on request
Type 0377 G	ASME Class 300	on request
Type 0677 G	ASME Class 600	on request

Below DN 80 / NPS 3 please see page 11 "G" indicates gear operated



Plug Type



Dimensions in mm for Type 177

DN	NPS	L	G	A	B	C	D	E	Approx. Weight in kg
80	3	310	155	204	236	200	169	52	
100	4	350	175	235	267	200	169	52	
125	5	267	200	308	347	300	223	67	63.5
*150	6	267	185	308	347	300	223	67	68.5
*200	8	292	260	345	384	300	223	67	109.0

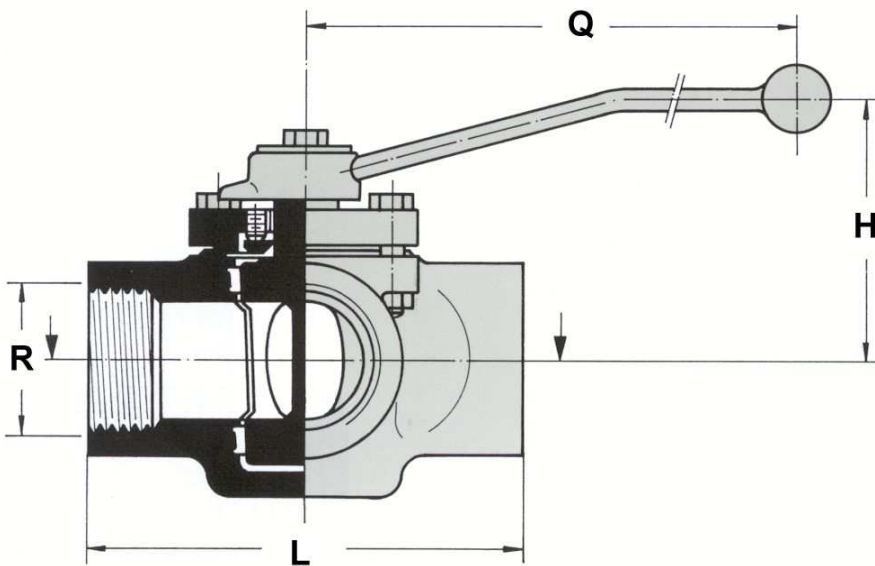
* PN 10-16 only (higher pressure classes on request)

Please indicate type of plug when ordering.

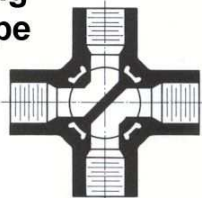
Dimensions of flanges in accordance with standards.

TUFLIN® Four Way Valves with Screwed Ends

Type 146 DIN PN 10-40 Whitworth R NPS ½ - 2
 Type 046 ASME Class 150 NPT ½ - 2
 Type 0346 ASME Class 300 NPT ½ - 2

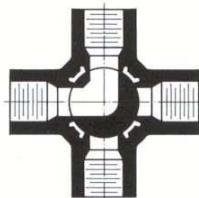


Plug Type

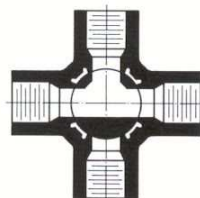


V

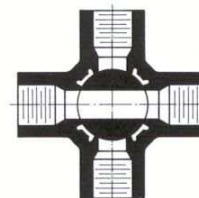
Standard Version



AX



C



Through Port

Dimensions in mm

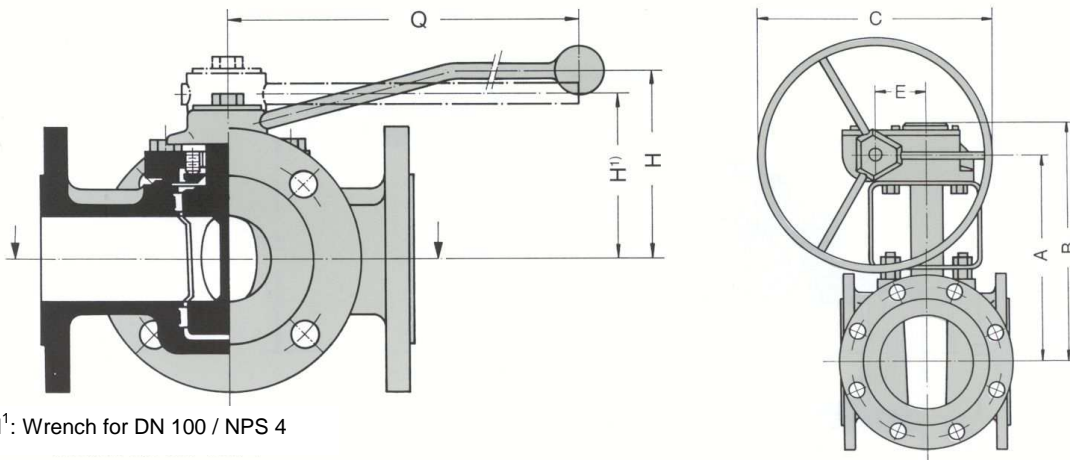
DN	NPS	R			L	H	Q	Approx. Weight in kg
		146	046-0346					
15	½	R ½	½	NPT	118	98	362	3.7
20	¾	R ¾	¾	NPT	118	98	362	4.0
25	1	R 1	1	NPT	118	98	362	4.4
40	1½	R 1½	1 ½	NPT	140	107	362	5.6
50	2	R 2	2	NPT	165	123	435	10.2

Please indicate type of plug when ordering.

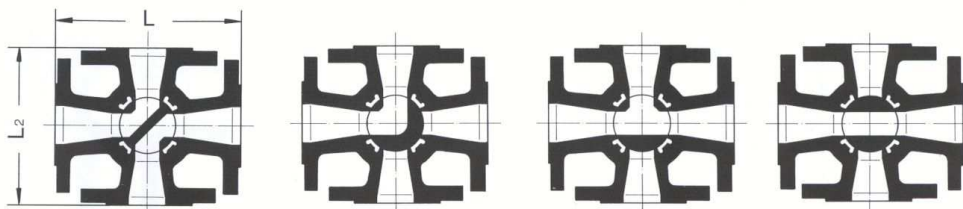
TUFLIN® Four Way Valves with Flanged Ends

Type 147 and 147G DIN PN 10 - 40 DN 15 - 200
 Type 047 and 047G ASME Class 150 NPS 1 - 8
 Type 0347 and 0347G ASME Class 300 on request

“G” indicates gear operated



H¹: Wrench for DN 100 / NPS 4



Plug Type: V Standard design AX C Through-Port

Dimensions in mm

Type 147	Material			Type 047	Material			Approx. Weight in kg									
	Ductile Iron	Steel and Other Alloys			Ductile Iron	Steel and Other Alloys		Ductile Iron		Steel and Other Alloys							
DN	L=L2	L	L 2	NPS	L=L2	L	L2	H	Q	A	B	C	E	Type 147	Type 047	Type 147	Type 047
15		150	150					98	362							6.4	
25	160	160	160	1	160	127	127	98	362					8.5	6.5	8.5	5.5
40	200	200	200	1 ½	200	164	165	107	362					13.8	8.7	13.8	9.0
50	230	230	230	2	230	178	178	118	435					21.5	17.5	21.5	17.5
*80	310	203	260	3	310	203	260	132	435					27.0	28.0	27.0	28.0
*100		229	305	4		229	305	151	600							44.0	49.5
*150	480	267	370	6	480	267	370			388	427	300	67	85.7	85.7	85.7	85.7
*200	600	292	520	8	600	292	520			425	464	300	67	120.0	120.0	120.0	120.0

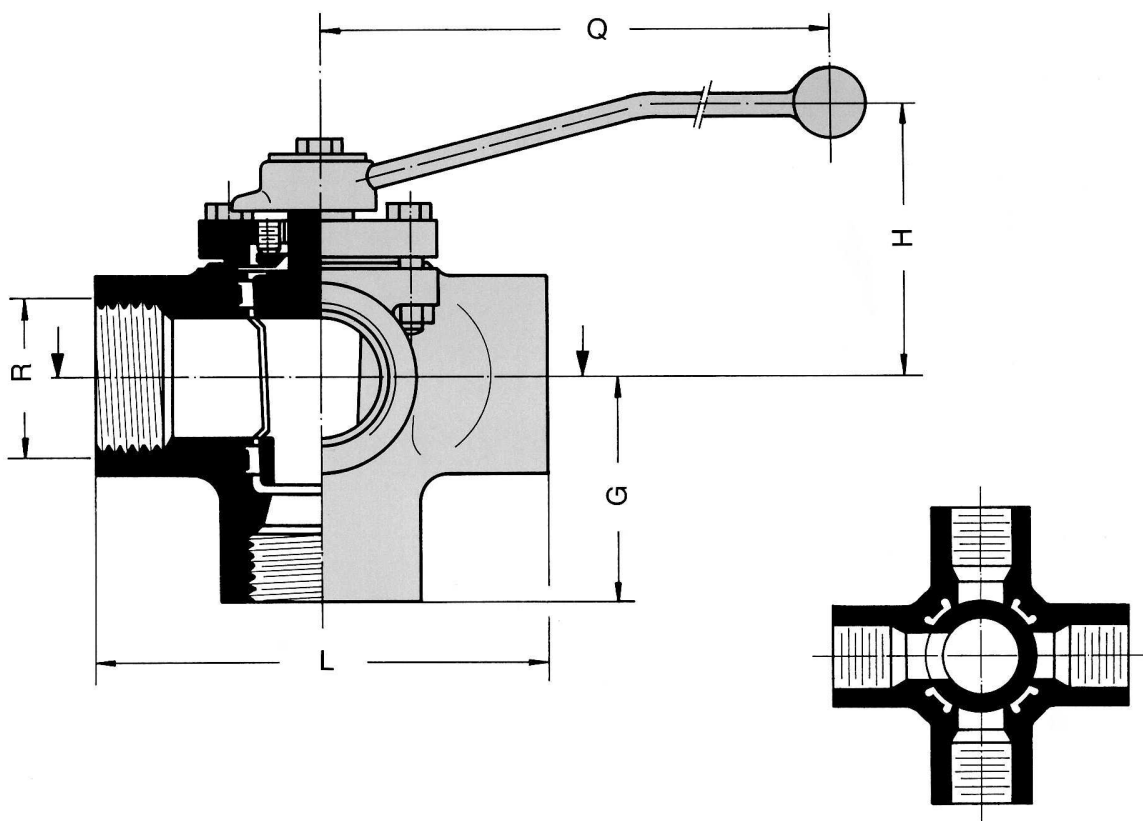
* PN 10 - 16 only (other pressure classes on request)

Please indicate type of plug when ordering.

Dimensions of flanges according to standards.

TUFLIN® Five Way Valves with Screwed Ends

Type 156 DIN PN 10 – 40 Whitworth R NPT ½ - 2
 Type 056 ASME Class 150 NPT ½ - 2
 Type 0356 ASME Class 300 NPT ½ - 2



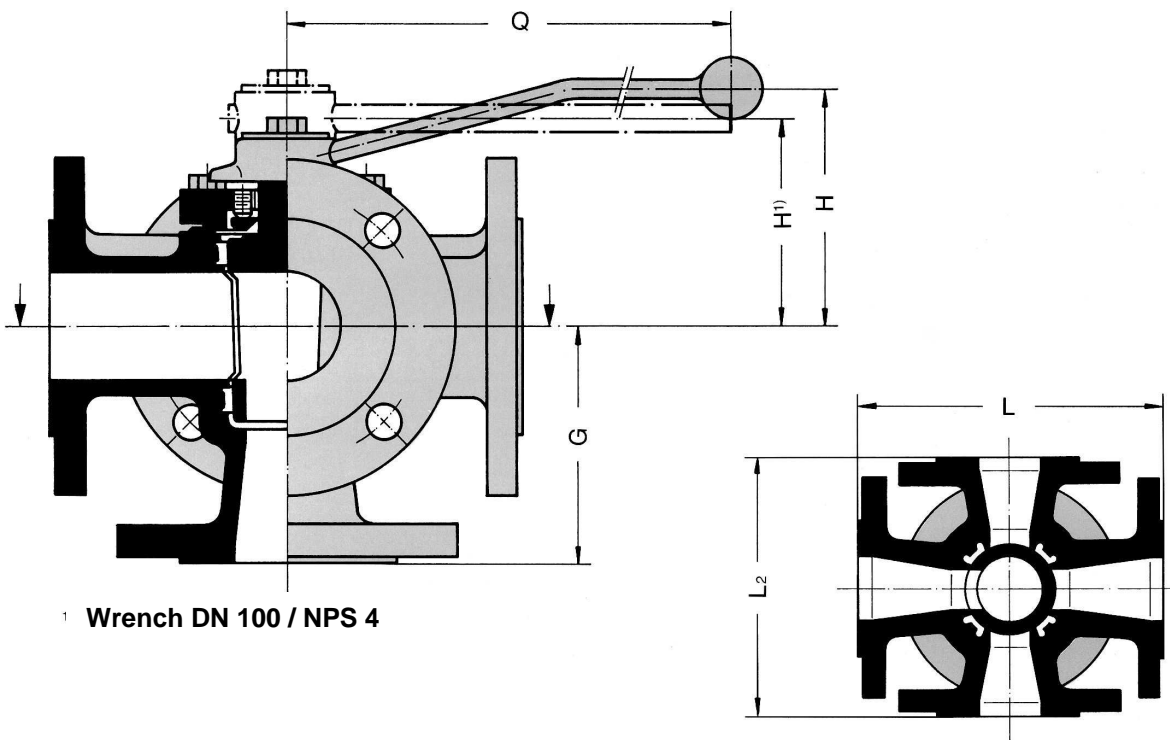
Plug Type AF

Dimensions in mm

DN	NPS	R		L	G	H	Q	Approx. Weight in kg
		156	056-0356					
15	½	R ½	½ NPT	118	59	98	362	3.7
20	¾	R ¾	¾ NPT	118	59	98	362	4.1
25	1	R1	1 NPT	118	59	98	362	4.5
40	1 ½	R 1 ½	1 ½ NPT	140	70	107	362	5.9
50	2	R 2	2 NPT	165	83	123	435	11.2

TUFLIN® Five Way Valves with Flanged Ends

Type 157 DIN PN 10 – 40 DN 25 - 100
 Type 057 ASME Class 150 NPS 1 - 4
 Type 0357 ASME Class 300 on request



Plug Type AF

Dimensions in mm

DN	Type 157			Type 057			G	H	Q	Approx. Weight in kg	
	L	L2	G	NPS	L	L2				Type 157	Type 057
25	160	160	80	1	127	127	86	98	362	10.2	6.8
40	200	200	100	1 ½	165	165	99	107	362	16.0	11.0
50	230	230	115	2	178	178	118	123	435	24.5	20.0
*80	203	260	130	3	203	260	130	132	435	31.0	33.2
*100	229	305	152	4	229	305	152	151	600	49.5	57.0

* PN 10 - 16

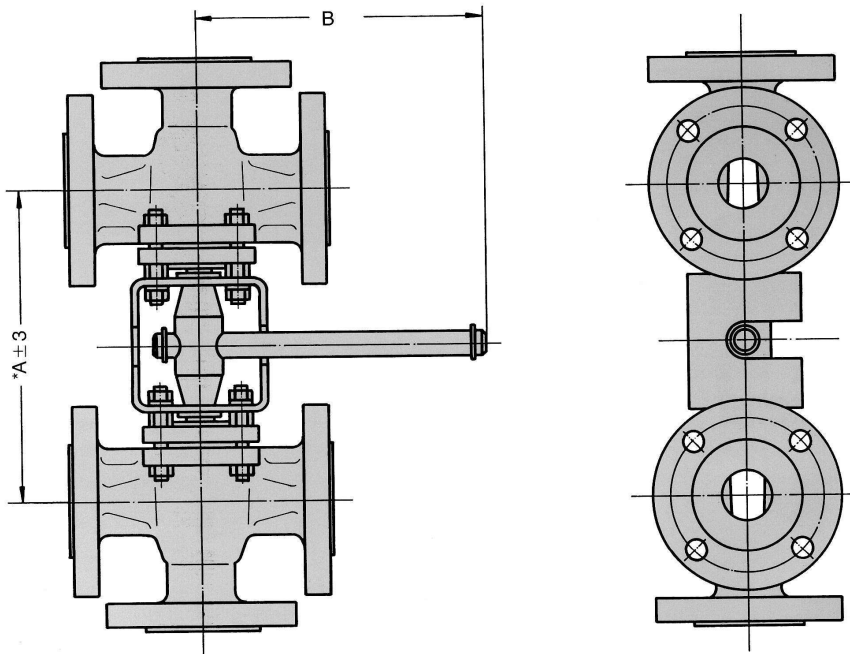
Dimensions of flanges acc. to standards.

TUFLIN® Interconnected Multiport Valves Wrench Operated

Type H 10 137 (Linked Three Way Valves Type 137)
 Type H 10 037 (Linked Three Way Valves Type 037)
 Type H 100337 (Linked Three Way Valves Type 0337)
 Type H 100637 (Linked Three Way Valves Type 0637)

DN 15 - 65
 NPS ½ - 2
 NPS ½ - 2
 on request

Above DN 65 / NPS 2 ½: with gear operator: please see page 19
 with pneumatic actuator: please see page 20



Dimensions in mm

Dimensions in mm				Approx. Weight in kg		
DN	NPS	*A	B	Type H 10 137	Type H 10 037	Type H 10 0337
15	½	150	243	8.0	6.7	10.5
20	¾	150	243	9.3	7.5	10.9
25	1	203	293	14.0	11.8	16.2
32		203	293	18.5		
40	1 ½	240	393	23.0	18.0	27.0
50	2	290	593	33.5	30.0	36.3
65		277	593	42.0		

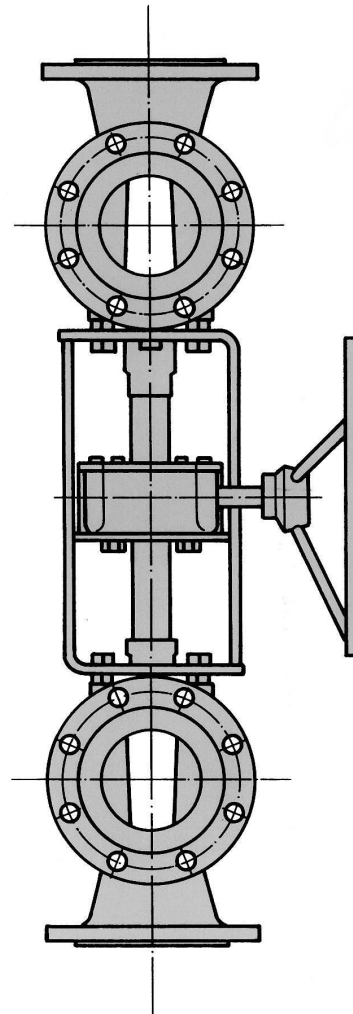
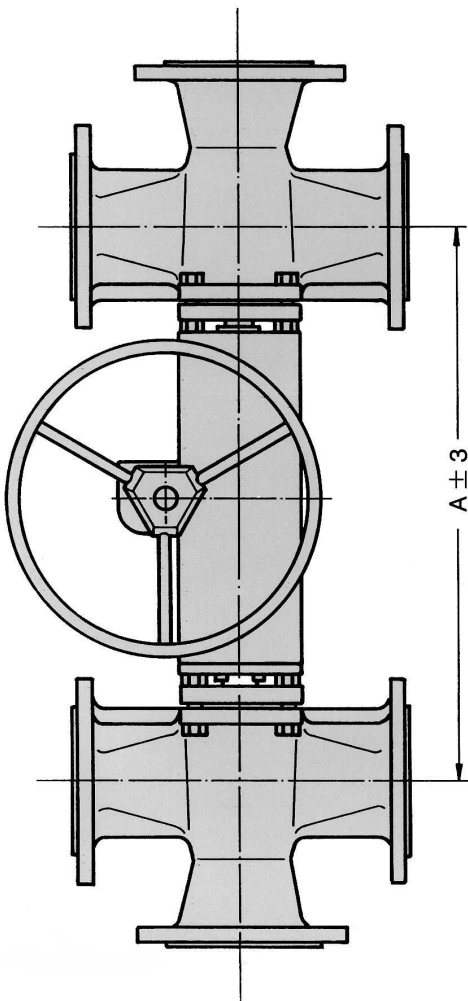
* Standard center distance
 Other dimensions on request.

For dimensions of valves see appropriate page.
 Please indicate types of plug and send flow sheet with required positions when ordering.
 Combinations of different sizes of XOMOX plug and butterfly valves are possible.

TUFLIN® Interconnected Multiport Valves Gear Operated

Type G 10 137 (Linked Three Way Valves Type 137)
 Type G 10 037 (Linked Three Way Valves Type 037)
 Type G 100337 (Linked Three Way Valves Type 0337)
 Type G 100637 (Linked Three Way Valves Type 0637)

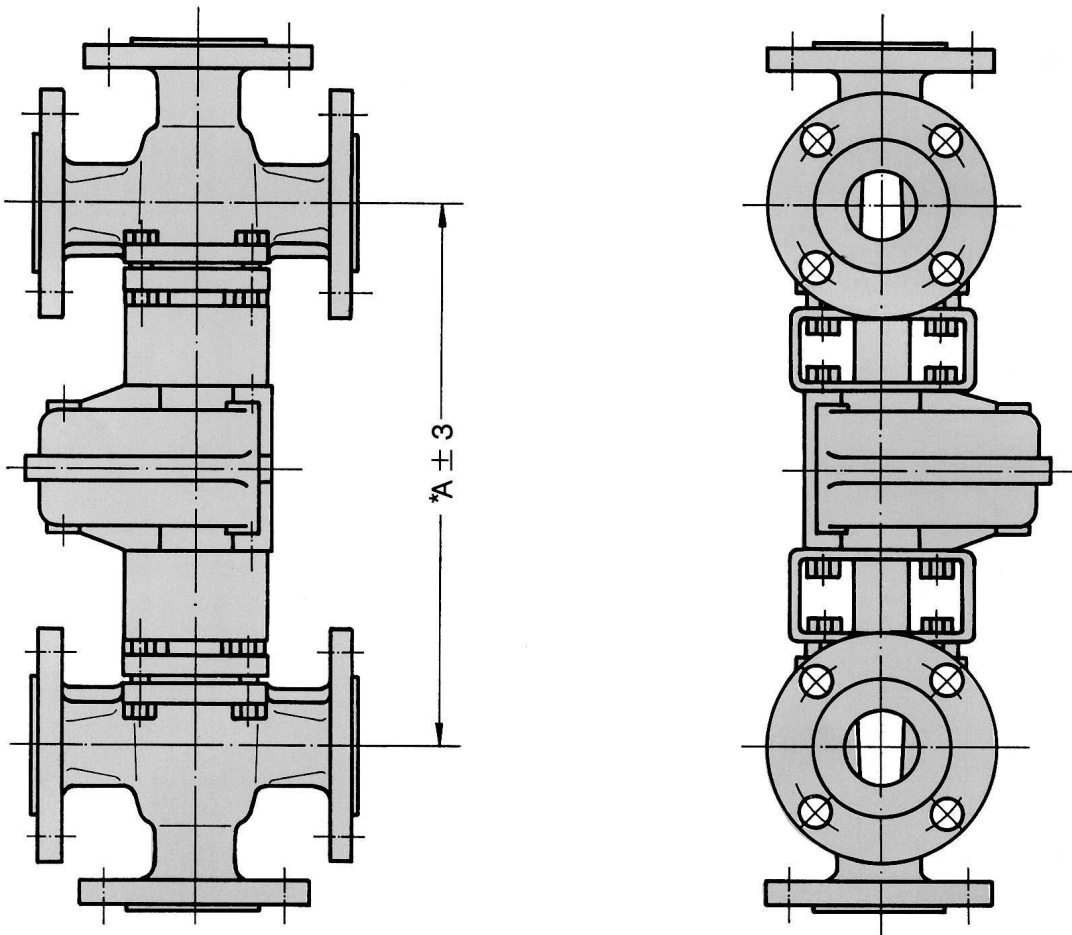
DN 80 - 300
 NPS 3 - 12
 PS 3 - 8
 on request



For dimensions of valves please see appropriate page.
 Please indicate types of plug and send flow sheet with required positions when ordering.
 Center distance "A" to suit individual application.
 Combinations of different sizes and types of valves on request.

Type PN 10 137 (Liked Three Way Valves Type 137) DN 15 - 100
 Type PN 10 037 (Liked Three Way Valves Type 037) NPS ½ - 4
 Type PN 100337 (Liked Three Way Valves Type 0337) NPS ½ - 4
 Type PN 100637 (Liked Three Way Valves Type 0637) on request

Above DN 100 / NPS 4 on request



For dimensions of valves please see appropriate page.
 Please indicate type of plug and send flow sheet with required positions when ordering.
 Center distance "A" to suit individual application
 Combinations of different sizes and types of valves on request.

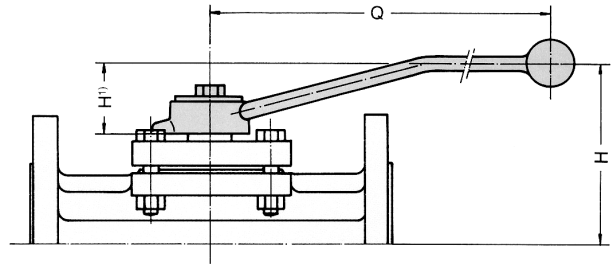
TUFLIN® Design and Dimensions of Wrenches (with flow direction indicator)

- 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**
 (Recommended wrench for isolated piping systems.)

Dimensions in mm

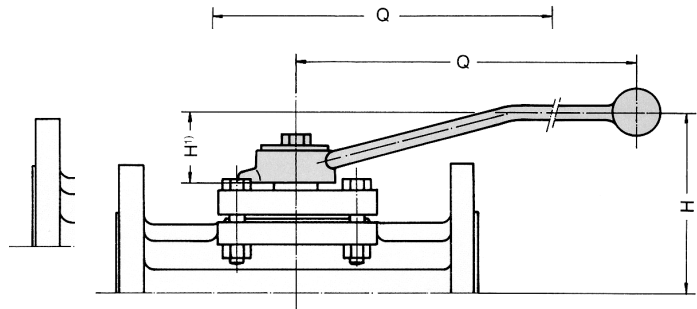
DN	NPS	H	H1	Q	Approx. Weight in kg
15	½	76	45	180	0.1
20	¾	76	45	180	0.1
25	1	96	46	260	0.2
32		96	46	260	0.2
40	1 ½	106	45	362	0.3
50	2	118	47	435	0.4
65		112	47	435	0.4
80	3	132	47	435	0.4

Standard wrench DN 100 / NPS 4: Fig. 2



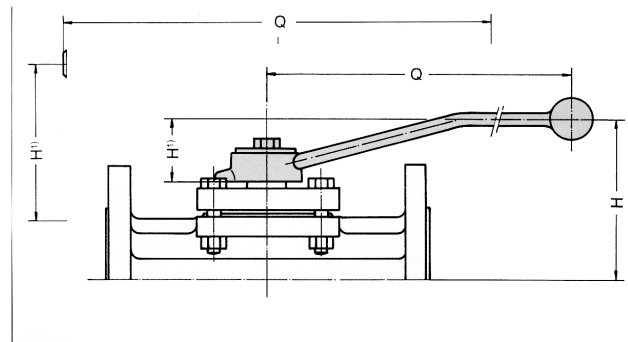
Dimensions in mm

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



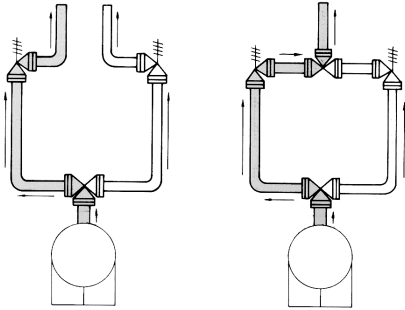
Dimensions in mm

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

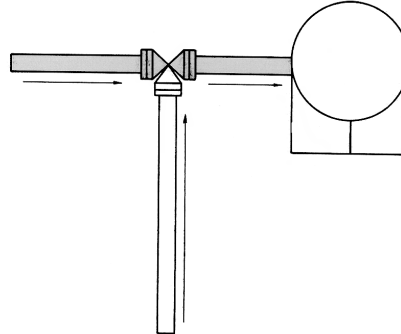


As standard DN 125 – 300 / NPS 5 – 12 are equipped with worm gear (see page 11)
 Other dimensions on request.

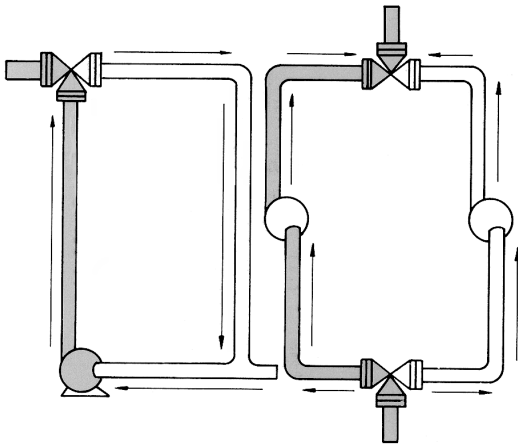
Typical Applications of TUFLIN®-Multiport Plug Valves



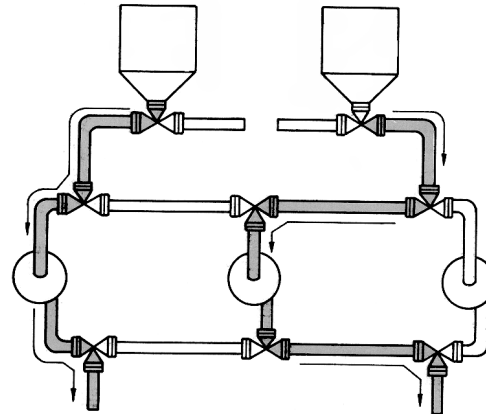
Three-way changeover valves for pressure relief duties (no shut off during plug rotation)



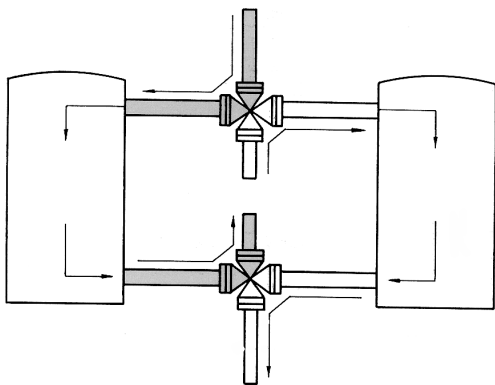
Three-way valves as by-pass or for mixing operation



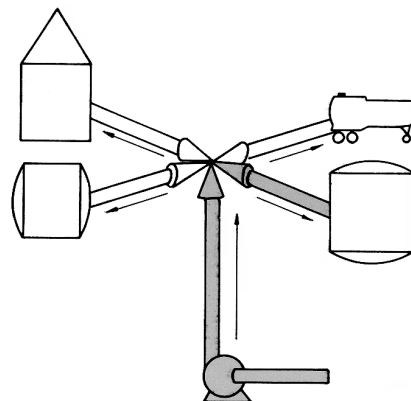
Three way switchover valves for filtration circuits



Three way valves in the pulp and paper industries



Three and four way valves in filtration or drying plants.



Five way valves for multi point distribution

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