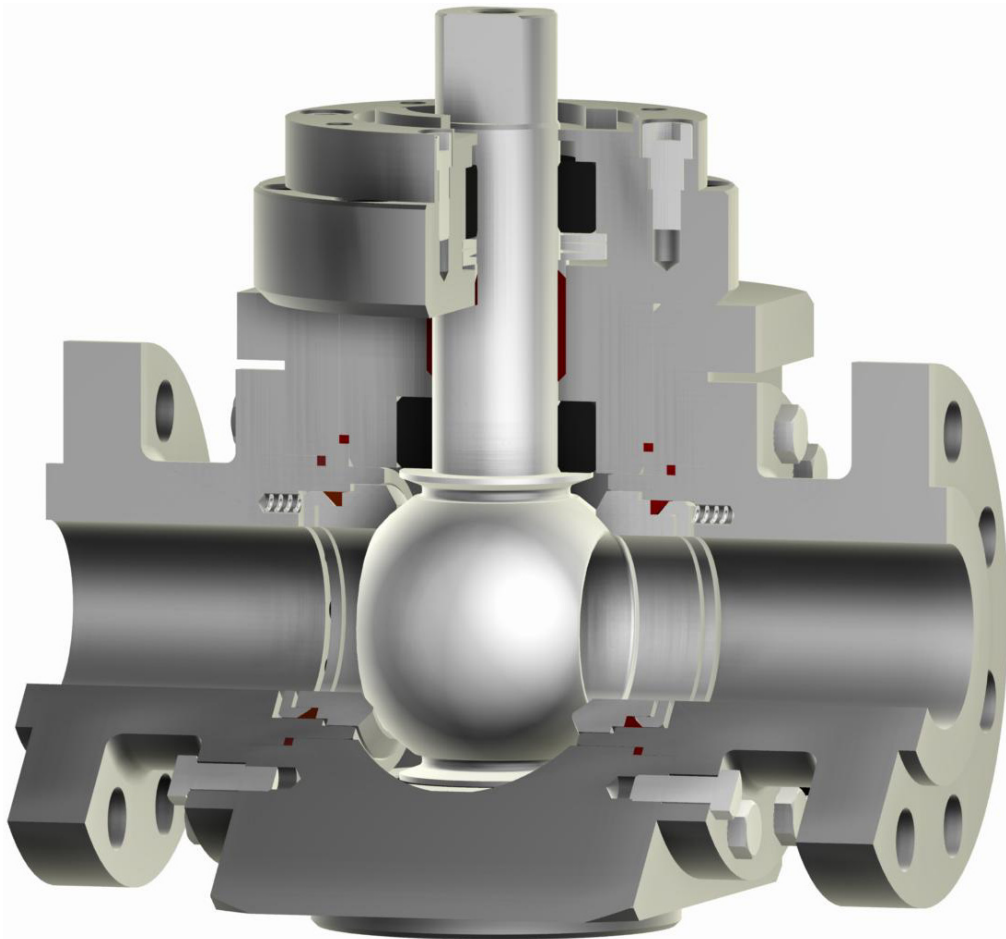




Two-Way Metal Seated Ball Valve Type 16-M



Design Characteristics

- ✓ Split body design
- ✓ 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 12" / DN 15 to 300
- ✓ 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
- 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 Body Gasket
- 28 Screw
- 29 Screw
- 30 Screw

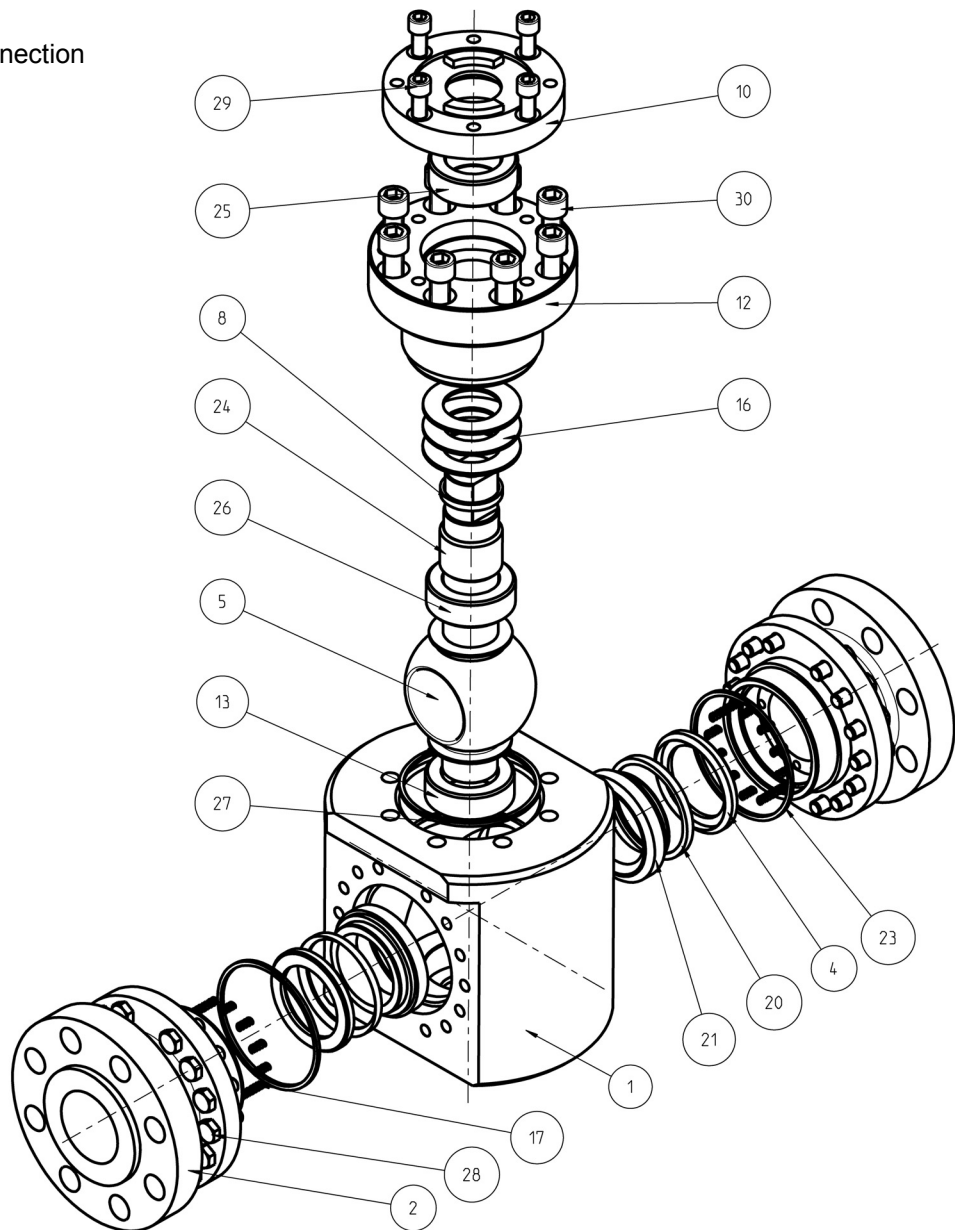


Fig.1

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 short-term temperature and pressure changes.

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

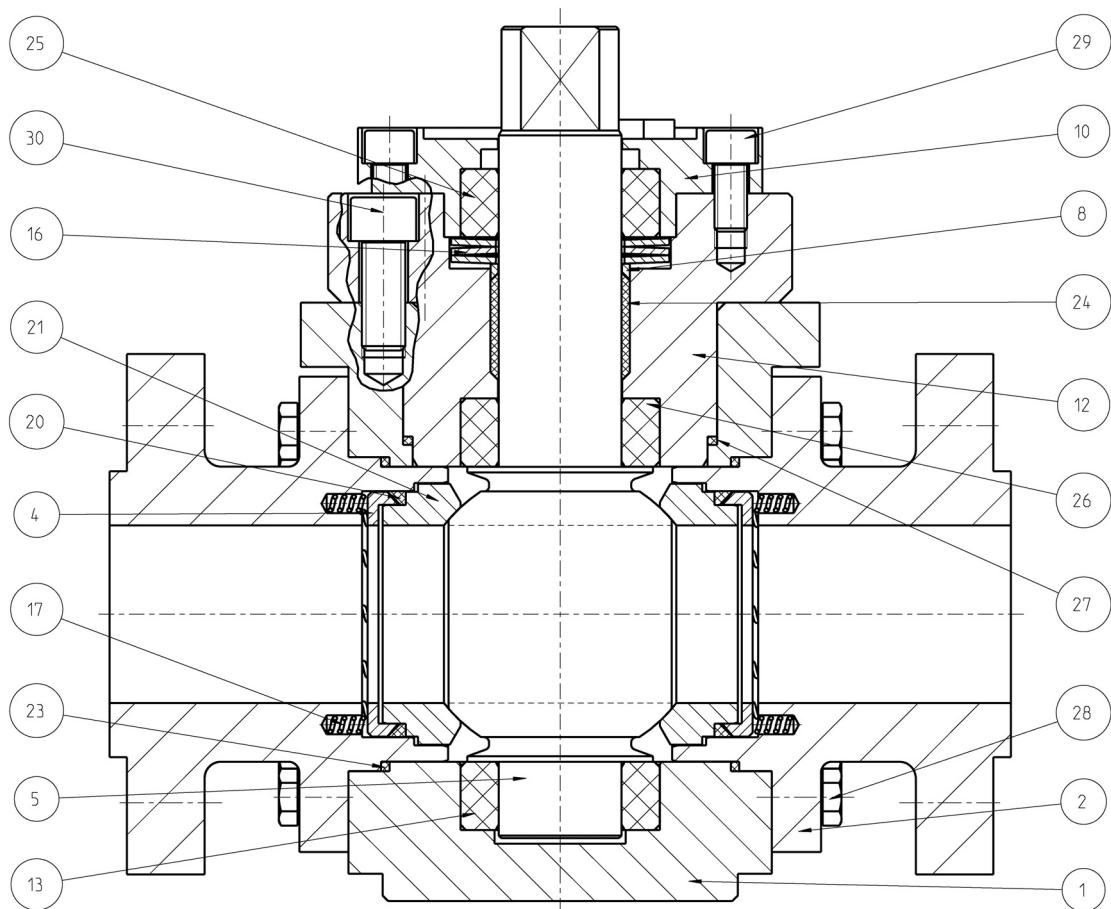


Fig.2

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	A216 WCB	1.4571	1.0619
12	Cover	Type 316 / A351 CF8M	A105 / A216 WCB	1.4571 / 1.4408 ¹⁾	1.0460 / 1.0619
13	Bearing Ring	Carbon-Antimony	Carbon-Antimony	Carbon-Antimony	Carbon-Antimony
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-Antimony	Carbon-Antimony	Carbon-Antimony	Carbon-Antimony
26	Bearing Ring	Graphite with SS	Graphite with SS	Graphite with SS	Graphite with SS
27	Body Gasket	Graphite	Graphite	Graphite	Graphite
28	Screw	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

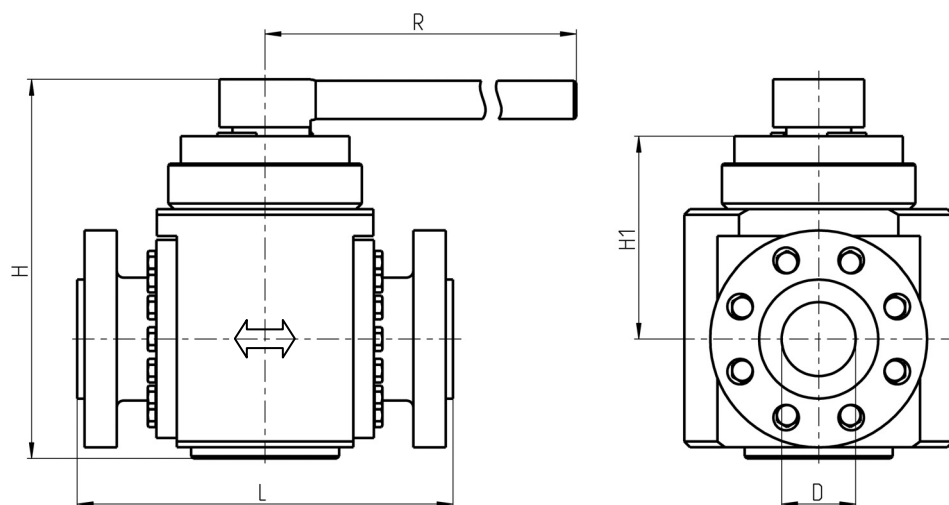


Fig.3

D = NPS = DN = Nominal Size
m = Weight

CLASS 150 - 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	6,2	158	3,5	89	12	300	6,5	165	27	51	23
¾	20	6,8	173	3,7	95	12	300	7,5	190	47	57	26
1	25	7,4	188	4,1	105	12	300	8,5	216	74	62	28
1¼	32	8,3	210	4,7	120	12	300	9	229	123	79	36
1½	40	9,4	238	5,3	135	12	300	9,5	241	191	101	46
2	50	10	255	5,8	147	18	450	11,5	292	298	134	61
2½	65	12,6	320	7	178	18	450	13	330	504	205	93
3	80	13,5	343	7,5	191	28	700	14	356	763	264	120
4	100	14,3	363	7,9	201	28	700	17	432	1192	499	227

Tab.2

CLASS 150 - 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	6,2	158	3,5	89	12	300	7	190	24	54	25
1	¾	6,8	173	3,7	95	12	300	9	216	43	59	27
1¼	1	7	188	4,1	105	12	300	9	229	67	75	34
1½	1¼	8,3	210	4,7	120	12	300	9	241	110	96	44
2	1½	9,4	238	5,3	135	12	300	11	292	172	128	58
2½	2	10,0	255	5,8	147	18	450	13	330	268	195	89
3	2½	12,6	320	7,0	178	18	450	14	356	454	251	114
4	3	13,5	343	8	191	28	700	17	432	687	476	216

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	6,2	158	3,5	89	12	300	6,5	165	27	53	24
¾	20	6,8	173	3,7	95	12	300	7,5	190	47	59	27
1	25	7,4	188	4,1	105	12	300	8,5	216	74	66	30
1¼	32	8,3	210	4,7	120	18	450	9	229	123	84	38
1½	40	9,4	238	5,3	135	18	450	9,5	241	191	108	49
2	50	10	255	5,8	147	18	450	11,5	292	298	141	64
2½	65	12,6	320	7	178	18	450	13	330	504	216	98
3	80	13,5	343	7,5	191	28	700	14	356	763	277	126
4	100	14,3	363	7,9	201	28	700	17	432	1192	524	238

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	6,2	158	3,5	89	12	300	7	190	24	57	26
1	¾	6,8	173	3,7	95	12	300	9	216	43	64	29
1¼	1	7,4	188	4,1	105	12	300	9	229	67	79	36
1½	1¼	8,3	210	4,7	120	18	450	9	241	110	103	47
2	1½	9,4	238	5,3	135	18	450	11	292	172	134	61
2½	2	10	255	5,8	147	18	450	13	330	268	205	93
3	2½	12,6	320	7	178	18	450	14	356	454	264	120
4	3	13,5	343	7,5	191	28	700	17	432	687	499	227

Tab.5

PN 16 – PN 40

DN [mm]	H [mm]	H1 [mm]	R [mm]	L [mm] Perrin Standard	Kv [m³/h]	m [kg]
15	158	89	300	210	23	24
20	173	95	300	230	41	27
25	188	105	300	230	64	30
32	210	120	300	230	106	38
40	238	135	450	260	165	48
50	255	147	450	300	258	63
65	320	178	450	340	436	95
80	343	191	700	380	660	122
100	363	201	700	430	1031	229

Tab.6

Other dimensions and pressure classes on request.

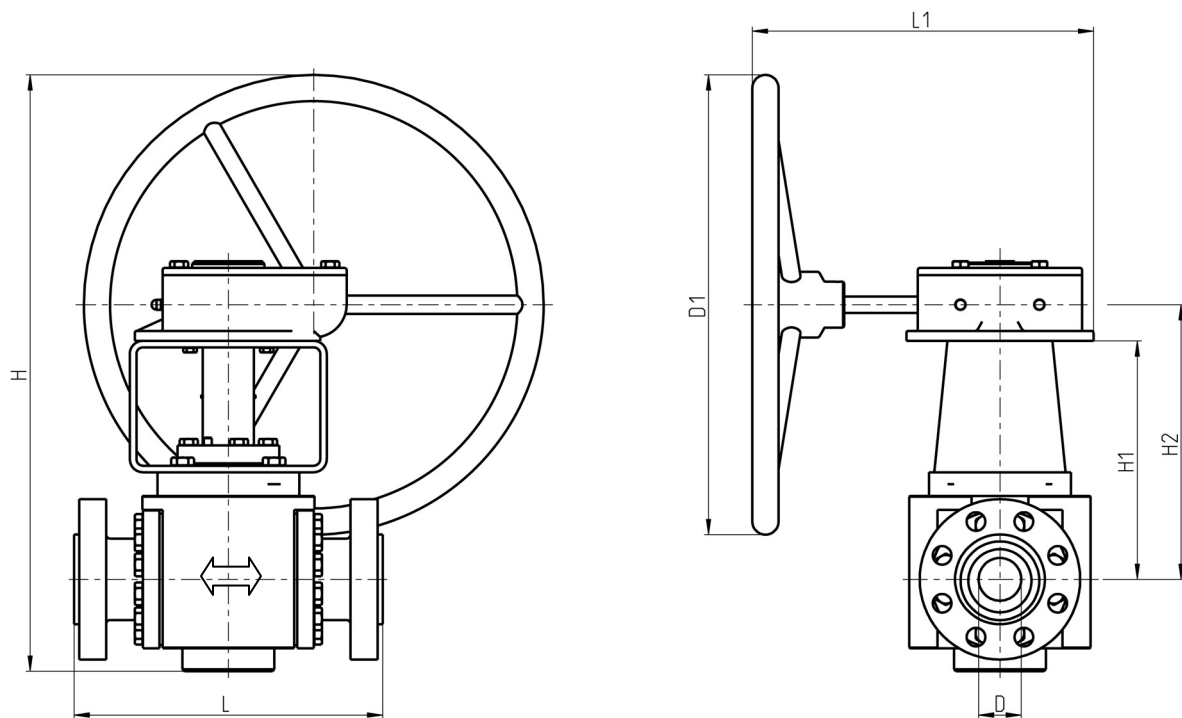


Fig.4

D = NPS = DN = Nominal Size
m = Weight

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	33	850	10	265	19	485	20	515	18	450	22	559	2682	605	275
8	200	41	1044	12	303	21	523	23	588	28	700	26	660	4767	840	382
10	250	45	1133	14	360	23	580	29	725	28	700	31	787	7746	1267	576
12	300	51	1306	16	415	24	615	30	770	35	900	33	850	10727	1749	795

Tab.7

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	31,9	811	7,9	201	16,6	421	19,4	492	20	500	22	559	1676	594	270
8	6	39,6	1006	10,4	265	19,1	485	20,3	515	28	700	26	660	2414	779	354
10	8	40,4	1026	11,9	303	20,6	523	23,1	588	24	600	31	787	4291	1173	533
12	10	46,1	1171	14,2	360	22,8	580	28,5	725	28	700	33	838	6972	1619	736

Tab.8

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	37	940	12	307	17	431	24	610	28	700	22	559	2682	726	330
8	200	43	1098	14	366	20	507	31	790	31	800	26	660	4767	1397	635
10	250	45	1155	18	452	25	633	28	718	24	600	31	787	7746	1976	898
12	300	53	1338	24	610	33	828	31	792	20	500	33	850	10727	2583	1174

Tab.9

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	5	32	820	7,9	201	14	361	22	560	24	600	22	559	1676	678	308
8	6	34	872	12,1	307	17	431	24	610	20	500	26	660	2414	926	421
10	8	40,5	1029	14,4	366	20	507	31	790	24	600	31	787	4291	1607	730
12	10	51	1293	17,8	452	24,9	633	28	718	31	800	33,5	850	6972	2272	1033

Tab.10

PN 16

DN [mm]	H [mm]	H1 [mm]	H2 [mm]	L1 [mm]	D1 [mm]	L [mm] Perrin Standard	Kv [m³/h]	m [kg]
150	757	265	389	435	450	550	2320	269
200	964	303	444	526	700	650	4124	370
250	1094	360	541	600	700	775	6701	561
300	1319	421	639	687	900	850	9279	790

Tab.11

PN 40

DN [mm]	H [mm]	H1 [mm]	H2 [mm]	L1 [mm]	D1 [mm]	L [mm] Perrin Standard	Kv [m³/h]	m [kg]
150	889	265	389	506	700	550	2320	315
200	1032	303	444	585	800	650	4124	617
250	1066	360	541	682	600	775	6701	879
300	1147	421	639	768	500	850	9279	1142

Tab.12

Other dimensions and pressure classes on request.

Top Works

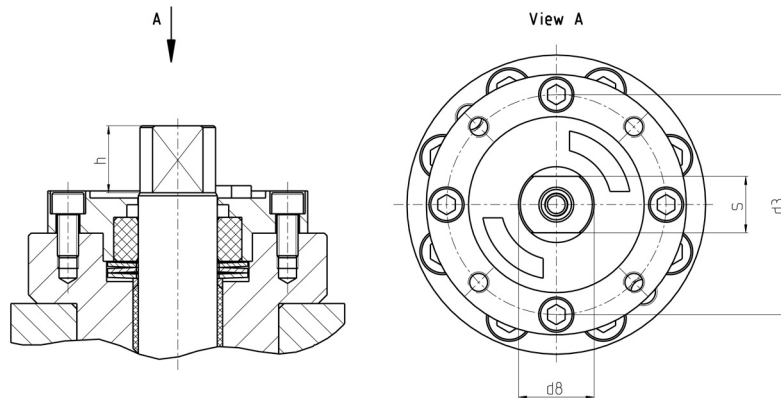


Fig.5

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

Tab.13

Actuator-Connection ISO 5211 Full Bore

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

Reduced Bore

NPS [inch]	NPS-R [inch]	CLASS	
		150	300
½	-	-	-
¾	½	F07	F07
1	¾	F07	F07
1¼	1	F07	F07
1½	1¼	F07	F10
2	1½	F07	F10
2½	2	F10	F10
3	2½	F10	F12
4	3	F12	F12
6	4	F12	F14
8	6	F12	F14
10	8	F14	F16
12	10	F16	F25

Tab.14

Pressure / Temperature Diagram

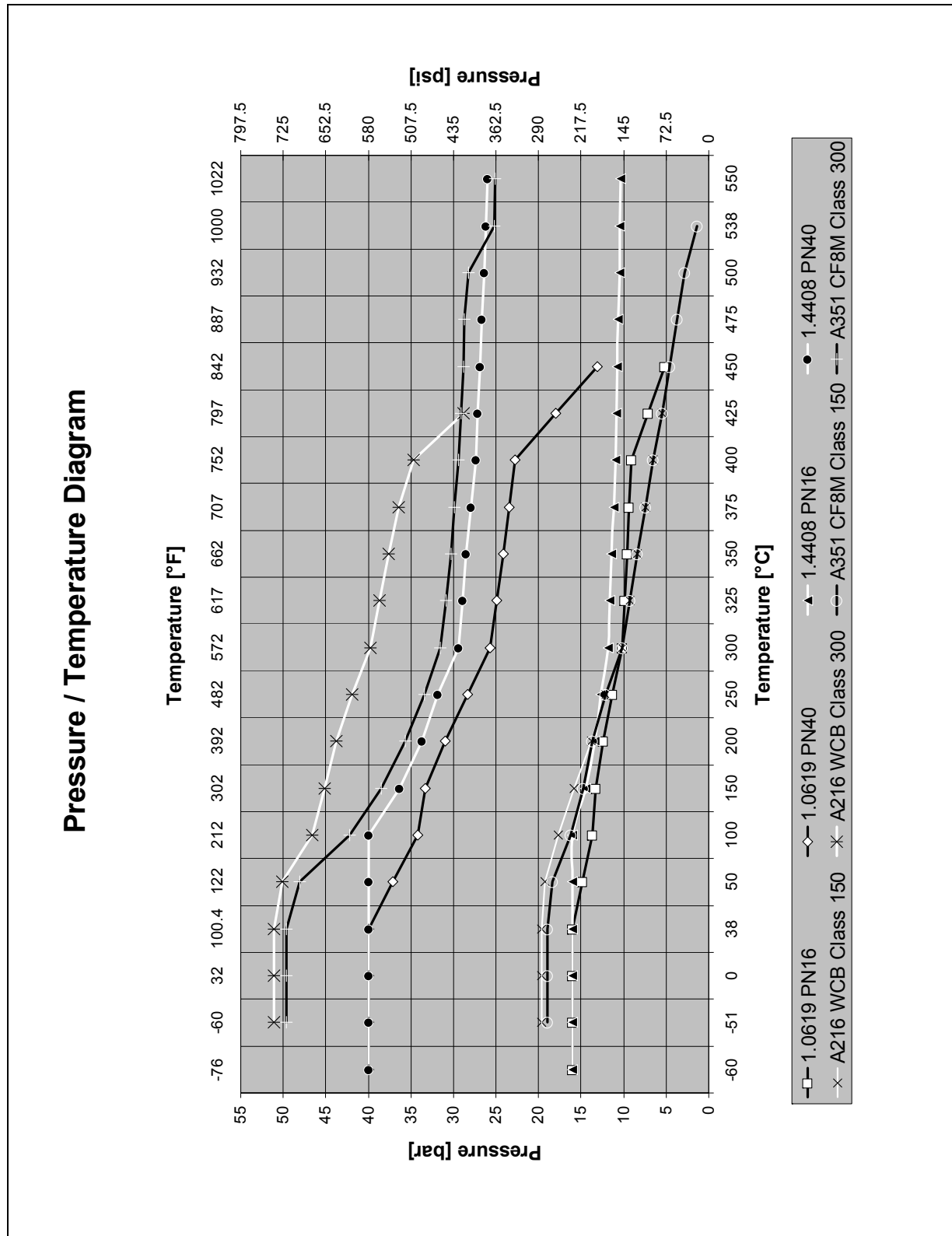


Fig.6



Options

1) Seat system with protected spring area

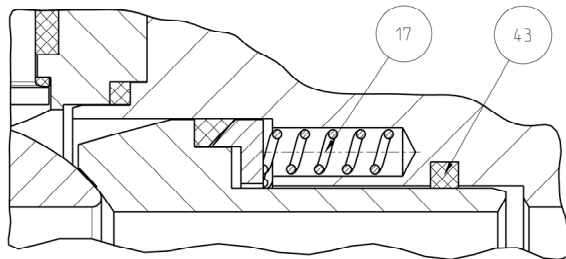


Fig.7

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

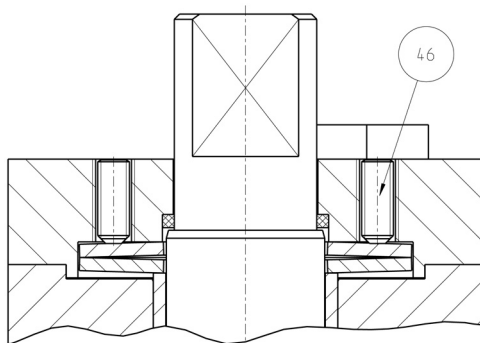


Fig.8

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) With high pressure seat system

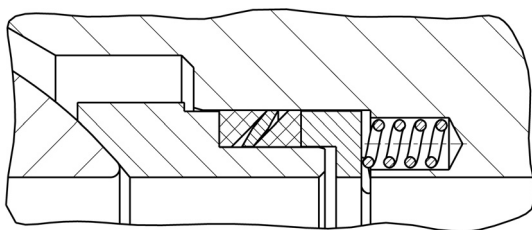


Fig.9

4) Double-stage gland packing with sniffing connection

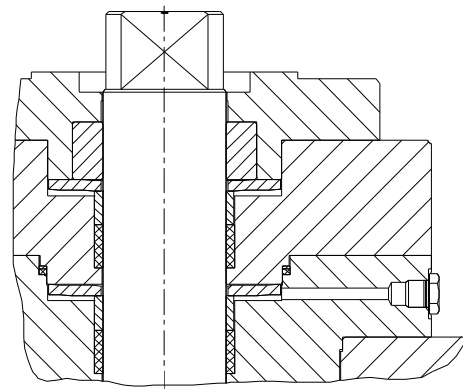


Fig.10



5) Valve with heating jacket

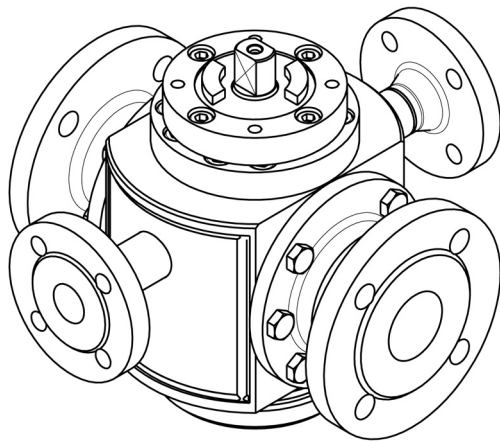


Fig.11

Technical modifications are reserved.

