

Ball valve type 21



body material	PVC-U	PVC-C	PP	PVDF
ball seat	PTFE			
other seats	• EPDM	• FPM	• *)	
working temperature	0 °C to 50 °C ¹⁾	0 °C to 90 °C ¹⁾	-20 °C to 80 °C ¹⁾	-20 °C to 100 °C ¹⁾
nominal size	DN 10 to DN 100			
connection with pipe	<ul style="list-style-type: none"> • socket or spigot end • flanged end acc. to DIN 2501 - PN 10 / 16 		<ul style="list-style-type: none"> • butt weld spigot • threaded socket 	
length	acc. to EN 558-1 series FTF 1 (DIN 3202 - series F 1)			
actuator	lever, optional pneumatic or electric actuator			
accessories	limit switches, solenoid valves, stemextensions			

*) special versions: CSM, NBR, FPM-F, FEP/Parofluor on request

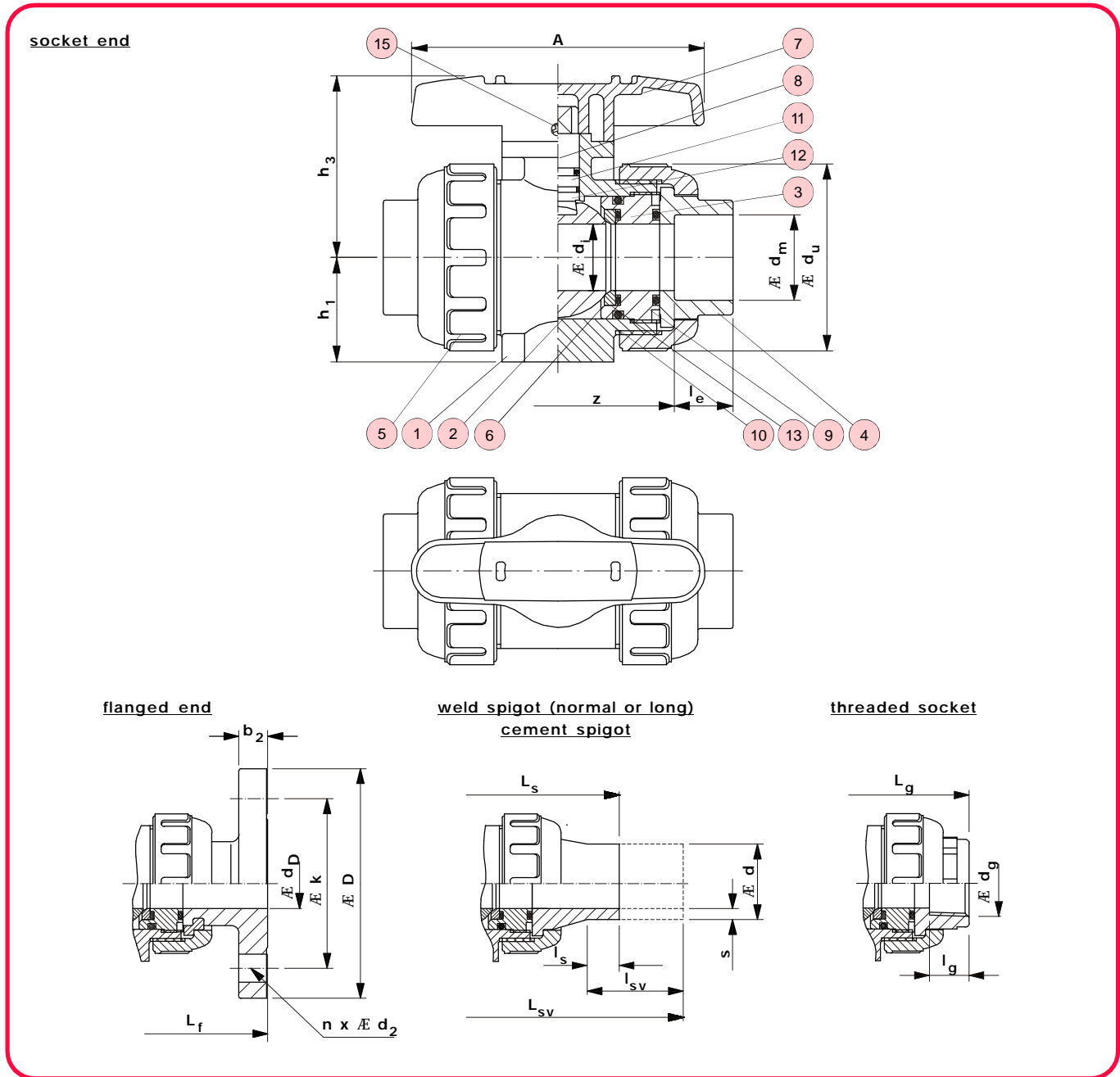
¹⁾ working temperatures of seat materials:

- EPDM: -20 bis 90 °C
- NBR: -20 bis 100 °C
- FPM: -8 bis 100 °C

example for an advertised bidding:

Ball valve type 21 DN 50, PN 16, PVC/EPDM, flange connection acc. to DIN 2501 PN 10 /16, length acc. to EN 558-1, series FTF 1, top flange acc. to DIN/ISO 5211 for actuator assembly, integrated bottom stand

Ball valve type 21



no.	name	qty.	material
1	body	1	PVC-U, PVC-C, PP, PVDF
2	ball ^{*)}	1	PVC-U, PVC-C, PP, PVDF
3	carrier	1 ¹⁾	PVC-U, PVC-C, PP, PVDF
4	end connector (socket, spigot, flange)	2	PVC-U/-C, PE, PP, PVDF
5	union nut	2	PVC-U, PVC-C, PP-G, PVDF
6	stem ^{*)}	1	PVC-U, PVC-C, PP, PVDF
7	ball seat ^{*)}	2	PTFE
8	O-ring(A) ^{*)}	2	EPDM, FPM ²⁾

no.	name	qty.	material
9	O-ring(B) ^{*)}	1	EPDM, FPM ²⁾
10	O-ring(C)/flat seat ^{*,3)}	2	EPDM, FPM ²⁾
11	O-ring(D) ^{*)}	1	EPDM, FPM ²⁾
12	O-ring(E) ^{*)}	1	EPDM, FPM ²⁾
13	stop ring ⁴⁾	2	PVDF
14	handle	1	ABS
15	handle screw ⁵⁾	1	W-Nr. 1.4301

^{*)} wearing parts
¹⁾ DN 65 to DN 100 2 pieces
²⁾ special version CSM, NBR, FPM-F, FEP/Parofluor on request

³⁾ flat seat for DN 65 and above
⁴⁾ with flanged version only
⁵⁾ DN 65 and above

Ball valve type 21

Dimensions and weights - flanged connection

DN	dimensions in mm										weight in kg/pc.			
	d_i	d_u	k	D	L_f	h_1	h_3	A	b_2	$n \times d_2$	PVC-U	PVC-C	PP	PVDF
10	13	46	60	90	120	-	43,5	80	12,5	4 x 14	0,32	0,35	0,21	0,40
15	15	48	65	95	130	29	51,5	92	12,5	4 x 14	0,40	0,44	0,26	0,50
20	20	60	75	105	150	35	59,5	100	14,5	4 x 14	0,60	0,65	0,38	0,74
25	25	70	85	115	160	39	68	110	14,5	4 x 14	0,79	0,85	0,51	0,97
32	31	82	100	140	180	47	80,5	121	16,5	4 x 18	1,23	1,33	0,79	1,52
40	40	100	110	150	200	55	89	131	16,5	4 x 18	1,65	1,78	1,06	2,03
50	51	126	125	165	230	66	102	159	16,5	4 x 18	2,46	2,70	1,58	3,70
65	58	133	145	185	290	72	126	200	18	4 x 18	3,30	3,50	2,10	4,00
80	68,5	152	160	200	310	85	140	240	21	8 x 18	4,60	5,40	3,00	5,70
100	90	210	180	220	350	110	178	300	18	8 x 18	9,80	10,60	6,30	12,10

Dimensions and weights - weld spigot (butt weld or electric weld)

DN	dimensions in mm												weight in kg/pc.			
	d	d_i	d_u	$s^{3)}$ SDR 17,6	$s^{3)}$ SDR 11	$l_{SV}^{2)}$	$l_S^{1)}$	$L_{SV}^{2)}$	$L_S^{1)}$	h_1	h_3	A	PVC-U	PVC-C	PP	PVDF
15	20	15	48	-	2,5	47	30	239	167	29	51,5	92	0,18	0,19	0,12	0,23
20	25	20	60	-	2,7	64	25	243	170	35	59,5	100	0,27	0,29	0,19	0,36
25	32	25	70	-	3,0	61	18	252	176	39	68	110	0,39	0,42	0,27	0,51
32	40	31	82	-	3,6	65	20	278	185	47	80,5	121	0,61	0,66	0,41	0,78
40	50	40	100	2,9	4,6	69	20	295	196	55	89	131	0,95	1,02	0,63	1,20
50	63	51	126	3,6	5,8	78	18	352	214	66	102	159	1,67	1,80	1,09	2,09
65	75	58	133	4,3	6,9	89	18	380	230	72	126	200	2,10	2,25	1,48	2,70
80	90	68,5	152	5,1	8,2	101	40	442	322	85	140	240	3,10	3,30	2,38	4,30
100	110	90	210	6,3	10,0	101	38	512	350	110	178	300	8,90	9,80	5,70	10,10

1) weld spigot (PEHD, PP-R, PVDF)

2) long weld spigots (PEHD, PP-R) for electric welding

3) PVDF-weld spigot SDR 33 / SDR 21 with differing wall thickness

Dimensions and weights - cement socket / weld socket

DN	dimensions in mm											weight in kg/pc.				
				cement socket			weld socket						cement socket		weld socket	
	d_i	d_u		d_m	l_e	z	d_m	l_e	z	h_1	h_3	A	PVC-U	PVC-C	PP	PVDF
10	13	46		16	14	71	15,5	13	71	-	43,5	80	0,14	0,16	0,09	0,18
15	15	48		20	16	70	19,5	16	72	29	51,5	92	0,19	0,20	0,12	0,23
20	20	60		25	19	82	24,5	18	77	35	59,5	100	0,29	0,32	0,19	0,34
25	25	70		32	22	87	31,5	19	83	39	68	110	0,42	0,45	0,27	0,51
32	31	82		40	26	98	39,45	22	93	47	80,5	121	0,64	0,69	0,41	0,79
40	40	100		50	31	101	49,45	24	102	55	89	131	0,97	1,04	0,62	1,19
50	51	126		63	38	121	62,5	27	124	66	102	159	1,66	1,79	1,06	2,04
65	58	133		75	44	145	74,3	31	145	72	126	200	2,30	2,47	1,48	2,70
80	68,5	152		90	51	180	89,2	35	177	85	140	240	3,80	4,10	2,38	4,40
100	90	210		110	61	227	109,1	41	202	110	178	300	9,20	9,90	5,70	10,80

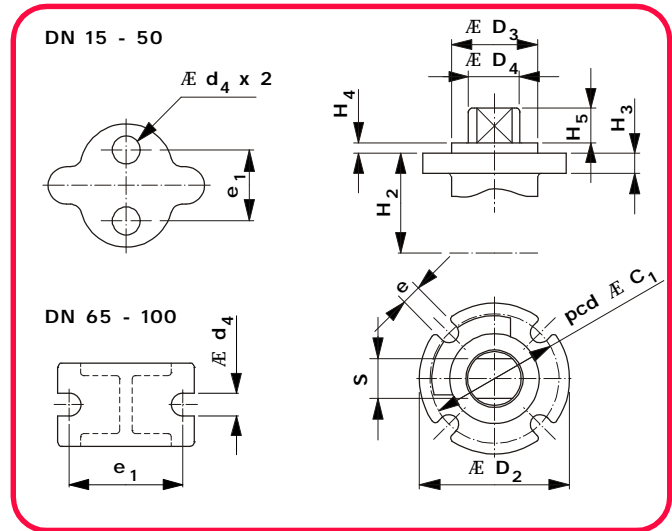
Dimensions and weights - threaded socket / cement spigot

DN	dimensions in mm									weight in kg/pc.							
	d_i	d_u	threaded socket			cement spigot						threaded socket		cement spigot			
			d_g	l_g	L_g	d	l_s	L_s	h_1	h_3	A	PVC-U	PVC-C	PP	PVDF	PVC-U	
10	13	46	R 3/8"	15	99	16	16	114	-	43,5	80	0,15	0,17	0,10	0,19		0,14
15	15	48	R 1/2"	15	102	20	18,5	124	29	51,5	92	0,20	0,21	0,13	0,24		0,19
20	20	60	R 3/4"	17	120	25	24	144	35	59,5	100	0,31	0,33	0,20	0,37		0,29
25	25	70	R 1"	20	131	32	24,5	154	39	68	110	0,43	0,46	0,27	0,52		0,42
32	31	82	R 1 1/4"	22	150	40	28	174	47	80,5	121	0,69	0,74	0,44	0,84		0,64
40	40	100	R 1 1/2"	25	163	50	34	194	55	89	131	1,06	1,15	0,68	1,30		0,97
50	51	126	R 2"	28	197	63	38	224	66	102	159	1,83	1,97	1,17	2,24		1,66
65	58	133	-	-	-	75	44	284	72	126	200	-	-	-	-		2,30
80	68,5	152	-	-	-	90	51	300	85	140	240	-	-	-	-		3,40
100	90	210	-	-	-	110	61	384	110	178	300	-	-	-	-		10,00

Ball valve type 21

Top flange dimensions (DIN/ISO 5211) for actuator assembly

DN	C ₁	D ₂	D ₃	D ₄	e	H ₂	H ₃	H ₄	H ₅	S	d ₄	e ₁
15	36	42	25	13,5	5,5	30	6	3	10	10,5	7,3	19
20	36	42	25	15	5,5	36,5	6	3	10	11	7,3	19
25	36	42	25	15	5,5	43,5	6	3	10	11	7,3	19
32	42	48	30	19	5,5	52,5	8	3	10	15	9	30
40	50	57	35	23	6,5	61	10	3	12	18	9	30
50	50	57	35	23	6,5	72,5	10	3	12	18	9	30
65	70	81	55	30	9	85	13	3	16	24	9	48
80	70	81	55	30	9	94	13	3	19	24	11	55
100	102	116	70	40	11	126	16	3	23	34	11	65



Flow capacity¹⁾ k_v in m³/h

DN	10	15	20	25	32	40	50	65	80	100
k _v [m ³ /h]	6,7	12,0	24,9	40,3	62,4	125,7	156,9	320,0	430,0	720,0

¹⁾ Definition k_v-value see chapter T2 / Technical Information

Actuator torque²⁾ M_A in Nm for ball movement

DN	10	15	20	25	32	40	50	65	80	100
M _A [Nm]	1,6	2,0	2,5	3,2	5,6	8,0	10,0	22,0	40,0	80,0

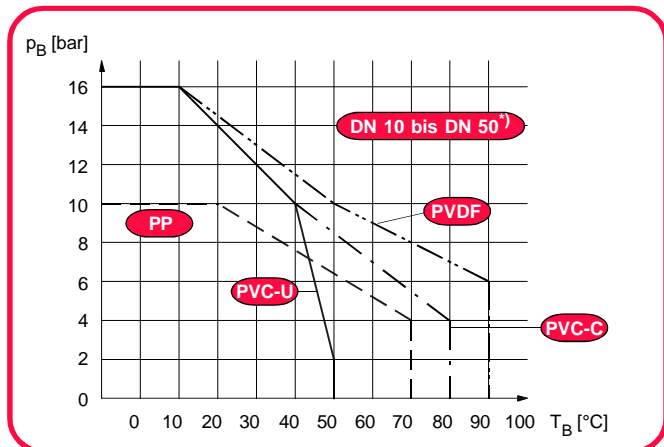
²⁾ all values refer to the maximum differential pressure

Vacuum resistance³⁾ in bar

DN	10 - 100
PVC-U-C, PP, PVDF	1,0

³⁾ all values refer to the range of allowed working pressures

Working pressure⁴⁾ p_B in bar



⁴⁾ differing values for DN 65 to DN 100 see opposite table

body material	T _B in °C	DN			
		10 - 50	65	80	100
PVC-U	0 to 20	16	16	16	10
	50	10	10	10	10
	60	2	-	-	-
PVC-C	0 to 20	16	16	16	10
	50	10	10	10	10
	90	4	4	3	3
PP	-20 to 30	10	10	10	10
	60	6	5	5	5
	80	4	3	3	3
PVDF	-20 to 60	16	16	16	10
	80	10	10	10	10
	90	8	8	7	7
	100	6	6	5	5

⁴⁾ definition of working pressure see chapter T2 / Techn. Information

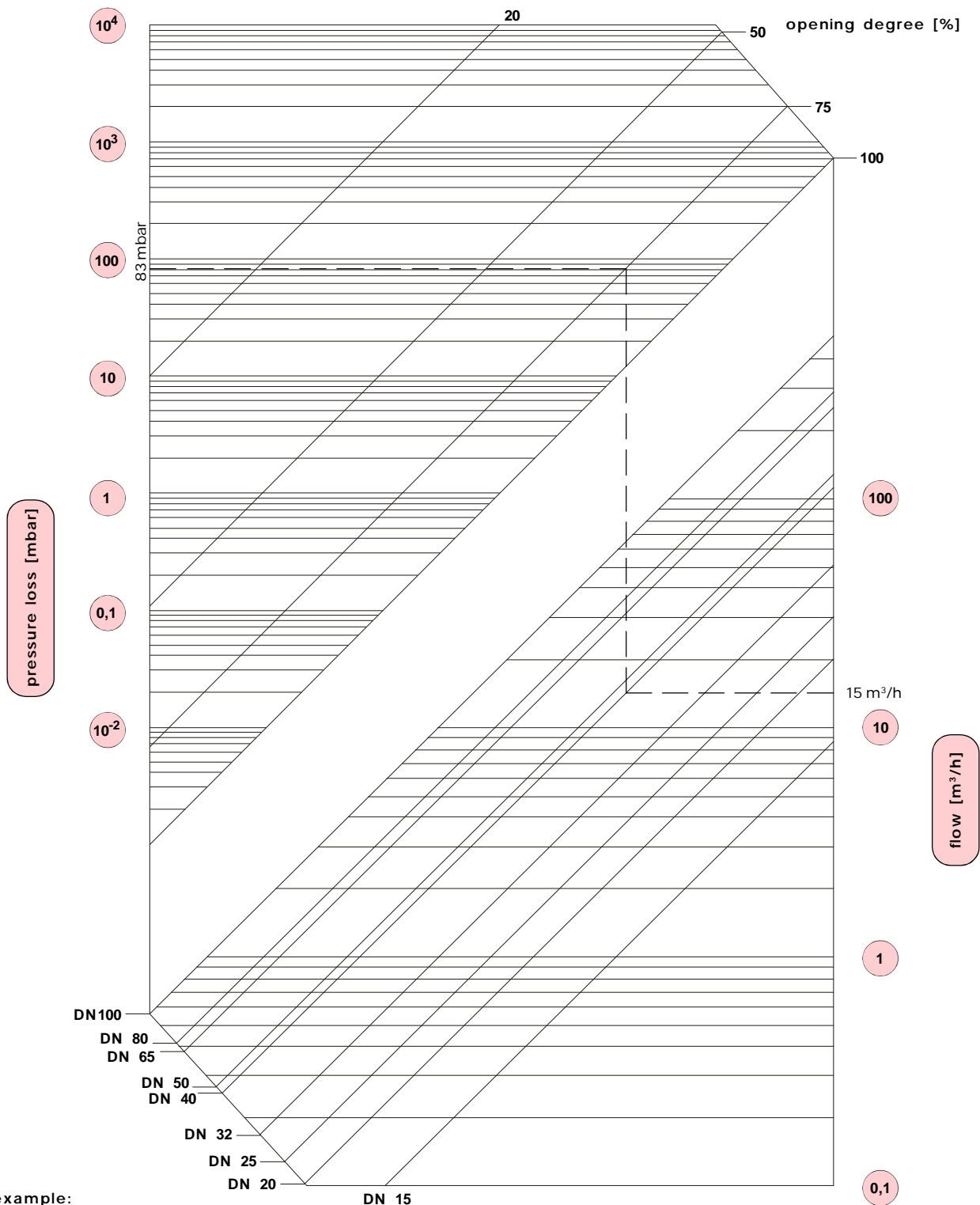
Hydrostatic Bursting pressure⁵⁾ in bar at 22 °C

DN	10	15	20	25	32	40	50	65	80	100
PVC-U	148	122	123	130	120	100	92	70	60	55

⁵⁾ definition of bursting pressure see chapter T2 / Technische Information

Ball valve type 21

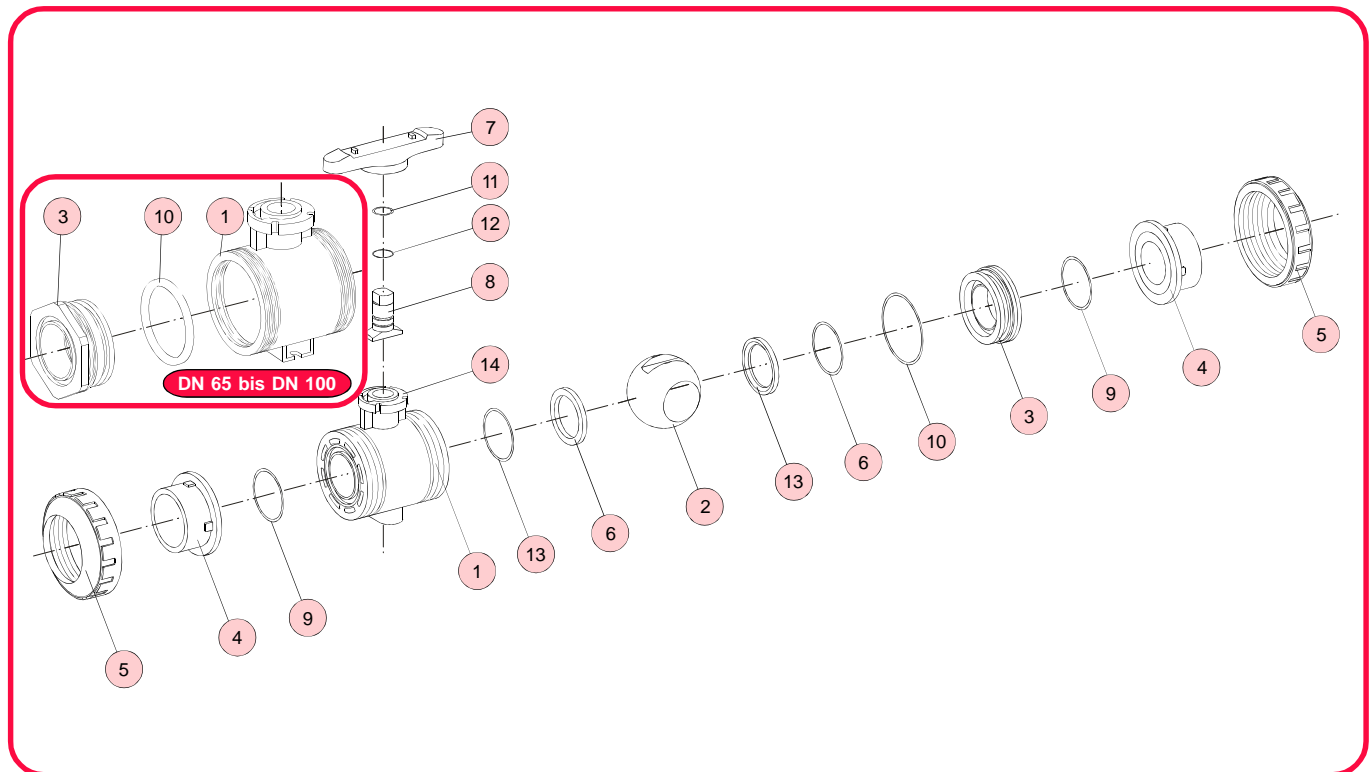
Pressure loss diagramm



example:
 flow: 15 m³/h
 nominal size: 40 mm
 opening degree: 75 %
 pressure loss: 83 mbar

Ball valve type 21

Maintenance and assembly instructions



all sizes

Disassembly of the valve

Caution: Never dismantle the valve when the pipe is under pressure.

- Bring the valve in closed position. (Handle has to be in perpendicular position to pipe.)
- **Caution:** The union nuts have to be loosened and tightened by hand or by a strap wrench. Handling by force has to be avoided.
- Loosen the union nuts 5, disconnect the joints and remove the body part from the pipe.
- DN 65 to DN100: Loosen the handle screw 15.
- Pull the handle 7 off the stem 8. Set the handle with its cams into the carrier 3 and turn it counter-clockwise off the body.
DN 65 and above: Proceed with the second carrier.
- Push the ball 2 carefully out of the body 1.
- Push the stem 8 from the top side into the body and take it out of the body.
- Take the ball seats 6 and the seats 13 out of the body.

Assembly of the valve

- The assembly has to be carried out in reverse procedure.
- Before assembly check all parts for damages and replace them if necessary.
- All parts have to be clean.

- It is important that the carriers 3 are mounted carefully into the body 1 and are tightened continuously with reasonable force. It is important that the O-ring 9 protrudes 1 mm from the body.
Caution: In activity the valve can be damaged when the carriers are mounted unevenly.
- If necessary, apply a silicone free lubricant on the O-rings.
- Before mounting the union nuts 5 check if the handle works smoothly. If necessary, loosen or adjust the carriers to achieve smooth operation.
- After assembly carry out a pressure test acc. to DIN 3230.

Actuator assembly

- Take the handle 7 from the body 1. DN 65 and above: Remove the handle screw 15 before.
- Mount the actuator and its assembly kit acc. to DIN/ISO 5211 onto the top flange 14.

Installation instructions

- Install the valve without invoking material stress, therefore be aware of flange face parallelism, axial misalignment and valve length.
- Flanged type:
Tighten the flange bolts and nuts gradually to the recommended torque in diagonal manner. Using plastic flanges the flange bolts are to be used with washers for both the bolt and the nut.
- Socket and spigot type:
Gluing and welding have to be carried out according to the relevant standards (e.g. DVS).