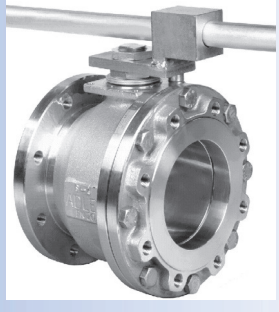


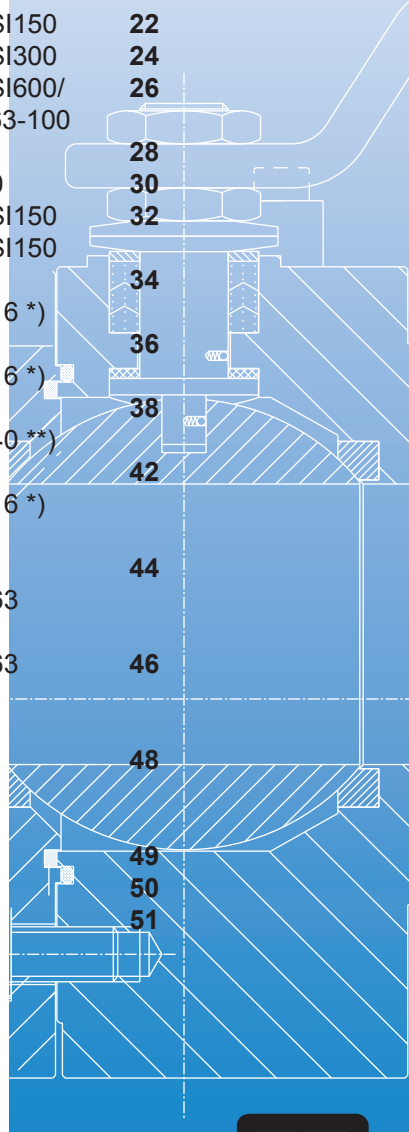
ADLER

DIETRICH SCHWABE

GESELLSCHAFT FÜR STEUER-REGEL-ARMATURENTECHNIK M.B.H.

INDEX

*) available in ANSI 150
**) available in ANSI 150 /ANSI 300
***) available in ANSI 600



PREFACE

ADLER BALL VALVES are high-quality fittings that are produced in Northern Italy according to ASTM and DIN-standards, mainly of rolled or forged material. The standard design includes, among others, the mechanical processing of all medium-contacting parts, an antistatic equipment to discharge any static charges and the blow-off-protected installation of the shafts. Fittings with "FIRE-SAFE"-equipment corresponding to B.S. 6755 part 2 can be delivered on request.

All ADLER ball valves have the connection dimensions according to EN ISO 5211 to set up swivel drives; on request, the ball valves can be delivered completely with pneumatic, electrical or electro-hydraulic drives for OPEN-CLOSED or controlled operation, with position feedback or as self-closing fittings with over-temperature trigger or according to the Deadman principle. ADLER ball valves are generally produced of materials according to ASTM standards. The catalogue sheets show the respective German equivalent. The flange ball valves FM2 and FN2 are preferably produced of DIN materials for the German market in the light of type testing.

Machining of almost all ADLER ball valves enables offering ball valves of special materials such as MONEL, HASTELLOY or titanium to you as well if required. Our compact flanged ball valves are perfect as boiler-drain fittings. We deliver these fittings with passage bores or provide matching screw bolts with collars.
If it is important that as little medium as possible can collet in the dead space of a fitting (separation problems), ADLER ball valves with reduced dead space can be used. The dead space reduction takes place either by spherical processing of the housing inside or by installation of PTFE half-shells, depending on fitting type.

ADLER BALL VALVES can also be offered with flushing connections. Ball valves may become hard-moving specifically at larger rated widths, higher pressure stages and/or viscous, powder- or granulate-shaped media. We offer a number of hand-gears for such cases or at detrimental installation situations.
Ball valves of type FP3 for welding require highest accuracy at installation – particularly for DN65 and up – and the corresponding specialist know-how among the assembly staff.

For certain applications where the medium within the pocket tends to expand, due to temperature differences, state change, chemical reactions or any other reason; we offer ball valves with a overpressure hole on request. This kind of hole unloads the pocket in the direction of the connecting pipe with higher pressure.
For special cases we offer one of our custom-built seats that consist of PTFE alloy with glass, coal, graphite, stainless steel or bronze and seats that are made of a PTFE sintered metal core.

For cases where media enclosed in the dead space tend to expand – by temperature differences, chemical reactions, etc. – we offer ball valves with relief bores on request. These bores relieve the dead space towards the connection line subject to higher pressure.
For special cases, ADLER offers a number of special ball seals (seats) made of alloys of PTFE with glass, coal, graphite, stainless steel or bronze, as well as seats made of a metal core sinter-coated with PTFE.

Since the production month 09/97, all ADLER ball valves of C-steel have been applied with a changed coating (modified epoxide/polyamide primer, colour blue according to RAL 5012, layer thickness of at least 0.030mm). For use outdoors, a proper interim and final coating must be applied no later than after 90 days (see TDA11).

If systems are subject to the ordinance on pressure vessels, individual fittings may also be subject to the ordinance on pressure vessels as equipment parts. In this case, TRB 801 no. 45 must be applied for the fittings.
The ADLER ball valves of the type series FM2 and FN2 comply with this TRB.
Observe that the screws and nuts of strength classes 8.8 or 8 are subject to an operating temperature limitation of 50°C. For higher temperatures, ADLER provides screws and nuts of the A2 classes.

We offer installation, maintenance and operating instructions in German, English, French and Italian for all ADLER ball valves.

IMPORTANT
Our liability at use of our fittings, drives, adjustment or control devices requires that the relevant operating data are always in the range of secured engineering insights. In doubt, we will assume liability only if all relevant usage data have been submitted to us and if we have expressly agreed to the use of our products under these conditions in writing without reservations.

We shall only be liable for the compliance with official or technical provisions if delivery and inspection basics were reported to us in detail according to the applicable rules, provisions, regulations and/or laws before the offer was made or confirmed and accepted by us in writing.

Ball Valves - Article-Code

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
				Material																		
	Type			Body	Ball Stem	DN			Rating	Seats		Options										
Example	F	A	1	C	C	0	1	5	D	T	P	A	4	P	B							

Position 1

F = full
V = ventur
R = reduced

Position 2

A = Ball Valve "Wafer Type"
PN 6-40; ANSI 150-300
B = Ball Valve "Wafer Type"
PN 6-40; ANSI 150-300
C = Ball Valve "Wafer Type"
PN 63-100; ANSI 600
E = Ball Valve, Split Body
ANSI 150, FTF ISO 5752S
F = Ball Valve, Split Body
ANSI 150, FTF ISO 5752M
G = Ball Valve, Split Body
ANSI 300, FTF ISO 5752S
H = Ball Valve, Split Body
PN 63-100; ANSI 600
M = Ball Valve, Split Body
PN 6-40, FTF EN558
N = Ball Valve, Split Body
PN 6-40, FTF EN558
P = Ball Valves with Threaded or
Buttweld Ends, PN 16-100, 800WOG
R = Ball Valves with Threaded or Buttweld
Ends with extended ends, PN 16-100
S = Ball Valves with Threaded Ends
PN 40-100
U = 3-Way-Ball Valves,
120° Way Out, 120° Switching Positions
V = 3-Way-Ball Valves,
90° Way Out, 120° Switching Positions
T = Multi-Way Ball Valve,
90° Way Out, 4 Seats, 90° Switching Positions
Z = 3-Way-Ball Valves,
90° Way Out, 2 Seats, 90° Switching Positions
X = Type A with Heating Jacket
Y = Type B with Heating Jacket
J = Type M with Heating Jacket
K = Type N with Heating Jacket

Position 3

1 = One-Piece Housing
2 = Two-Piece Housing
3 = Three-Piece Housing
4 = 3-Way Flange Connections
5 = 4-Way Flange Connections
6 = 3-Way Female Thread
7 = 4-Way Female Thread

Position 4 and 5

A = A105
B = 304 / CF8
C = 316 / CF8M
D = 1.4401
E = C22.8
F =
G =
H = Hastelloy C276
I =
J = Hastelloy C22
K = 2RE69
L = LF2
M = Monel 400
N = 1.4439
O = Brass
P = SAF 2507
Q = 420
R = Bronce
S = SAF 2205
T = Titan
U = 1.4539
V = 321
W =
X = 316 Ti
Y =
Z =

Position 6, 7 and 8

006 = 6 = 1/4"
010 = 10 = 3/8"
015 = 15 = 1/2"
020 = 20 = 3/4"
025 = 25 = 1"
032 = 32 = 1 1/4"
040 = 40 = 1 1/2"
050 = 50 = 2"
065 = 65 = 2 1/2"
080 = 80 = 3"
100 = 100 = 4"
125 = 125 = 5"
150 = 150 = 6"
200 = 200 = 8"
250 = 250 = 10"
300 = 300 = 12"
350 = 350 = 14"
400 = 400 = 16"

Position 9

A = PN 6
B = PN 10
C = PN 16
D = PN 40
E = PN 63
F = PN 100
G = PN 160
H = PN 250
I = ANSI 150
J = PN 20
K = PN 25
L = ANSI 300
M = ANSI 600
N = ANSI 900
O = ANSI 1500
P = SAE 6000
Q = ANSI 400
R =
S =
T = ANSI 2500

Position 10 and 11

AM = PTFE with Metal Core
TG = PTFE 15% Graphit
TP = PTFE
TS = PTFE Inox
TV = PTFE-reinforced
TN = PTFE Nickel
PK = Peek
PC = PCTFE
TF = TFM
PE = PE
WP = Pocket Less Searts
PTFE-Half-Shells (pure)
WV = Pocket Less Searts
(reinforced) PTFE-Half-Shells
WG = Pocket Less Searts (graphit-
reinforced) PTFE-Half-Shells
DL = Delrin
GG = PTFE with Graphit Block
BR = Bronce
TB = PTFE Bronce Powder
TC = PTFE Hardcarbon
PF = PFA

Position 12 and 13

FG = GAS
FN = NPT
TC = Tri clamp
BW = BW
SW = SW
PW = plain ends

BG = BW+GAS
BS = BW + SW
BN = BW + NPT
GN = GAS + NPT
GS = GAS + SW
NS = NPT + SW

Position 12, 13 and 14

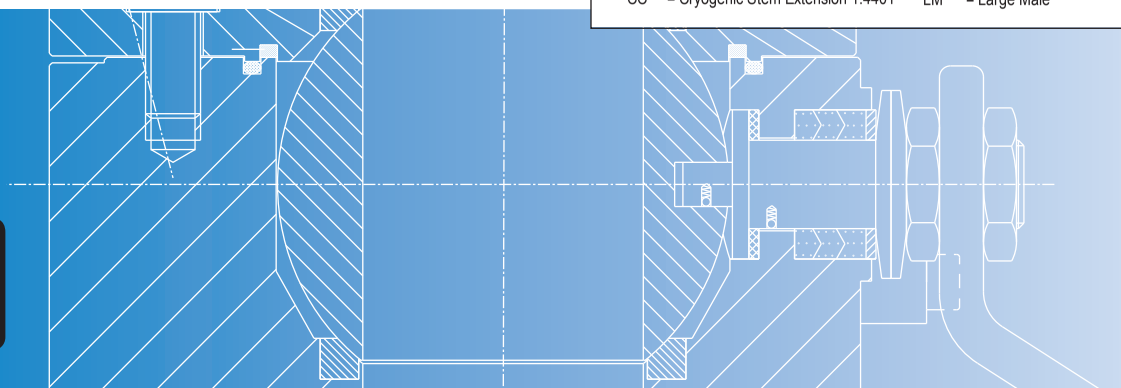
CA0 = Heating Jacket (C21) without Connections
CA1 = Heating Jacket (C21) with Female Thread BSP F/F
CA2 = Heating Jacket (C21) with Buttweld Ends
CA3 = Heating Jacket (C21) with Flange Connection PN16
CA4 = Heating Jacket (C21) with Flange Connection ANSI 150
CA5 = Heating Jacket (C21) with Flange Connection ANSI 300
CA6 = Heating Jacket (C21) with Plain Ends
CA7 = Heating Jacket (C21) iwth Socket Connection
CA8 = Heating Jacket (C21) with Flange Connection ANSI 600

CB.... = Stainless Steel Heating Jacket (1.4301) see above
CC.... = Stainless Steel Heating Jacket (1.4401) see above

The options of ball valves are sorted alphabetically, inserted at position 12 in the code.

Options

A2 = Housing Screws A2
A4 = Housing Screws A4
AGR = Seal in Graphit (O-Ring)
AP = O-Ring in PTFE
AV = Seal in VITON (O-Ring)
B = Special 304
BC = Bussola PTFE carbone
CA = Cryogenic Stem Extension C21
CB = Cryogenic Stem Extension 1.4301
CC = Cryogenic Stem Extension 1.4401
CK = Connection with CAMLOCK-Coupling
EF = Stud Bolt (metrical) C21
EFB = Stud Bolt (metrical) 1.4301
EFU = Stud Bolt (metrical) UNC
EFBU = Stud Bolt (metrical) 1.4301 UNC
EQ = Over Pressure Hole into the Ball
FS = Fire Safe
LF = Large Female
LG = Large Groove
LM = Large Male
LT = Large Tongue
MF = Male/Female
MO = Hand Wheel oval
MT = Reduced Dead Space
(spherical bore)
NT = Positive Overlap
O = O-Ring Viton (Stem Seal)
PA = Stem Extension C21
PB = Stem Extension 1.4301
PE = Seats and Seals are in PE
PI = Housing Screws, Spring Washers,
Nuts and Stop Pin are in Stainless Steel
PIV = es. PIVOT
PU = Seats, Seals and Chevron-Rings
are in PTFE (pure)
PVP = Chevron Rings in PTFE (pure)
SC = Ball, hard chromed
SF = Small Female
SG = Small Groove

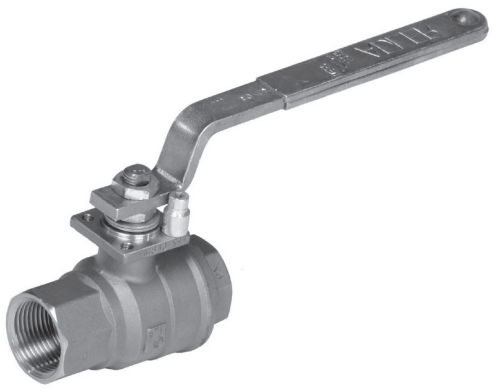


Article-Code
Ball Valves

SOCKET BALL VALVE TYPE FP2

full bore

Face to Face acc. to DIN 3202 M3



Specifications

Nominal Width	: DN 06 to 50
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench
Working Pressure	: PN 40 to 100
max. Working Overpressure	: acc. to Pressure-Temperature-Diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange Dimensions acc.t o EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti-Blow-Out Stem
- Antistatic Device
- Face to FAce acc. to DIN 3202
- Chevron Rings
- Double Seals
- All Broach Surfaces are Mechanical Shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)

Torque
(with PTFE-Seats)

DN	Nm
06	9,6
10	9,6
15	13,0
20	25,0
25	29,0
32	36,0
40	66,0
50	88,0

Measured with 40bar water and room temperature. Another nominal pressure to inquiry.

Material

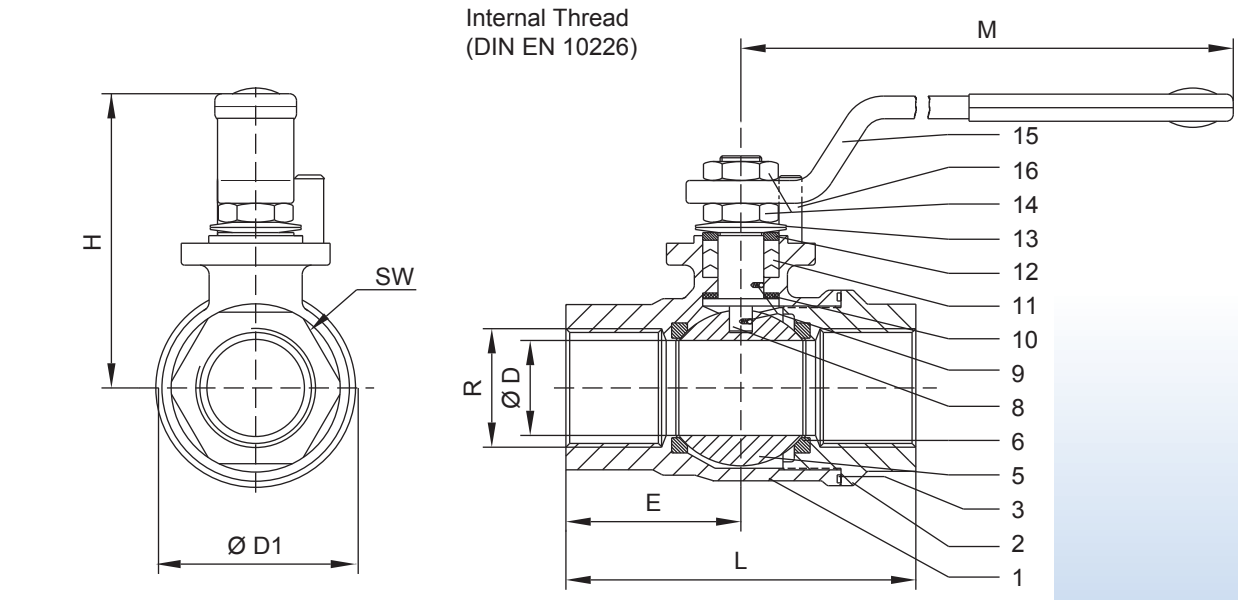
No.	Description	Piece	Material	Carbon-Steel dt. Equivalent	Material	Stainless Steel dt. Equivalent
1	Body	1			ASTM A 351 CF8M	1.4401
2	End	1			ASTM A 351 CF8M	1.4401
3	Seal	1			PTFE	P.T.F.E.
5	Ball	1			ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2			PTFE	P.T.F.E.
8	Stem	1			ASTM A 182 F316	1.4401
9	Antistatic Device	2			ASTM A 182 F316	1.4401
10	Stem Seal	1			PTFE	P.T.F.E.
11	Chevron Rings	1			PTFE/Graphit	P.T.F.E./Graphit
12	Pressing Bush	1			ASTM A 182 F316L	1.4404
13	Spring Washer	2			C72*	50CrV4 *
14	Nut	2			UNI 3740 6S*	
15	Wrench	1			ASTM A 182 F304	1.4301
16	Stop Pin	1			UNI 3740 8.8	DIN EN ISO 4762

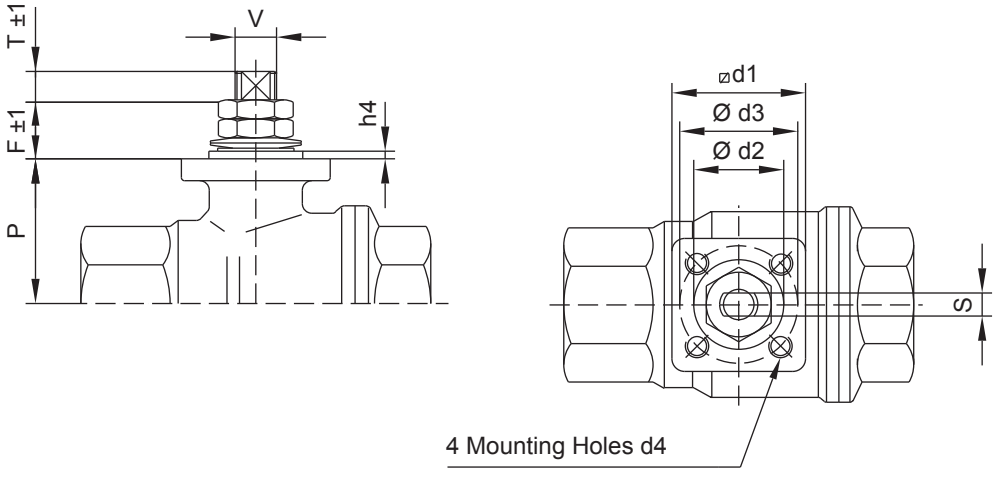
*) electroplated zinc coating

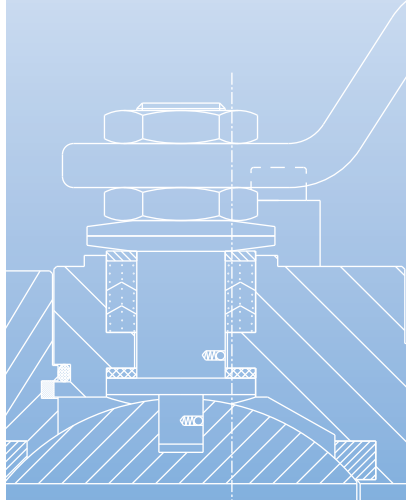
SOCKET BALL VALVE TYPE FP2

full bore

Face to Face acc. to DIN3202 M3







Dimensions in mm

DN	PN	R*)	ØD	D1	E	H	L	F	SW	M	P	S	T	V	d1	d2	d3	d4	h4	EN ISO 5211	Weight (kg)
06	100	1/4"	10	31	25	46	50	11	22	120	17,5	5	5,5	8	33	25	36	M5	1,5	F03	0,3
10	100	3/8"	10	31	30	46	60	11	22	120	17,5	5	5,5	8	33	25	36	M5	1,5	F03	0,35
15	63	1/2"	15	39	37,5	66	75	13,5	26	145	26	6	7	10	36	25	36	M5	1,5	F03	0,45
20	63	3/4"	19	44	40	68	80	13,5	32	145	28,5	6	7	10	36	25	36	M5	1,5	F03	0,60
25	63	1"	25	53	45	85	90	16,5	38	185	41	8	9,5	12	36	25	36	M5	2	F03	0,90
32	63	1 1/4"	30	61	55	91	110	16,5	47	185	45,5	8	9,5	12	36	25	36	M5	2	F03	1,25
40	63	1 1/2"	38	72	60	106	120	19,5	54	280	50,5	10	14,5	16	51	35	50	M6	2	F05	2,10
50	63	2"	51	93	70	116	140	19,5	66	280	60,5	10	14,5	16	51	35	50	M6	2	F05	3,60

*) R = Internal Thread acc. to DIN EN 10226

SOCKET BALL VALVE TYPE FS2

full bore

Face to Face acc. to DIN 3202 M3

Specifications

Nominal Width	: DN 06 to 50
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench
Nominal Pressure	: PN 40 to 100
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Torque
(with PTFE-seats)

DN	Nm
06	9,6
10	9,6
15	13,0
20	25,0
25	29,0
32	36,0
40	66,0
50	88,0

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Utilities

- Mounting Flange Dimensions acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti-Blow-Out Stem
- Antistatic Device
- Face to Face acc. to DIN 3202 M3
- Contained Seals
- Double Seals
- All Broach Surfaces are Mechanical Shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Type FR2 (BW) with prewelded nipples available

Material

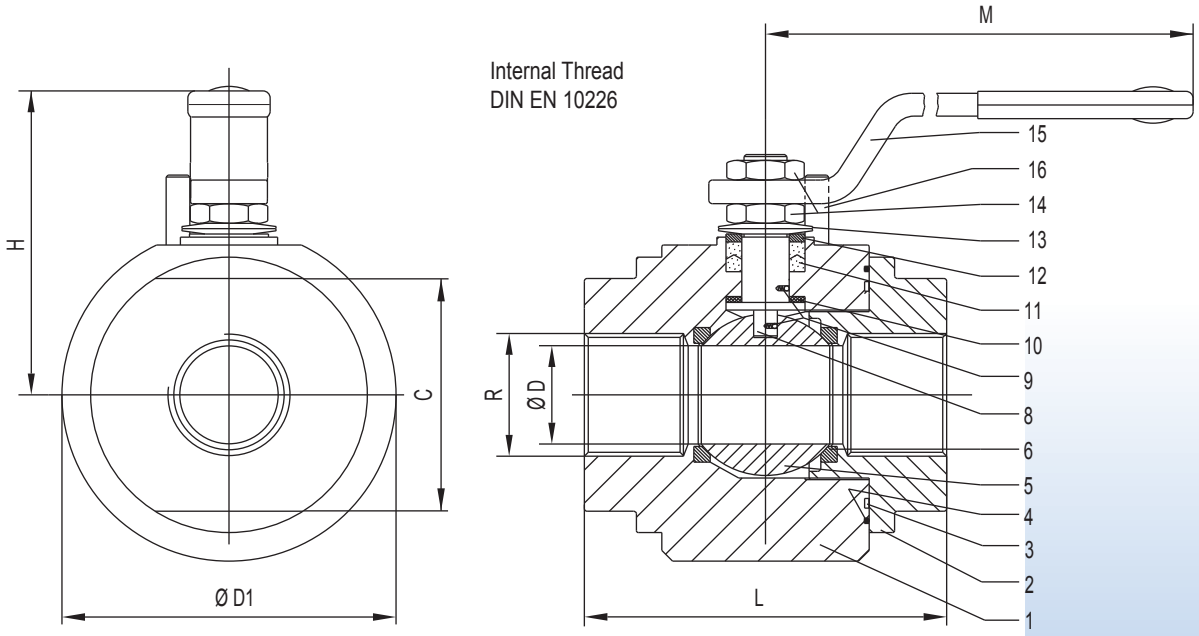
No.	Description	Piece	Material	Carbon Steel dt. Equivalent	Material	Stainless Steel dt. Equivalent
1	Body	1	ASTM A 105+	C21*	ASTM A 182 F316	1.4401
2	End	1	ASTM A 105+	C21*	ASTM A 182 F316	1.4401
3	Seal	1	PTFE	P.T.F.E.	PTFE	P.T.F.E.
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4208	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	P.T.F.E.	PTFE	P.T.F.E.
8	Stem	1	ASTM A 182 F304/316	1.4201/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	P.T.F.E.	PTFE	P.T.F.E.
11	Chevron Rings	1	PTFE/Graphit	P.T.F.E./Graphit	PTFE/Graphit	P.T.F.E./Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	ST37*+	UNI 5946 Fe37*	ST37*
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762	UNI 3740 8.8*	DIN EN ISO 4762

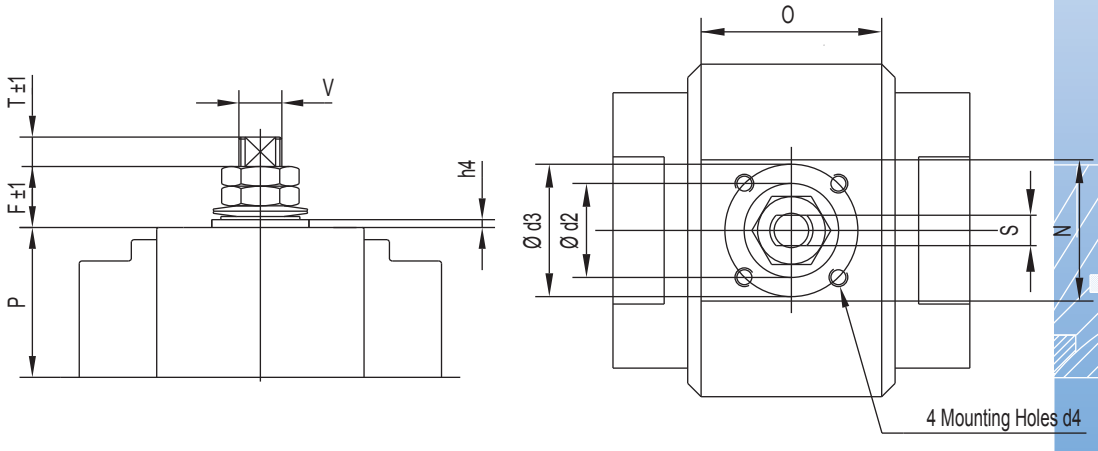
+) varnish paint coat *) electroplated zinc coating

SOCKET BALL VALVE TYPE FS2

full bore

Face to Face acc. to DIN 3202 M3





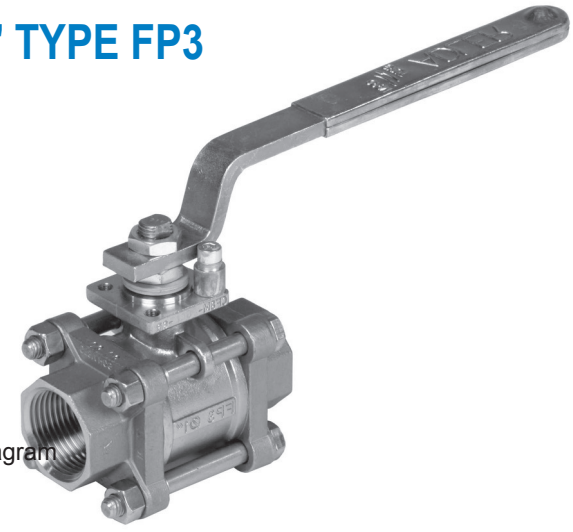
Dimensions in mm

DN	PN Seats PTFE	PN Seats **) PTFE with Metal Core	R*)	ØD	ØD1	C	H	L	M	P	T	P	F	S	V	O	N	d2	d3	d4	h4	EN ISO 5211	Weight (kg)
06	100	100	1/4"	10	49,5	30	46	50	120	17,5	5,5	17,5	11	5	8	33	35	25	36	M5	1,5	F03	0,6
10	100	100	3/8"	10	49,5	30	46	60	120	17,5	5,5	17,5	11	5	8	33	35	25	36	M5	1,5	F03	0,65
15	63	100	1/2"	15	59	38	63	75	145	23	7	26	14	6	10	42	37	25	36	M5	1,5	F03	1,2
20	63	100	3/4"	19	64	42	65	80	145	25,5	7	28,5	14	6	10	46	38	25	36	M5	1,5	F03	1,4
25	40	100	1"	25	74	50	76	90	185	32	8,5	41	16,5	8	12	55	37	25	36	M5	2	F03	2,2
32	40	100	1 1/4"	30	80	55	80	110	185	36	8,5	45,5	16,5	8	12	58	35	25	36	M5	2	F03	3,2
40	40	100	1 1/2"	38	99	70	98	120	280	44	10,5	50,5	19,5	10	16	71	46	35	50	M6	2	F05	5,2
50	40	100	2"	51	119	85	108	140	280	54	10,5	60,5	19,5	10	16	79	50	35	50	M6	2	F05	7,8

*) R = Internal Thread acc. to DIN EN 10226

BALL VALVE "3 PIECE BOLTED" TYPE FP3

with internal thread or B.W
full bore
face to face dimensions acc. to DIN 3202



Specifications

Nominal Width	: DN 06 to 100
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench
Nominal Pressure	: PN 16 to 100
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Torque
(with PTFE-Seats)

DN	Nm	DN	Nm
06	9,0	40	62
10	9,0	50	80
15	11,0	65	132
20	22,0	80	156
25	27,0	100	280
32	32,0		

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Utilities

- Mounting Flange Dimensions acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Guided Bolts
- Self Adjusting Ends
- Face to Face acc. to DIN 3202
- All Broach Surfaces are Mechanical Shaped

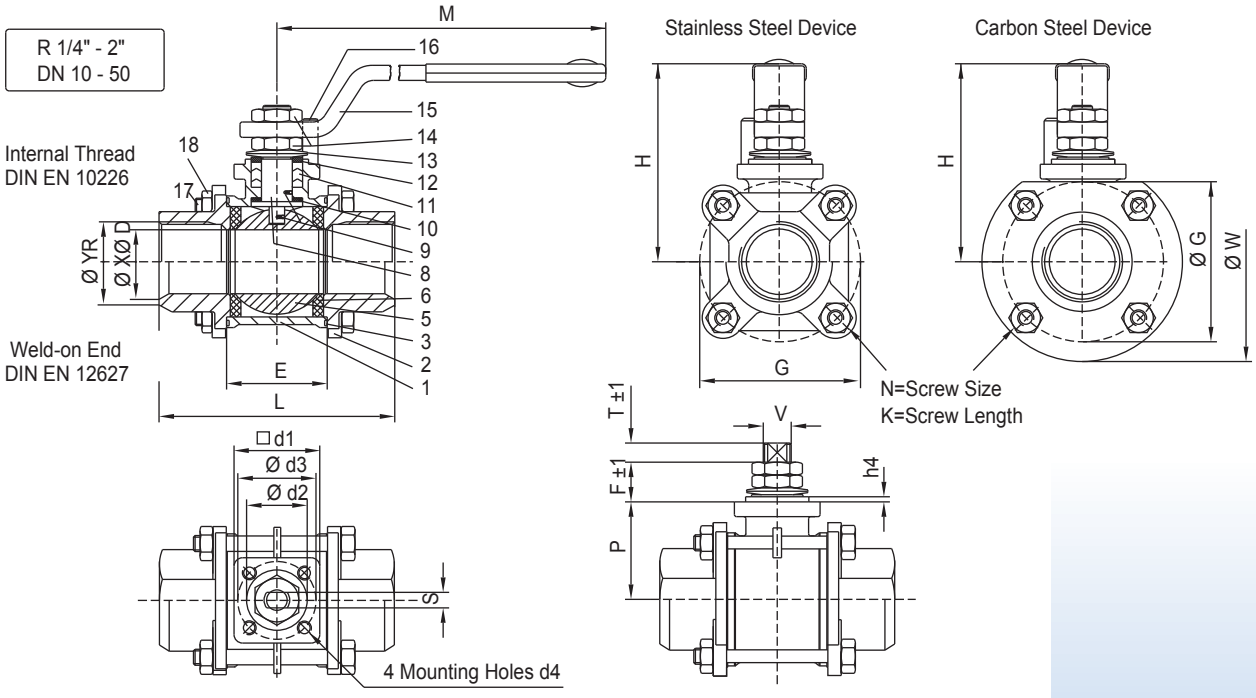
Special Design

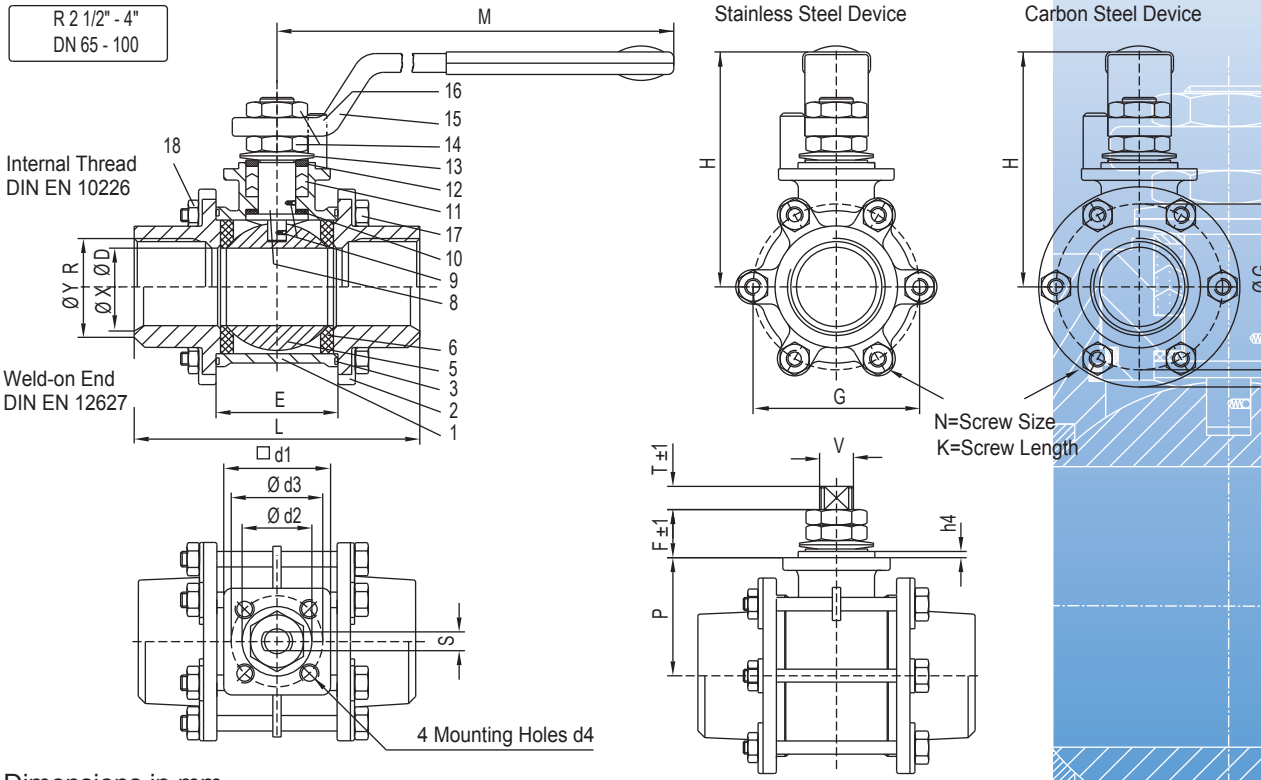
- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocket Less Seats in PTFE

Material

No.	Descriptions	Piece	Material			
			Carbon Steel		Stainless Steel	
			Material	dt. Equivalent	Material	dt. Equivalent
1	Body	1	ASTM A 216 WCB+	1.0619 +C 21/	ASTM A 351 CF8M	1.4408
2	End	2	ASTM A 105/216 WCB+	1.0619 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	2	PTFE	P.T.F.E.	PTFE	P.T.F.E.
5	Seat	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Ball	2	PTFE	P.T.F.E.	PTFE	P.T.F.E.
8	Stem	1	ASTM A 182 F6/304/316	1.4001/	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4301/1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	1.4401	PTFE	P.T.F.E.
11	Chevron Rings	2	PTFE/Graphit	P.T.F.E.	PTFE/Graphit	P.T.F.T./Graphit
12	Pressing Bush	1	ASTM A 182 F316L	P.T.F.E./Graphit	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	1.4404	C72*	50CrV4 *
14	Nut/Lock Nut	2	UNI 3740 6S*+	50CrV4 *+	UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+		UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	St 37 *+	UNI 3740 8.8*	DIN EN ISO 4762
17	Screws (DIN EN 24014)	4 - 6	UNI 3740 8.8*+	DIN EN ISO 4762	A2-70	
18	Nut (DIN EN 24032)	4 - 6	UNI 3740 8.8*+		A2-70	
					+) varnish paint coat	*) electroplated zinc coating

BALL VALVE "3 PIECE BOLTED" TYPE FP3





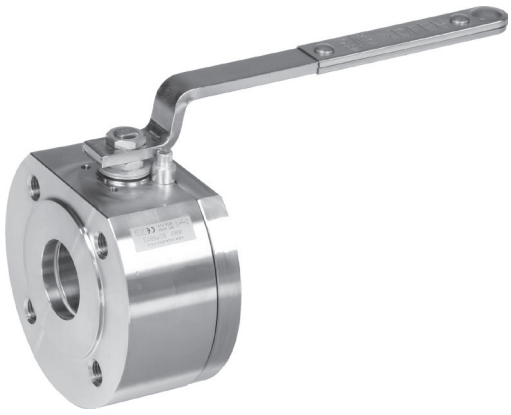
Dimensions in mm

DN	PN	R	ØD	X	Y	E	L	M	G	H	N	K	d1	d2	d3	d4	S	F	P	T	V	h4	W	EN ISO 5211	Gewicht (kg)
06	100	1/4"	10			20	50	120	35	46	M5	40	33	25	36	M5	5	6,5	22,2	5,5	8	1,5	44	F03	0,30
10	100	3/8"	10	13	18	20	60	120	35	46	M5	40	33	25	36	M5	5	6,5	22,2	5,5	8	1,5	44	F03	0,35
15	63	1/2"	15	17	22	26	75	145	43	66	M6	55	36	25	36	M5	6	7,5	32,5	7	10	1,5	54,5	F03	0,75
20	63	3/4"	19	22	28	28,5	80	145	49	68	M6	55	36	25	36	M5	6	7,5	35	7	10	1,5	63	F03	0,85
25	40	1"	25	28	34	37	90	185	61	85	M8	70	36	25	36	M5	8	16,5	41	9,5	12	2	78	F03	1,35
32	40	1 1/4"	30	32	42	44,6	110	185	67	91	M8	80	36	25	36	M5	8	16,5	45,5	9,5	12	2	84	F03	1,75
40	40	1 1/2"	38	43	49	53,6	120	280	84	106	M10	90	51	35	50	M6	10	19,5	50,5	14,5	16	2	103,5	F05	3,30
50	40	2"	51	54	61	70,5	140	280	102	116	M10	110	51	35	50	M6	10	19,5	60,5	14,5	16	2	120	F05	4,90
65	25	2 1/2"	64	70	77	83	185	370	123	140	M12	120	65	55	70	M8	14	23,5	77,5	16,5	22	2	148	F07	11,00
80	25	3"	76	82	90	96,2	205	370	143	148	M14	140	65	55	70	M8	14	23,5	86	16,5	22	2	168,5	F07	15,00
100	16	4"	101	106	115	118,2	240	470	176	174	M14	170	70	55	70	M8	18	26,5	99,5	16,5	30	2	199	F07	23,50

R = Internal Thread acc. to DIN EN 10226 X/Y = Weld-on End acc. to DIN EN 12627

BALL VALVE "WAFER TYPE"
TYPE FA1 / FA2
TYPE FB1 / FB2

full bore, split body



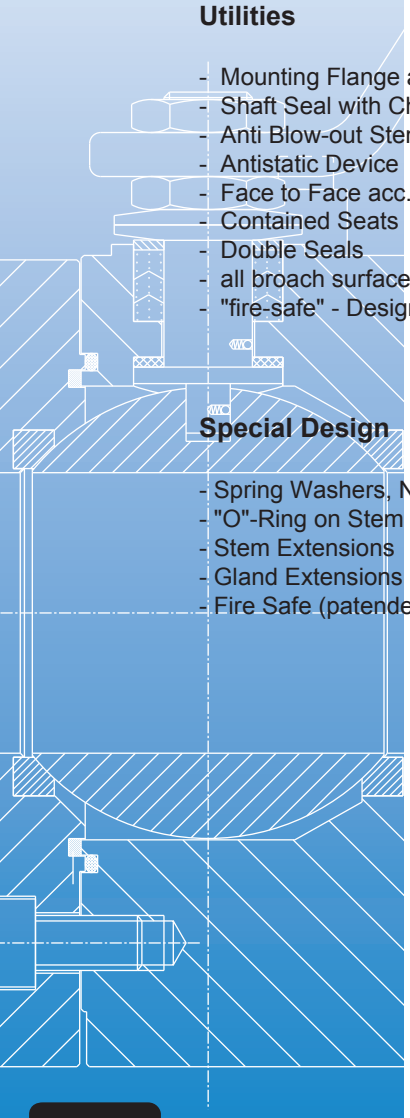
Specifications

Nominal Width	: DN 10 to 250
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench
Nominal Pressure	: PN 10 to 40
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

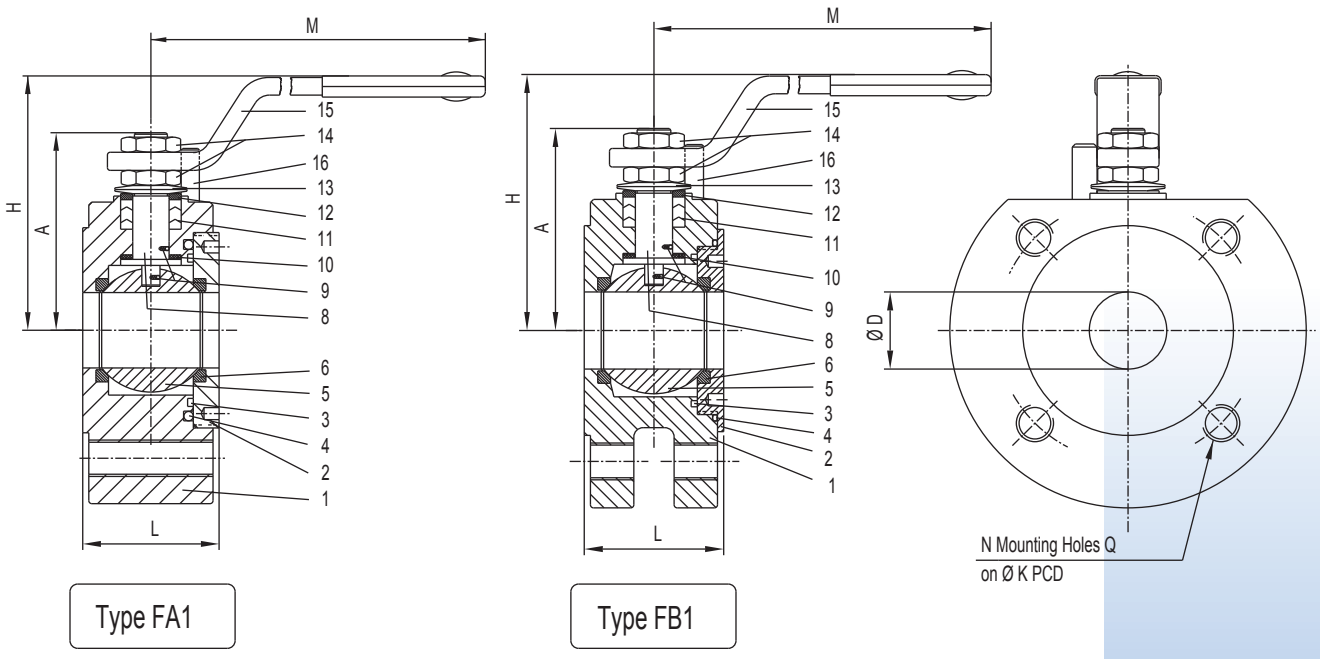
- Mounting Flange acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Face to Face acc. to DIN EN 558
- Contained Seats
- Double Seals
- all broach surface are mechanical shaped
- "fire-safe" - Design

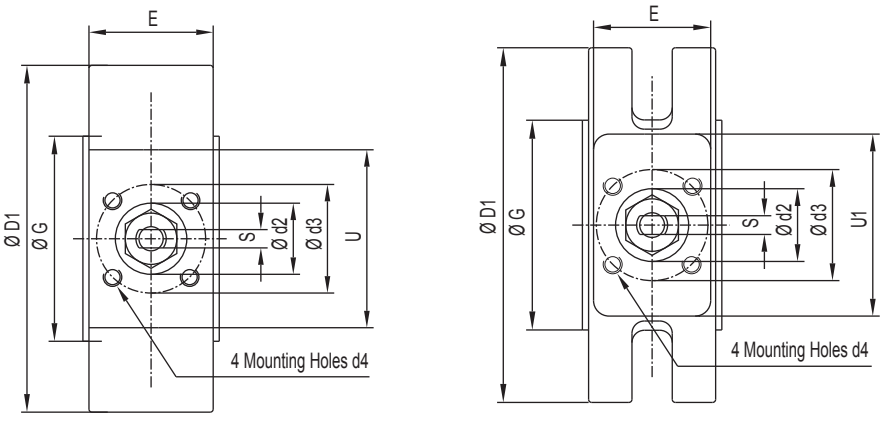


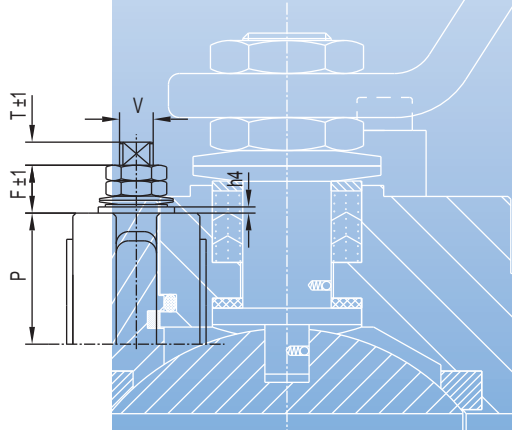
Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)

BALL VALVE "WAFER TYPE"
TYPE FA1/2 FB1/2
full bore





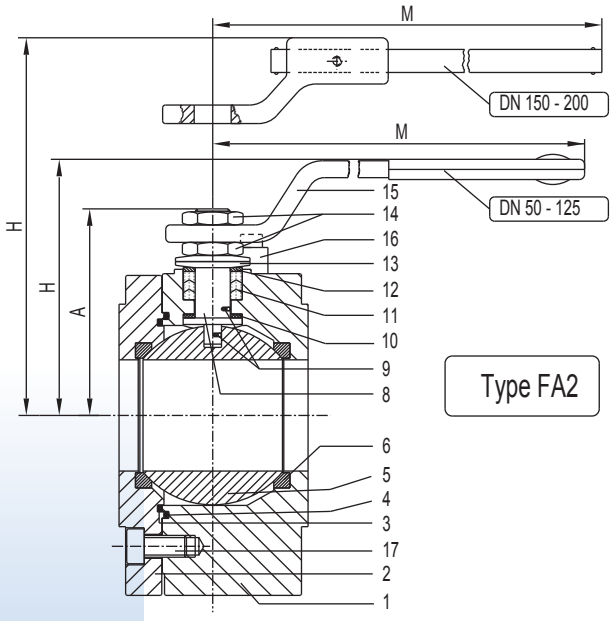


Dimensions in mm

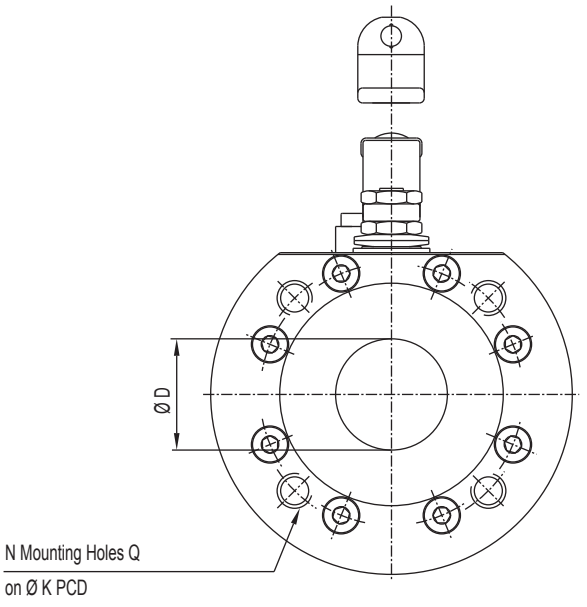
DN	Design (Type) C-Steel Standard Option		S-Steel Standard Option		PN10-16 ANSI 150 P	F	PN25-40 P	F	ANSI 300 P	F	A	H	M	D	L	h4	T	V	d2	d3	d4	U	E	S	D2	EN ISO 5211	Weight (kg)
10	FA1	FA2	FA1	FA2	32,5	7,5	siehe PN 10 - 16	siehe PN 10 - 16	32,5	7,5	47	66	145	15	35*)	1,5	7	10	25	36	M5	69	33	6		F03	1,6
15	FA1	FA2	FA1	FA2	32,5	7,5			32,5	7,5	47	66	145	15	35*)	1,5	7	10	25	36	M5	69	33	6		F03	1,6
20	FA1	FA2	FA1	FA2	35	7,5			35	7,5	49,5	68	145	19	35*)	1,5	7	10	25	36	M5	78	33	6		F03	1,9
25	FA1	FA2	FA1	FA2	41	16,5			42,5	16,5	67	85	185	25	43*)	2	9,5	12	25	36	M5	81	36,5	8		F03	2,8
32	FA1	FA2	FA1	FA2	46,5	16,5			46,5	16,5	72,5	91	185	30	51*)	2	9,5	12	25	36	M5	105	41	8		F03	4,8
40	FA1	FA2	FA1	FA2	63	11,5			63	11,5	84,5	110	280	38	64*)	2	10	16	35	50	M6	75	52	10		F05	7,2
50	FA2	FA1	FA2	FB1	65	19,5			74,5	10	94,5	120	280	51	85	2	10	16	35	50	M6	102	62	10		F05	10,6
65	FA2	FA1	FA2	FB1	82	23,5			87	18,5	117	144	370	64	103	2	12	22	55	70	M8	88	79	14		F07	19,0
80	FA2	FA1	FA2	FB1	90,5	23,5			95	19	126	152	370	76	120	2	12	22	55	70	M8	85	88	14		F07	25,0
100	FA2	FA1	FA2	FB1	99,5	26,5	108	18	108	18	142,5	174	470	101	155	2	16,5	30	55	70	M8	94	105	18		F07	34,0
125	FA2	-			113	26,5	122	17,5	122	17,5	156	188	650	118	182	2	16,5	30	70	102	M10	107	137	18		F10	47,0
150	FA2	-			144	34	144	34	144	34	197	256	750	152	234	2	19	42	85	125	M12	110	130	28		F12	92,0
200	FA2	-			183	36	183	36	183	36	239	294	900	203	310	2	20	48	100	140	M16	125	176	32		F14	181,0
250	FA2	-			225,5	39,5	225,5	39,5	225,5	39,5	239	343	1000	254	314	2	20	56	130	165	M20	150	257	36		F16	230,0
125			FB1	-	113	26,5	113	26,5	122	17,5	156	188	650	118	182	2	16,5	30	70	102	M10	97	97	18		F10	31,0
150			FB2	-	144	34	144	34	144	34	197	256	750	152	234	2	19	42	85	125	M12	113	116	28	300	F12	57,0
200			FB2	-	183	36	183	36	183	36	239	294	900	203	310	2	20	48	100	140	M16	135	135	32	375	F14	92,0

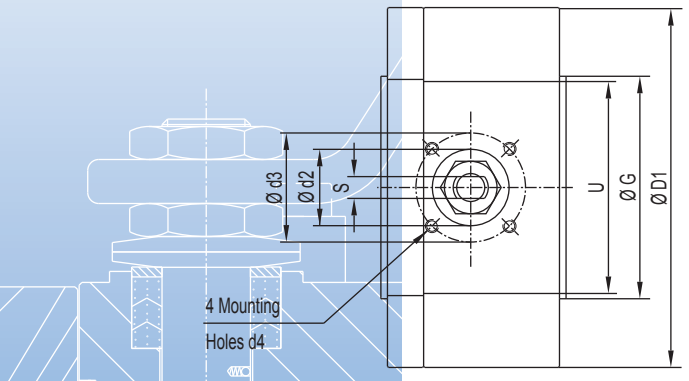
*) The measure "L" at type FA2 changes as follow: DN10 = 53, DN15 = 53, DN20 = 53, DN25 = 57, DN32 = 65, DN40 = 79. Further dimensions on request. The diameter of the casing D1 of type Typ FA2 und nominal weidhts 150 and 200 are acc. to EN 1092 PN40.
The dimensions D1, G, N, Q and K are acc. to EN1092 or ANSI150 und 300. ANSI-pressure are delivery standard with UNC-size acc. threads, likewise available UNC-threads acc. to ANSI page 1.

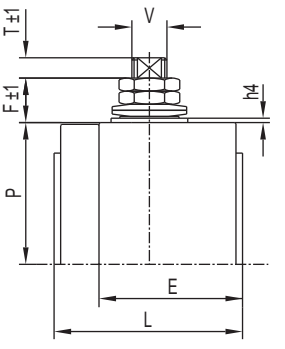
BALL VALVE "WAFER TYPE"
TYPE FA1/2 FB1/2
full bore

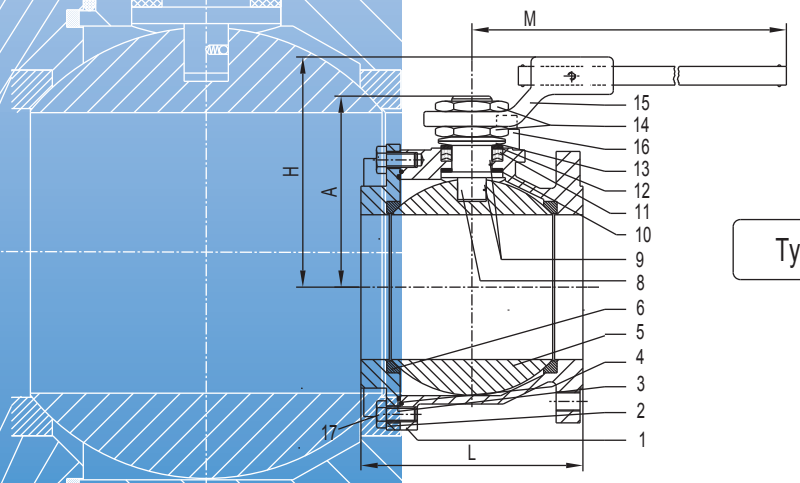


Type FA2

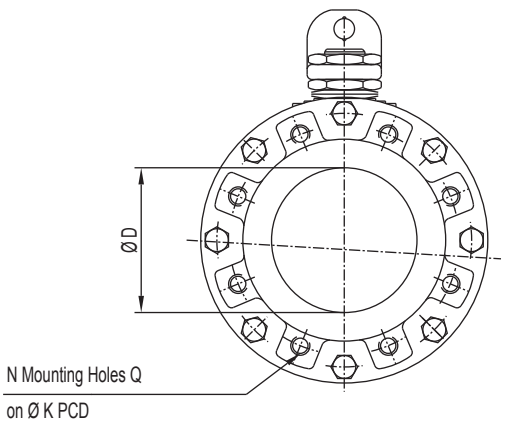


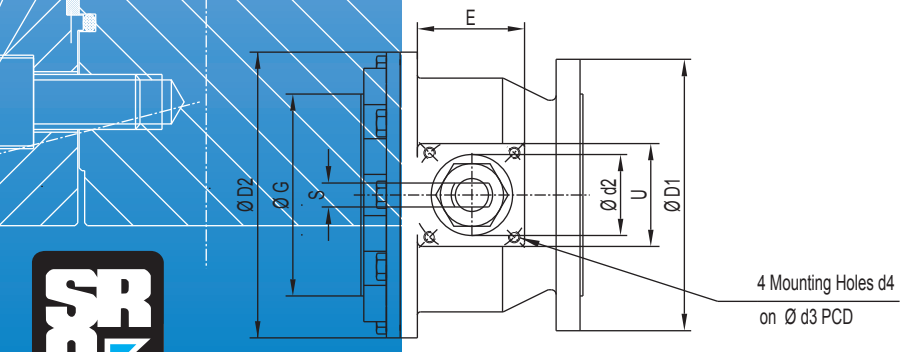


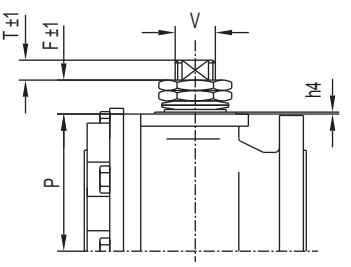




Type FB2







BALL VALVE "WAFER TYPE"
TYPE FA1/2 FB1/2
full bore

TECHNICAL DETAILS

Torque			
DN	Nm	DN	Nm
10	9	65	132
15	11	80	156
20	22	100	280
25	27	125	316
32	32	150	680
40	62	200	1020
50	80		

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Material of Type FA1/FA2

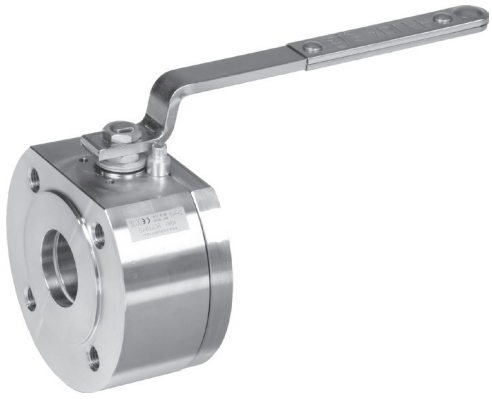
Pos.	Description	Piece	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
2	End	1	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
3	Seal	1	PTFE	PTFE	PTFE	PTFE
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF	1.301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	PTFE	PTFE	PTFE
8	Stem	1	ASTM A 182 F304/316	1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*+	50CrV4 *
14	Nut	2	UNI 3740 6S*+	DIN EN ISO 4762	UNI 3740 6S*+	DIN EN ISO 4762 *
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*+	St 37 *+
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762*+	UNI 3740 8.8*+	DIN EN ISO 4762 *
17	Screws	div.	UNI 3740 8.8*+	DIN EN ISO 4762*+	A2-70*+	DIN EN ISO 4762
					+) lacquered	*) electrogalvanize

Material of Type FB1/FB2

Pos.	Description	Piece	Material		
			Carbon-Steel	Stainless-Steel	
				Material	german Equivalent
1	Body	1		ASTM A 351 CF8/CF8M	1.4401
2	End	1		ASTM A 351 F316/351 CF8M	1.4401
3	Seal	1		PTFE	PTFE
4	O-Ring	1		VITON O-Ring	VITON O-Ring
5	Ball	1		ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2		PTFE	PTFE
8	Stem	1		ASTM A 182 F316	1.4401
9	Antistatic Device	2		ASTM A 182 F316	1.4401
10	Stem Seal	1		PTFE	PTFE
11	Chevron Rings	1		PTFE/Graphit	PTFE/Graphit
12	Pressing Bush	1		ASTM A 182 F316L	1.4404
13	Spring Washer	2		C72*+	50CrV4 *
14	Nut	2		UNI 3740 6S*+	DIN EN ISO 4762 *
15	Wrench	1		UNI 5946 Fe37*+	St 37 *+
16	Stop Pin	1		UNI 3740 8.8*+	DIN EN ISO 4762 *
17	Screws	div.		A2-70*+	DIN EN ISO 4762
				+) lacquered	*) electrogalvanize

BALL VALVE "WAFER TYPE"
TYPE FC1 / FC2

full bore
Flange Dimensions acc. to EN 1092, Form B2



Specifications

Nominal Width	: DN 15 to100
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (optional gearbox)
Nominal Pressure	: PN 63 to 100 bzw. ANSI 600
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange acc. to EN ISO 5211
- Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Double Seals and Metal Beating End
- Contents Ball
- Contained Seats
- all broach surface are mechanical shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- End Tank ssembling
- Metallic Pocket Less Seats (FC2)

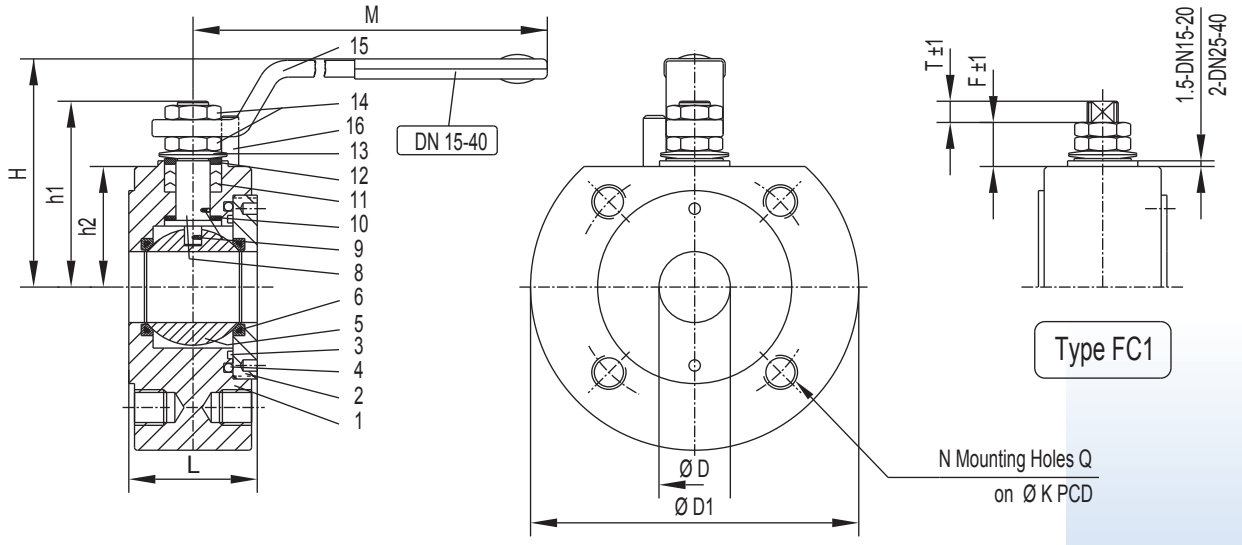
Material

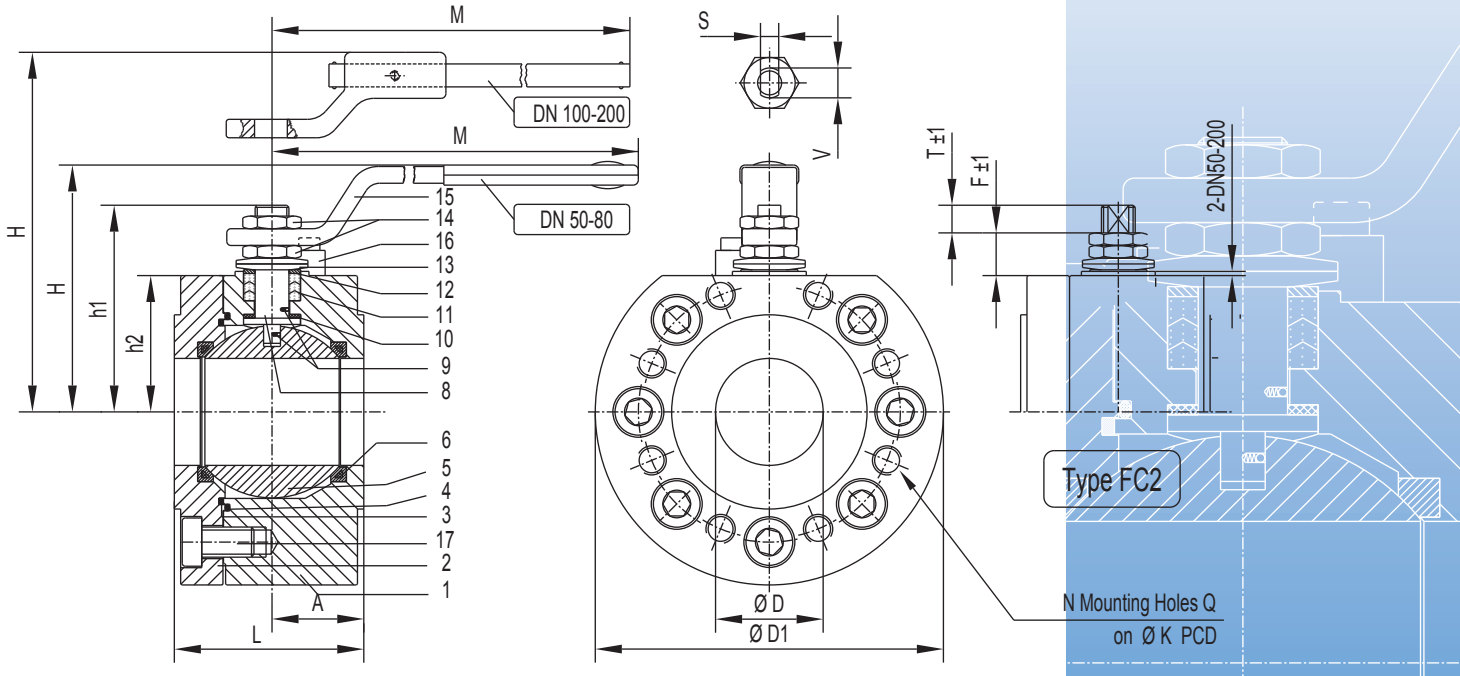
Pos.	Descriptions	Anzahl	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	End	1	ASTM A 105+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	1	PTFE	PTFE	PTFE	PTFE
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE with Metal Core	PTFE with Metal Core	PTFE with Metal Core	PTFE with Metal Core
8	Stem	1	ASTM A 182 F304/316/6	1.4301/1.4401/1.4001	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F304	1.4301	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFT/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*+	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*+	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*+	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*+	DIN EN ISO 4762 *
17	Screw	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*+	DIN EN ISO 4762 *
					+) lacquered	*) electrogalvanize

BALL VALVE "WAFER TYPE"
TYPE FC1 / FC2

full bore

Flange Dimensions acc. to EN 1092, Form B2



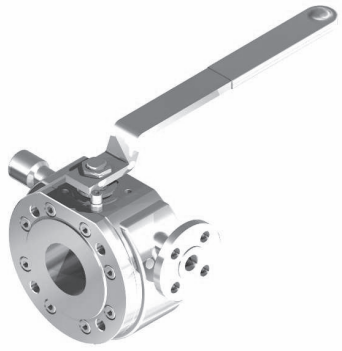


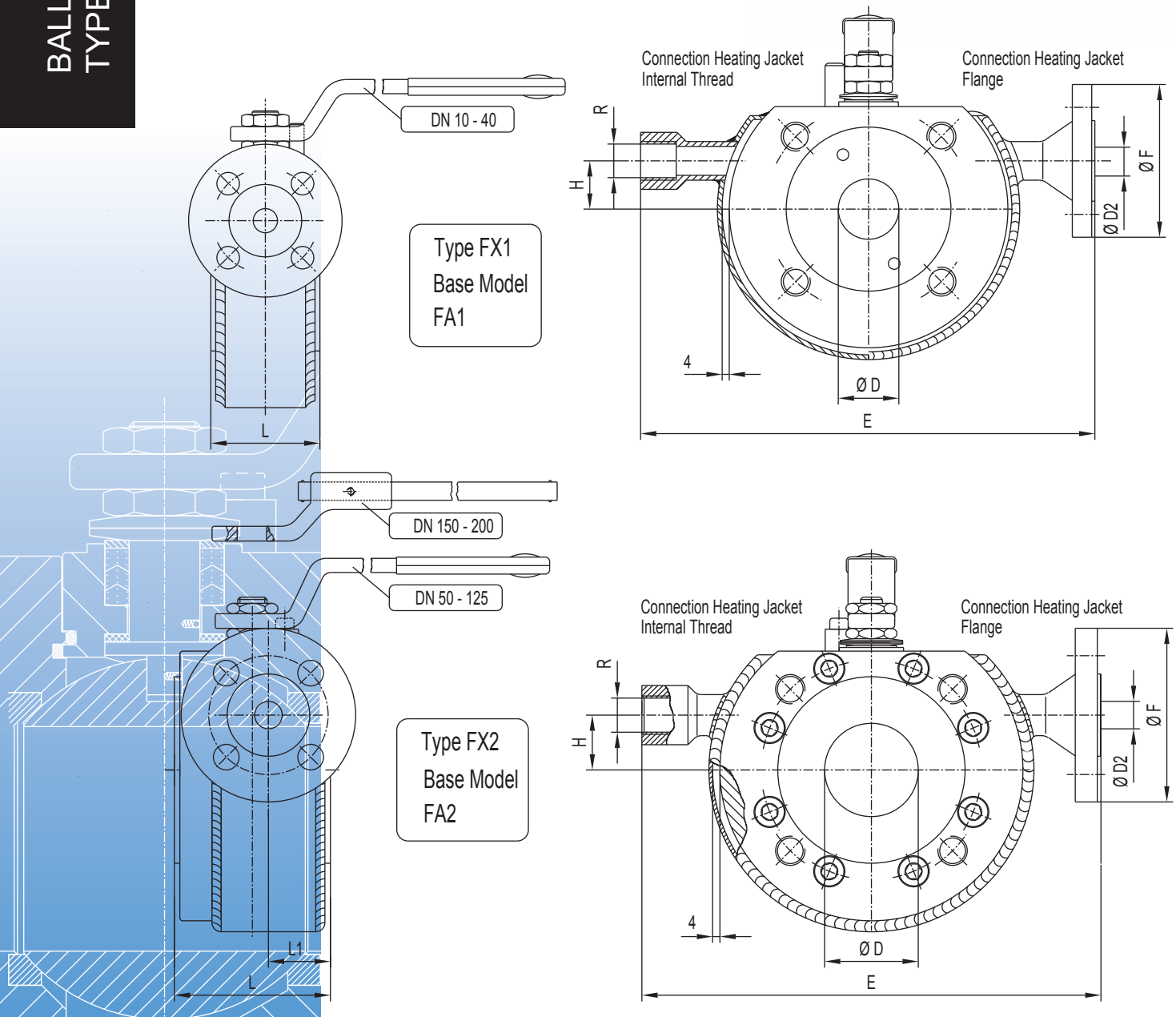
Dimensions in mm

DN ANSI	DN DIN	Design/Type C-Steel	Design/Type S-Steell	A	D	L	H	h1 59	M	S	V	PN 63 F	PN 63 T	PN 63 h2	PN 100 F	PN 100 T	PN 100 h2		EN ISO 5211
1/2"	15	FC1	FC1	-	15	55	78	61	185	8	12	14	9,5	36	14	9,5	36	Dimensions F, T and h2 on request (PN160, ANSI600/900)	F03
3/4"	20	FC1	FC1	-	19	60	80	76	185	8	12	8,4	9,5	43	8,4	9,5	43		F03
1"	25	FC1	FC1	-	25	65	101	80	280	10	16	15,6	10	50	15,6	10	50		F05
1 1/4"	32	FC1	FC1	-	30	75	104	103	280	10	16	13,4	10	56	13,4	10	56		F05
1 1/2"	40	FC1	FC1	-	38	85	129	112	370	14	22	23,5	12	67	23,5	12	67		F07
2"	50	FC2	FC2	46,5	51	115	139	130	370	14	22	23,5	12	76,5	23,5	12	76,5		F07
2 1/2"	65	FC2	FC2	60	64	135	163	140	470	18	30	21	16,5	94	14	16,5	101		F07
3"	80	FC2	FC2	70	76	150	172	166	470	18	30	26,5	16,5	97	19,5	16,5	104		F07
4"	100	FC2	FC2	91	101	190	225	184	750	28	42	34	19	113	29	19	118		F12
5"	125	FC1/FC2	FC1/FC2	100	118	220	239	210	750	28	42	28	19	133	22	19	139		F12
6"	150	FC2	on request	140	152	280	265	248	900	32	48	30	20	160	23,5	20	166,5		F14
8"	200	FC2	on request	165	203	330	307		1000	36	56	33	20	195	28	20	200		F16

The Dimensions D1, G, N, Q and K are acc. to EN1092 or ANSI150 and 300. ANSI-pressure are delivery standard with UNC-size acc. threads, likewise available UNC-threads acc. to ANSI; UNC-Threads acc. to ANSI Bl. 1 are available.

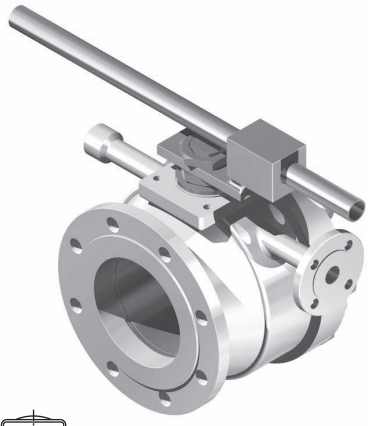
BALL VALVE "WAFER TYPE"
WITH HEATING JACKET TYPE FX1 / FX2
full bore



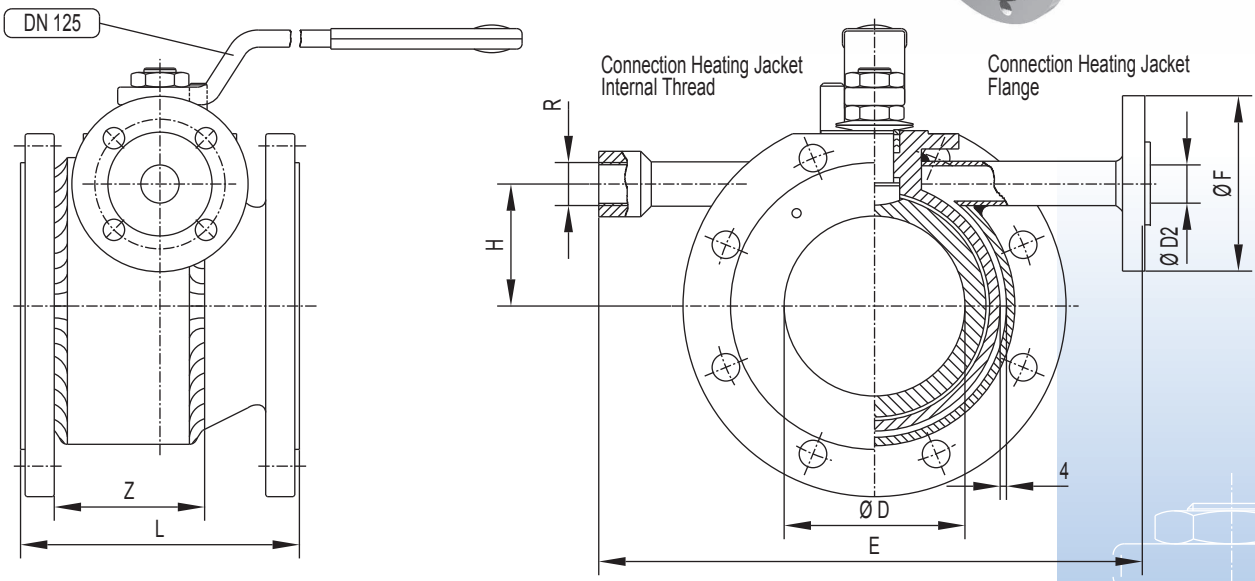


DN	10	15	20	25	32	40	50	65	80	100	125	150	200
Type/ C-Steel	FX1	FX1	FX1	FX1	FX1	FX1	FX2	FX2	FX2	FX2	FX2	FX2	FX2
Description S-Steel	FX1	FX1	FX1	FX1	FX1	FX1	FX2	FX2	FX2	FX2	see page 15		
D	15	15	19	25	30	38	51	64	76	101	118	152	203
E	170	170	180	190	210	230	250	270	300	340	360	420	500
H	0	0	0	0	25	30	30	45	50	70	80	95	130
L	35	35	35	43	51	64	85	103	120	155	182	234	310
L1	-	-	-	-	-	-	34	43	47	56	70	117	155
D2	15	15	15	15	15	15	15	15	15	25	25	25	25
F	95	95	95	95	95	95	95	95	95	115	115	115	115
R	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1"	1"	1"	1"

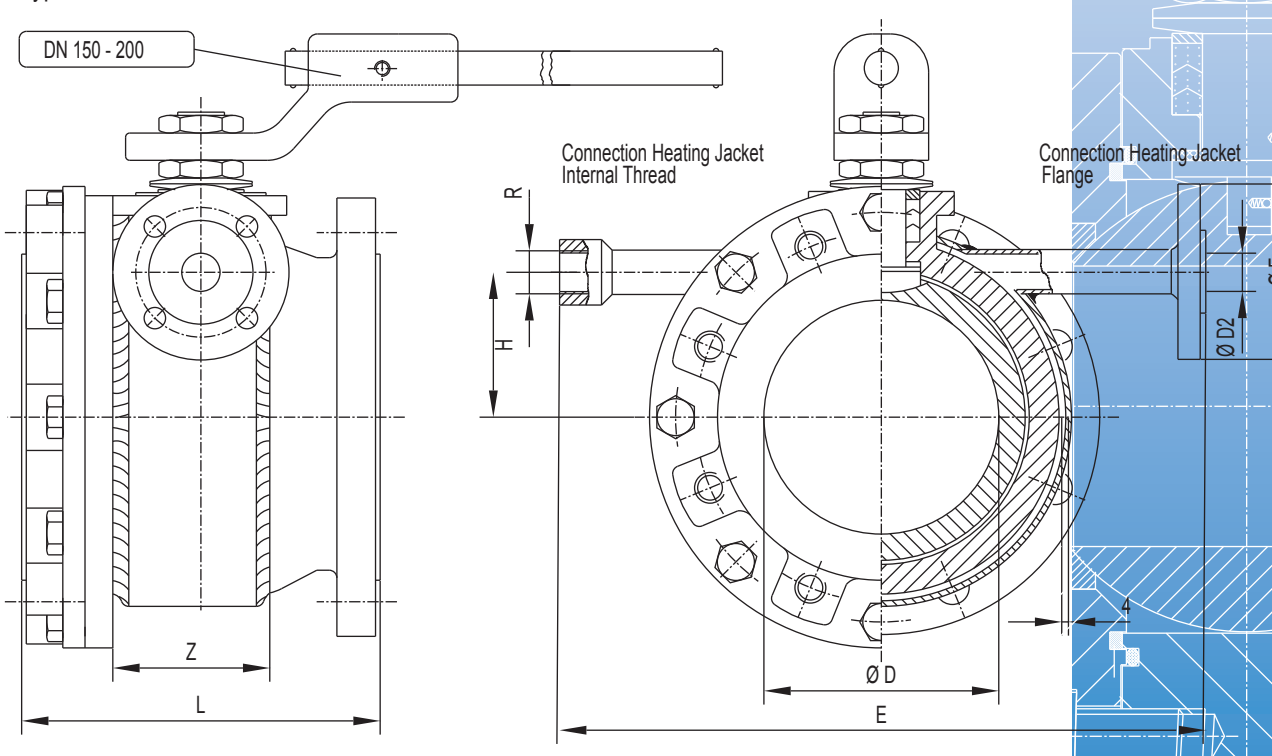
BALL VALVE "WAFER TYPE"
WITH HEATING JACKET TYPE FY1 / FY2
full bore



Type FY1 Base Model FB1



Type FY2 Base Model FB2



DN		Ø D	E	H	L	Z	F	D2	R
125	Stainless Steel in	118	360	80	182	110	115	25	1"
150	Nominal Width 10 - 100	152	420	95	234	120	115	25	1"
200	acc. to FX1 / FX2	203	500	130	310	180	115	25	1"

All dimension and material description acc. to ball valve type FB1 and FB2

BALL VALVE "WAFER TYPE"
TYPE FM2 / FN2

full bore, split body

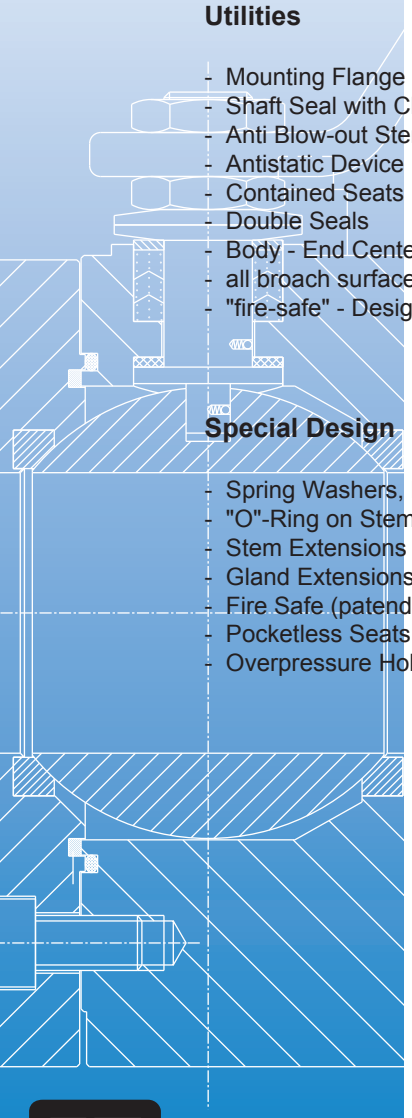
Specifications

Nominal Width	: DN 15 to 300
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (optional Gear Box)
Nominal Pressure	: PN 10 to 40
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Contained Seats
- Double Seals
- Body - End Centering
- all broach surface are mechanical shaped
- "fire-safe" - Design

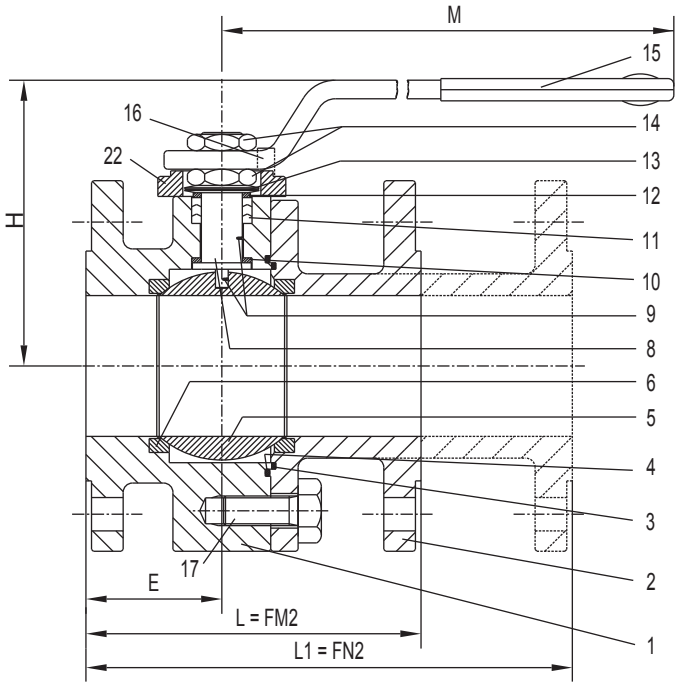


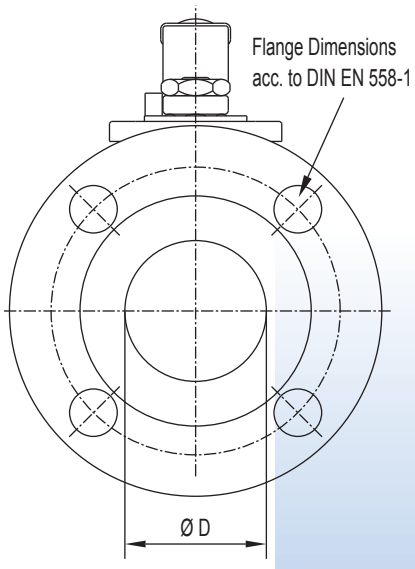
Special Design

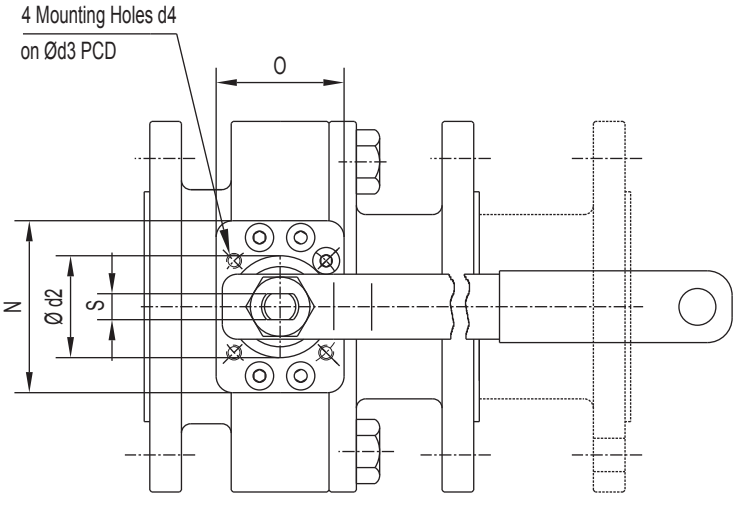
- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocketless Seats
- Overpressure Hole into Ball

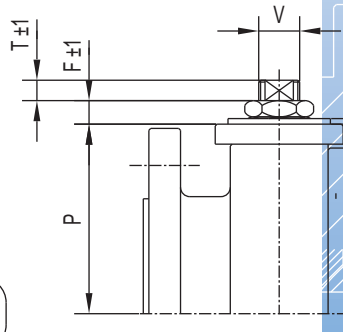
BALL VALVE "WAFER TYPE"
TYPE FM2 / FN2
full bore, split body

Types FM2/FN2 DN 15 - DN 80







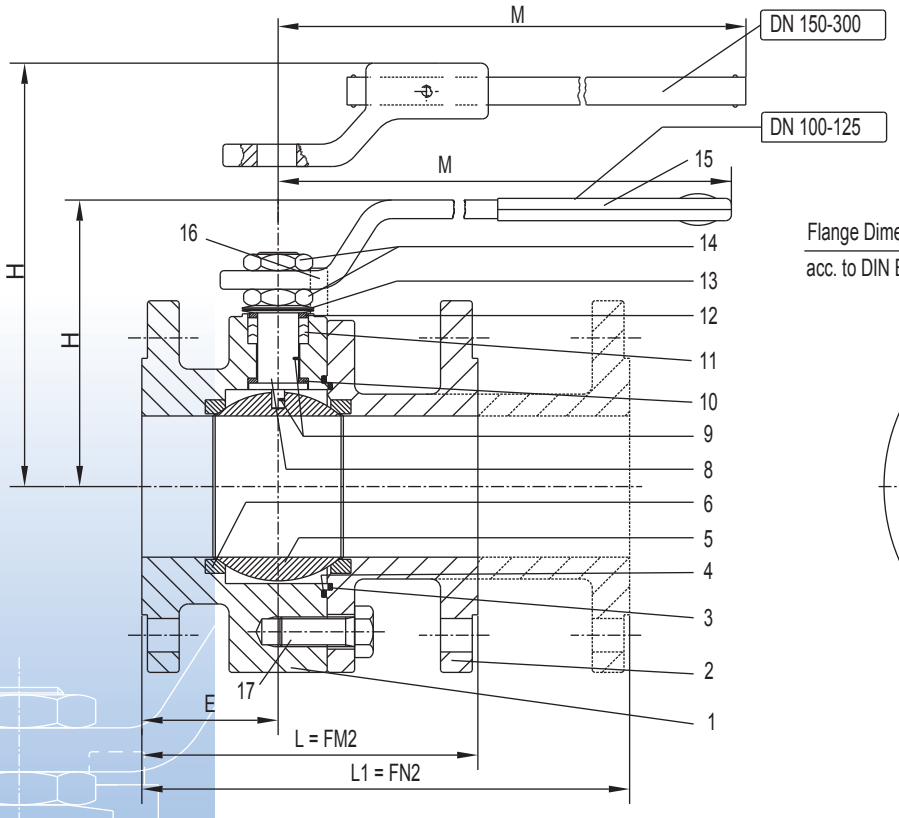


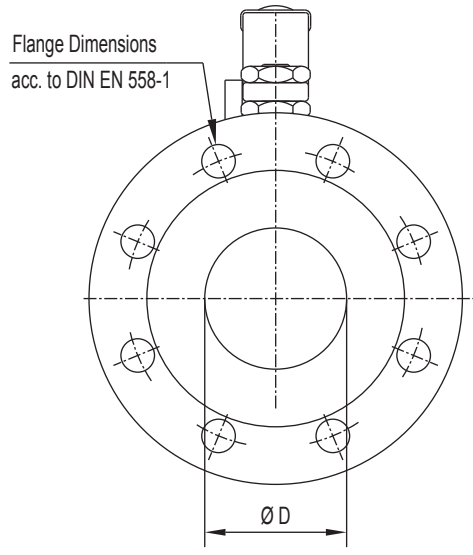
Dimensions in mm

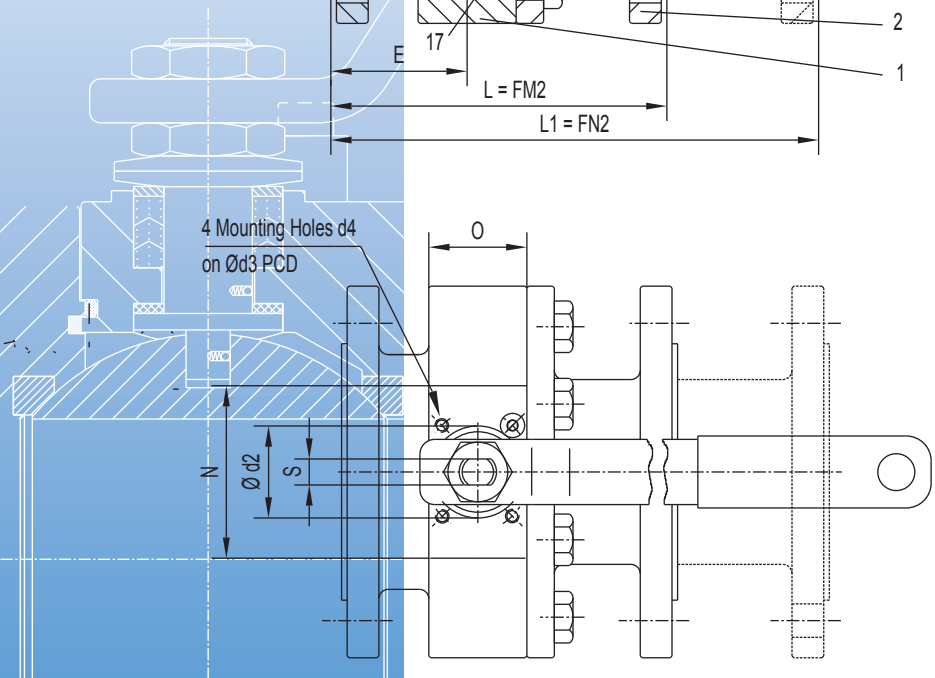
DN	ØD	E	H	L	L1	M	N	O	S	Ød2	Ød3	d4	F	h4	P	T	V	EN ISO 5211	Weight (kg)
15	15	49	86	115	130	145	58	35	6	25	36	M5	6,6	1,5	33,1	7	10	F03	3,0
20	19	51,5	88	120	150	145	58	35	6	25	36	M5	6,6	1,5	35,4	7	10	F03	4,0
25	25	50	113	125	160	185	58	35	8	25	36	M5	8,2	1,5	49,3	9,5	12	F03	5,2
32	30	51,5	119	130	180	185	58	35	8	25	36	M5	8,2	1,5	54,8	9,5	12	F03	7,0
40	38	59	110	140	200	280	72,5	46,5	10	35	50	M6	9,7	2	64,8	10	16	F05	10,0
50	51	61,5	120	150	230	280	72,5	46,5	10	35	50	M6	9,7	2	74,8	10	16	F05	13,5
65	64	70,5	144	170	290	370	90	64,5	14	55	70	M8	11	2	93,5	12	22	F07	21,5
80	76	73	152	180	310	370	90	64,5	14	55	70	M8	11	2	102	12	22	F07	26,0

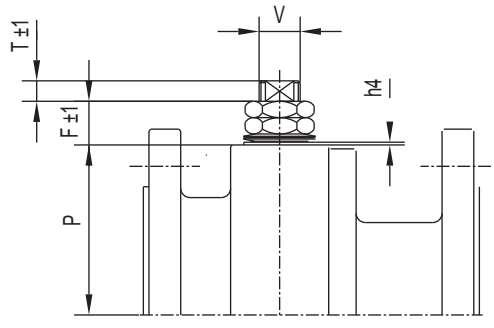
BALL VALVE "WAFER TYPE"
TYPE FM2 / FN2
full bore, split body

Types FM2/FN2 DN 100 - DN 300









Dimensions in mm

DN	ØD	E	H	L	L1	M	N	O	S	Ød2	Ød3	d4	F	h4	P	T	V	EN ISO 5211	Weight (kg)	
100	101	85	174	190	350	470	70	65	18	55	70	M8	26,5	2	99,5	16,5	30	F07	30,5	
125	118	100	188	325	400	650	97	93	18	70	102	M10	26,5	2	113	16,5	30	F10	61	50*)
150	152	144	256	350	480	750	112	113	28	85	125	M12	34	2	144	19	42	F12	96	70*)
200	203	180	294	400	600	900	130	130	32	100	140	M16	36	2	183	20	48	F14	157	120*)
250	254	196	343	450	730	1000	153	153	36	130	165	M20	44	3	220	20	56	F16	215	175*)
300	305	237	381	500	850	1000	153	153	36	130	165	M20	44	3	258,5	20	56	F16	255	200*)
400	387	381		762			288	288		200	254	Ø18		3	419			F25	930	

*) different weight for stainless steel device

BALL VALVE "WAFER TYPE"
TYPE FM2 / FN2
full bore, split body

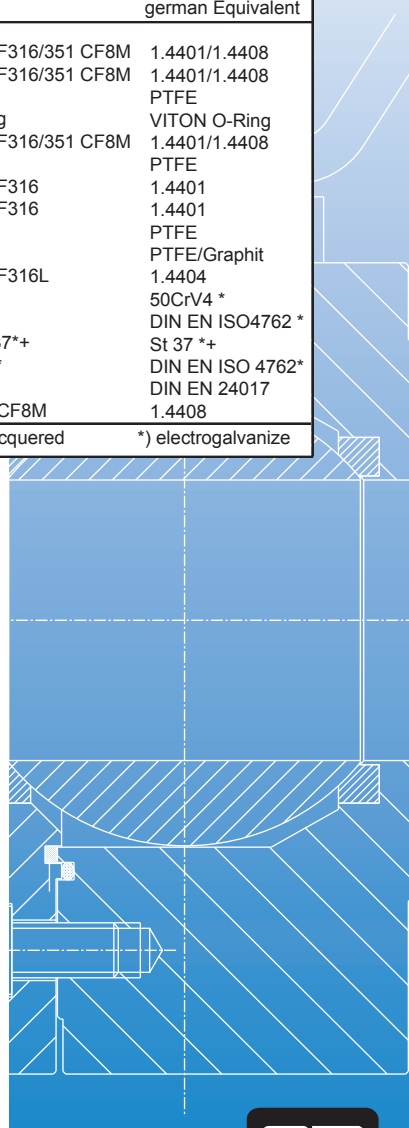
TECHNICAL DETAILS

Torque			
DN	Nm	DN	Nm
15	11	80	156
20	22	100	280
25	27	125	318
32	32	150	680
40	62	200	1020
50	80	250	1600
65	132	300	2400

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Material

Pos.	Description	Piece	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105/216 WCB+	C 21/1.0619 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	End	1	ASTM A 105/216 WCB+	C 21/1.0619 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	1	PTFE	PTFE	PTFE	PTFE
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	2	ASTM A 182 F304/351 CF8	1.301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	1	PTFE	PTFE	PTFE	PTFE
8	Stem	2	ASTM A 182 F304/316	1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	1	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit
12	Pressing Bush	2	ASTM A 182 F316L+	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	1	UNI 3740 6S*+	DIN EN ISO 4762	UNI 3740 6S*	DIN EN ISO4762 *
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*+	St 37 *+
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*	DIN EN ISO 4762*
17	Screw	div.	UNI 3740 8.8*+	DIN EN ISO 4762 *+	A2-70	DIN EN 24017
22	DIN-Adapter Plate	1	ASTM A 351 CF8M+	ASTM A 351 CF8M +	ASTM A 351 CF8M	1.4408
					+) lacquered	*) electrogalvanize



BALL VALVE "WAFER TYPE" TYPE FE/F2

TYPE FE2 Face to Face acc. to ISO 5752 S

TYPE FF2 Face to Face acc. to ISO 5752 M

full bore, split body

Specifications

Nominal Width	: DN 15 to 300
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (optional Gear Box)
Nominal Pressure	: ANSI 150
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Torque

DN	Nm	DN	Nm
15	11	80	156
20	22	100	280
25	27	125	316
32	32	150	680
40	62	200	1020
50	80	250	1600
65	132	300	2400

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Utilities

- Mounting Flange acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Contained Seats
- Double Seals
- Body - End Centering
- Metal Beating End
- all broach surface are mechanical shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocketless Seats
- Overpressure Hole into Ball

Material

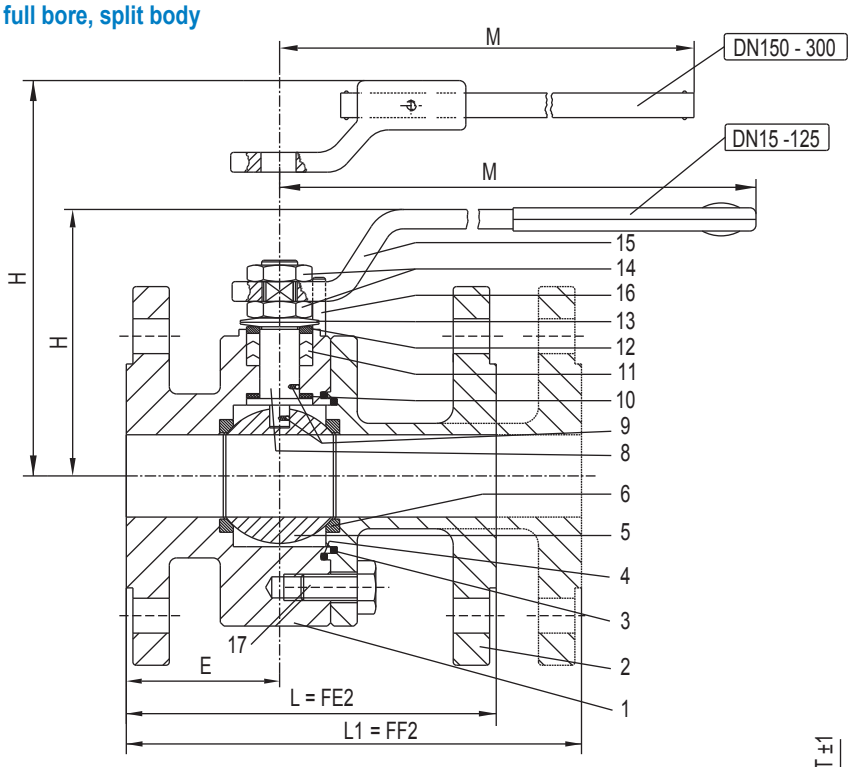
Pos.	Description	Piece	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105/216 WCB+	C 21/GS-C25 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	End	1	ASTM A 105/216 WCB+	C 21/GS-C25 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	1	PTFE	PTFE	PTFE	P.T.F.E.
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	PTFE	PTFE	P.T.F.E.
8	Stem	1	ASTM A 182 F6/304/316	1.4001/1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	P.T.F.E.
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	P.T.F.T./Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN 912-8.8 *+	A2-70	DIN 912-8.8
17	Screw	div.	UNI 3740 8.8*+	DIN EN 24017 *+	UNI 3740 8.8*	DIN EN 24017
					+) lacquered	*) electrogalvanize

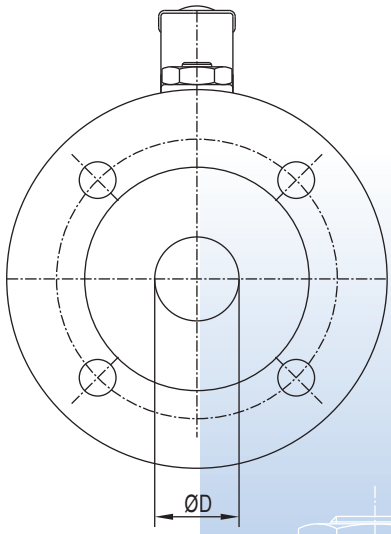
BALL VALVE "WAFER TYPE" TYPE FE/F2

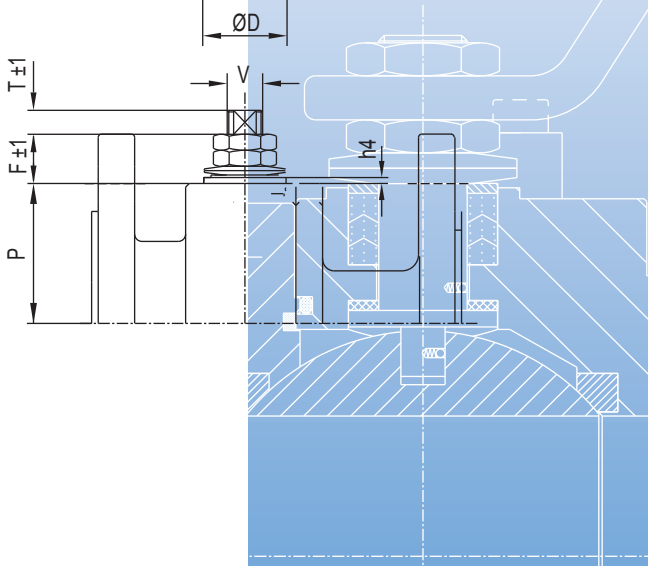
TYPE FE2 Face to Face acc. to ISO 5752 S

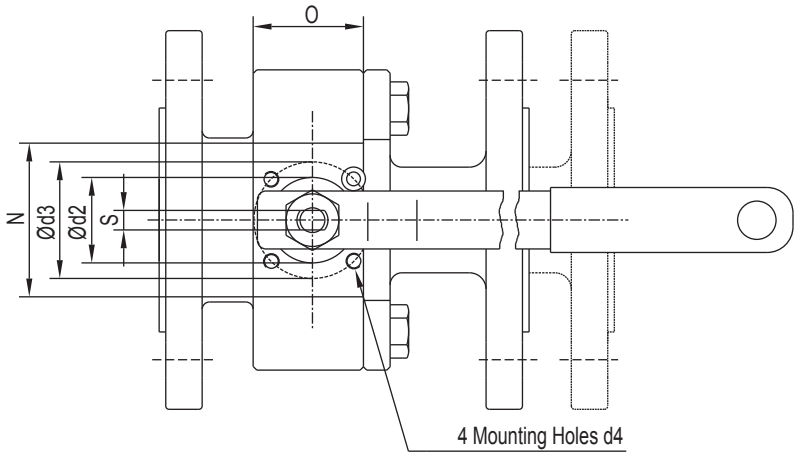
TYPE FF2 Face to Face acc. to ISO 5752 M

full bore, split body









Dimensions in mm

DN	D	E	H	L	L1	M	N	O	S	Ød2	Ød3	d4	F	h4	P	T	V	EN ISO 5211	Weight (kg)	
15	15	46	86	108		145	35	33	6	25	36	M5	7,5	1,5	32,5	7	10	F03	2,7	
20	19	48,5	88	117		145	35	33	6	25	36	M5	7,5	1,5	35,5	7	10	F03	3,6	
25	25	49	113	127		185	37	33	8	25	36	M5	16,5	2	41	9,5	12	F03	4,5	
32	30	52	119	140		185	45	33	8	25	36	M5	16,5	2	46,5	9,5	12	F03	6,2	
40	38	58	110	165		280	46	45	10	35	50	M6	19,5	2	55	10	16	F05	9	
50	51	76	120	178	203	280	48	45	10	35	50	M6	19,5	2	65	10	16	F05	14,3	
65	64	72	144	190		370	63	62	14	55	70	M8	23,5	2	82	12	22	F07	21,3	
80	76	75	152	203	241	370	63	62	14	55	70	M8	23,5	2	86	16,5	22	F07	25	
100	101	77	174	229	305	470	70	65	18	55	70	M8	26,5	2	99,5	16,5	30	F07	34	
125	118	100	188	254		650	97	93	18	70	102	M10	26,5	2	113	16,5	30	F10	56	48*)
150	152	117	256	267	394	750	112	113	28	85	125	M12	34	2	144	19	42	F12	91	67*)
200	203	155	294	419	457	900	130	130	32	100	140	M16	36	2	183	20	48	F14	159	121*)
250	254	196	343		533	1000	153	153	36	130	165	M20	44	3	220	20	56	F16		
300	305	237	381		610	1000	153	153	36	130	165	M20	44	3	258,5	20	56	F16		
400	387	381			762		288	288		200	254	Ø18		3	419			F25		

Flange dimensions acc. to respective ANSI-Norm *) different weight for stainless steel device

BALL VALVE "WAFER TYPE" TYPE FG2

Face to Face acc. to DIN EN 558-2
full bore

Specifications

Nominal Width	: DN 1/2" to 8"
Material	: ac. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (optional Gear Box)
Nominal Pressure	: ANSI 300
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Contained Seats
- Double Seals
- Body - End Centering
- all broach surface are mechanical shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocketless Seats
- Overpressure Hole into Ball

Torque

DN	Nm	DN	Nm
1/2"	11	2 1/2"	132
3/4"	22	3"	156
1"	27	4"	280
1 1/4"	32	5"	316
1 1/2"	62	6"	680
2"	80	8"	1020

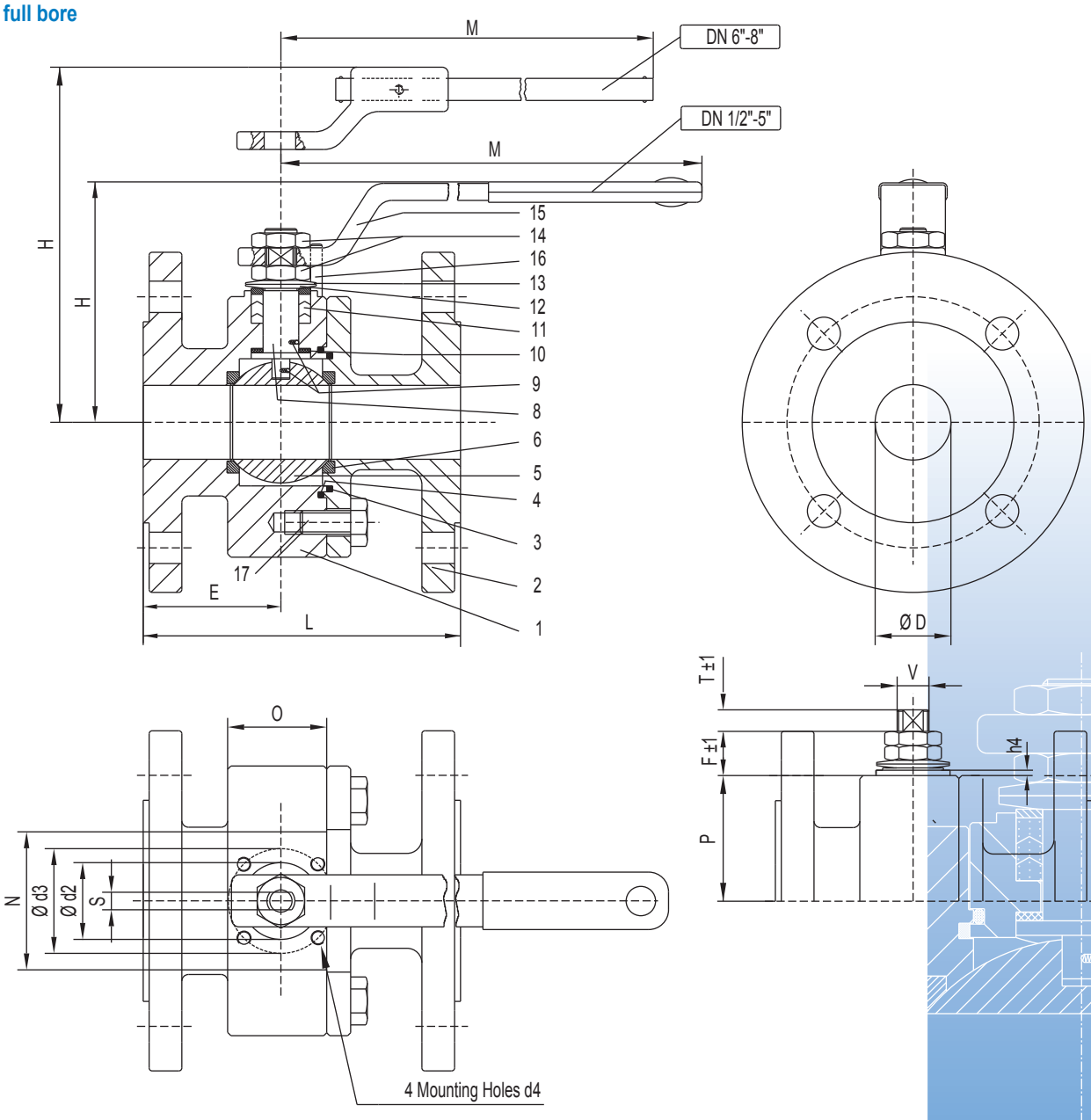
Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Material

Pos.	Description	Piece	Material (Carbon-Steel)	german Equivalent	Material (Stainless-Steel)	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	End	1	ASTM A 105+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	1	PTFE	PTFE	PTFE	PTFE
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	PTFE	PTFE	PTFE
8	Stem	1	ASTM A 182 F304/316/6	1.4001/1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*+	St 37 *+
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	A2-70UNI 3740 8.8*	DIN EN ISO 4762*
17	Screw	div.	UNI 3740 8.8*+	DIN EN ISO 24017 *+	UNI 3740 8.8*	DIN EN 24017
					+) lacquered	*) electrogalvanize

BALL VALVE "WAFER TYPE" TYPE FG2

Face to Face acc. to DIN EN 558-2
full bore



Dimensions in mm

DN	D	E	H	L	M	N	O	S	Ød2	Ød3	d4	F	h4	P	T	V	EN ISO 5211	Weight (kg)	
1/2"	15	57,5	86	140	145	50	34	6	25	36	M5	7,5	1,5	32,5	7	10	F03	4,0	
3/4"	19	58,5	88	151	145	48	33	6	25	36	M5	7,5	1,5	35	7	10	F03	5,2	
1"	25	59,5	113	165	185	54	34	8	25	36	M5	16,5	2	41	9,5	12	F03	6,8	
1 1/4"	30	71	119	179	185	73	43	8	25	36	M5	16,5	2	46,5	9,5	12	F03	11	
1 1/2"	38	69	110	191	280	67	46	10	35	50	M6	19,5	2	55	10	16	F05	14	
2"	51	82	120	216	280	64	48	10	35	50	M6	19,5	2	65	10	16	F05	19	
2 1/2"	64	89	144	241	370	79	65	14	55	70	M8	23,5	2	82	12	22	F07	28	
3"	76	109	152	283	370	80	80	14	55	70	M8	23,5	2	90,5	16,5	22	F07	38	
4"	101	94	174	305	470	94	67	18	55	70	M8	26,5	2	99,5	16,5	30	F07	54	
5"	118	135	188	381	650	96	92	18	70	102	M10	26,5	2	113	16,5	30	F10	70	
6"	152	154	256	403	750	125	143,5	28	85	125	M12	34	2	144	19	42	F12	130	82*)
8"	203	180,5	294	502	900	123	180	32	100	140	M16	36	2	183	20	48	F14	190	130*)

Flange dimensions acc. with the respective ANSI-Norm *) difference weight in stainless steel device

BALL VALVE "WAFER TYPE" TYPE FH/FN2

TYPE FH2 Face to Face acc. to ISO 5752 S

TYPE FN2 Face to Face acc. to DIN EN 558

full bore

Specifications

Nominal Width	: DN 15 to 150 or 1/2" bis 6"
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (optional Gear Box)
Nominal Pressure	: PN 63 - 100 or ANSI 600 - 900
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Contained Seats
- Double Seals
- Body - End Centering
- all broach surface are mechanical shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocketless Seats

Material

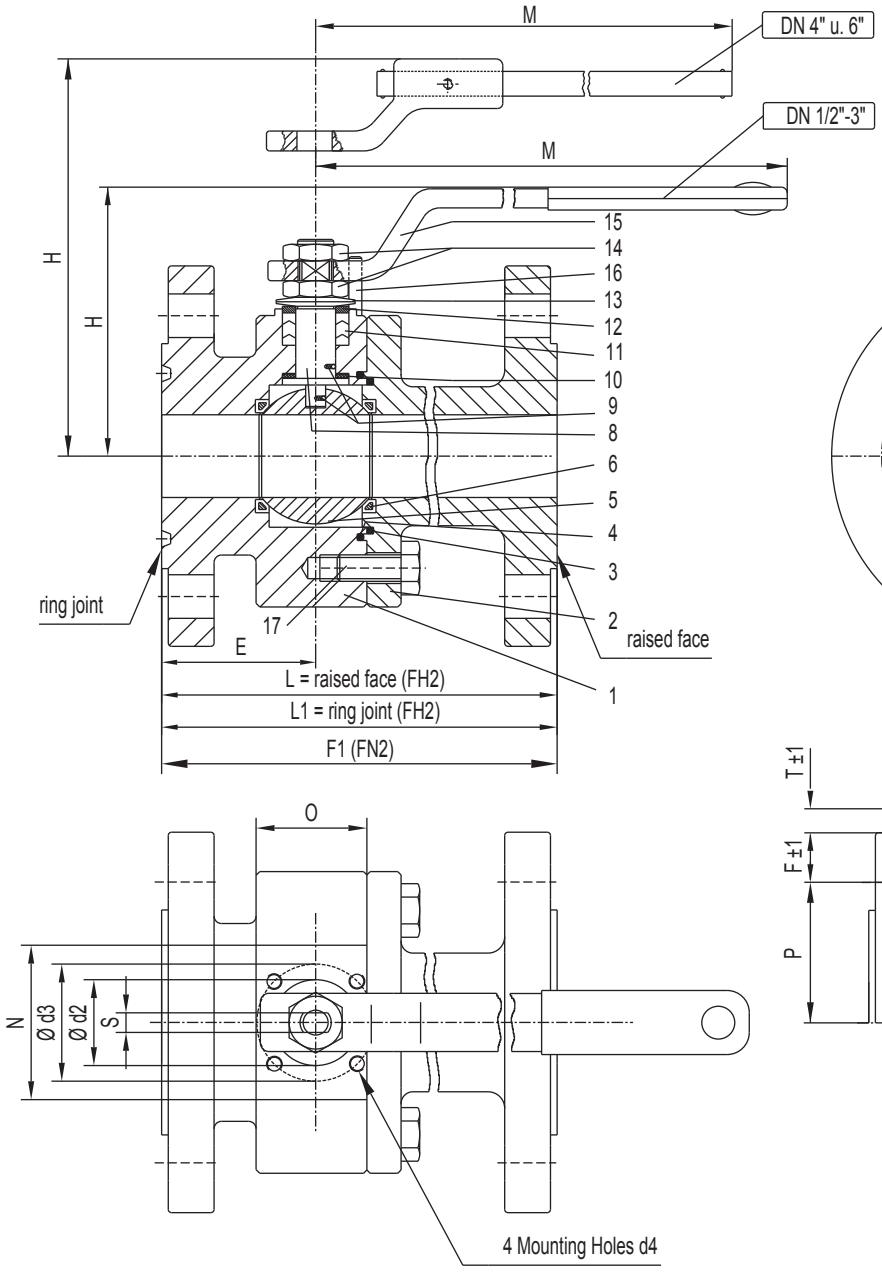
Pos.	Description	Piece	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21+	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	End	1	ASTM A 105+	C 21+	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	1	PTFE	PTFE	PTFE	PTFE
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE with Metal Core	PTFE with Metal Core	PTFE with Metal Core	PTFE with Metal Core
8	Stem	1	ASTM A 182 F6/316	1.4001/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFT/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*+	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*	DIN EN ISO 4762
17	Screw	div.	UNI 3740 8.8*+	DIN EN 24017 *+	A2-70	DIN EN 24017
					+) lacquered	*) electrogalvanize

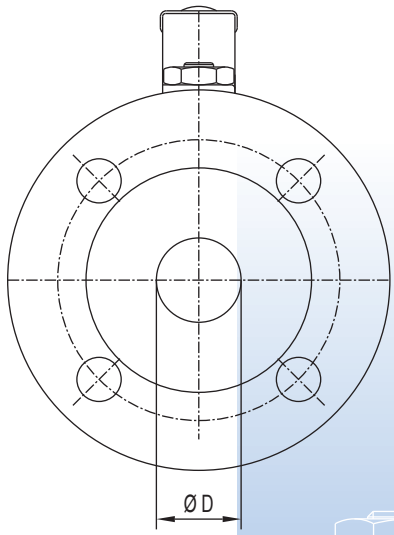
BALL VALVE "WAFER TYPE" TYPE FH/FN2

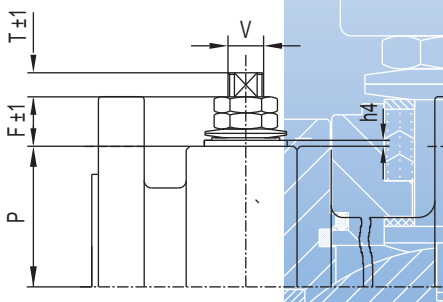
TYPE FH2 Face to Face acc. to ISO 5752 S

TYPE FN2 Face to Face acc. to DIN EN 558

full bore







Dimensions in mm

DN	D	E	H	L	L1	F1	M	N	O	S	Ød2	Ød3	d4	F	h4	P	T	V	EN ISO 5211	Weight (kg)	
1/2"	15	65,5	104	165	165	130	185	43	38	8	25	36	M5	14	2	35,5	8,5	12	F03	5,5	
3/4"	19	78,5	106	190	191	150	185	66	47	8	25	36	M5	14	2	37,5	8,5	12	F03	7,4	
1"	25	77	100	216	216	160	280	48	47	10	35	50	M6	19,5	2	46	10	16	F05	9	
1 1/4"	30	80	104	229	229	180	280	50	47	10	35	50	M6	19,5	2	50	10	16	F05	14	
1 1/2"	38	99	128	241	241	200	370	70	65	14	55	70	M8	23,5	2	66,5	12	22	F07	18	
2"	51	98,5	138	292	295	230	370	70	67	14	55	70	M8	23,5	2	76,5	12	22	F07	25	
2 1/2"	64	134	151	330	333	290	470	106	95	18	55	70	M8	26,5	2	77,5	16,5	30	F07	37	
3"	76	155	160	356	359	310	650	92	110	18	70	102	M10	26,5	2	86	16,5	30	F10	50	
4"	101	180	223	432	435	350	750	120	150	28	85	125	M12	34	2	113	19	42	F12	92	
6"	152	194	274	559	562	480	900	135	139	32	100	140	M16	26,5	2	163	20	48	F14	210	130*)

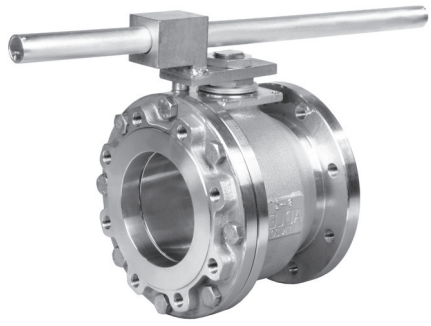
Flange dimensions acc. with the respective DIN- or ANSI-Norm (DN20 and 32 acc. to UNI)
*) difference weight in stainless steel device

BALL VALVE "WAFER TYPE" VM/VN2

TYPE VM2 Face to Face acc. to DIN EN 558

TYPE VN2 Face to Face acc. to DIN EN 558

reduced bore



Specifications

Nominal Width	: DN 15 to 300
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (optional Gear Box)
Nominal Pressure	: PN 06 - 40
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Contained Seats
- Double Seals
- Body - End Centering
- all broach surface are mechanical shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocketless Seats

Torque

DN	Nm	DN	Nm
15	11	80	132
20	11	100	156
25	22	125	280
32	27	150	316
40	32	200	680
50	62	250	1020
65	80	300	1600

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Material

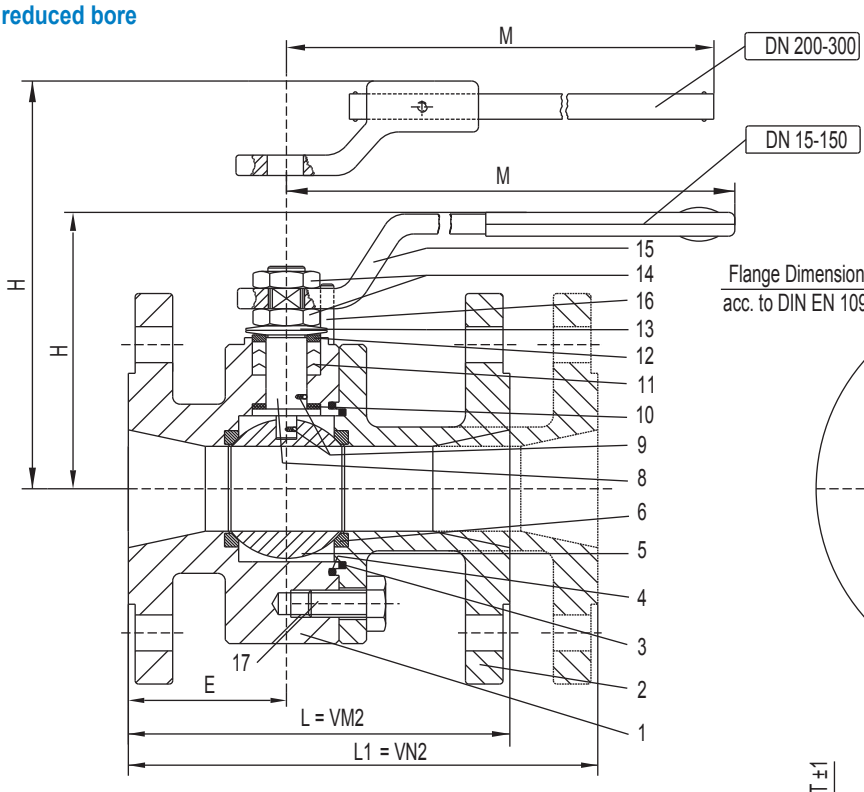
Pos.	Description	Piece	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Werkstoffbezeichnung	dt. Äquivalent
1	Body	1	ASTM A 105/216 WCB*	C 21/GS-C25+	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	End	1	ASTM A 105/216 WCB+	C 21/GS-C25+	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	1	PTFE	PTFE	PTFE	PTFE
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	PTFE	PTFE	PTFE
8	Stem	1	ASTM A 182 F304/316	1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFT/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*	DIN EN ISO 4762
17	Screw	div.	UNI 3740 8.8*+	DIN EN 24017 *+	A2-70*	DIN EN 24017
					+) lacquered	*) electrogalvanize

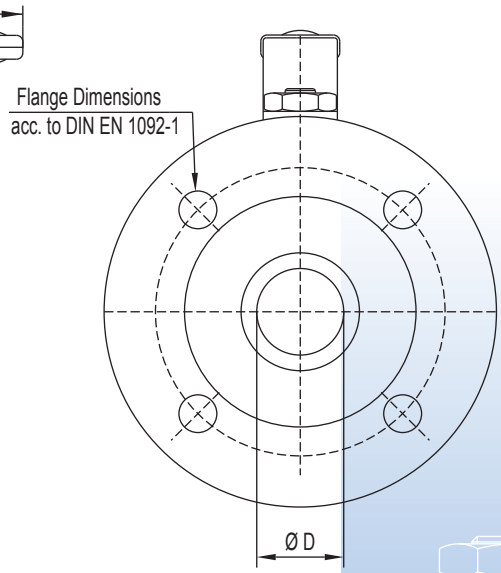
BALL VALVE "WAFER TYPE" VM/VN2

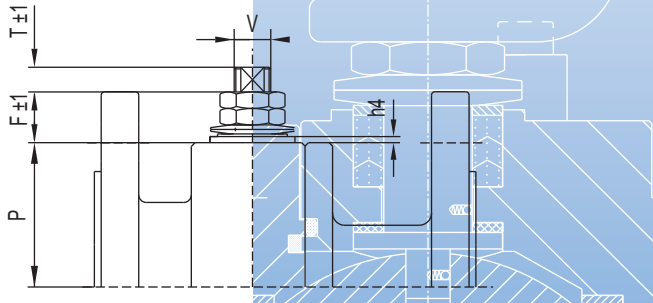
TYPE VM2 Face to Face acc. to DIN EN 558

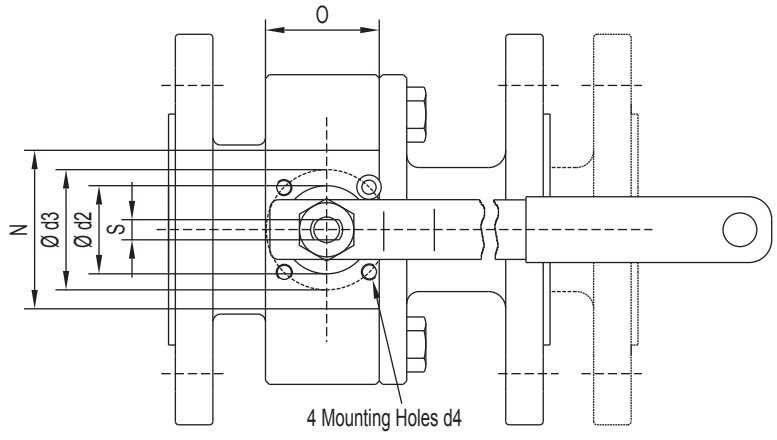
TYPE VN2 Face to Face acc. to DIN EN 558

reduced bore









Dimensions in mm

DN	D	E	H	L	L1	M	N	O	S	Ød2	Ød3	d4	F	h4	P	T	V	EN ISO 5211	Weight VM2 (kg)	Weight VN2
15	15	49	86	115	130	145	58	35	6	25	36	M5	6,6	1,5	33,1	7	10	F03	3,0	3,1
20	15	51,5	86	120	150	145	58	35	6	25	36	M5	6,6	1,5	35,4	7	10	F03	4,0	4,1
25	19	50	88	125	160	145	58	35	6	25	36	M5	8,2	1,5	49,3	9,5	10	F03	5,2	5,4
32	25	51,5	113	130	180	185	58	35	8	25	36	M5	8,2	1,5	54,8	9,5	12	F03	7,0	7,3
40	30	55	119	140	200	185	37	34	8	25	36	M5	16,5	2	46,5	9,5	12	F03	9,0	13,0
50	38	61	110	150	230	280	60	45	10	35	50	M6	19,5	2	55	10	16	F05	11,9	17,0
65	51	65	120	170	290	280	62	46	10	35	50	M6	19,5	2	65	10	16	F05	16,6	21,6
80	64	74	144	180	310	370	74	62	14	55	70	M8	23,5	2	82	12	22	F07	19,6	32,0
100	76	74	152	190	350	370	74	62	14	55	70	M8	23,5	2	90,5	12	22	F07	25,0	40,0
125	101	119	174	350	480	470	82	80	18	55	70	M8	26,5	2	99,5	16,5	30	F07	76,6	100,0
150	118	109	188	350	480	650	98	98	18	70	102	M10	26,5	2	113	16,5	30	F10	72,6	95,0
200	152	122	256	400	600	750	139	128	28	85	125	M12	34	2	144	19	42	F12	114,0	140,0
250	203	191	294	450	730	900	140	140	32	100	140	M16	36	2	183	20	48	F14	160,0	220,0
300	254	220	343	500	850	1000	166	160	36	130	165	M20	44	3	220	20	56	F16	220,0	250,0

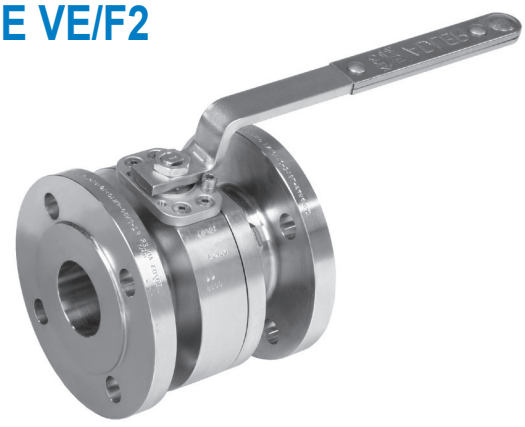
Flange dimensions acc. with the respective ANSI-Norm *) difference weight in stainless steel device

BALL VALVE "WAFER TYPE" TYPE VE/F2

TYPE VE2 Face to Face acc. to ISO 5752 S

TYPE VF2 Face to Face acc. to ISO 5752 M

reduced bore



Specifications

Nominal Width	: DN 1/2" to 12"
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (optional Gear Box)
Nominal Pressure	: ANSI 150
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Contained Seats
- Double Seals
- Body - End Centering
- all broach surface are mechanical shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocketless Seats

Torque

DN	Nm	DN	Nm
1/2"	11	3"	132
3/4"	11	4"	156
1"	22	5"	280
1 1/4"	27	6"	316
1 1/2"	32	8"	680
2"	62	10"	1020
2 1/2"	80	12"	1600

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Material

Pos.	Description	Piece	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105/216 WCB+	C 21/GS-C25 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	End	1	ASTM A 105/216 WCB+	C 21/GS-C25 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	1	PTFE	P.T.F.E.	PTFE	P.T.F.E.
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	P.T.F.E.	PTFE	P.T.F.E.
8	Stem	1	ASTM A 182 F304/316	1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	P.T.F.E.	PTFE	P.T.F.E.
11	Chevron Rings	1	PTFE/Graphit	P.T.F.E./Graphit	PTFE/Graphit	P.T.F.T./Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN 912-8.8 *+	UNI 3740 8.8*	DIN 912-8.8
17	Screw	div.	UNI 3740 8.8*+	DIN EN 24017 *+	A2-70	DIN EN 24017

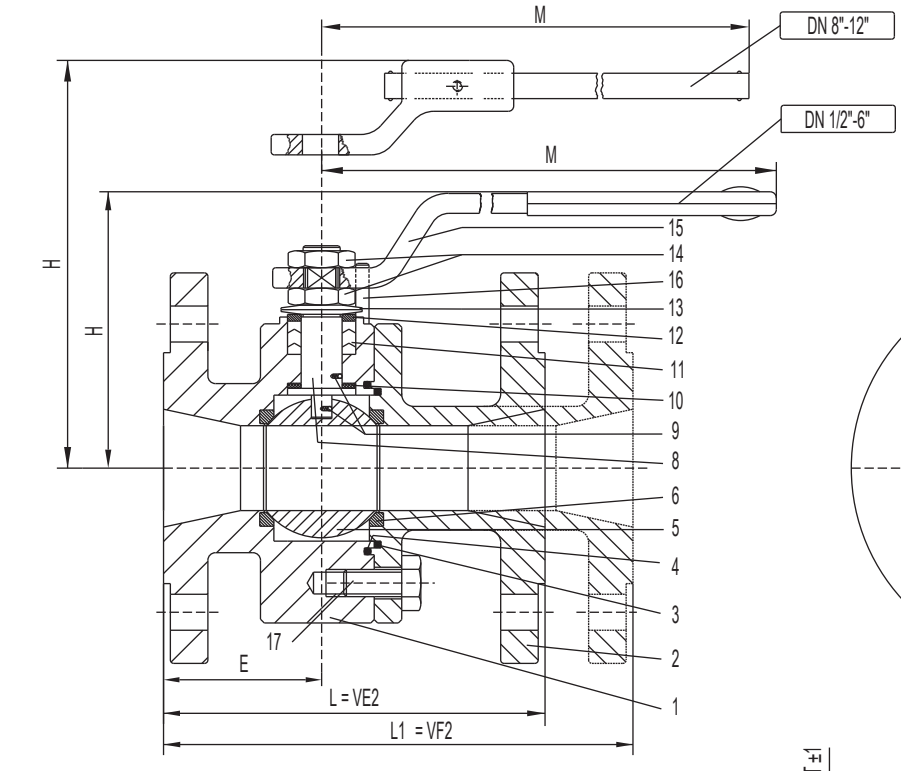
+) lacquered *) electrogalvanize

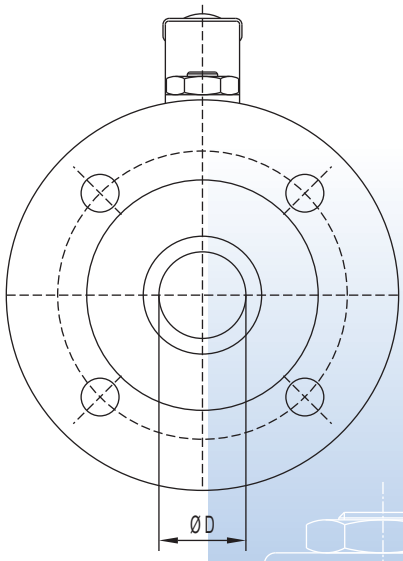
BALL VALVE "WAFER TYPE" TYPE VE/F2

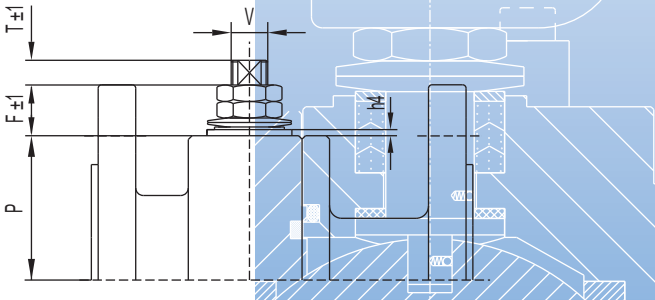
TYPE VE2 Face to Face acc. to ISO 5752 S

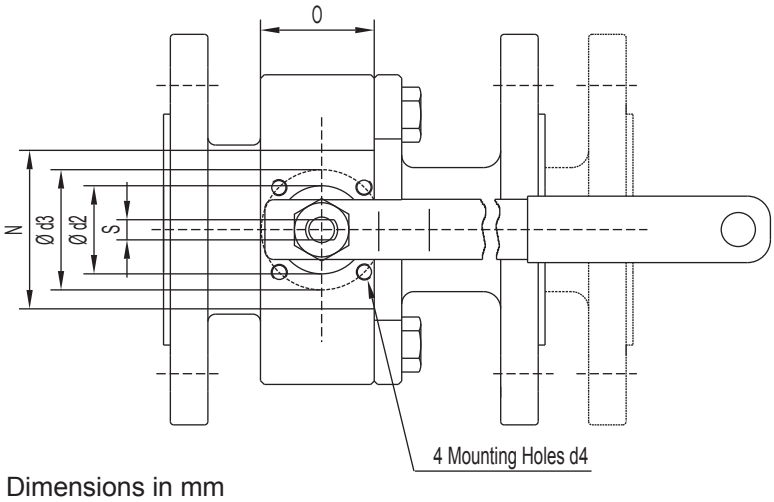
TYPE VF2 Face to Face acc. to ISO 5752 M

reduced bore









Dimensions in mm

DN	D	E	H	L	L1	M	N	O	S	Ød2	Ød3	d4	F	h4	P	T	V	EN ISO 5211	Weight VE2 (kg)	VF2
1/2"	15	46	86	108		145	35	33	6	25	36	M5	7	1,5	32,5	7	10	F03	2,7	3,6
3/4"	15	48,5	86	117		145	35	33	6	25	36	M5	7	1,5	32,5	7	10	F03	3,6	3,6
1"	19	49	88	127		145	37	33	6	25	36	M5	7	1,5	35	9,5	10	F03	4,5	5,0
1 1/4"	25	52	113	140		185	45	33	8	25	36	M5	16,5	1,5	41	9,5	12	F03	6,2	6,5
1 1/2"	30	78	119	165		185	40	34	8	25	36	M5	16,5	2	46,5	9,5	12	F03	7,7	8,0
2"	38	82	110	178		280	60	45	10	35	50	M6	19,5	2	55	10	16	F05	12,0	10,0
2 1/2"	51	88	120	190		280	62	46	10	35	50	M6	19,5	2	65	10	16	F05	17,0	13,0
3"	64	107	144	203		370	84	63	14	55	70	M8	23,5	2	82	12	22	F07	20,0	19,0
4"	76	109	152	229		370	73	75	14	55	70	M8	23,5	2	90,5	12	22	F07	32,8	27,0
5"	101	171	174	267		470	115	80	18	55	70	M8	26,5	2	99,5	16,5	30	F07	55,7	40,0
6"	118	157	188	267		650	100	98	18	70	102	M10	26,5	2	113	16,5	30	F10	52,6	72,0
8"	152	160	256	292	457	750	139	128	28	85	125	M12	34	2	144	19	42	F12	85,0	80,0
10"	203	135	256	330	533	900	140	144	28	85	125	M12	34	2	144	19	42	F12	145,0	125,0
12"	254	158	294	356	610	1000	141	170	32	100	140	M16	26	3	193	20	48	F14	210,0	180,0

Flange dimensions acc. with the respective ANSI-Norm

BALL VALVE "WAFER TYPE" TYPE VG2

Face to Face acc. to ISO 5752 S
reduced bore

Specifications

Nominal Width	: DN 1/2" to 12"
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (optional Gear Box)
Nominal Pressure	: ANSI 300
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti Blow-out Stem
- Antistatic Device
- Contained Seats
- Double Seals
- Body - End Centering
- all broach surface are mechanical shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocketless Seats

Torque

DN	Nm	DN	Nm
1/2"	11	3"	132
3/4"	11	4"	156
1"	22	5"	280
1 1/4"	27	6"	316
1 1/2"	32	8"	680
2"	62	10"	1020
2 1/2"	80	12"	1600

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

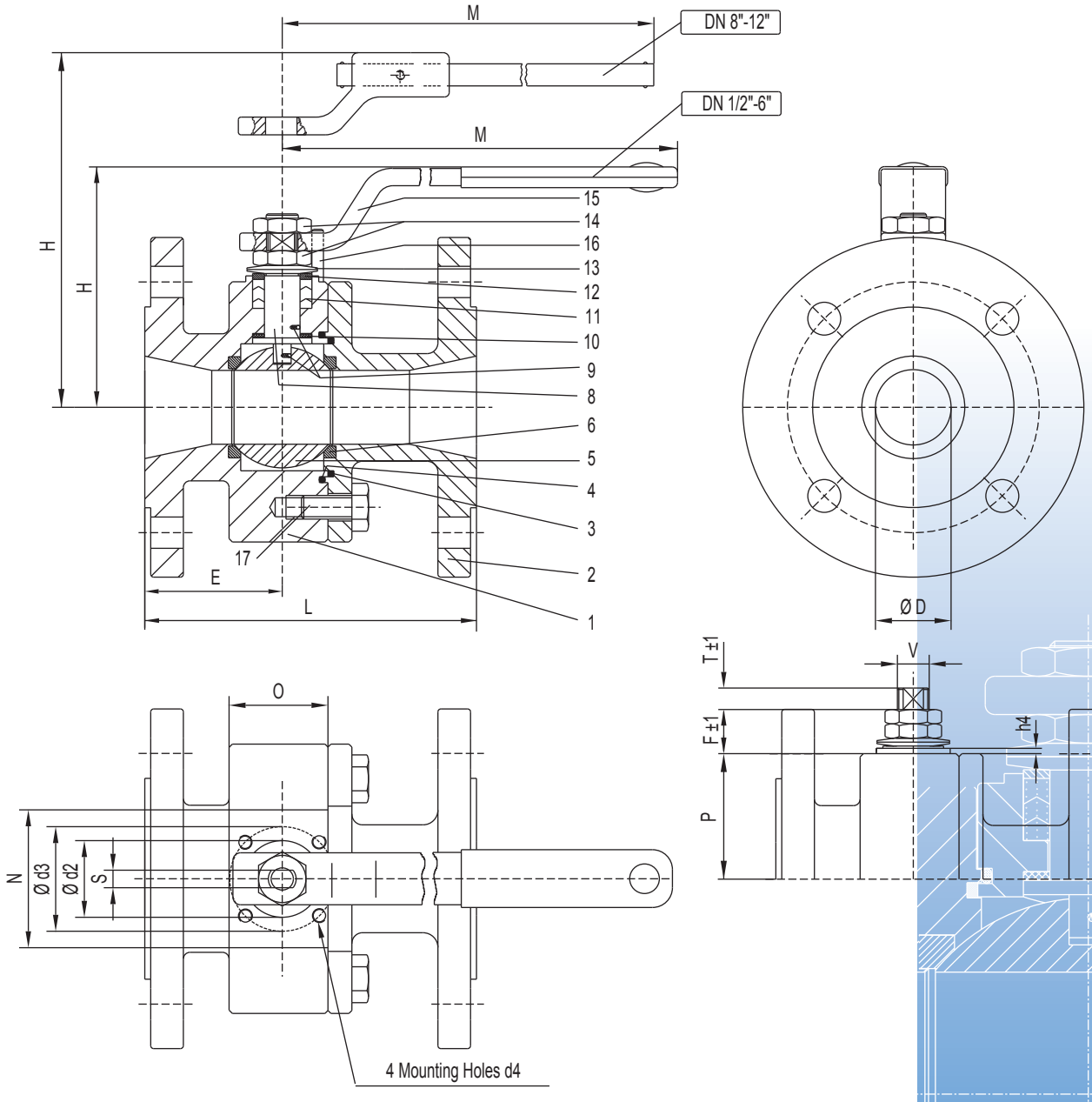
Material

Pos.	Description	Piece	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105/216 WCB+	C 21+/GS-C25+	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	End	1	ASTM A 105/216 WCB+	C 21+/GS-C25+	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	1	PTFE	PTFE	PTFE	PTFE
4	O-Ring	1	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	PTFE	PTFE	PTFE
8	Stem	1	ASTM A 182 F304/316/6	1.4001/1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFT/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*	DIN EN ISO 4762
17	Screw	div.	UNI 3740 8.8*+	DIN EN 24017 *+	A2-70	DIN EN 24017

+) lacquered *) electrogalvanize

BALL VALVE "WAFER TYPE" TYPE VG2

Face to Face acc. to ISO 5752 S
reduced bore



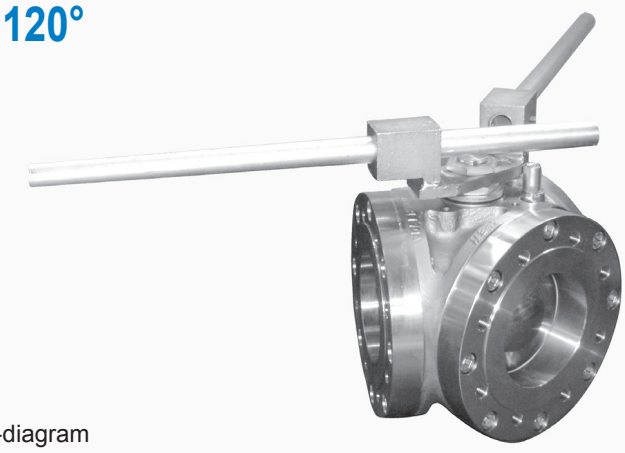
Dimensions in mm

DN	D	E	H	L	M	N	O	S	Ød2	Ød3	d4	F	h4	P	T	V	EN ISO 5211	Weight (kg)
1/2"	15	57,5	86	140	145	35	33	6	25	36	M5	7,5	1,5	32,5	7,5	10	F03	2,7
3/4"	15	58,5	88	151	145	35	33	6	25	36	M5	7,5	1,5	32,5	7,5	10	F03	3,6
1"	19	59,5	113	165	145	37	33	6	25	36	M5	16,5	1,5	35	7,5	10	F03	4,5
1 1/4"	25	71	119	178	185	45	33	8	25	36	M5	16,5	1,5	41	9,5	12	F03	6,2
1 1/2"	30	78	119	191	185	40	34	8	25	36	M5	16,5	2	46,5	9,5	12	F03	7,7
2"	38	82	110	216	280	60	45	10	35	50	M6	19,5	2	55	10	16	F05	12,0
2 1/2"	51	88	120	241	280	62	46	10	35	50	M6	19,5	2	65	10	16	F05	17,0
3"	64	107	144	283	370	84	63	14	55	70	M8	23,5	2	82	12	22	F07	20,0
4"	76	109	152	305	370	73	75	14	55	70	M8	23,5	2	90,5	12	22	F07	32,8
5" *)	101	171	174	403	470	115	80	18	55	70	M8	26,5	2	99,5	16,5	30	F07	55,7
6"	118	157	188	403	650	100	98	18	70	102	M10	26,5	2	113	16,5	30	F10	52,6
8"	152	160	256	419	750	139	128	28	85	125	M12	34	2	144	19	42	F12	85,0
10"	203	135	256	457	900	140	144	28	85	125	M12	34	2	144	19	42	F12	145,0
12"	254	158	294		1000	141	170	32	100	140	M16	26	3	193	20	48	F14	210,0

Flange dimensions acc. with the respective ANSI-Norm
*) EXCEPTION: ball valve specified with RG2

BALL VALVE "3 WAY WAFER" 120°
TYPE FU4

full bore



Specifications

Nominal Width	: DN 40 bis 200
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench
Nominal Pressure	: PN 10 to16 or ANSI 150
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Torque

DN	Nm	DN	Nm
10	15	65	191
15	16	80	226
20	32	100	410
25	40	125	460
32	46	150	986
40	90	200	1480
50	116		

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Utilities

- Mounting Flange Dimensions acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti-Blow-Out Stem
- Antistatic Device
- Contents Ball
- Metal Beating Ring
- Double Seals
- All broach surfaces are mechanical shaped
- "Fire-Safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)

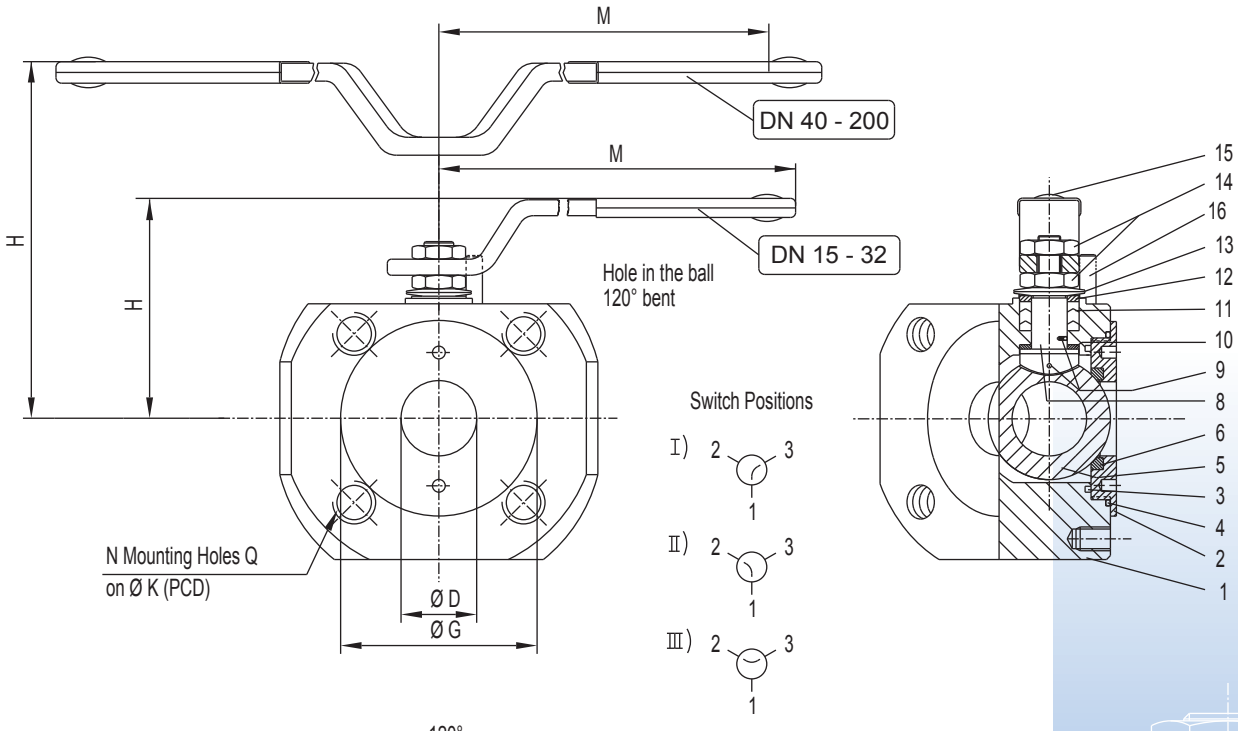
Material

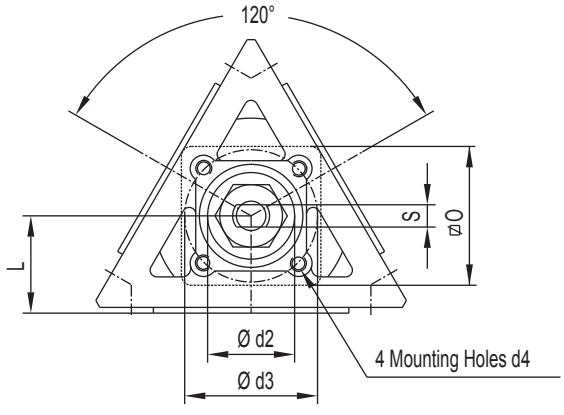
Pos.	Description	Piece	Description			
			Carbon Steel		Stainless Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	Insert	3	ASTM A 105+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	3	PTFE	PTFE	PTFE	P.T.F.E.
4	O-Ring	3	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	PTFE	PTFE	P.T.F.E.
8	Stem	1	ASTM A 182 F6/304/316	1.4001/1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	P.T.F.E.
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	P.T.F.T./Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN 912-8.8 *+	UNI 3740 8.8*	DIN 912-8.8

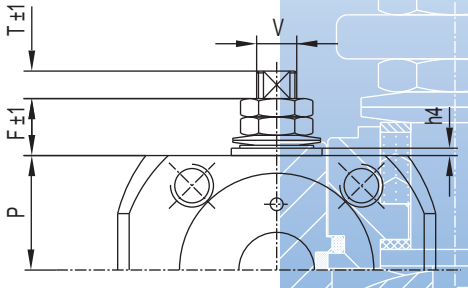
+)varnish paint coat *) electroplated zinc coating

BALL VALVE “3 WAY WAFER” 120°
TYPE FU4

full bore





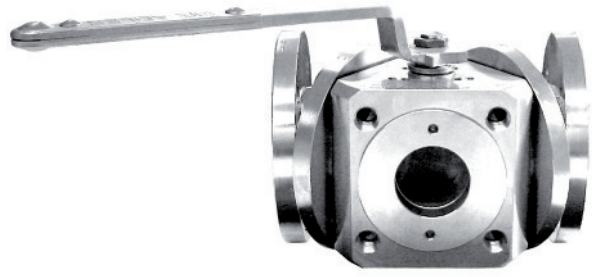


Dimensions in mm

DN	D	L	H	M	S	P	F	T	h4	O	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
10*)	15	33	59	150	6	32,5	7	7,5	1,5	45	25	36	M5	F03	3,8
15*)	15	33	59	150	6	32,5	7	7,5	1,5	45	25	36	M5	F03	3,8
20*)	19	36	62	150	6	35,5	7	7,5	1,5	49	25	36	M5	F03	5,0
25*)	25	39,5	80	190	8	41	16,5	9,5	2	54	25	36	M5	F03	5,8
32*)	30	45	85	190	8	46,5	16,5	9,5	2	62	25	36	M5	F03	9,0
40*)	38	46,5	108	285	10	55	19,5	10	2	62	35	50	M6	F05	13,0
50*)	51	51	116	285	10	65	19,5	10	2	70	35	50	M6	F05	19,0
65**)	64	56,5	142	375	14	82	23,5	12	2	70	55	70	M8	F07	27,0
80*)	76	66	152	375	14	90,5	23,5	12	2	70	55	70	M8	F07	35,0
100	101	77,5	174	475	18	99,5	26,5	16,5	2	97	70	102	M10	F10	38,0
125	118	91	183	475	18	113	26,5	16,5	2	97	70	102	M10	F10	41,0
150	152	137	252	600	28	144	34	19	2	108	85	125	M12	F12	100,0
200	203	155	293	745	32	183	36	20	2	126	100	140	M16	F14	140,0

*) Pressure Stage PN 10 - 40; **) Pressure Stage PN 25 - 40 delivery; Dimension 550 acc. to EN 558
Dimensions G, N, Q and K acc. to EN 1092-2 or ANSI 150. ANSI-Pressure are delivered as standard the UNC-Size acc. to metric thread, likewise available UNC-Thread acc. to ANSI BI.

BALL VALVE “3 WAY”
TYPE FV4 Face to Face acc. to EN 558
full bore



Specifications

Nominal Width	: DN 40 to 200
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench
Nominal Pressure	: PN 10 to16 or ANSI 150
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange Dimensions acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti-Blow-Out Stem
- Antistatic Device
- Contents Ball
- Metal Beating Ring
- Double Seals
- All broach surfaces are mechanical shaped
- "Fire-Safe" - Design

Torque

DN	Nm
40	90
50	116
65	191
80	226
100	410
125	460
150	986
200	1480

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Special Design

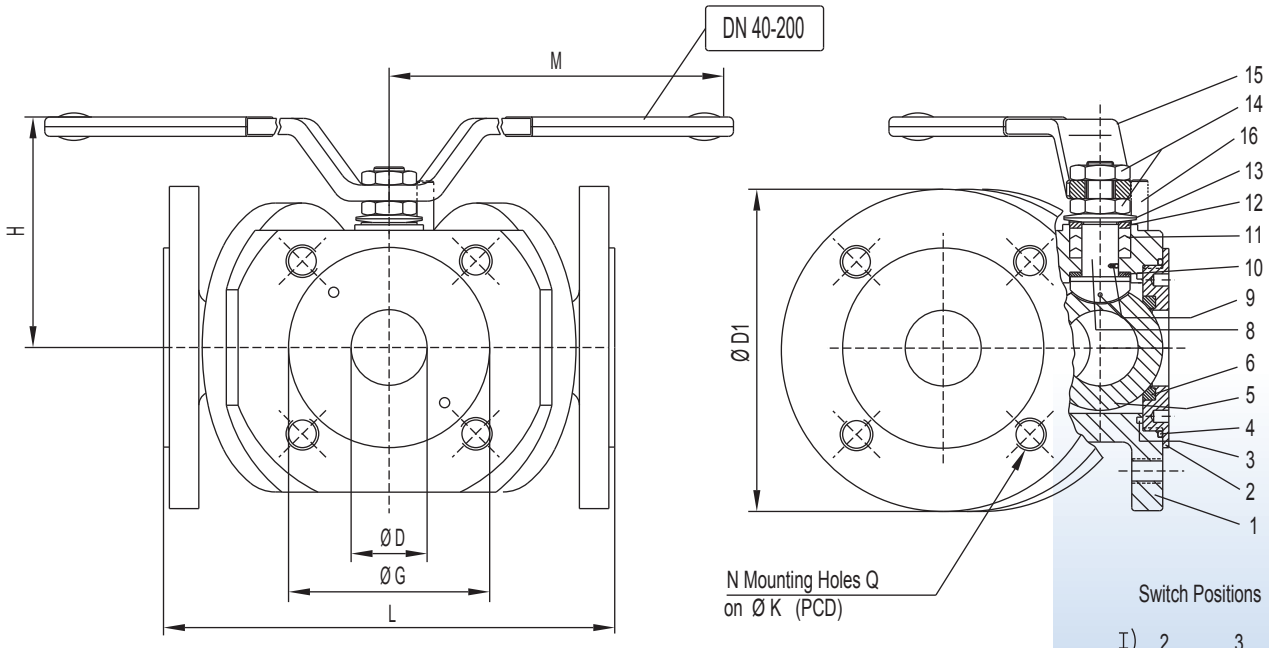
- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)

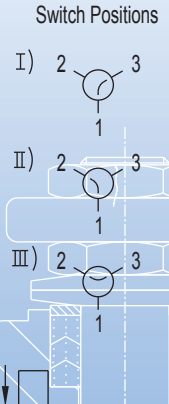
Material

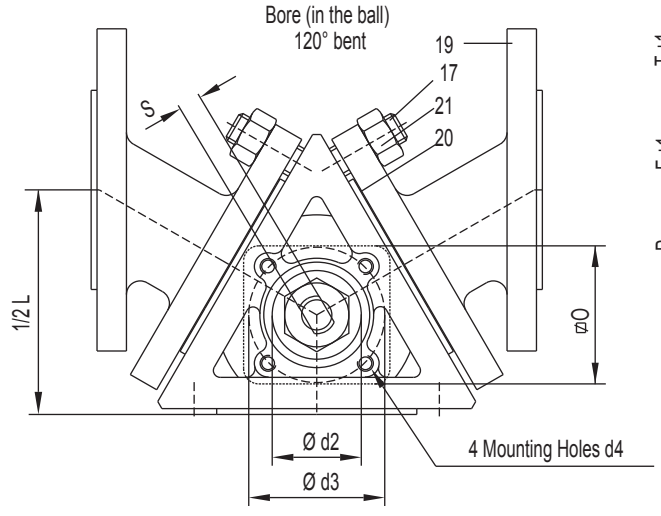
No.	Description	Piece	Material			
			Carbon Steel		Stainless Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
2	Insert	3	ASTM A 105+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
3	Seal	3	PTFE	PTFE	PTFE	PTFE
4	O-Ring	3	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2	PTFE	PTFE	PTFE	PTFE
8	Stem	1	ASTM A 182 F316/304/6	1.4001/1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFT/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*	DIN EN ISO 4762 *
17	Threaded Bolts	div.	UNI 3740 8.8*+	DIN 835-8.8 *+	A2-70*	DIN 835-8.8
19	Flange	2	ASTM A 105*+	C 21 +	ASTM A 182 F316/351 CF8M	1.4401/1.4408
20	Flange Seals	2	PTFE	PTFE	PTFE	PTFE
21	Nuts	div.	UNI 3740 8.8*+	DIN EN 24032 *+	A2-70*	DIN EN 24032

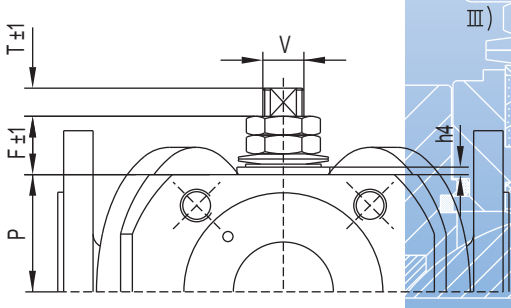
+)varnish paint coat *) electroplated zinc coating

BALL VALVE “3 WAY”
TYPE FV4 ace to Face acc. to EN 558
full bore









Dimensions in mm

DN	D	L	H	M	S	P	F	T	h4	O	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
40*)	38	200	108	285	10	55	19,5	10	2	62	35	50	M6	F05	16,0
50*)	51	230	116	285	10	65	19,5	10	2	70	35	50	M6	F05	23,0
65**)	64	290	142	375	14	82	23,5	12	2	70	55	70	M8	F07	31,0
80*)	76	310	152	375	14	90,5	23,5	12	2	70	55	70	M8	F07	40,0
100	101	350	174	475	18	99,5	26,5	16,5	2	97	70	102	M10	F10	50,0
125	118	400	183	475	18	113	26,5	16,5	2	97	70	102	M10	F10	60,0
150	152	550**)	252	600	28	144	34	19	2	108	85	125	M12	F12	125,0
200	203	600	293	745	32	183	36	20	2	126	100	140	M16	F14	180,0

*) Pressure Stage PN 10 - 40; **) Pressure Stage PN 25 - 40 delivery; Dimension 550 acc. to EN 558
Dimensions G, N, Q and K acc. to EN 1092-2 or ANSI 150. ANSI-Pressure are delivered as standard the UNC-Size acc. to metric thread, likewise available UNC-Thread acc. to ANSI BI.

BALL VALVE “3 WAY WAFER” 90°

TYPE FZ4 (2 Seats)

TYPE FT4 (4 Seats)

L- or T-Bore

Specifications

Nominal Width	: DN 15 to 150
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench
Nominal Pressure	: PN 10 to 40
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange Dimensions acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti-Blow-Out Stem
- Antistatic Device
- Double Seals and Metal Beating Ring
- Ball contained in 2 Seats
- Ball contained in 4 Seats
- 3 Sides supported Seats
- Contents Ball
- All Broach Surfaces are Mechanical Shaped
- "fire-safe" - Design

Torque (Nm)

DN	FZ4	FT4
15	11	20
20	22	41
25	27	44
32	32	54
40	62	119
50	80	136
65	132	228
80	156	272
100	280	425
125	316	420
150	680	800

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocket Less Seats in PTFE
  (available for the ball valve type FZ4)

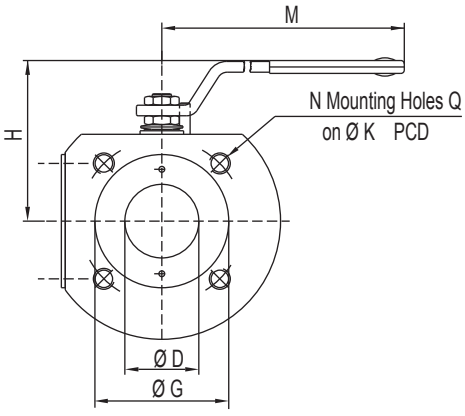
Material

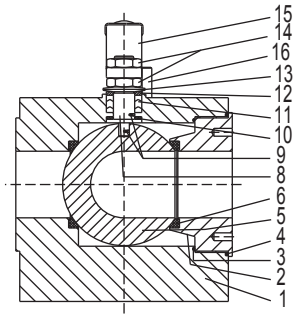
Pos.	Descriptions	Pieces	Material: Carbon-Steel		Material: Stainless Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
2	End	1/3	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
3	Seal	1/3	PTFE	PTFE	PTFE	P.T.F.E.
4	O-Ring	1/2	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304	1.4301	ASTM A 182 F316	1.4401
6	Seat	2/4	PTFE	PTFE	PTFE	P.T.F.E.
8	Stem	1	ASTM A 182 F304/316	1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	P.T.F.E.
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	P.T.F.T./Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	A2-70*	DIN 912-8.8

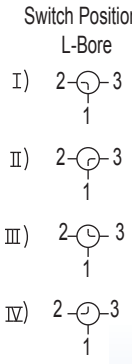
+) lacquered *) electrogalvanize

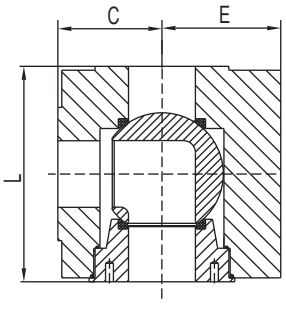
BALL VALVE “3 WAY WAFER” 90°
TYPE FZ4 (2 Seats) L- Bore

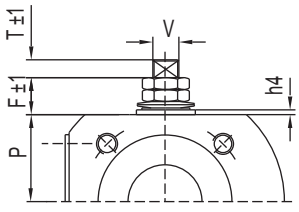
ATTENTION: Ball Valve Type FZ4 with L-Bore in position Ⅲ and Ⅳ are not closed!

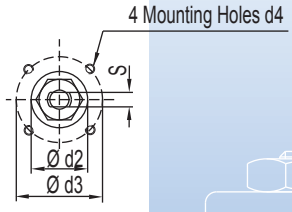












Dimensions in mm Type FZ4-PN10/16 or ANSI 150

DN	D	L	C	E	H	M	P	F	T	V	h4	S	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
15	15	97	32	47,5	70	145	36,5	7,5	7	10	1,5	6	25	36	M5	F03	4,0
20	19	108	40	55	75	145	41	7,5	7	10	1,5	6	25	36	M5	F03	6,5
25	25	115	41	57,5	90	185	46	16,5	9,5	12	2	8	25	36	M5	F03	7,5
32	30	140	52,5	70	95	185	51	16,5	9,5	12	2	8	25	36	M5	F03	12,0
40	38	150	56	75	112	280	57	19,5	14,5	16	2	10	35	50	M6	F05	15,5
50	51	165	62	82,5	122	280	67	19,5	14,5	16	2	10	35	50	M6	F05	18,0
65	64	185	70	94	147	370	85	23,5	16,5	22	2	14	55	70	M8	F07	25,5
80	76	216	87	117,5	149	370	87	23,5	16,5	22	2	14	55	70	M8	F07	54,0
100	98	230	96	133	174	650	99,5	26,5	16,5	30	2	18	70	102	M10	F10	69,0
125 *	115	290	116	152,5	183	650	113	26,5	16,5	30	2	18	70	102	M10	F10	125,0
150	150	350	153	175	256	750	144	34	19	42	2	28	85	125	M12	F12	180,0

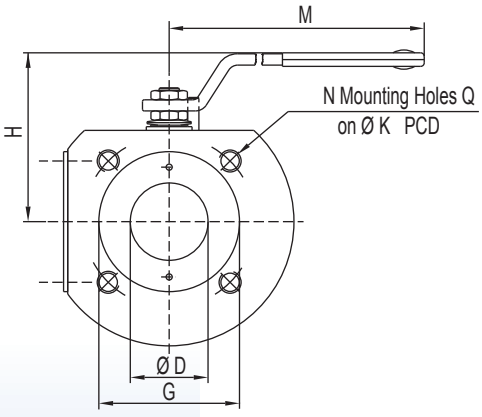
Dimensions G, N, Q and K are acc. to EN 1092 or ANSI 150. ANSI-pressure are delivered as standard UNC size corresponding threads; likewise available UNC-threads are acc. to ANSI B1.1
* reduces; DN 100 - ANSI 150: C = 100,5 L = 240

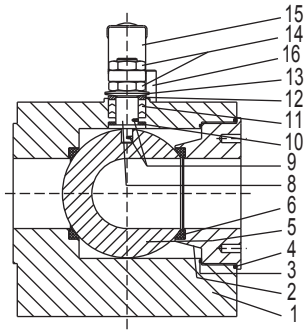
Dimensions in mm Type FZ4-PN25/40

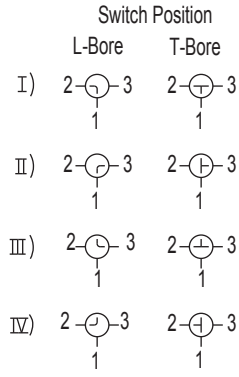
DN	D	L	C	E	H	M	P	F	T	V	h4	S	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
15	15	97	32	47,5	70	145	36,5	7,5	7	10	1,5	6	25	36	M5	F03	4,0
20	19	108	40	55	75	145	41	7,5	7	10	1,5	6	25	36	M5	F03	6,5
25	25	115	41	57,5	90	185	46	16,5	9,5	12	2	8	25	36	M5	F03	7,5
32	30	140	52,5	70	95	185	51	16,5	9,5	12	2	8	25	36	M5	F03	13,0
40	38	150	56	75	112	280	57	19,5	14,5	16	2	10	35	50	M6	F05	15,0
50	51	165	62	82,5	122	280	67	19,5	14,5	16	2	10	35	50	M6	F05	19,0
65	64	206	81	110	147	370	85	23,5	16,5	22	2	14	55	70	M8	F07	31,0
80	76	216	87	117,5	149	370	87	23,5	16,5	22	2	14	55	70	M8	F07	52,0
100	98	262	105	133	174	650	107	19	16,5	30	2	18	70	102	M10	F10	75,0
125 *	115	318	125	152,5	183	650	121	18,5	16,5	30	2	18	70	102	M10	F10	100,0
150	150	398	156	175	256	750	144	34	19	42	2	28	85	125	M12	F12	200,0

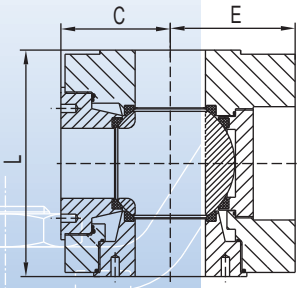
Dimensions G, N, Q and K are acc. to EN 1092 ; * reduced

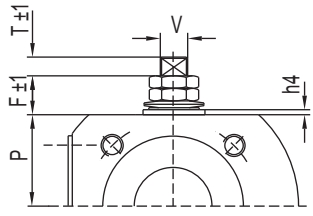
BALL VALVE “3 WAY WAFER” 90°
TYPE FT4 (4 Seats) L- or T-Bore

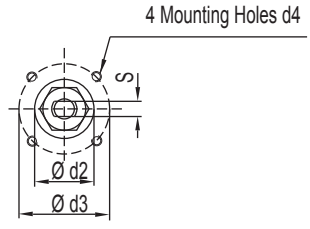












Dimensions in mm Type FT4-PN10/16 or ANSI 150

DN	D	L	C	E	H	M	P	F	T	V	h4	S	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
15	15	97	32	47,5	70	145	36,5	7,5	7	10	1,5	6	25	36	M5	F03	4,0
20	19	108	40	55	75	145	41	7,5	7	10	1,5	6	25	36	M5	F03	6,5
25	25	115	41	57,5	90	185	46	16,5	9,5	12	2	8	25	36	M5	F03	7,5
32	30	140	52,5	70	95	185	51	16,5	9,5	12	2	8	25	36	M5	F03	12,0
40	38	150	56	75	112	280	57	19,5	14,5	16	2	10	35	50	M6	F05	15,5
50	51	165	62	82,5	122	280	67	19,5	14,5	16	2	10	35	50	M6	F05	18,0
65	64	185	70	94	147	370	85	23,5	16,5	22	2	14	55	70	M8	F07	25,5
80 *	69	216	87	117,5	149	370	87	23,5	16,5	22	2	14	55	70	M8	F07	54,0
100 *	87	230	96	133	174	650	99,5	26,5	16,5	30	2	18	70	102	M10	F10	69,0
125 *	108	290	116	152,5	183	650	113	26,5	16,5	30	2	18	70	102	M10	F10	125,0
150 *	136	370	180	175	256	750	144	34	19	42	2	28	85	125	M12	F12	200,0

Dimensions G, N, Q and K are acc. to EN 1092 or ANSI 150. ANSI-pressure are delivered as standard UNC size corresponding threads; likewise available UNC-threads are acc. to ANSI B1.1
* reduces; DN 100 - ANSI 150: C = 100,5 L = 240

Dimensions in mm Type FT4-PN25/40

DN	D	L	C	E	H	M	P	F	T	V	h4	S	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
15	15	97	32	47,5	70	145	36,5	7,0	7,5	10	1,5	6	25	36	M5	F03	4,0
20	19	108	40	55	75	145	41	7,0	7,5	10	1,5	6	25	36	M5	F03	6,0
25	25	115	41	57,5	90	185	46	16,5	9,5	12	2	8	25	36	M5	F03	7,5
32	30	140	52	70	95	185	51	16,5	9,5	12	2	8	25	36	M5	F03	13,0
40	38	150	56	75	112	280	57	19,5	14,5	16	2	10	35	50	M6	F05	15,0
50	51	165	62	82,5	122	280	67	19,5	14,5	16	2	10	35	50	M6	F05	19,0
65	64	206	81	110	147	370	85	23,5	16,5	22	2	14	55	70	M8	F07	31,0
80 *	69	216	87	117,5	149	370	87	23,5	16,5	22	2	14	55	70	M8	F07	52,0
100 *	87	262	105	133	174	650	107	19,0	16,5	30	2	18	70	102	M10	F10	75,0
125 *	108	318	125	152,5	183	650	121	18,5	16,5	30	2	18	70	102	M10	F10	100,0

Dimensions G, N, Q and K are acc. to EN 1092 ; * reduced

BALL VALVE “3 WAY WAFER” 90°
TYPE FZ4 (2 Seats)
TYPE FT4 (4 Seats)
L- or T-Bore

Dimensions in mm Type FZ4 - ANSI 300

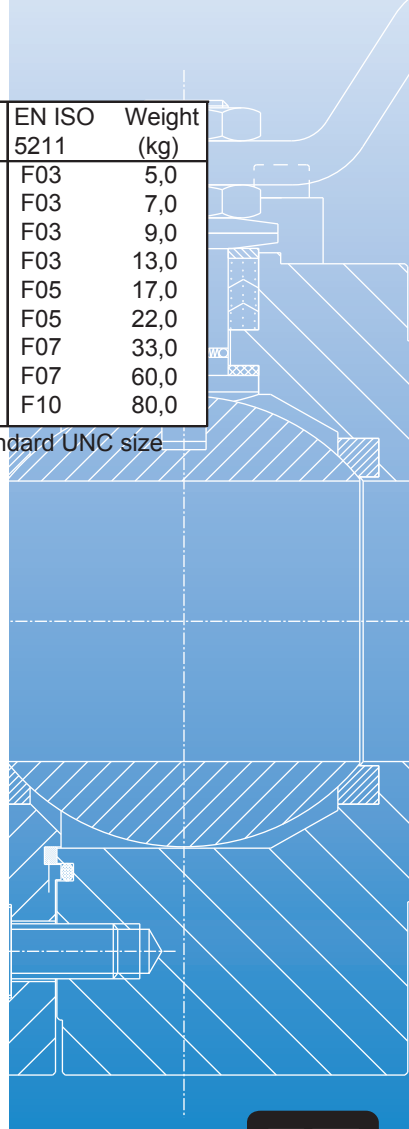
DN	D	L	C	E	H	M	P	F	T	V	h4	S	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
15	15	107	35	47,5	70	145	36,5	7,5	7	10	1,5	6	25	36	M5	F03	5,0
20	19	128	43	55	75	145	41	7,5	7	10	1,5	6	25	36	M5	F03	7,0
25	25	133	46	57,5	90	185	46	16,5	9,5	12	2	8	25	36	M5	F03	9,0
32	30	140	52	70	95	185	51	16,5	9,5	12	2	8	25	36	M5	F03	13,0
40	38	166	56,5	75	112	280	61,5	19,5	10,0	16	2	10	35	50	M6	F05	17,0
50	51	185	72	82,5	122	280	71,5	19,5	10,0	16	2	10	35	50	M6	F05	22,0
65	64	227	89	94	147	370	89,5	23,5	12,0	22	2	14	55	70	M8	F07	33,0
80	76	245	95	117,5	149	370	91,5	23,5	12,0	22	2	14	55	70	M8	F07	60,0
100	98	274	109	133	174	650	108	18,0	16,5	30	2	18	70	102	M10	F10	80,0

Dimensions G, N, Q and K are acc. to EN 1092 or ANSI 150. ANSI-pressure are delivered as standard UNC size corresponding threads; likewise available UNC-threads are acc. to ANSI B1.1
* reduces

Dimensions in mm Type FT4 - ANSI 300

DN	D	L	C	E	H	M	P	F	T	V	h4	S	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
15	15	107	35	47,5	70	145	36,5	7,5	7,0	10	1,5	6	25	36	M5	F03	5,0
20	19	128	43	55	75	145	41	7,5	7,0	10	1,5	6	25	36	M5	F03	7,0
25	25	133	46	57,5	90	185	46	16,5	9,5	12	2	8	25	36	M5	F03	9,0
32	30	140	52,5	70	95	185	51	16,5	9,5	12	2	8	25	36	M5	F03	13,0
40	38	166	56,5	75	117	280	61,5	19,5	10,0	16	2	10	35	50	M6	F05	17,0
50	51	185	72	82,5	127	280	71,5	19,5	10,0	16	2	10	35	50	M6	F05	22,0
65	64	227	89	94	152	370	89,5	23,5	12,0	22	2	14	55	70	M8	F07	33,0
80 *	69	245	95	117,5	154	370	91,5	23,5	12,0	22	2	14	55	70	M8	F07	60,0
100 *	87	274	109	133	174	650	108	18,0	16,5	30	2	18	70	102	M10	F10	80,0

Dimensions G, N, Q and K are acc. to EN 1092 or ANSI 150. ANSI-pressure are delivered as standard UNC size corresponding threads; likewise available UNC-threads are acc. to ANSI B1.1
* reduces



BALL VALVE “4 WAY”
TYPE FT5 L- or T-Bore
TYPE VT5 X-Bore
full bore = FT5; reduce bore = VT5

Specifications

Nominal Width : DN 15 to 100
Material : acc. to material list
Flow Direction : any
Fitting Position : any
Operation : Wrench
Nominal Pressure : PN 10 to 16
max. Working Pressure : acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange Dimensions acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti-Blow-Out Stem
- Antistatic Device
- Double Seals and Metal Beating Ring
- Ball contained in 4 Seats
- 3 Sides supported Seats
- All Broach Surfaces are Mechanical Shaped
- "fire-safe" - Design

Torque

DN	Nm
15	20
20	41
25	44
32	54
40	119
50	136
65	228
80	272
100	425

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

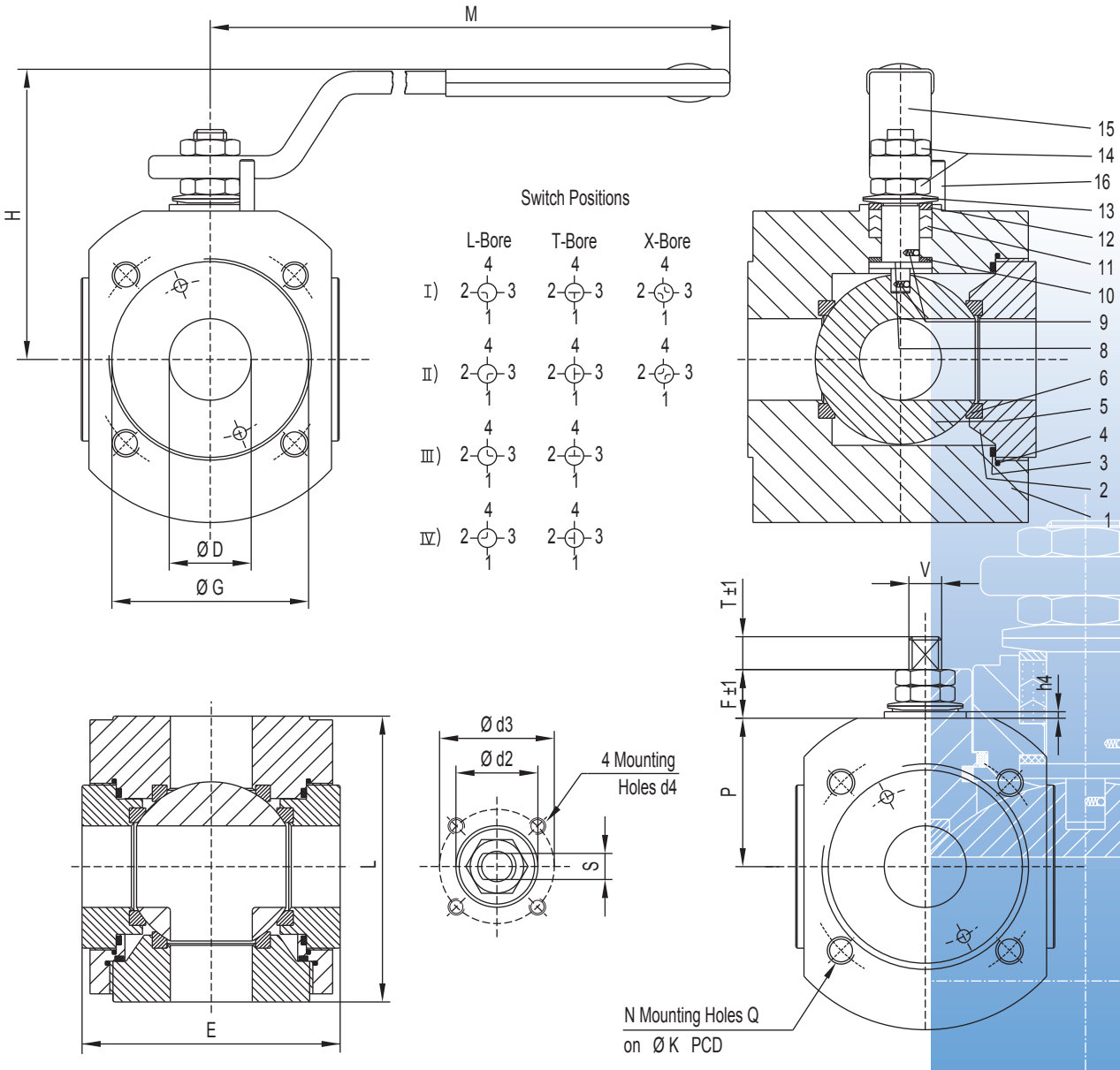
Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)

Material

Pos.	Descriptions	Pieces	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
2	End	3	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
3	Seal	3	PTFE	PTFE	PTFE	P.T.F.E.
4	O-Ring	3	VITON O-Ring	VITON O-Ring	VITON O-Ring	VITON O-Ring
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316	1.4401
6	Seat	4	PTFE	PTFE	PTFE	P.T.F.E.
8	Stem	1	ASTM A 182 F304/316/6	1.4301/1.4401/1.4001	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	P.T.F.E.
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	P.T.F.T./Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN 912-8.8 *+	UNI 3740 8.8*	DIN 912-8.8 *
					+) lacquered	*) electrogalvanize

BALL VALVE “4 WAY”
TYPE FT5 L- or T-Bore
TYPE VT5 X-Bore
full bore = FT5; reduce bore = VT5



Dimensions in mm

DN	D FT5	D VT5	L	E	H	M	P	F	T	V	h4	S	Ød2	Ød3	d4	EN ISO 5211	Weight (kg)
15	15	10	97	64	63	145	36,5	7,0	7,5	10	1,5	6	25	36	M5	F03	3,8
20	19	14	108	80	67	145	41	7,0	7,5	10	1,5	6	25	36	M5	F03	5,7
25	25	18	115	82	88	185	46	16,5	9,5	12	2	8	25	36	M5	F03	7,1
32	30	23	140	104	93	185	51	16,5	9,5	12	2	8	25	36	M5	F03	12,5
40	38	29	150	112	111	280	57	19,5	14,5	16	2	10	35	50	M6	F05	14,2
50	51	38	165	124	121	280	67	19,5	14,5	16	2	10	35	50	M6	F05	18,0
65	64	50	185	140	146	370	85	23,5	16,5	22	2	14	55	70	M8	F07	26,0
80	69	60	216	174	148	370	87	23,5	16,5	22	2	14	55	70	M8	F07	48,0
100	87	66	230	192	174	470	99,5	26,5	16,5	30	2	18	70	102	M10	F10	60,0

Dimensions G, N, Q and K are acc. to EN 1092 or ANSI 150. ANSI-pressure are delivered as standard UNC size corresponding threads; likewise available UNC-threads are acc. to ANSI B1.1

BALL VALVE “3 WAY WAFER”
TYPE FZ6 (2 Seats) L- or T-Bore
TYPE FT6 (4 Seats)
full bore

Specifications

Nominal Width	: DN 1/4" to 2"
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench (Gearbox optional)
Nominal Pressure	: PN 25 to 40
max. Working Pressure	: acc. to pressure-temperature-diagram (page 50)

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Utilities

- Mounting Flange Dimensions acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti-Blow-Out Stem
- Antistatic Device
- Double Seals and Metal Beating Ring
- Ball contained in 2 Seats
- Ball contained in 4 Seats
- 3 Sides supported Seats
- All Broach Surfaces are Mechanical Shaped
- "fire-safe" - Design

Torque (Nm)

DN	Nm
06	11
10	11
15	11
20	22
25	27
32	32
40	62
50	80

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)
- Pocket Less Seats in PTFE
  (available for the ball valve type FZ6)

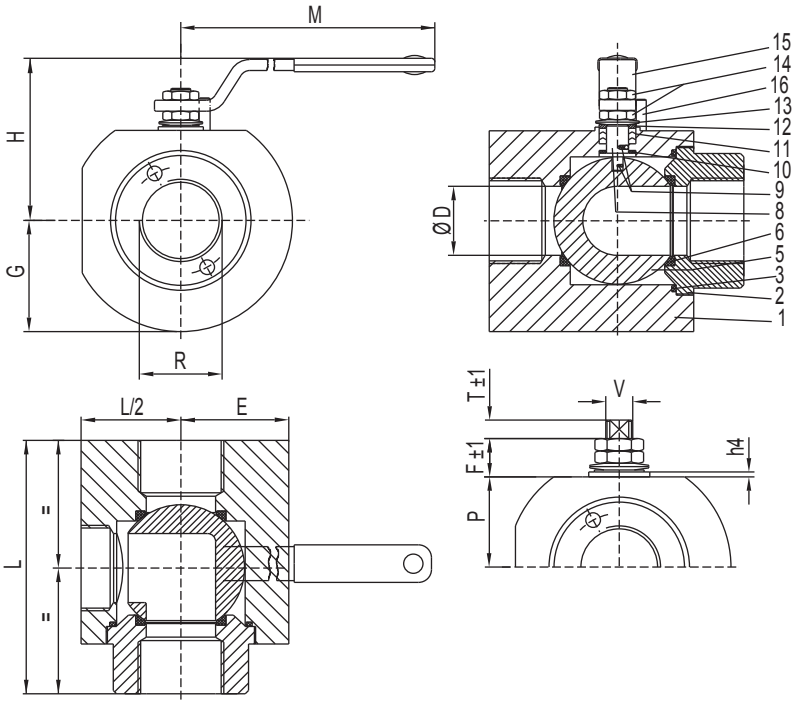
Material

Pos.	Descriptions	Pieces	Material			
			Carbon-Steel		Stainless Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
2	End	1/3	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
3	Seal	1/3	PTFE	PTFE	PTFE	PTFE
5	Ball	1	ASTM A 182 F304/316	1.4301/1.4401	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	2/4	PTFE	PTFE	PTFE	PTFE
8	Stem	1	ASTM A 182 F304/316	1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFT/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*	DIN EN ISO 4762 *
					+) lacquered	*) electrogalvanize

BALL VALVE “3 WAY WAFER”

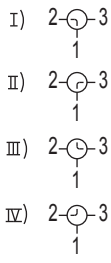
TYPE FZ6 (2 Seats) L- or T-Bore

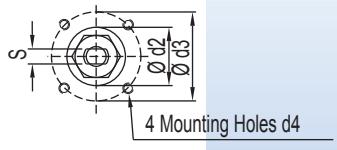
full bore



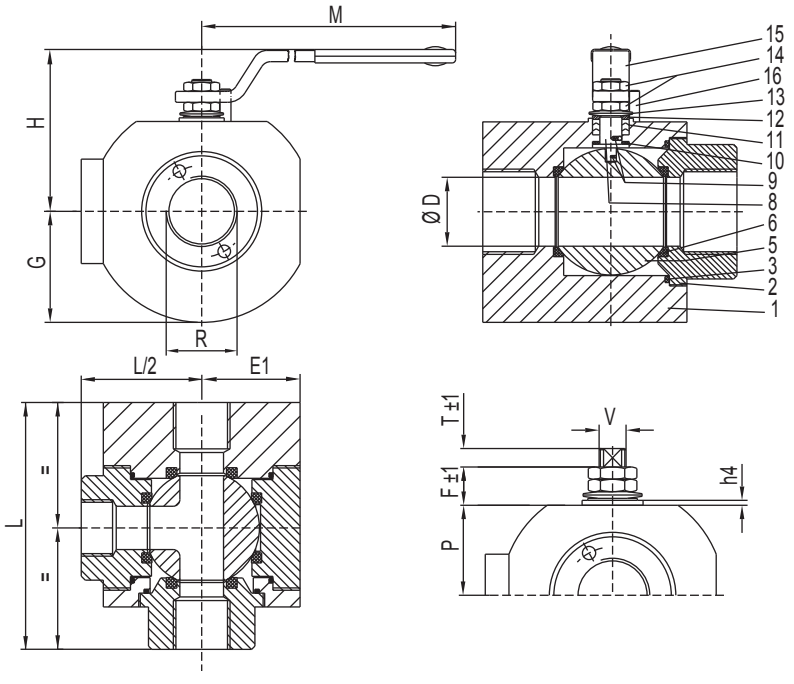
ATTENTION: Ball Valve Type FZ4 with L-Bore in position Ⅲ and Ⅳ are not closed!

Switch Positions
L-Bore

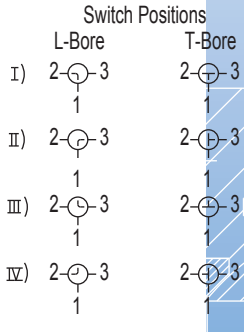


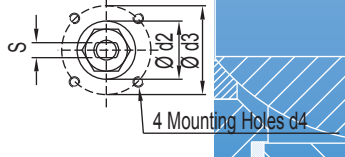


TYPE FT6 (4 Seats)



Switch Positions





Dimensions in mm

DN	PN	R*)	ØD	L	H	M	E	E1	G	P	F	T	V	h4	S	d2	d3	d4	EN ISO 5211	Weight (kg)
06	40	1/4"	10	60	50	120	32	24,5	32	21,5	11	5,5	8	1,5	5	25	36	M5	F03	1,5
10	40	3/8"	10	60	50	120	32	24,5	32	21,5	11	5,5	8	1,5	5	25	36	M5	F03	1,5
15	40	1/2"	15	75	70	145	39,5	30	39,5	30	13,5	7	10	1,5	6	25	36	M5	F03	2,3
20	40	3/4"	19	80	74	145	42	32,5	42	34,5	13,5	7	10	1,5	6	25	36	M5	F03	3,1
25	40	1"	25	90	90	185	49,5	39	49,5	46	16,5	9,5	12	2	8	25	36	M5	F03	4,4
32	40	1 1/4"	30	110	96,5	185	59,5	43,5	59,5	51	16,5	9,5	12	2	8	25	36	M5	F03	6,2
40	25	1 1/2"	38	120	112,5	280	64,5	51,5	64,5	57	19,5	14,5	16	2	10	35	50	M6	F05	9,5
50	25	2"	51	140	122,5	280	77	60,5	77	67	19,5	14,5	16	2	10	35	50	M6	F05	15,0

*) R = Internal Thread acc. to DIN EN 10226

BALL VALVE "4 WAY"
TYPE FT7 (L-or T-Bore)
TYPE RT7 (X-Bore)

full bore = FT7
reduce bore = RT7

Specifications

Nominal Width	: DN 06 to 50
Material	: acc. to material list
Flow Direction	: any
Fitting Position	: any
Operation	: Wrench
Nominal Pressure	: PN 25 to 40
max. Working Pressure	: siehe Druck-Temp.-Diagramm Seite 50

The maximum allowable working pressure (corresponding to the normal pressure) can only be exploited in temperature range of gasket material.

Torque (Nm)

DN	Nm
06	20
10	20
15	20
20	41
25	44
32	54
40	119
50	136

Measured with 16bar water and room temperature. Another nominal pressure to inquiry.

Utilities

- Mounting Flange Dimensions acc. to EN ISO 5211
- Shaft Seal with Chevron Rings
- Anti-Blow-Out Stem
- Antistatic Device
- Double Seals and Metal Beating Ring
- Ball contained in 4 Seats
- 3 Sides supported Seats
- All Broach Surfaces are Mechanical Shaped
- "fire-safe" - Design

Special Design

- Spring Washers, Nuts and Stop Pin are Stainless Steel
- "O"-Ring on Stem (patended)
- Stem Extensions
- Gland Extensions
- Fire Safe (patended)

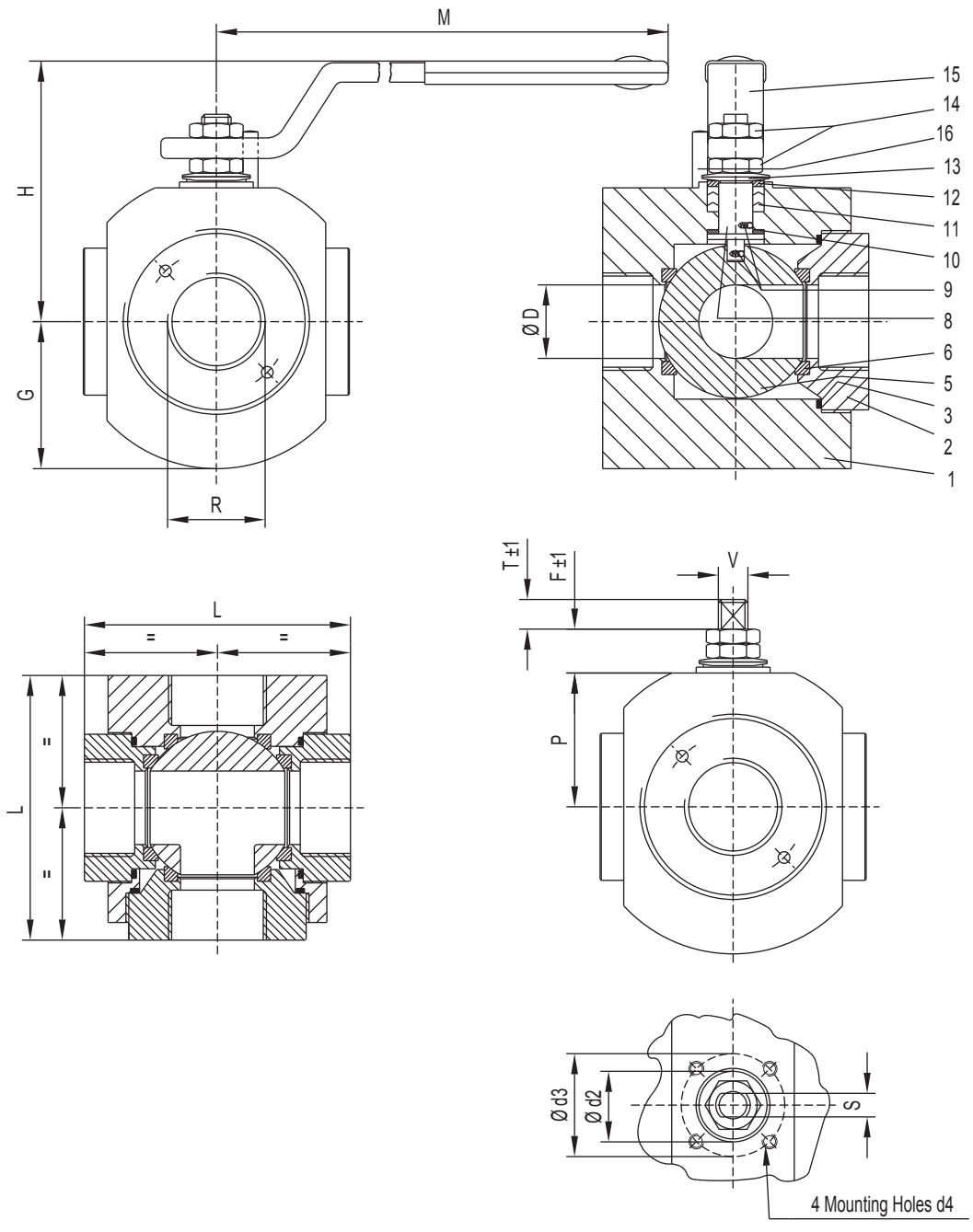
Material

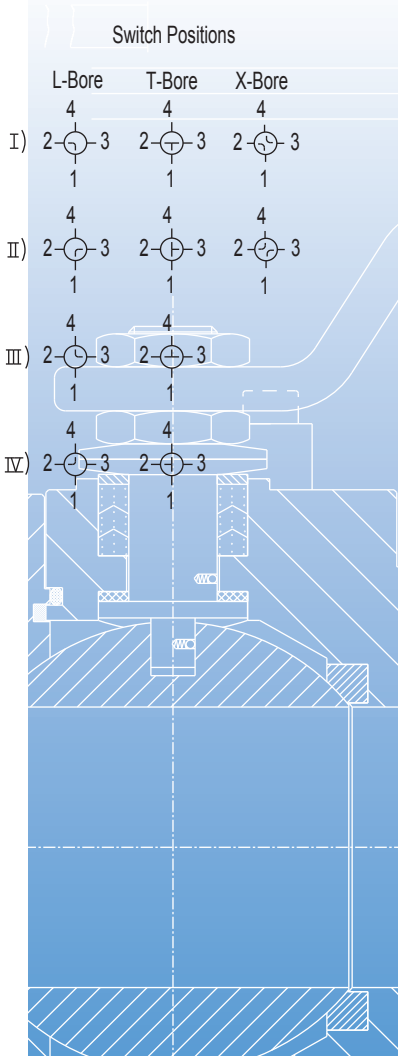
Pos.	Descriptions	Pieces	Material			
			Carbon-Steel		Stainless-Steel	
			Material	german Equivalent	Material	german Equivalent
1	Body	1	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
2	End	3	ASTM A 105+	C 21 +	ASTM A 182 F316	1.4401
3	Seal	3	PTFE	PTFE	PTFE	PTFE
5	Ball	1	ASTM A 182 F304/351 CF8	1.4301/1.4308	ASTM A 182 F316/351 CF8M	1.4401/1.4408
6	Seat	4	PTFE	PTFE	PTFE	PTFE
8	Stem	1	ASTM A 182 F304/316	1.4301/1.4401	ASTM A 182 F316	1.4401
9	Antistatic Device	2	ASTM A 182 F316	1.4401	ASTM A 182 F316	1.4401
10	Stem Seal	1	PTFE	PTFE	PTFE	PTFE
11	Chevron Rings	1	PTFE/Graphit	PTFE/Graphit	PTFE/Graphit	PTFT/Graphit
12	Pressing Bush	1	ASTM A 182 F316L	1.4404	ASTM A 182 F316L	1.4404
13	Spring Washer	2	C72*+	50CrV4 *+	C72*	50CrV4 *
14	Nut	2	UNI 3740 6S*+		UNI 3740 6S*	
15	Wrench	1	UNI 5946 Fe37*+	St 37 *+	UNI 5946 Fe37*	St 37 *
16	Stop Pin	1	UNI 3740 8.8*+	DIN EN ISO 4762 *+	UNI 3740 8.8*	DIN EN ISO 4762 *

+) lacquered *) electrogalvanize

BALL VALVE “4 WAY”
TYPE FT7 (L-or T-Bore)
TYPE RT7 (X-Bore)

full bore = FT7
reduce bore = RT7



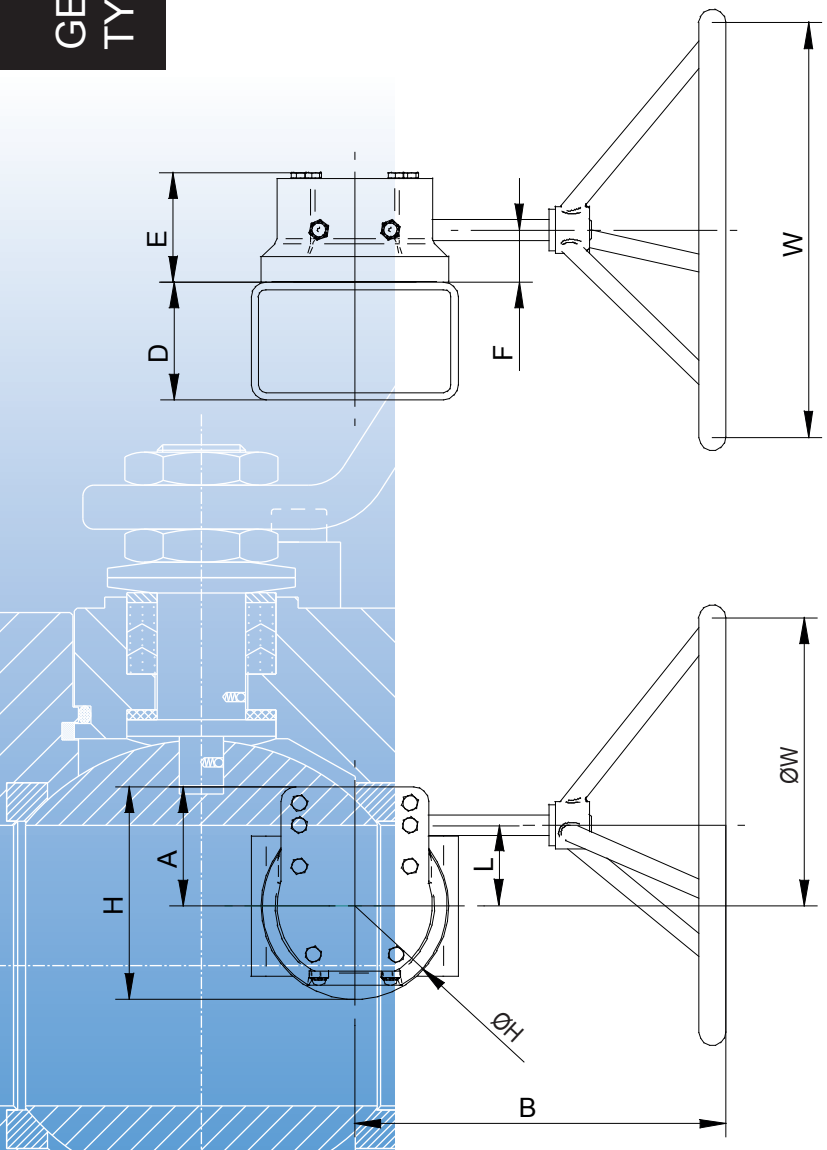


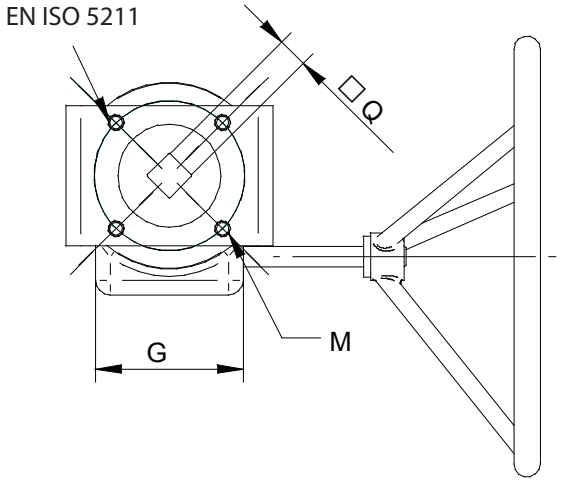
Dimensions in mm

DN	PN	R*)	ØD Typ FT7	ØD Typ Rt7	L	G	H	M	P	F	T	V	h4	S	d2	d3	d4	EN ISO 5211	Weight (kg)
06	40	1/4"	10	7	60	29,5	46	120	21,5	11	5,5	8	1,5	5	25	36	M5	F03	1,5
10	40	3/8"	10	7	60	29,5	46	120	21,5	11	5,5	8	1,5	5	25	36	M5	F03	1,5
15	40	1/2"	15	10	75	37	63	145	30	13	7,5	10	1,5	6	25	36	M5	F03	2,2
20	40	3/4"	19	14	80	39,5	68	145	34,5	13	7,5	10	1,5	6	25	36	M5	F03	3,0
25	40	1"	25	18	90	45	85	185	46	16,5	9,5	12	1,5	8	25	36	M5	F03	4,4
32	40	1 1/4"	30	23	110	54	90	185	51	16,5	9,5	12	2	8	25	36	M5	F03	6,2
40	25	1 1/2"	38	29	120	60	110	280	57	19,5	14,5	16	2	10	35	50	M6	F05	9,8
50	25	2"	51	38	140	74,5	120	280	67	19,5	14,5	16	2	10	35	50	M6	F05	15,5

*) R = Internal Threads are acc. to DIN EN 10226

GEARBOX
TYPE AG-101 bis AG-160
with Mounting Bracket
for ADLER-BAll Valves

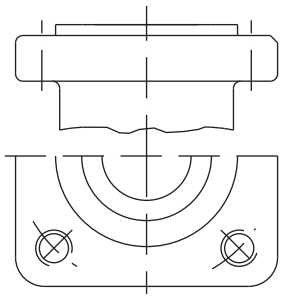
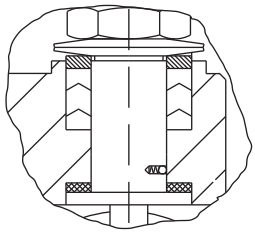
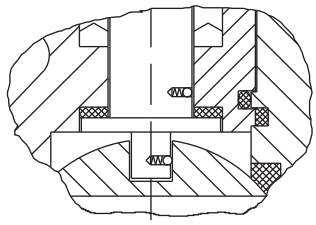
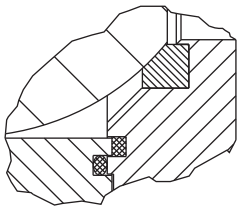
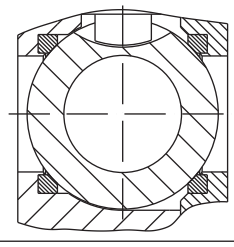




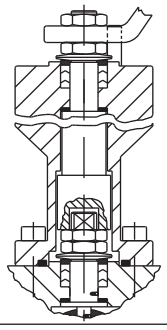
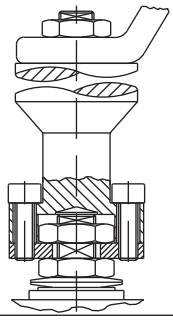
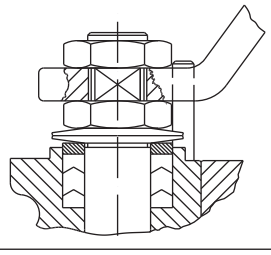
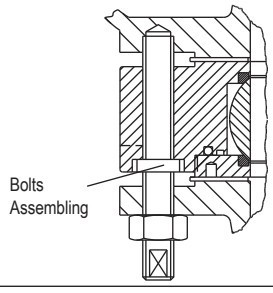
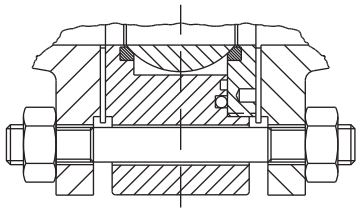
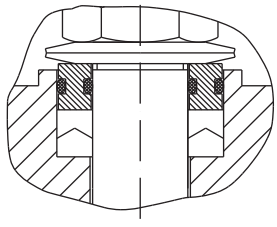
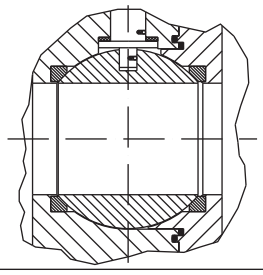
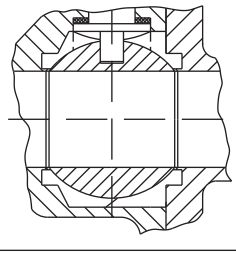
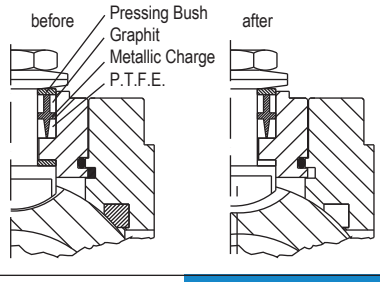
Dimensions in mm

Typ	A	B	C	D	E	F	G	H	ØH	L	ØW	M	□Q	EN ISO 5211	Nm
AG-101	50,5	117	106	60	56	34	57	98	95	46	120	M6x10/M8x12	22x22	F05/07	100
AG-110	50,5	131	146	60	56	34	57	98	95	46	200	M6x10/M8x12	22x22	F05/07	150
AG-120	79,5	250	205	80	73	35	100	143	127	55	300	M10x15	22x22	F10	500
AG-130	99,0	274	274	80	97	48	120	188	178	74	400	M16x20	27x27	F14	1000
AG-140	129,5	365	396	100	106	55	150	237	215	96	600	M20x26	36x36	F16	2000
AG-160	148,5	411	455	100	100	48	186	260	223	105	700	M20x26	36x36	F16	3250

Utilities of Standard ADLER Ball Valves

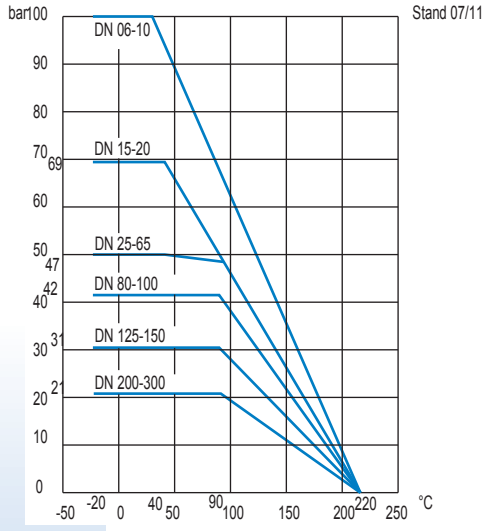
Mounting Flanges acc. to EN ISO 5211 	Chevron Rings 	Antistatic Device Anti-Blow-Out Stem 
Double Seals and Metal Beating Ring 	Contents Ball 	opt. Materials (Seats) P.T.F.E. - Glas P.T.F.E. - Carbon P.T.F.E. - Stainless Steel P.T.F.E. - Bronce P.T.F.E. - Metal Core

Special Design of ADLER Ball Valves

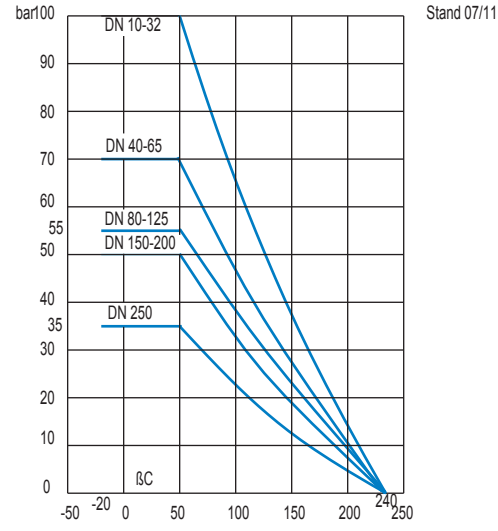
Stem Extensions 	Gland Extensions 	Spring Washers, Nuts and Stop Pin are Stainless Steel 
Ball Valves “Wafer Type” available for End Tank Assembling 	Bolts Assembling 	"O"-Ring on Stem (patended) 
Metallic Pocket Less Seats 	Pocket Less Seats in PTFE 	Fire Safe ISO FT+ “O” Ring on Stem 

PRESSURE-TEMPERATURE-DIAGRAM BALL VALVE SEATS ADLER

Pressure-Temperature-diagram for ADLER ball valve
Seats: 100% PTFE

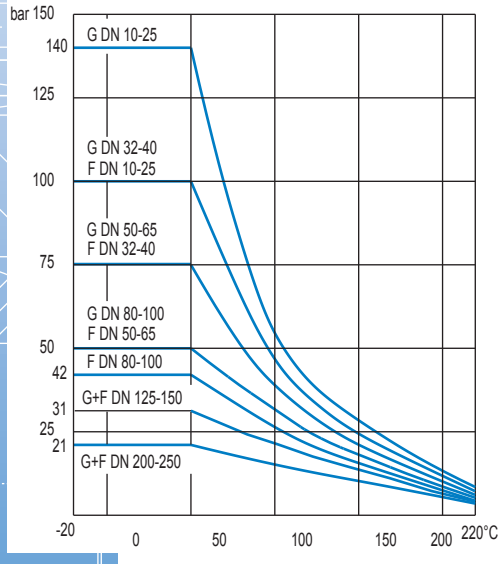


Pressure-Temperature-diagram for ADLER ball valve
Seats: PTFE with 15-20% glas

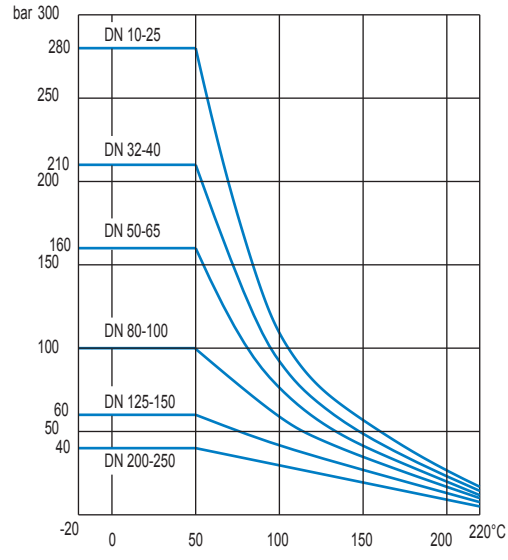


The permissible pressure for the valve body conforms as part of the respective nominal pressure according to DIN 2401 and/or ANSI B 16.5 and the remaining relevant determinations.

Pressure-Temperature-diagram A for ADLER ball valve
Seats: PTFE with metal core



Pressure-Temperature-diagram B for ADLER ball valve
Seats: PTFE with metal core

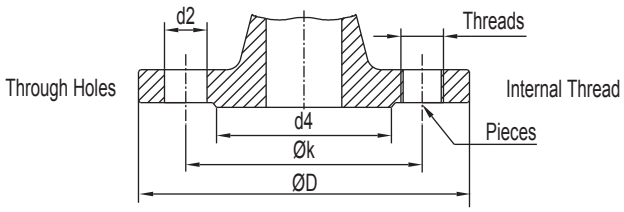


The pressure - temperature-diagram "A" shows the application limit for PTFE - seats with metal core, whereby "G" for gaseous media (excepted steam), F is for liquid medium. These limitation for normal aplications (ON/TO - acting, not abrasive medium) can be examined as secured. Pressure - temperature-diagram "B": apply on lab with switching time by 2-4 seconds - determined maximum charge coefficient of PTFE - seats with metal core. To give a guarantee for the validity (see at diagram B, sketched limitations), we require detailed informations likewise:

- medium
- primary presure (pvmax)
- primary pressure (pvmin)
- difference pressure (Δ pmax)
- difference pressure (Δ p) during the control
- temperature (tmax)
- temperature (tmin)
- frequency of temperature change
- flow rate
- switch time
- operating cycles
- ON/OFF-acting
- controlled operation
- special features (outside influences, state of aggregation danger through abrasion, shock pressure oa.)

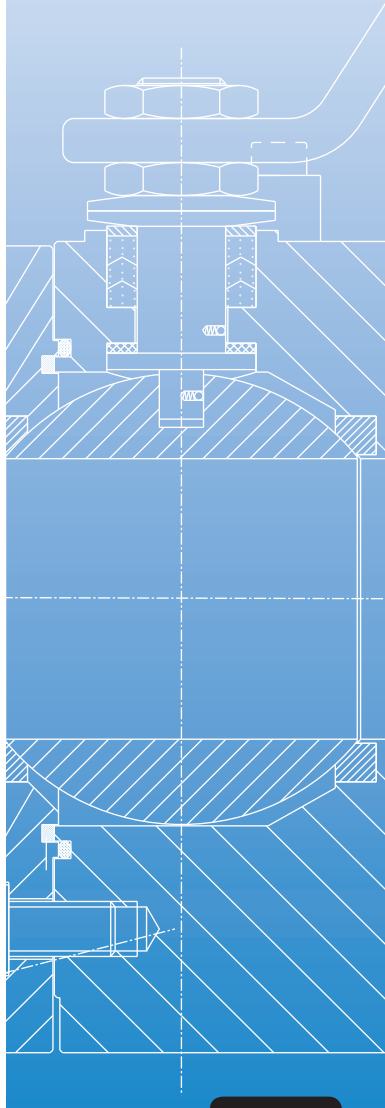
The permissible pressure for the valve body conforms as part of the respective nominal pressure according to DIN 2401 and/or ANSI B 16.5 and the remaining relevant determinations, the permissible pressure in conclusion are conforms according to diagram "A" and can be expanded (after coordination with manufacturer) to the limitation of diagram "B".

FLANGE DIMENSIONS acc. to DIN EN 1092-1



PN	Dimensions	DN10	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300
PN 2.5 - 6	ØD	75	80	90	100	120	130	140	160	190	210	240	265	320	375	440
	Ød4	35	40	50	60	70	80	90	110	128	148	178	202	258	312	365
	Øk	50	55	65	75	90	100	110	130	150	170	200	225	290	335	395
	Pieces	4	4	4	4	4	4	4	4	4	4	8	8	8	12	12
	Threads	M10	M10	M10	M10	M12	M12	M12	M12	M16	M16	M16	M16	M16	M16	M20
	Ød2	11	11	11	11	14	14	14	14	18	18	18	18	18	18	22
PN 10	ØD	90	95	105	115	140	150	165	185	200	220	250	285	340	395	445
	Ød4	40	45	58	68	78	88	102	122	138	158	188	212	268	320	370
	Øk	60	65	75	85	100	110	125	145	160	180	210	240	295	350	400
	Pieces	4	4	4	4	4	4	4	4	8	8	8	8	8	12	12
	Threads	M12	M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M20	M20	M20	M20
	Ød2	14	14	14	14	18	18	18	18	18	18	18	22	22	22	22
PN 16	ØD	90	95	105	115	140	150	165	185	200	220	250	285	340	405	460
	Ød4	40	45	58	68	78	88	102	122	138	158	188	212	268	320	378
	Øk	60	65	75	85	100	110	125	145	160	180	210	240	295	355	410
	Pieces	4	4	4	4	4	4	4	4	8	8	8	8	12	12	12
	Threads	M12	M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M20	M20	M24	M24
	Ød2	14	14	14	14	18	18	18	18	18	18	18	22	22	26	26
PN 25	ØD	90	95	105	115	140	150	165	185	200	235	270	300	360	425	485
	Ød4	40	45	58	68	78	88	102	122	138	162	188	218	278	335	395
	Øk	60	65	75	85	100	110	125	145	160	190	220	250	310	370	430
	Pieces	4	4	4	4	4	4	4	8	8	8	8	8	12	12	16
	Threads	M12	M12	M12	M12	M16	M16	M16	M16	M16	M20	M24	M24	M24	M27	M27
	Ød2	14	14	14	14	18	18	18	18	18	22	26	26	26	30	30
PN 40	ØD	90	95	105	115	140	150	165	185	200	235	270	300	375	450	515
	Ød4	40	45	58	68	78	88	102	122	138	162	188	218	285	345	410
	Øk	60	65	75	85	100	110	125	145	160	190	220	250	320	385	450
	Pieces	4	4	4	4	4	4	4	8	8	8	8	8	12	12	16
	Threads	M12	M12	M12	M12	M16	M16	M16	M16	M16	M20	M24	M24	M27	M30	M30
	Ød2	14	14	14	14	18	18	18	18	18	22	26	26	30	33	33
PN 63	ØD	100	105	-	140	-	170	180	205	215	250	295	345	415	470	530
	Ød4	40	45	-	68	-	88	102	122	138	162	188	218	285	345	410
	Øk	70	75	-	100	-	125	135	160	170	200	240	280	345	400	460
	Pieces	4	4	-	4	-	4	4	8	8	8	8	8	12	12	16
	Threads	M12	M12	-	M16	-	M20	M20	M20	M20	M24	M27	M30	M33	M33	M33
	Ød2	14	14	-	18	-	22	22	22	22	26	30	33	36	36	36
PN 100	ØD	100	105	-	140	-	170	195	220	230	265	315	355	430	505	585
	Ød4	40	45	-	68	-	88	102	122	138	162	188	218	285	345	410
	Øk	70	75	-	100	-	125	145	170	180	210	250	290	360	400	500
	Pieces	4	4	-	4	-	4	4	8	8	8	8	12	12	12	16
	Threads	M12	M12	-	M16	-	M20	M24	M24	M24	M27	M30	M30	M33	M33	M39
	Ød2	14	14	-	18	-	22	26	26	26	30	33	33	36	36	42
PN 160	ØD	100	105	-	140	-	170	195	220	230	265	315	355	430	515	585
	Ød4	40	45	-	68	-	88	102	122	138	162	188	218	285	345	410
	Øk	70	75	-	100	-	125	145	170	180	210	250	290	360	430	500
	Pieces	4	4	-	4	-	4	4	8	8	8	8	12	12	12	16
	Threads	M12	M12	-	M16	-	M20	M24	M24	M24	M27	M30	M30	M33	M39	M39
	Ød2	14	14	-	18	-	22	26	26	26	30	33	33	36	42	42
PN 250	ØD	125	130	-	150	-	185	200	230	255	300	340	390	485	585	690
	Ød4	40	45	-	68	-	88	102	122	138	162	188	218	285	345	410
	Øk	85	90	-	105	-	135	150	180	200	235	275	320	400	490	590
	Pieces	4	4	-	4	-	4	8	8	8	8	12	12	12	16	16
	Threads	M16	M16	-	M20	-	M24	M24	M24	M27	M30	M30	M33	M39	M45	M48
	Ød2	18	18	-	22	-	26	26	26	30	33	33	36	42	48	52

Notice



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