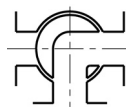
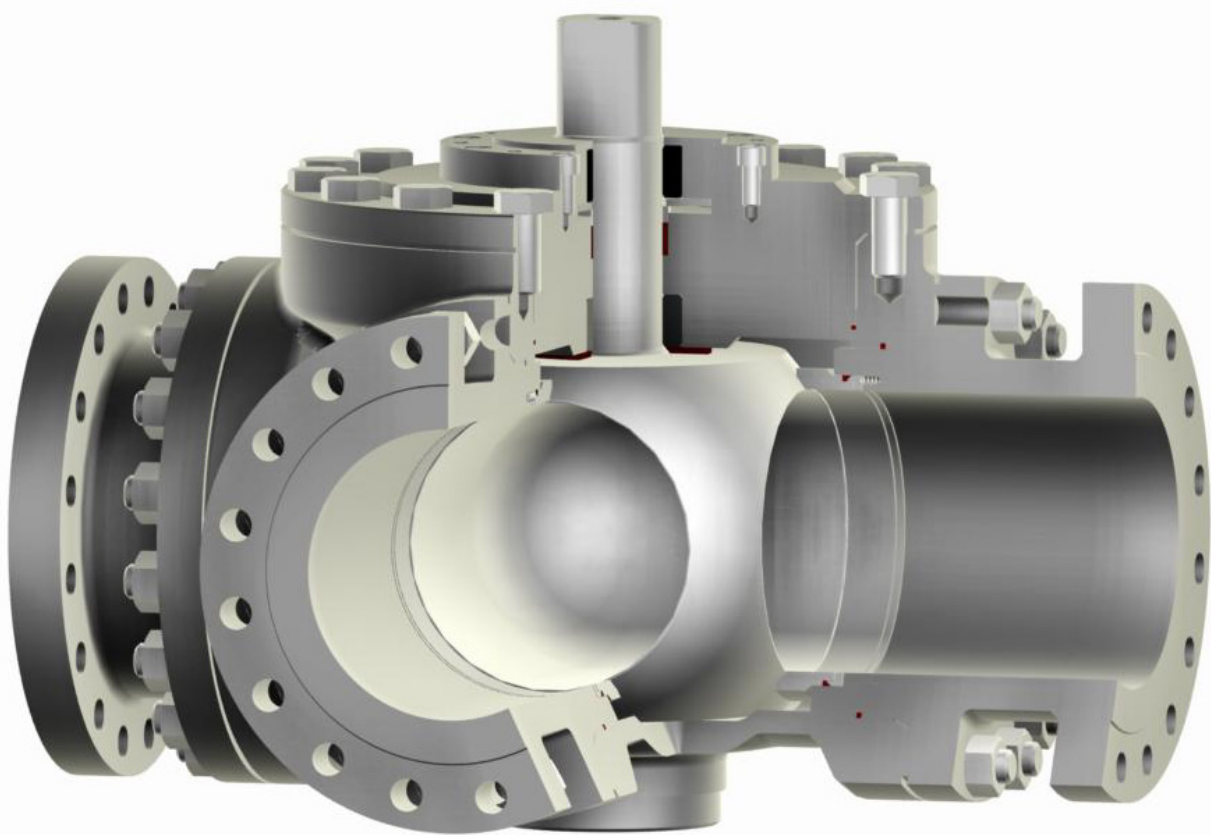




Three-Way Metal Seated Ball Valve Type 21-M



Design Characteristics

- ✓ Split body
- ✓ Ball with integral stem and twin bearings
- ✓ Live loaded stem packing
- ✓ Spring loaded seat system
- ✓ Fire Safe design optional
- ✓ 90° L- or T-port

Design Standards

- ✓ EN 12516, EN 1983, ISO 5211, AD-2000
- ✓ ASME B16.34, API 608

Range of Application

- ✓ Diameter 1/2" to 20" / DN 15 to 500
- ✓ Class 150 to 1500 / PN 10 to 250
- ✓ -20°F to +1000°F / -60°C to +550°C

Approvals

- ✓ "TA-Luft" certified for low fugitive emissions

Testing Standards

- ✓ EN 12266-1/2
- ✓ API 598



Main Parts

- 1 Body
- 2 Body End Connection
- 4 Retainer Ring
- 5 Ball with Stem
- 8 Gland Washer
- 10 Bearing Cover
- 12 Cover
- 13 Bearing Ring
- 14 Distance Disc
- 16 Plate Spring
- 17 Coil Spring
- 20 Sealing Ring
- 21 Seat Ring
- 23 Body Gasket
- 24 Stem Packing
- 25 Bearing Ring
- 26 Bearing Ring
- 27 Sealing Ring
- 28.1 Stud Bolt
- 28.2 Nut
- 29 Screw
- 30 Screw

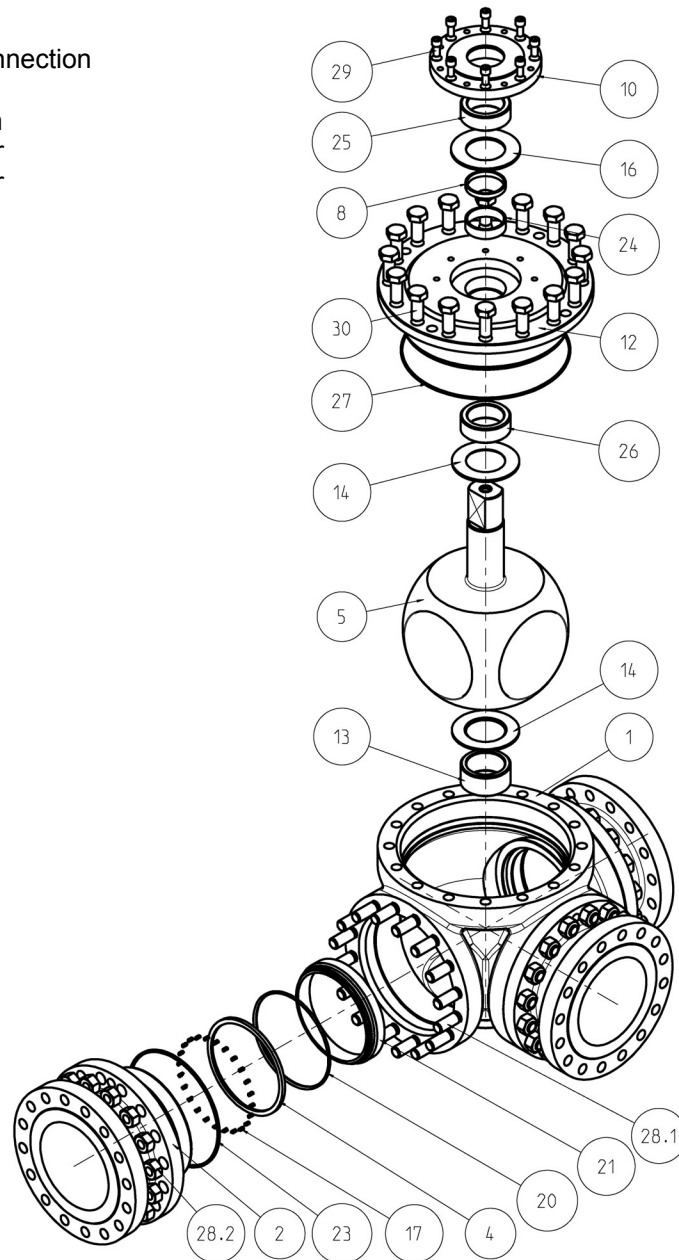


Fig.1

Description

This PERRIN ball valve has twin bearing ball with integral stem and split body housing. The spring loaded metallic seat system and live loaded stem packing also provide continuous tightness during short-term temperature and pressure changes.

Ball valve can be designed as transflow or non-transflow (see options).

The valve is equipped with an integral actuator mounting flange for actuator connection according to ISO 5211. Stem extensions, locking devices and actuators with accessories, can be attached without operating interruptions.

The ball valve has an antistatic design. The stem packing and sealings are "TA-Luft" certified for low fugitive emissions.

Parts List / Materials

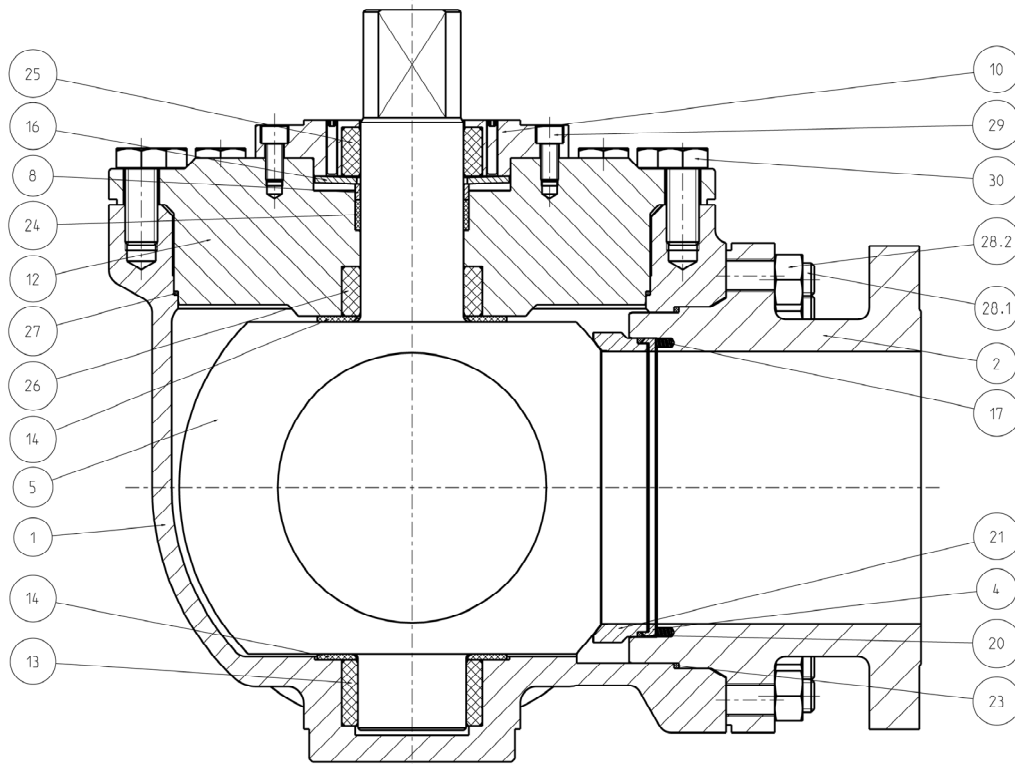


Fig. 2

Item	Designation	ASME		DIN EN	
		-20°F up to +1000°F	-20°F up to +1000°F	-60°C up to +550°C	-10°C up to +450°C
1	Body	A351 CF8M	A216 WCB	1.4408 ¹⁾	1.0619
2	Body End Connection	Type 316 (up to 2")	A105 (up to 2")	1.4571 (up to 2")	1.0460 (up to 2")
4	Retainer Ring	Type 316	Type 316	1.4571	1.4571
5	Ball with Stem	Type 316 coated A351 CF8M coated	Type 316 coated A351 CF8M coated	1.4571 coated 1.4408 ¹⁾ coated	1.4571 coated 1.4408 ¹⁾ coated
8	Gland Washer	Type 316	Type 316	1.4571	1.4571
10	Bearing Cover	Type 316	A105	1.4571	1.0460
12	Cover	Type 316 A351 CF8M	A216 WCB A105	1.4571 1.4408 ¹⁾	1.0619 1.0460
13	Bearing Ring	Carbon-Antimony	Carbon-Antimony	Carbon-Antimony	Carbon-Antimony
14	Distance Disc	Type 316	Type 316	1.4571	1.4571
16	Plate Spring ²⁾	Type 301	AISI 6150	1.4310	1.8159
17	Coil Spring	Type 316	Type 316	1.4571	1.4571
20	Sealing Ring	Graphite	Graphite	Graphite	Graphite
21	Seat Ring	Type 316 coated	Type 316 coated	1.4571 coated	1.4571 coated
23	Body Gasket	Graphite	Graphite	Graphite	Graphite
24	Stem Packing				
25	Bearing Ring	Carbon	Carbon	Carbon	Carbon
26	Bearing Ring	Carbon-Antimony	Carbon-Antimony	Carbon-Antimony	Carbon-Antimony
27	Sealing Ring	Graphite	Graphite	Graphite	Graphite
28.1	Stud Bolt	SS	SS	SS	SS
28.2	Nut	SS	SS	SS	SS
29	Screw	SS	SS	SS	SS
30	Screw	SS	SS	SS	SS

Tab. 1

1) Temperature limitation 300°C [576°F] acc. to German technical rule AD-2000 W5 if intercrystalline corrosion resistant is required

2) Material 2.4668 (Inconel 718) is generally required for operating temperature over 200°C [392°F]

3) Materials for lower / higher temperature on request

Technical Data

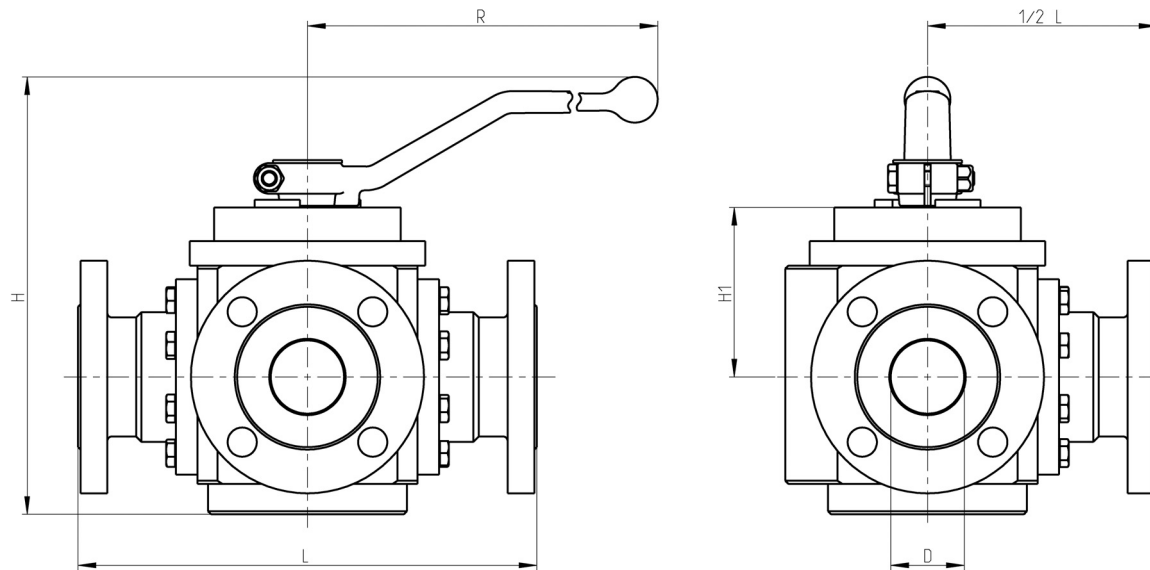


Fig.3

D = NPS = DN = Nominal Size
m = Weight
Cv; Kv = Flow Rate for L-Port

CLASS 150 - Full Bore

NPS [inch]	DN [mm]	H		H1		R		L		Cv [gal/min]	m	
		[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	Perrin Standard [inch]	[mm]		[lbs]	[kg]
½	15	6,9	176	2,9	74	7	180	8	210	23	18	8
¾	20	7,1	181	2,8	70	7	180	9	230	42	22	10
1	25	7,2	182	3,6	91	12	300	9	230	66	31	14
1¼	32	7,5	191	3	77	12	300	10	260	109	48	22
1½	40	10,4	263	3,9	100	18	450	10	260	171	68	31
2	50	11,3	287	4,4	112	18	450	12	300	267	95	43
2½	65	11,8	299	4,7	119	18	450	13	340	453	134	61
3	80	12,3	312	6,1	156	31	800	15	380	687	183	83
4	100	13,3	337	6,6	167	31	800	17	430	1074	253	115

Tab.2

CLASS 150 - Reduced Bore

NPS [inch]	NPS-R [inch]	H		H1		R		L		Cv [gal/min]	m	
		[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	Perrin Standard [inch]	[mm]		[lbs]	[kg]
¾	½	6,9	176	2,9	74	7	180	9	230	21	20	9
1	¾	7,1	181	2,8	70	7	180	9	230	37	25	12
1¼	1	7,2	182	3,6	91	12	300	10	260	59	35	16
1½	1¼	7,5	191	3	77	12	300	10	260	98	56	25
2	1½	10,4	263	3,9	100	18	450	12	300	154	78	36
2½	2	11,3	287	4,4	112	18	450	13	340	240	109	49
3	2½	11,8	299	4,7	119	18	450	15	380	408	154	70
4	3	12,3	312	6,1	156	31	800	17	430	618	210	95

Tab.3

CLASS 300 - Full Bore

NPS [inch]	DN [mm]	H		H1		R		L Perrin Standard		Cv [gal/min]	m	
		[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]		[lbs]	[kg]
½	15	6,9	176	2,9	74	7	180	8	210	23	20	9
¾	20	7,1	181	2,8	70	7	180	9	230	42	26	12
1	25	7,2	182	3,6	91	12	300	9	230	66	35	16
1¼	32	7,5	191	3	77	12	300	10	260	109	55	25
1½	40	10,4	263	3,9	100	18	450	10	260	171	77	35
2	50	11,3	287	4,4	112	18	450	12	300	267	101	46
2½	65	11,8	299	5,7	145	18	450	13	340	453	143	65
3	80	12,3	312	6,1	156	31	800	15	380	687	198	90
4	100	13,3	337	6,6	167	31	800	17	430	1074	282	128

Tab.4

CLASS 300 - Reduced Bore

NPS [inch]	NPS-R [inch]	H		H1		R		L Perrin Standard		Cv [gal/min]	m	
		[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]		[lbs]	[kg]
¾	½	6,9	176	2,9	74	7	180	9	230	21	20	9
1	¾	7,1	181	2,8	70	7	180	9	230	37	25	12
1¼	1	7,2	182	3,6	91	12	300	10	260	59	35	16
1½	1¼	7,5	191	3	77	12	300	10	260	98	56	25
2	1½	10,4	263	3,9	100	18	450	12	300	154	78	36
2½	2	11,3	287	4,4	112	18	450	13	340	240	109	49
3	2½	11,8	299	4,7	119	18	450	15	380	408	154	70
4	3	12,3	312	6,1	156	31	800	17	430	618	210	95

Tab.5



PN 16

DN [mm]	H [mm]	H1 [mm]	R [mm]	L [mm] Perrin Standard	Kv [m³/h]	m [kg]
15	124	58	180	210	20	8
20	137	70	180	230	36	10
25	153	74	300	230	57	14
32	163	80	300	260	94	22
40	213	100	450	260	148	31
50	230	112	450	300	231	43
65	244	119	450	340	392	61
80	301	156	800	380	594	83
100	323	167	800	430	929	115

Tab.6

PN 40

DN [mm]	H [mm]	H1 [mm]	R [mm]	L [mm] Perrin Standard	Kv [m³/h]	m [kg]
15	124	58	180	210	20	8
20	137	70	180	230	36	10
25	153	74	300	230	57	14
32	163	80	300	260	94	22
40	213	100	450	260	148	31
50	230	112	450	300	231	47
65	244	119	450	340	392	66
80	301	156	800	380	594	90
100	323	167	800	430	929	127

Tab.7

Other dimensions and pressure classes on request.

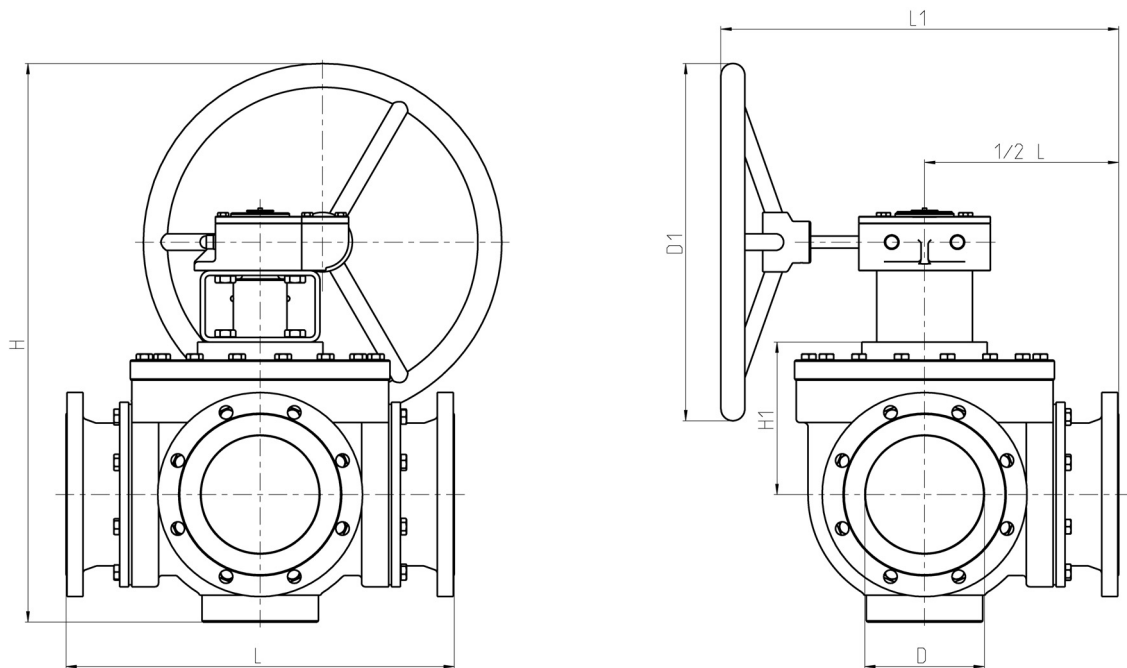


Fig.4

D = NPS = DN = Nominal Size
m = Weight
Cv; Kv = Flow Rate for L-Port

CLASS 150 - Full Bore

NPS [inch]	DN [mm]	H		H1		H2		L1		D1		L Perrin Standard		Cv [gal/min]	m	
		[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]		[lbs]	[kg]
6	150	32	821	8	201	13	331	20	515	28	700	22	550	2418	352	160
8	200	35	877	10	266	18	456	23	588	20	500	26	650	4299	840	382
10	250	42	1057	11	284	20	504	29	725	28	700	31	775	6986	1135	516
12	300	41	1053	12	312	20	512	30	770	24	600	35	900	9672	2070	941
14	350	45	1152	14	345	25	635	39	995	20	500	40	1025	13165	2992	1360
16	400	55	1408	19	470	30	760	42	1075	28	700	45	1150	17197	3696	1680
20	500	78	1987	30	763	46	1181	47	1202	36	914	49	1250	26870	5416	2462

Tab.8

CLASS 150 - Reduced Bore

NPS [inch]	NPS-R [inch]	H		H1		H2		L1		D1		L Perrin Standard		Cv [gal/min]	m	
		[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]		[lbs]	[kg]
6	5	27	687	7	167	12	297	19	492	20	500	22	550	1511	329	150
8	6	34	852	8	201	13	331	20	515	28	700	26	650	2177	405	184
10	8	36	909	10	266	18	456	23	588	20	500	31	775	3869	966	439
12	10	43	1095	11	284	20	504	29	725	28	700	35	900	6287	1305	593
14	12	42	1079	12	312	20	512	30	770	24	600	40	1025	8705	2381	1082
16	14	47	1183	14	345	25	635	39	995	20	500	45	1150	11848	3441	1564
20	18	57	1459	19	470	30	760	42	1075	28	700	49	1250	19588	5148	2340

Tab.9



CLASS 300 - Full Bore

NPS [inch]	DN [mm]	H		H1		H2		L1		D1		L Perrin Standard		Cv [gal/min]	m	
		[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]		[lbs]	[kg]
6	150	33	840	12	307	17	431	24	610	20	500	22	550	2418	726	330
8	200	39	998	14	366	20	507	31	790	24	600	31	800	4299	1397	635
10	250	49	1255	18	452	25	633	28	718	31	800	37	940	6986	1976	898
12	300	52	1313	24	610	33	828	31	792	18	450	41	1050	9672	2583	1174
14	350	59	1495	24	600	35	898	37	937	24	610	45	1150	13165	3505	1593
16	400	61	1559	25	632	37	930	38	975	24	610	45	1150	17197	4037	1835
20	500	83	2097	34	863	49	1253	50	1278	36	914	49	1250	26870	6057	2753

Tab.10

CLASS 300 - Reduced Bore

NPS [inch]	NPS-R [inch]	H		H1		H2		L1		D1		L Perrin Standard		Cv [gal/min]	m	
		[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]		[lbs]	[kg]
6	4	31	796	7	167	13	337	22	560	24	600	22	550	1511	678	308
8	6	34	872	12	307	17	431	24	610	20	500	31	800	2177	926	421
10	8	41	1029	14	366	20	507	31	790	24	600	37	940	3869	1607	730
12	10	51	1293	18	452	25	633	28	718	31	800	41	1050	6287	2272	1033
14	12	53	1345	24	610	33	828	31	792	18	450	45	1150	8705	2970	1350
16	14	60	1527	24	600	35	898	37	937	24	610	45	1150	11848	3863	1756
20	16	64	1622	25	632	37	930	38	975	24	610	49	1250	19588	4653	2115

Tab.11

PN 16

DN [mm]	H [mm]	H1 [mm]	H2 [mm]	L1 [mm]	D1 [mm]	L [mm] Perrin Standard	Kv [m³/h]	m [kg]
150	824	201	331	515	700	550	2092	139
200	1026	266	456	588	800	650	3719	332
250	1007	284	504	679	600	775	6043	449
300	992	312	512	770	500	900	8367	818
350	1145	345	635	888	500	1025	11388	1183
400	1275	470	760	953	450	1150	14876	1461
500	1996	763	1181	1202	914	1250	23244	2141

Tab.12

PN 40

DN [mm]	H [mm]	H1 [mm]	H2 [mm]	L1 [mm]	D1 [mm]	L [mm] Perrin Standard	Kv [m³/h]	m [kg]
150	924	307	431	515	700	550	2092	287
200	1077	366	507	588	800	650	3719	552
250	1136	452	633	679	600	775	6043	781
300	1308	610	828	770	500	900	8367	1021
350	1408	600	898	888	500	1025	11388	1385
400	1445	632	930	953	450	1150	14876	1596
500	2068	863	1253	1202	914	1250	23244	2394

Tab.13

Other dimensions and pressure classes on request.



Top Works

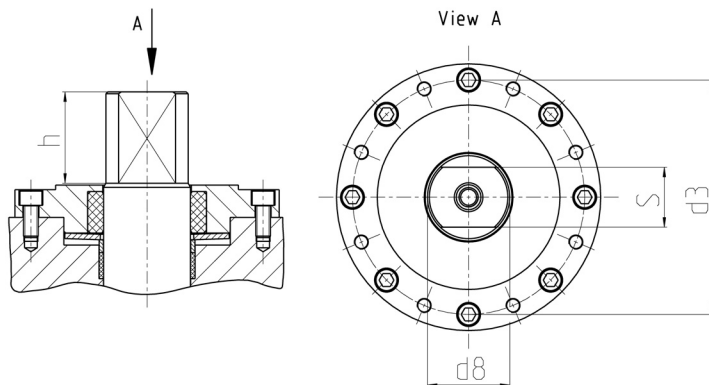


Fig.5

F	h		s		d3		d8	
	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
F07	22	0,9	12	0,5	70	2,8	17	0,7
F10	27	1,1	18	0,7	102	4	27	1,1
F12	38	1,5	32	1,3	125	4,9	40	1,6
F14	38	1,5	38	1,5	140	5,5	57	2
F16	48	1,9	44	1,7	165	6,5	68	2,7
F25	48	1,9	55	2,2	254	10	82	3,2
F35	94	3,7	65	2,6	356	14	98	3,9

Tab.14

Actuator-Connection ISO 5211 Full Bore

Reduced Bore

NPS [inch]	DN [mm]	CLASS / PN		NPS [inch]	NPS-R [inch]	CLASS	
		150 / 16	300 / 40			150	300
½	15	F07	F07	½	-	-	-
¾	20	F07	F07	¾	-	-	-
1	25	F07	F07	1	¾	F07	F07
1¼	32	F07	F10	1¼	1	F07	F07
1½	40	F07	F10	1½	1¼	F07	F10
2	50	F10	F10	2	1½	F07	F10
2½	65	F10	F10	2½	2	F10	F10
3	80	F12	F12	3	2½	F10	F12
4	100	F12	F12	4	3	F12	F12
6	150	F12	F14	6	4	F12	F14
8	200	F14	F16	8	6	F12	F14
10	250	F16	F25	10	8	F14	F16
12	300	F16	F25	12	10	F16	F25
14	350	F25	F35*	14	12	F16	F25
16	400	F25*	F35*	16	14	F25	F35*
20	500	F35*	F40*	20	16	F25*	F35*

* Feather Keyway

Tab.15

Pressure / Temperature Diagram

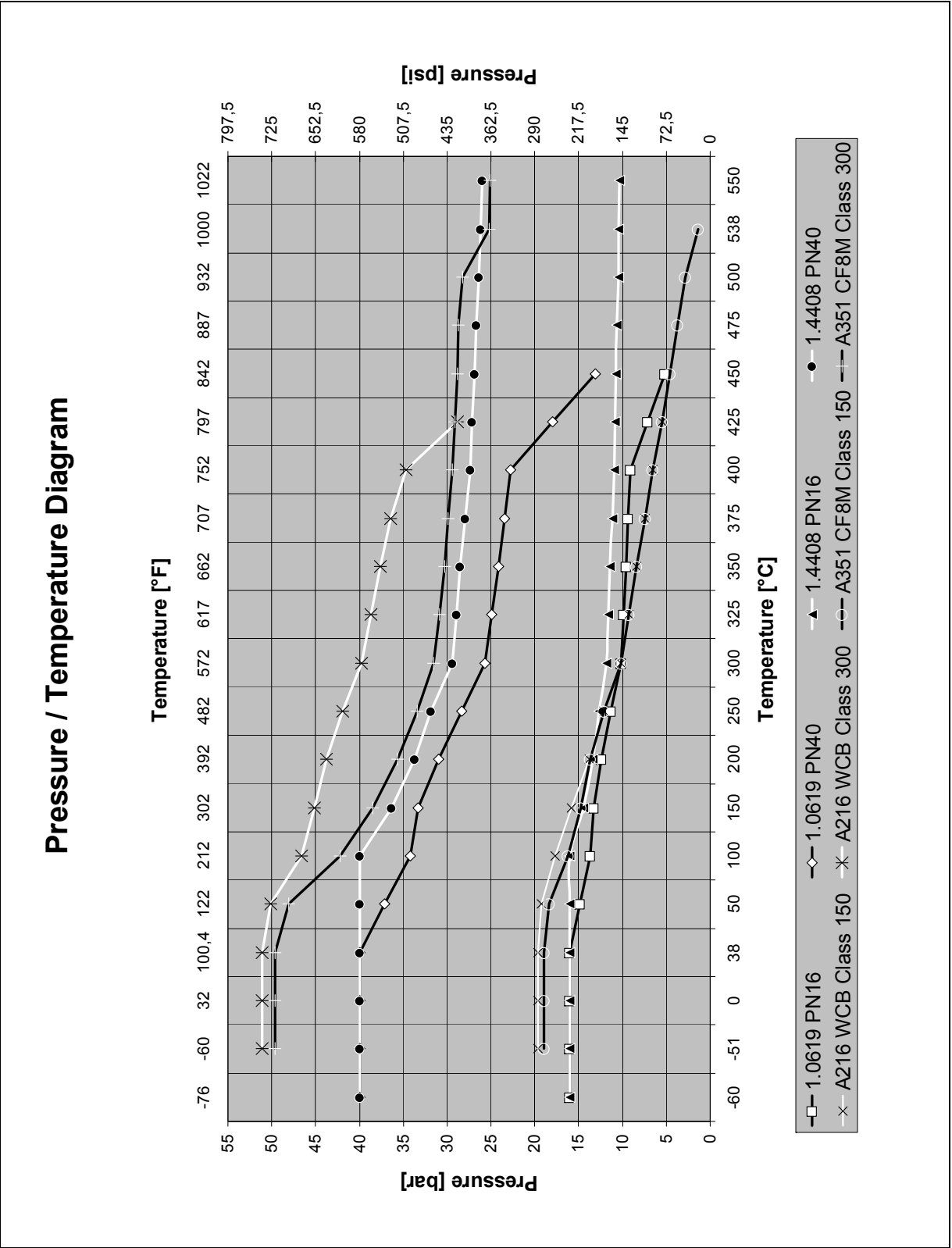


Fig.6



Options

1) Seat system with protected spring area

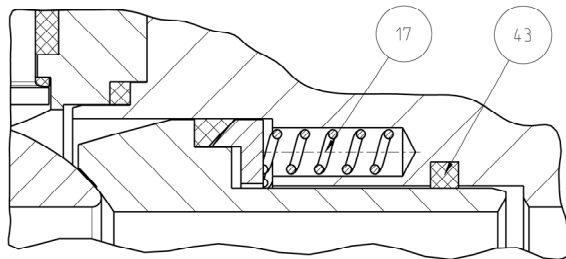


Fig.7

The area where the springs (17) are located is protected by graphite-based seal (43). This seal prevents material from entering the spring area or recess but allow the spring chamber to be energized by line pressure.

2) Adjustable stem packing

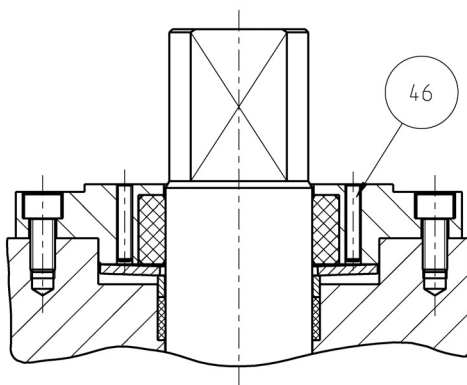


Fig.8

Additionally the live loaded stem packing may be equipped with hexagon socket screws (46). To fasten these screws it is possible to increase the spring force on the packing in the event of leakage.

3) Valve with heating jacket

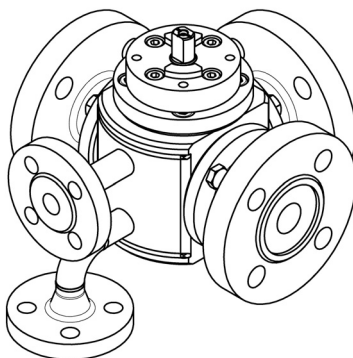


Fig.9



4) Ball options

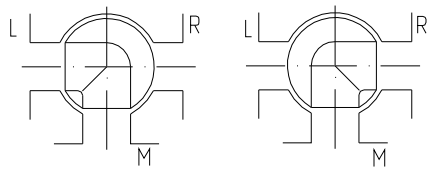


Fig. 10 L-port

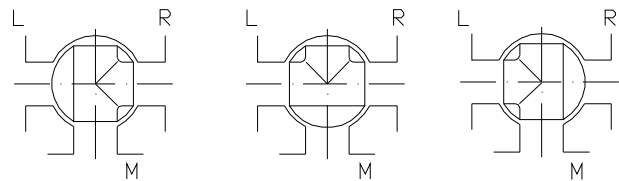


Fig. 11 T-port

5) Seat system for ball with T-port

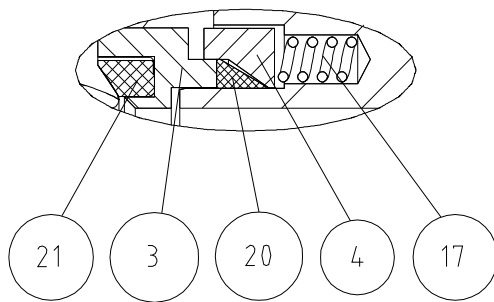


Fig. 12

6) Double-stage gland packing with sniffing connection

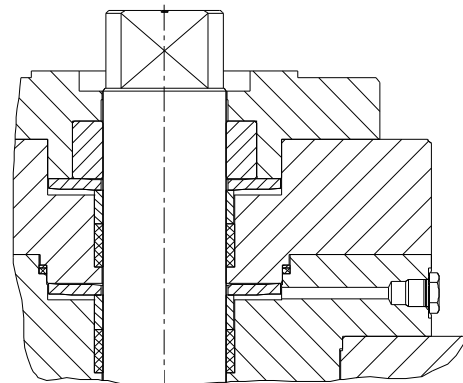


Fig. 13

7) Flow options

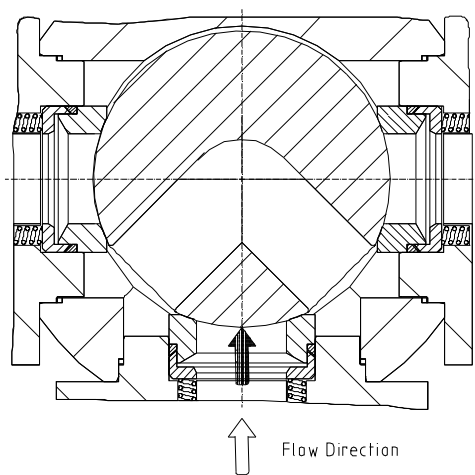


Fig. 14 Non-transflow

Direct flow is not possible in this ball position.

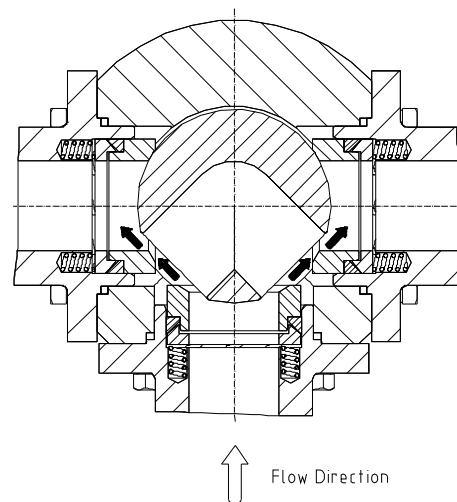


Fig. 15 Transflow

Direct flow is possible through both outlets at the same time.

Technical modifications are reserved.







