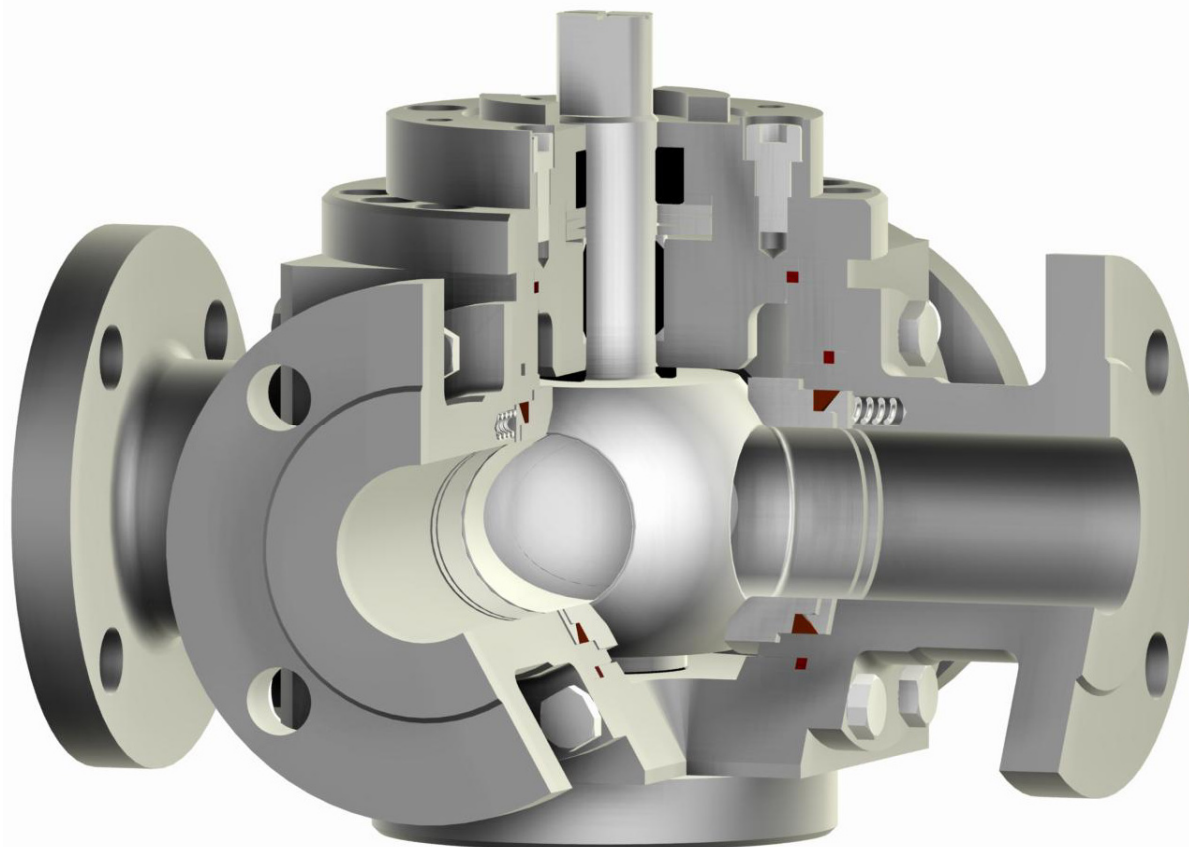




Four-Way Ball Valve 90° Metal Seated Type 23-M



Design Characteristics

- ✓ Split body
- ✓ Trunnion mounted ball with integral stem
- ✓ Live loaded stem packing
- ✓ Spring loaded seat system
- ✓ Fire Safe design optional

Design Standards

- ✓ EN 12516, EN 1983, ISO 5211, AD-2000
- ✓ ASME B 16.34, API 608

Range of Application

- ✓ Diameter ½" 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
- 27 Body Gasket
- 28 Hexagonal Screw
- 29 Socket Screw
- 30 Hexagonal Screw

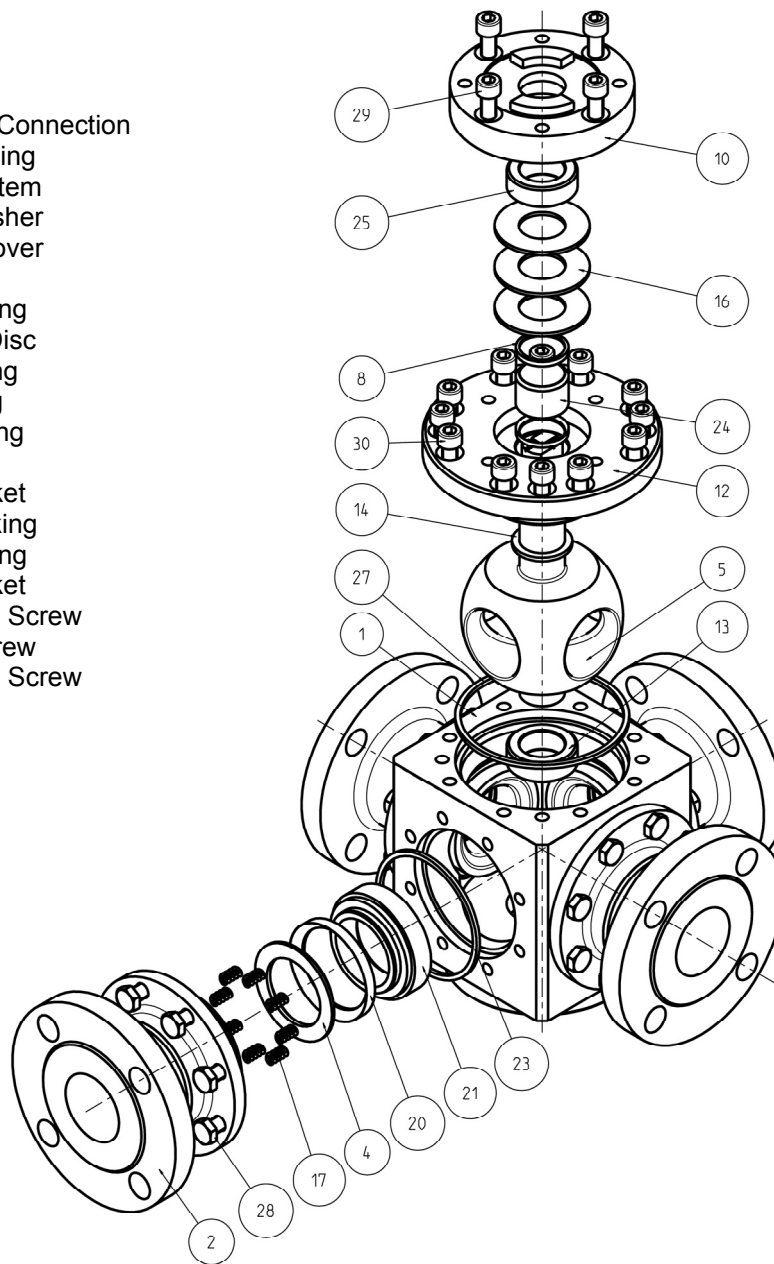


Fig.1

Description

This PERRIN ball valve is a trunnion mounted ball design with split body housing and integral stem. The spring loaded metallic seat system and live loaded stem packing also provide continuous tightness during rapid temperature changes.

The valve is equipped with an integral actuator mounting flange for actuator connection according to ISO 5211 standard. 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

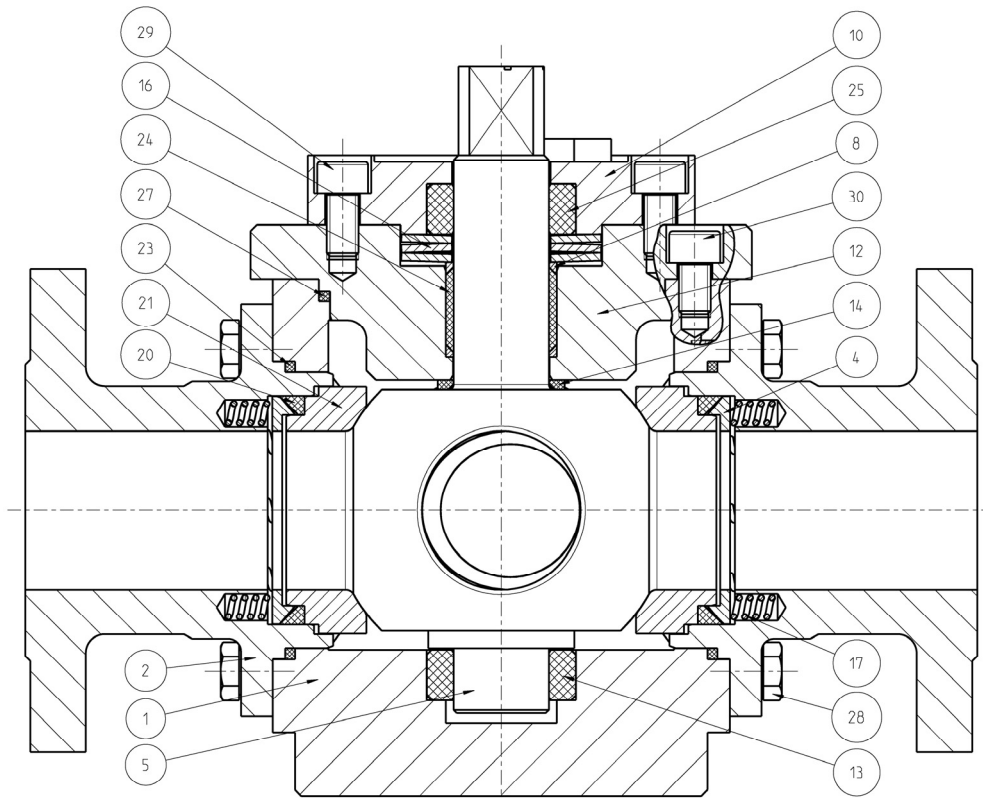


Fig.2

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
27	Body Gasket	Graphite	Graphite	Graphite	Graphite
28	Hexagonal Screw	SS	SS	SS	SS
29	Socket Screw	SS	SS	SS	SS
30	Hexagonal 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

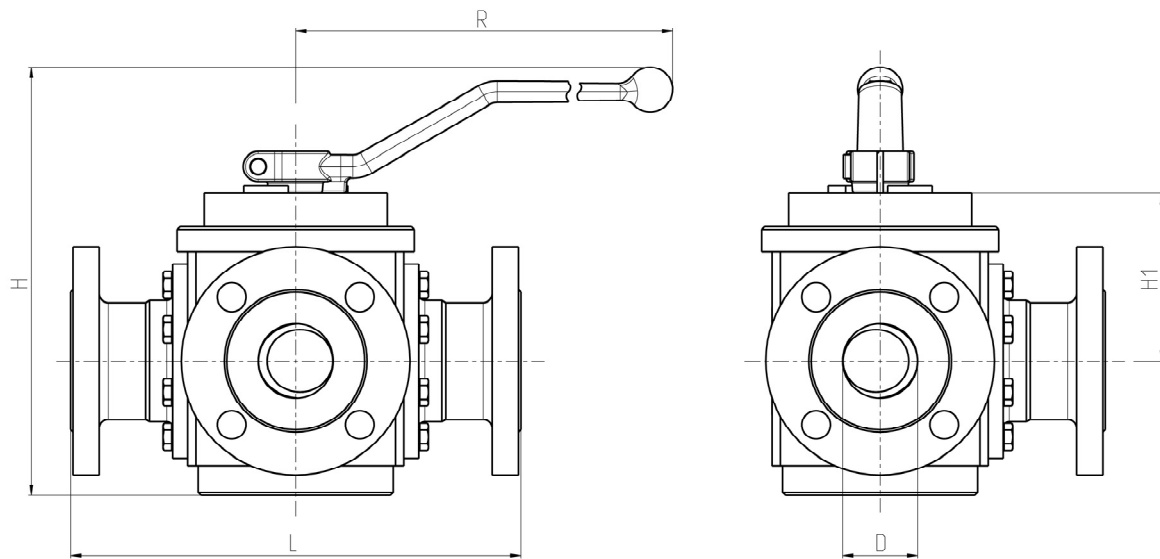


Fig.3

D = NPS = DN

Nominal Size		Class 150 - Full Bore Dimensions acc. to ASME Standards						Face to Face Perrin Standard		Cv [gal/min]	Weights	
NPS [inch]	DN [mm]	H [inch]	H [mm]	H1 [inch]	H1 [mm]	R [inch]	R [mm]	L [inch]	L [mm]		kg	lbs
½	15	4.9	124	2.3	58	7	180	8	210	23	8.5	19
¾	20	5.4	137	2.8	70	7	180	9	230	42	11	24
1	25	6	153	2.9	74	12	300	9	230	67	15	33
1¼	32	6.4	163	3.1	80	12	300	10	260	110	23	51
1½	40	8.4	213	3.9	100	18	450	10	260	173	33	72
2	50	9.1	230	4.4	112	18	450	12	300	270	46	100
2½	65	9.6	244	4.7	119	18	450	13	340	459	65	143
3	80	11.9	301	6	156	31	800	15	380	695	88	193
4	100	13	323	6.6	167	31	800	17	430	1087	122	268

Tab.2

Nominal Size		Class 150 - *Single Reduced Bore Dimensions acc. to ASME Standards						Face to Face Perrin Standard		Cv [gal/min]	Weights	
NPS [inch]	*SRB [inch]	H [inch]	H [mm]	H1 [inch]	H1 [mm]	R [inch]	R [mm]	L [inch]	L [mm]		kg	lbs
½	-	-	-	-	-	-	-	-	-	-	-	-
¾	½	4.9	124	2.3	58	7	180	9	230	23	10	22
1	¾	5.4	137	2.8	70	7	180	9	230	42	13	28
1¼	1	6	153	2.9	74	12	300	10	260	67	17	38
1½	1¼	6.4	163	3.1	80	12	300	10	260	110	27	59
2	1½	8.4	213	3.9	100	18	450	12	300	173	38	84
2½	2	9.1	230	4.4	112	18	450	13	340	270	54	118
3	2½	9.6	244	4.7	119	18	450	15	380	459	75	165
4	3	11.9	301	6	156	31	800	17	430	695	102	225

Tab.3



Nominal Size		Class 300 - Full Bore Dimensions acc. to ASME Standards						Face to Face Perrin Standard		Cv [gal/min]	Weights	
NPS [inch]	DN [mm]	H [inch]	H [mm]	H1 [inch]	H1 [mm]	R [inch]	R [mm]	L [inch]	L [mm]		kg	lbs
½	15	4.9	124	2.3	58	7	180	8	210	23	10	21
¾	20	5.4	137	2.8	70	7	180	9	230	42	13	29
1	25	6	153	2.9	74	12	300	9	230	67	18	39
1¼	32	6.4	163	3.1	80	12	300	10	260	110	27	59
1½	40	8.4	213	3.9	100	18	450	10	260	173	38	83
2	50	9.1	230	4.4	112	18	450	12	300	270	49	109
2½	65	9.6	244	4.7	119	18	450	13	340	459	70	154
3	80	11.9	301	6	156	31	800	15	380	695	97	213
4	100	13	323	6.6	167	31	800	17	430	1087	139	306

Tab.4

Nominal Size		Class 300 - *Single Reduced Bore Dimensions acc. to ASME Standards						Face to Face Perrin Standard		Cv [gal/min]	Weights	
NPS [inch]	*SRB [inch]	H [inch]	H [mm]	H1 [inch]	H1 [mm]	R [inch]	R [mm]	L [inch]	L [mm]		kg	lbs
½	-	-	-	-	-	-	-	-	-	-	-	-
¾	½	4.9	124	2.3	58	7	180	9	230	23	10.5	23
1	¾	5.4	137	2.8	70	7	180	9	230	42	13	29
1¼	1	6	153	2.9	74	12	300	10	260	67	18	40
1½	1¼	6.4	163	3.1	80	12	300	10	260	110	28	62
2	1½	8.4	213	3.9	100	18	450	12	300	173	39	86
2½	2	9.1	230	4.4	112	18	450	13	340	270	55	120
3	2½	9.6	244	4.7	119	18	450	15	380	459	77	170
4	3	11.9	301	6	156	31	800	17	430	695	107	235

Tab.5



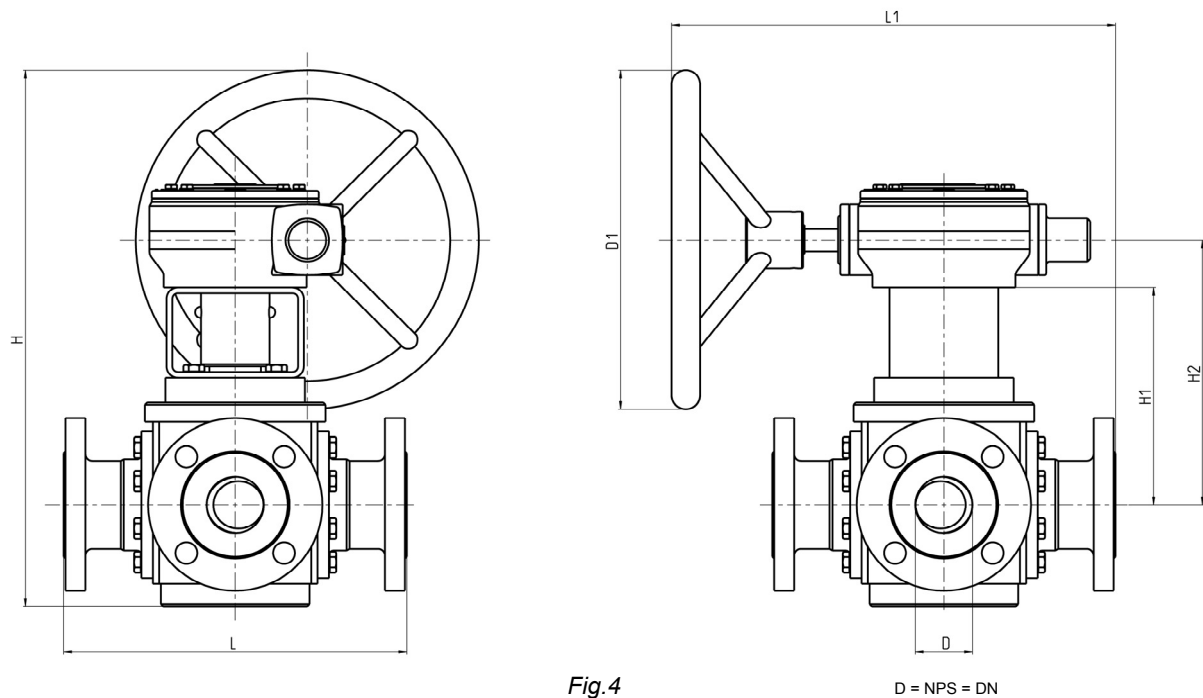
Nominal Size	PN 16 Dimensions [mm] acc. to DIN EN Standards			Face to Face Perrin Standard	Kv [m³/h]	Weights [kg]
DN	H	H1	R	L		
15	124	58	180	210	20	9
20	137	70	180	230	36	11
25	153	74	300	230	57	15
32	163	80	300	260	94	24
40	213	100	450	260	148	33
50	230	112	450	300	231	46
65	244	119	450	340	392	64
80	301	156	800	380	594	87
100	323	167	800	430	929	120

Tab.6

Nominal Size	PN 40 Dimensions [mm] acc. to DIN EN Standards			Face to Face Perrin Standard	Kv [m³/h]	Weights [kg]
DN	H	H1	R	L		
15	124	58	180	210	20	9
20	137	70	180	230	36	11
25	153	74	300	230	57	15
32	163	80	300	260	94	24
40	213	100	450	260	148	33
50	230	112	450	300	231	50
65	244	119	450	340	392	70
80	301	156	800	380	594	95
100	323	167	800	430	929	133

Tab.7

Other dimensions and pressure classes on request.



Nominal Size		Class 150 - Full Bore Dimensions acc. to ASME Standards										Face to Face Perrin Standard		Cv [gal/min]	Weights	
NPS [inch]	DN [mm]	H [inch]	H [mm]	H1 [inch]	H1 [mm]	H2 [inch]	H2 [mm]	L1 [inch]	L1 [mm]	D1 [inch]	D1 [mm]	L [inch]	L [mm]		kg	lbs
6	150	32.3	821	7.9	201	13	331	20.3	515	28	700	22	550	2448	171	375
8	200	34.5	877	10.5	266	18	456	23	588	20	500	26	650	4351	400	879
10	250	42	1057	11.2	284	19.8	504	29	725	28	700	31	775	7070	540	1188
12	300	41	1053	12	312	20.2	512	30	770	24	600	35	900	9789	978	2151
14	350	45.3	1152	13.6	345	25	635	39	995	20	500	40	1025	13324	1408	3098
16	400	55	1408	18.5	470	29.9	760	42	1075	28	700	45	1150	17405	1741	3829
20	500	78.2	1987	30	763	46.5	1181	47	1202	36	914	49	1250	27195	2547	5602

Tab.8

Nominal Size		Class 150 - *Single Reduced Bore Dimensions acc. to ASME Standards										Face to Face Perrin Standard		Cv [gal/min]	Weights	
NPS [inch]	*SRB [inch]	H [inch]	H [mm]	H1 [inch]	H1 [mm]	H2 [inch]	H2 [mm]	L1 [inch]	L1 [mm]	D1 [inch]	D1 [mm]	L [inch]	L [mm]		kg	lbs
6	4	27	687	6.6	167	12	297	19.4	492	20	500	22	550	1699	160	352
8	6	33.6	852	7.9	201	13	331	20.3	515	28	700	26	650	2448	202	444
10	8	35.8	909	10.5	266	18	456	23	588	20	500	31	775	4351	463	1019
12	10	43	1095	11.2	284	19.8	504	29	725	28	700	35	900	7070	630	1386
14	12	42	1079	12	312	20.2	512	30	770	24	600	40	1025	9789	1131	2487
16	14	46.6	1183	13.6	345	25	635	39	995	20	500	45	1150	13324	1625	3574
20	16	57	1459	18.5	470	29.9	760	42	1075	28	700	49	1250	17405	2425	5334

Tab.9



Nominal Size		Class 300 - Full Bore Dimensions acc. to ASME Standards										Face to Face Perrin Standard		Cv [gal/min]	Weights	
NPS [inch]	DN [mm]	H [inch]	H [mm]	H1 [inch]	H1 [mm]	H2 [inch]	H2 [mm]	L1 [inch]	L1 [mm]	D1 [inch]	D1 [mm]	L [inch]	L [mm]		kg	lbs
6	150	33	840	12.1	307	17	431	24	610	20	500	22	550	2448	349	768
8	200	39.3	998	14.4	366	20	507	31	790	24	600	31	800	4351	665	1463
10	250	49	1255	17.8	452	24.9	633	28	718	31	800	37	940	7070	941	2070
12	300	52	1313	24	610	32.6	828	31	792	18	450	41	1050	9789	1236	2719
14	350	58.9	1495	23.6	600	35	898	37	937	24	610	45	1150	13324	1679	3693
16	400	61	1559	24.9	632	36.6	930	38	975	24	610	45	1150	17405	1941	4270
20	500	82.6	2097	34	863	49.3	1253	50	1278	36	914	49	1250	27195	2911	6404

Tab.10

Nominal Size		Class 300 - *Single Reduced Bore Dimensions acc. to ASME Standards										Face to Face Perrin Standard		Cv [gal/min]	Weights	
NPS [inch]	*SRB [inch]	H [inch]	H [mm]	H1 [inch]	H1 [mm]	H2 [inch]	H2 [mm]	L1 [inch]	L1 [mm]	D1 [inch]	D1 [mm]	L [inch]	L [mm]		kg	lbs
6	4	31	796	6.6	167	13	337	22	560	24	600	22	550	1699	327	720
8	6	34	872	12.1	307	17	431	24	610	20	500	31	800	2448	451	992
10	8	40.5	1029	14.4	366	20	507	31	790	24	600	37	940	4351	773	1700
12	10	51	1293	17.8	452	24.9	633	28	718	31	800	41	1050	7070	1095	2408
14	12	53	1345	24	610	32.6	828	31	792	18	450	45	1150	9789	1436	3159
16	14	60.1	1527	23.6	600	35	898	37	937	24	610	45	1150	13324	1862	4096
20	16	64	1622	24.9	632	36.6	930	38	975	24	610	49	1250	17405	2273	5001

Tab.11

Nominal Size	PN 16 Dimensions [mm] acc. to DIN EN Standards					Face to Face Perrin Standard	Kv [m³/h]	Weights [kg]	
	DN	H	H1	H2	L1	D1			L
150	824	201	331	515	700		550	2092	147
200	1026	266	456	588	800		650	3719	344
250	1007	284	504	679	600		775	6043	465
300	992	312	512	770	500		900	8367	840
350	1145	345	635	888	500		1025	11388	1215
400	1275	470	760	953	450		1150	14876	1502
500	1996	763	1181	1202	914		1250	23244	2207

Tab.12

Nominal Size	PN 40 Dimensions [mm] acc. to DIN EN Standards					Face to Face Perrin Standard	Kv [m³/h]	Weights [kg]
DN	H	H1	H2	L1	D1	L		
150	924	307	431	515	700	550	2092	299
200	1077	366	507	588	800	650	3719	573
250	1136	452	633	679	600	775	6043	815
300	1308	610	828	770	500	900	8367	1068
350	1408	600	898	888	500	1025	11388	1455
400	1445	632	930	953	450	1150	14876	1694
500	2068	863	1253	1202	914	1250	23244	2524

Tab.13

Other dimensions and pressure classes on request.



Top Works

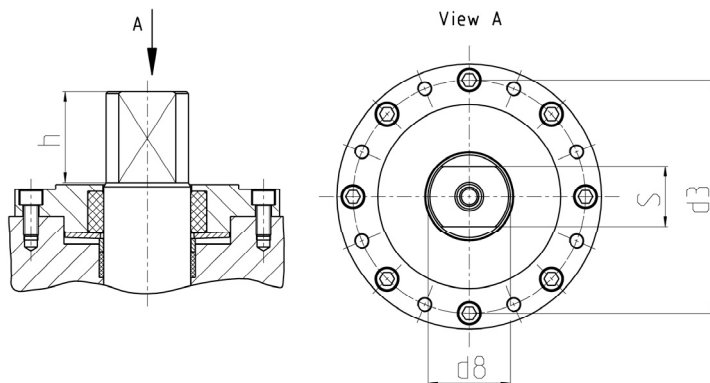


Fig.5

Dimensions								
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

Nominal Size		Actuator-Connection ISO 5211 Full Bore		**Feather keyway	Nominal Size		Actuator-Connection ISO 5211 *Single Reduced Bore	
NPS [inch]	DN [mm]	Class 150	Class 300		NPS [inch]	*SRB [inch]	Class 150	Class 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**

Tab.15

Pressure / Temperature Diagram

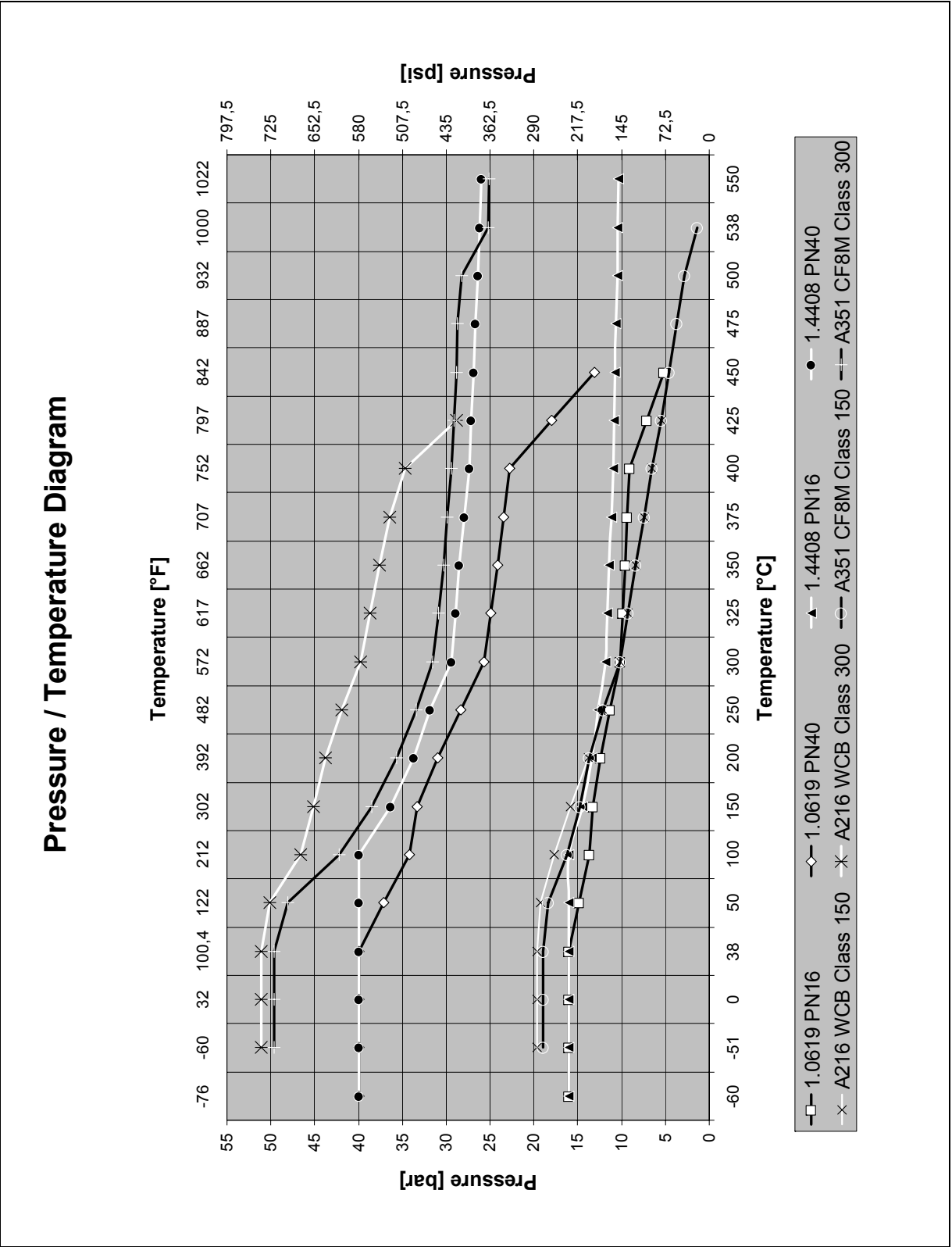


Fig.6

Options

1) Seat system with protected spring area

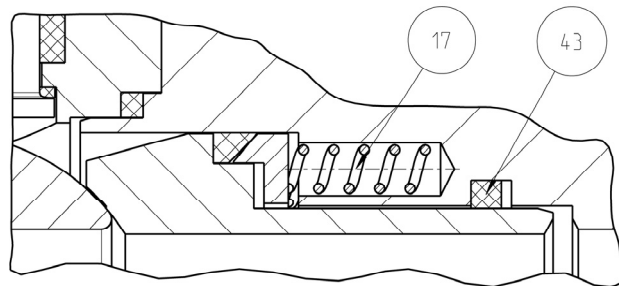


Fig.7

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

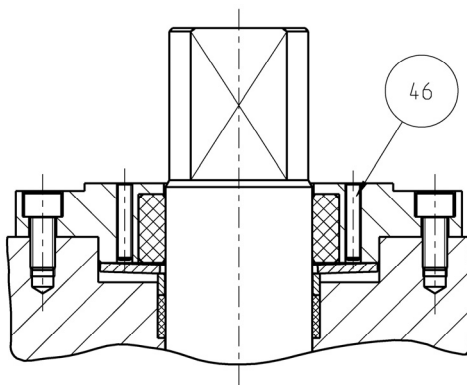


Fig.8

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) Double-stage gland packing with purge connection

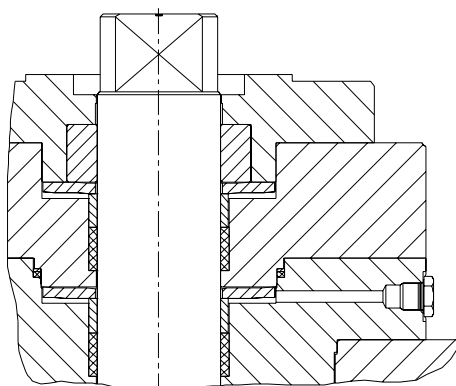


Fig.9

4) Ball positions

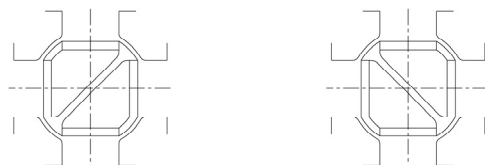


Fig.10

Technical modifications are reserved.

