

**Technical description**

Ball valves are designed and manufactured to ensure maximum durability and reliability. Valves meet requirements of API 6D and EN 12516-1.

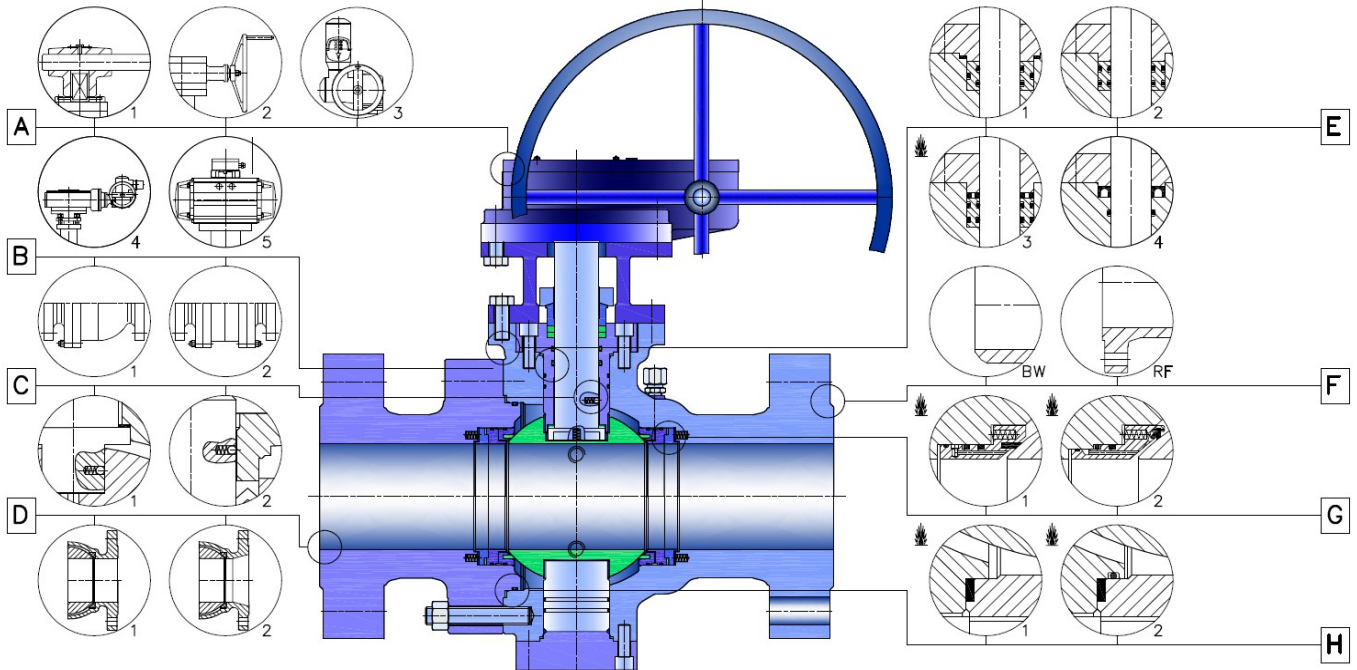
**Material specification**

Ball valves are made from carbon and stainless steels. Material execution of check valves can be selected according to the customer's request so that it suits as much as valve service conditions.

**Application**

These shut-off valves are designed for complete closing or opening of the flow of the transported medium. The ball valves are intended for gaseous and liquid media, e.g. air, propane-butane, city gas, natural gas, coke-oven gas, blast-furnace gas, hydrocarbons, crude oil products (diesel, petrol and oil), water and weak acid.

**Structural design of ball valve**



**A – Control**

- Hand lever
- Gearbox with hand-wheel
- Electric actuator
- Electric actuator with gearbox
- Pneumatic actuator

**E – Body execution**

- Two pieces type
- Three pieces type

**C – Antistatic execution**

- Is solved by using springs and small balls. The ball, stem and body are electrically connected among themselves by electro-conductive method.

**D – Flow through the valve**

- valve with full flow
- valve with reduced flow

**E – The stem packing and top bonnet sealing**

- dynamically by two O-rings, statically by O-ring + graphite packing
- dynamically and statically by two O-rings
- dynamically and statically by two O-rings + graphite packing rings, meeting requirements of fire safe design
- by O-ring + V-shaped PTFE ring packing

**F – Connection into piping**

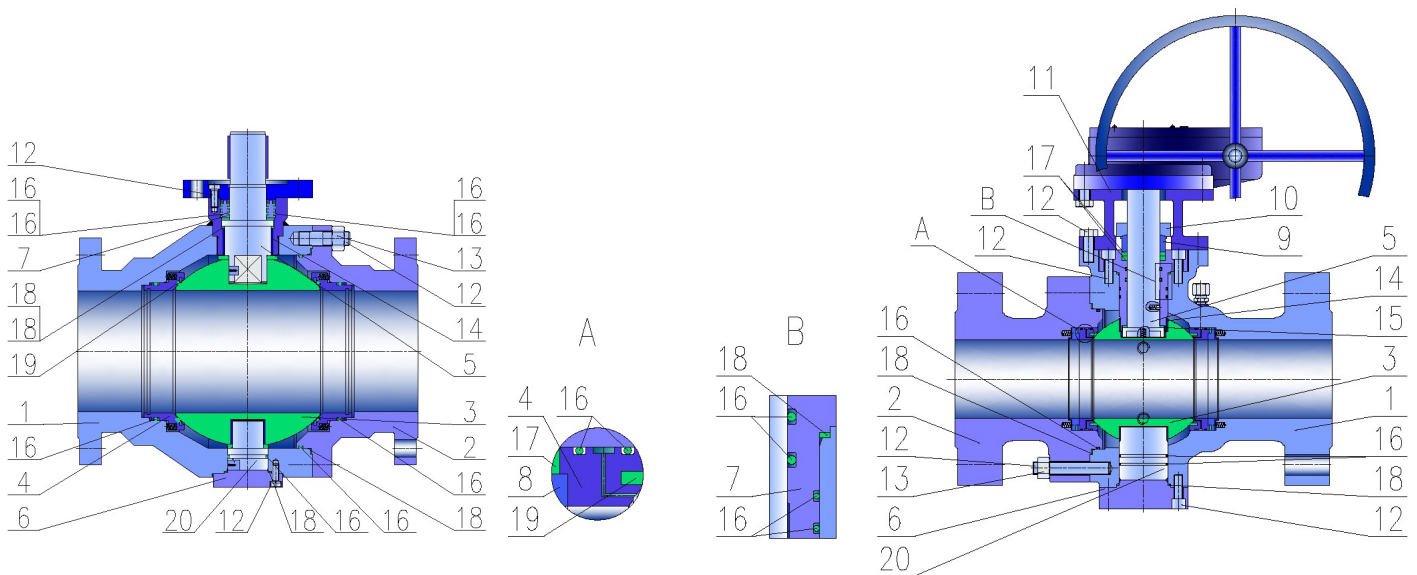
- Flanged
  - with rough or smooth raised face
  - with male / female facing
  - with tongue / groove facing
- Welding-on
  - with welding ends according to customer's requirement

**G- Execution of the seats**

- The seats are made with single or double piston effect, with possibilities of greasing and in Fire safe design execution. Also the seats are supplied with „DBB“ (double block and bleed) execution. The seats with single piston effect have possibility to reduce the pressure in an intermediate space between the ball and body. The seats with double piston effect are pressed to the ball also by the fluid pressure in the intermediate space, what is ensuring hermetic closure at the inlet and the outlet side of the valve. For restriction of the pressure in the intermediate space of the body an overflow device is mounted.

**H – Bonnet sealing**

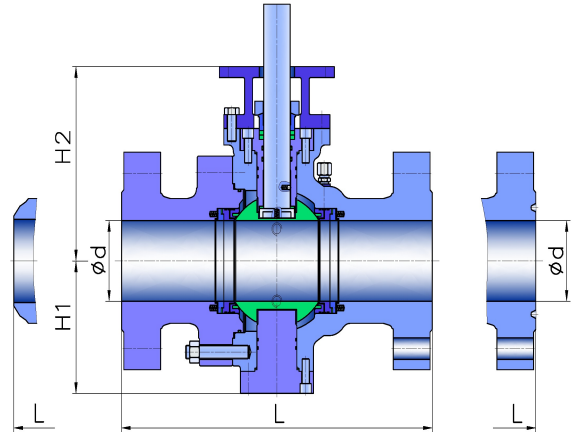
- executed by sealing ring or a combination of sealing ring and O-ring. To comply with Fire safe design the graphite seal ring is used, moreover body and bonnet are sealed by metal to metal.

**MATERIAL SPECIFICATION**


Pos	Designation	Foundry execution							Forged execution					
		WCB	LCB, LCC	CF3	CF3M	CF8	CF8M	LF2	A105	1.4541	F316L	F304	F316	
1	Body	A216 WCB	A352 LCB, LCC	A351 F3	A351 CF3M	A351 CF8	A351 CF8M	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316	
2	Bonnet	A216 WCB	A352 LCB, LCC	A351 CF3	A351 CF3M	A351 CF8	A351 CF8M	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316	
3	Ball	A105 + ENP (Cr), A350 LF2 + ENP (Cr)	A352 LCB, LCC + ENP (Cr)	A351 CF3, A182 F304L	A351 CF3M, A182 F316L	A351 CF8, A182 F304	A351CF8M, A182 F316	A350 LF2 + ENP (Cr)	A105 + ENP (Cr)	1.4541	A351 CF3M, A182 F316L	A351 CF8, A182 F304	A351 CF8M, A182 F316	
4	Seat	A105 + ENP (Cr), A350 LF2 + ENP (Cr)	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A350 LF2 + ENP (Cr)	A105 + ENP (Cr)	1.4541	A182 F316L	A182 F304	A182 F316	
5	Upper Stem	A182 F6a	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A182 F6a	A182 F6a	1.4541	A182 F316L	A182 F304	A182 F316	
6	Bottom cover	A105, A350 LF2	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316	
7	Top cover	A105, A350 LF2	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316	
8	Thrust ring of the seat	A105 + ENP (Cr), A350 LF2 + ENP (Cr)	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A350 LF2 + ENP (Cr)	A105 + ENP (Cr)	1.4541	A182 F316L	A182 F304	A182 F316	
9	Thrust ring	A182 F6a	A182 F6a	A182 F304L	A182 F316	A182 F304	A182 F316	A182 F6a	A182 F6a	1.4541	A182 F316L	A182 F304	A182 F316	
10	Gland flange	A216 WCB	A352 LCB, LCC	A351 CF3	A351 CF3M	A351 CF8	A351 CF8M	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316	
11	Yoke	A216 WCB	A352 LCB, LCC	A351 CF3	A351 CF3M	A351 CF8	A381 CF8M	-	-	-	-	-	-	
12	Bolt	A193 B7	A320 L7	A193 B8	A193 B8M	A193 B8	A193 B8M	25CrMo4	A193 B7	A2 - 70	A193 B8M	A193 B8	A193 B8M	
13	Nut	A194 2H	A194 4	A194 8	A194 8M	A194 8	A194 8M	A2 - 70	A194 2H	A2 - 70	A194 8M	A194 8	A194 BM	
14	Bushing	Stainless steel + PTFE, Bronze												
15	Washer	Stainless steel + PTFE, Bronze												
16	O-ring	NITRIL, VITON, NBR, HNBR, EPDM												
17	Sealing ring	Graphite												
18	Gasket	Graphite, Graphite+Stainless steel												
19	Seat ring	NYLON, DEVLON, PTFE, RPTFE, PEEK, NITRIL, VITON, NBR, HNBR, EPDM												
20	Bottom stem	A182 F6a	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A182 F6a	A182 F6a	1.1.4541	A182 F316L	A182 F304	A182 F316	

Basic standards for design

- Basic design.....API 6D, EN 12516-1
- Building length.....EN 558-1, EN 12982
- Flange dimension.....EN 1092-1
- Dimension of the welding-on ends.....EN 12627
- Testing.....EN 12266-1
- Pressure-temperature dependence.....EN 12516-1
- Top flange dimension.....EN ISO 5211
- Special .....NACE MR-0175



DN	PN 16								PN 25								PN 40							
	L		d	H1	H2	EN ISO 5211	weight (kg)		L		d	H1	H2	EN ISO 5211	weight (kg)		L		d	H1	H2	EN ISO 5211	weight (kg)	
	RF	BW					RF	BW	RF	BW					RF	BW	RF	BW					RF	BW
50	230	300	54	107	119	F07	19	21	230	300	54	107	119	F07	19	21	230	300	54	107	119	F07	22	21
65	290	360	70	110	170	F10	34	33	290	360	70	110	170	F10	34	33	290	360	70	110	170	F10	40	33
80	310	390	82	118	215	F12	52	54	310	390	82	118	215	F12	52	54	310	390	82	118	215	F12	60	54
100	350	450	107	153	218	F12	69	66	350	450	107	153	218	F12	69	66	350	450	107	153	218	F12	82	66
125	400	525	132	170	229	F14	99	92	400	525	132	170	229	F14	99	92	400	525	131	170	229	F14	115	98
150	450	600	159	193	266	F16	154	132	450	600	159	193	266	F16	154	132	450	600	159	193	266	F16	175	145
200	550	600	207	240	312	F16	235	190	550	600	207	210	312	F16	235	190	550	600	207	210	312	F16	260	210
250	650	730	260	293	475	F25	300	245	650	730	259	270	475	F25	300	245	650	730	259	270	475	F16	350	285
300	750	850	310	340	510	F25	450	370	750	850	308	340	510	F25	450	370	750	850	308	340	510	F25	530	445
350	850	980	340	355	380	F25	685	580	850	980	340	355	380	F25	685	580	850	980	337	355	380	F25	770	660
400	950	1100	390	415	440	F25	930	810	950	1100	389	415	440	F25	930	810	950	1100	387	430	450	F25	1090	915
500	1150	1250	492	511	515	F30	1660	1400	1150	1250	488	490	515	F25	1660	1400	1150	1250	489	500	540	F30	1820	1540
600	1350	1143	594	600	605	F30	2810	2740	1350	1143	588	600	65	F30	2810	2740	1350	1143	591	620	620	F30	2900	2740
700	1550	1346	693	675	683	F35	4320	4050	1550	1346	686	675	683	F35	4320	4050	1550	1346	686	675	690	F35	4620	4050
800	1750	1524	793	760	775	F35	6090	5640	1750	1524	785	760	775	F35	6090	5640	1750	1524	781	785	815	F35	6430	5640
900	1950	1727	894	835	850	F35	8565	8040	1950	1727	882	835	850	F35	8565	8040	1950	1727	876	905	890	F40	8966	8040
1000	2150	1840	996	930	945	F35	10872	10260	2150	1840	981	930	945	F35	10872	10260	2150	1780	978	940	955	F40	10890	10260

DN	PN 63								PN 100								PN 160							
	L		d	H1	H2	EN ISO 5211	weight (kg)		L		d	H1	H2	EN ISO 5211	weight (kg)		L		d	H1	H2	EN ISO 5211	weight (kg)	
	RF	BW					RF	BW	RF	BW					RF	BW	RF	BW					RF	BW
50	230	300	54	107	119	F07	35	28	230	300	52	107	119	F07	35	28	230	300	48	110	174	F12	63	40
65	290	360	69	110	170	F10	49	41	290	360	66	110	170	F10 / F12	54	43	419	360	60	120	196	F12	73	56
80	310	390	80	118	215	F12	66	58	310	390	78	118	215	F12	76	64	470	390	80	145	235	F16	83	69
100	350	450	100	153	218	F12	96	72	350	450	101	153	218	F12 / F14	107	75	546	450	99	175	270	F16	157	140
125	400	525	125	170	229	F14	133	115	400	525	124	170	229	F14 / F16	149	117	650	525	120	250	290	F25	240	203
150	450	600	150	193	266	F16	198	170	450	600	149	193	266	F16 / F25	225	195	705	600	143	330	300	F25	340	300
200	550	600	203	210	312	F16	305	265	550	600	194	210	312	F25	350	295	832	600	195	390	350	F30	570	520
250	650	730	253	270	475	F16	455	380	650	730	241	270	475	F25	545	470	991	730	235	445	425	F30	720	560
300	750	850	299	340	510	F25	615	535	750	850	288	340	510	F25	755	650	1130	850	282	500	470	F35	990	770
350	850	980	337	380	400	F25	855	760	850	980	324	380	400	F30	980	860	-	-	-	-	-	-	-	-
400	950	1100	387	430	450	F25	1230	995	950	1100	387	430	450	F30	1340	1100	-	-	-	-	-	-	-	-
500	1150	1250	489	500	540	F30	1970	1690	1150	1250	489	500	540	F30	2110	1860	-	-	-	-	-	-	-	-
600	1350	1397	591	620	620	F35	3750	3320	1350	1397	591	615	620	F35	3850	3440	-	-	-	-	-	-	-	-
700	1550	1549	686	675	690	F40	5680	5130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
800	1750	1651	781	785	815	F40	9197	8227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Type designation**
**K82 XYZ RST - M PN / A**
**K82** – Valve type – Trunnion Ball Valve

**X** – Body design

- 2...Two pieces
- 3...Three pieces

**Y** – Seat execution

- 1...PTFE
- 2...PTFE + secondary sealing by paste
- 3...PTFE + Fire safe
- 4...PTFE + Fire safe + secondary sealing by paste
- 5...Metal + O - ring
- 6...Metal + O - ring + secondary sealing by paste
- 7...Metal + O - ring + Fire safe
- 8...Metal + O - ring + Fire safe + secondary sealing by paste
- 9...Metal to metal

**Z** – Control stem sealing method

- 1...Dynamic, Static - 2 x O - ring
- 2...Dynamic - 2xO-ring, Static-2xO-ring + Graphite
- 3...Fire safe: Dynamic - 2 x O - ring + Graphite packing,  
Static - O - ring + Graphite
- 4...V-shaped PTFE O-rings
- 5...Graphite packing

**R** – Flow direction

- 1...Straight, full flow
- 2...Straight, reduced flow

**S** – Connection into piping

- 0...Wafer
- 1...Flanged
- 2...Welding-on
- 3...Combined
- 4...Outside thread G,R
- 5...Outside thread NPT
- 6...Inside thread M
- 7...Inside thread G,Rp

**T** – Control method

- 1...By hand lever
- 2...Hand wheel with gearbox
- 3...Electric actuator
- 4...Electro actuator with gearbox
- 5...Pneumatic actuator
- 9...Without control - bare shaft

**M** – Body material

- 0...Stainless steel
- 2...Alloy steel
- 4...Carbon steel

**A** – Special execution

- DPE**...Seats with double piston effect „Double Piston Effect”
- AS**...Antistatic design
- LT**...Low temperature design

DN	PN 250							
	L		d	H1	H2	EN ISO 5211	weight (kg)	
	RF	BW					RF	BW
50	230	300	200	110	174	F12	63	40
80	470	390	255	145	235	F16	115	88
100	546	450	300	175	270	F16	180	160
150	705	600	390	330	300	F25	400	330
200	832	600	485	390	350	F30	735	615
250	991	730	858	445	425	F30	1120	925

