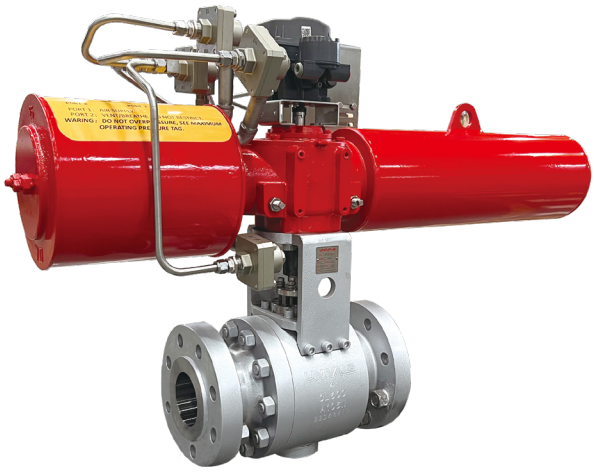
UV664 Trunnion Ball Valve

UV664 ball valve from UNIVALS is designed with an advanced innovation concept, which includes unique design and high quality manufacturing process. UV664Q ball valve is capable of delivering a longer service life and better sealing performance to meet safety, emission, and performance requirements in the Oil & Gas, Petrochemical and Chemical industries. It is suitable for a wide range of applications, such as emergency shutdown valves (ESDV) and cryogenic service.



Features

Proven features provide long service life with outstanding Low leakage and low operating torques in even the toughest applications.

- Heavy Duty Bearings
- Self-Relieving Seat
- Integrated Yoke
- Resilient Valve Seat
- Fugitive Emission Valves

Technical Summary

- Size: 2~24 inch
- Rating: Class 150 ~ Class 2500
- Body: Carbon Steel, Alloy Steel, Stainless Steel
- Trim: Carbon Steel, Alloy Steel, Stainless Steel
- Seat: RPTFE, PEEK

Please consult with UNIVALS for more material options.

Advantage

- Tight shut-off sealing
- Long service life
- Clear indication of switch position
- Reliable safety

Design Standards

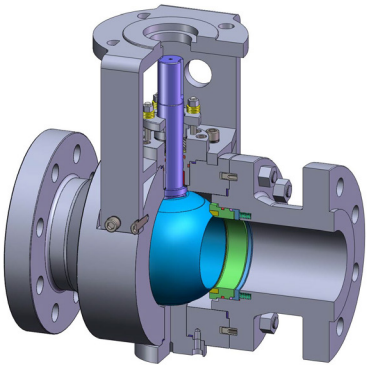
- **Design**
  API 6D, ISO 14313
- **Pressure / Temperature Rating**
  ASME B16.34 or DIN EN 12516
- **Face-to-face Dimensions**
  API 6D, ISO 14313
- **Flange End Dimensions**
  ASME B16.5 or DIN EN 1092-1
- **NACE**
  MR 0103 or MR 0175
- **Fugitive Emission**
  ISO15848, TA-LUFT
- **Fire-safe Type Test**
  API607, API 6FA, ISO10497

Available Configurations

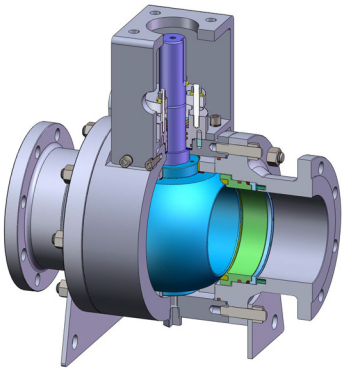
UV664 ball valves are easily adapted to a variety of standard and severe service applications.
Configurable elements include:

- Extended stem
- Cryogenic
- Multiple end connection types
- Customized design

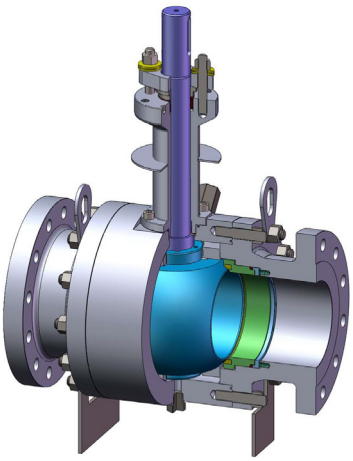
Configurations



STANDARD (NPS≤4)



STANDARD (NPS≥6)



LOW TEMPERATURE

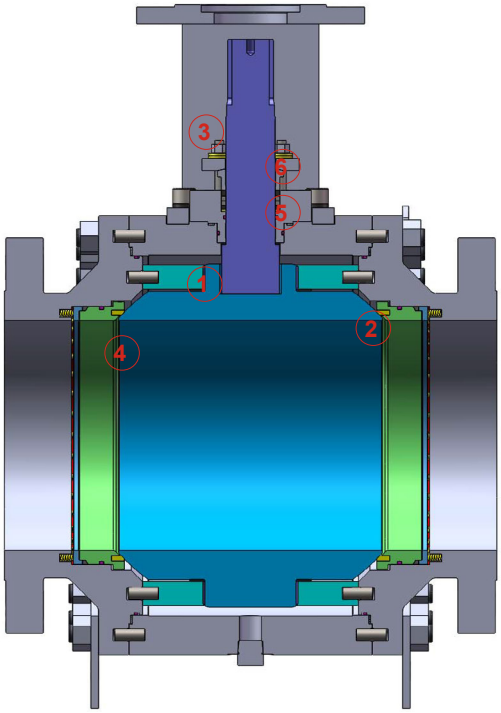
Size and Pressure Range

Product Supply Scope for ASME B16.5 Flange														
ASME	NPS													
Class	2	2-1/2	3	4	5	6	8	10	12	14	16	18	20	24
CL150	*	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CL300	*	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CL600	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CL900	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CL1500	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	*
CL2500	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	*	*	*

NOTE: "✓" Standard products, "*"Please contact sales for relevant data.

Product Supply Scope for DIN-EN-1092 Flange														
DIN	DN													
PN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
PN10	*	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PN16	*	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PN25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PN40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PN63	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	*
PN100	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	*

NOTE: "✓" Standard products, "*"Please contact sales for relevant data.



1. Heavy Duty Bearings

Heavy-duty metal PTFE composite bearings mount on the trunnion, providing low-friction, self-lubricating bearings are maintenance-free.

2. Self-Relieving Seat

The single-piston design allows for the automatic release of any abnormal overpressure in the body cavity when the valve is in the fully open or fully closed position.

3. Integrated Yoke

Integrated valve body yoke enables the valve to operate reliably and stably in the automatic control system, and the finite element analysis of the natural frequency of valve and the actuator after assembly is ≥33Hz.

5. Fugitive Emission Valves

Double seal of O-ring and graphite is provided at each leak point to ensure that the valve meets the fugitive emission standards.

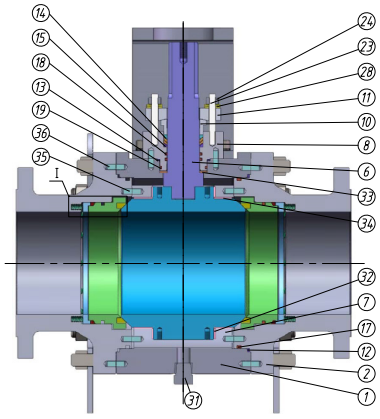
6. Clear Indication of Switch Position

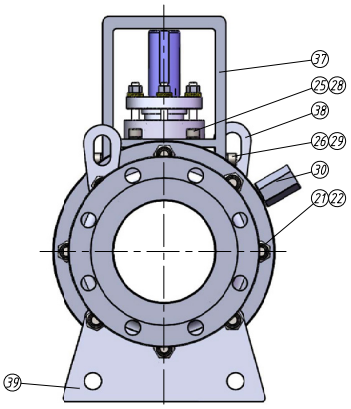
Stem groove marking and the position indication on the packing gland clearly show the position of the valve.

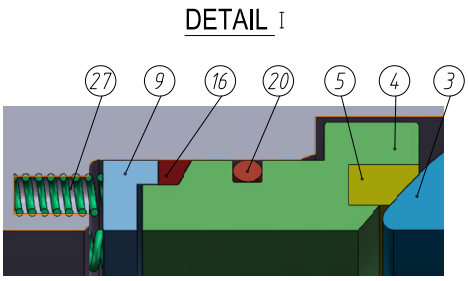
7. Optional Sealing Surface Material

In addition to the standard RPTFE sealing ring, optional such as TFE, NYLON, PEEK, rubber etc.,

Section Drawing







No.	Description	No.	Description
1	Body	20	Stud
2	End Connection	21	Nut
3	Ball	22	Stud
4	Seat	23	Nut
5	Stem	24	Socket Head Screw
6	Trunnion Plate	25	Socket Head Screw
7	Stem Cover Flange	26	Cylinder Spring
8	Seat-Press Ring	27	Belleville Spring
9	Packing Follower	28	Spring Washer
10	Packing Gland	29	Vent Bleeder
11	Spiral-Wound Gasket	30	Drain Plug
12	Spiral-Wound Gasket	31	Bushing
13	Low Emission Packing Kit	32	Thrust Washer
14	Packing Metal Ring	33	Thrust Washer
15	Seat Packing Ring	34	Pin
16	O-Ring	35	Pin
17	O-Ring	36	Body Yoke
18	O-Ring	37	Lifting Lug
19	O-Ring	38	Valve Leg

Materials of Construction

Max. Temperature	180°C	180°C	180°C
Min. Temperature	-29°C	-45°C	-45°C
Body	A105N	A182 F316	A182 F316L
Ball	F316 F51	F316 F51	F316 F51
Seat Insert	RPTFE/PEEK	RPTFE/PEEK	RPTFE/PEEK
Seat Ring	F316 F51	F316 F51	F316 F51
Stem	S17400 S20910	S17400 S20910	S17400 S20910
Trunnion Plate	A182 F316L	A182 F316L	A182 F316L
Stem Cover Flange	A105N	A182 F316	A182 F316L
Seat-Press Ring	A182 F316L	A182 F316L	A182 F316L
Packing Follower	316L+Nitrided	316L+Nitrided	316L+Nitrided
Packing Gland	A276 304	A276 304	A276 304
Spiral-Wound Gasket	316L+Graphite	316L+Graphite	316L+Graphite
Low Emission Packing Kit	Graphite	Graphite	Graphite
Packing Metal Ring	A276 316L	A276 316L	A276 316L
Seat Packing Ring	Graphite	Graphite	Graphite
O-Ring	FKM	FKM-LT	FKM-LT
Stud	A193 B7	A193 B8M	A193 B8M
Nut	A194 2H	A194 8M	A194 8M
Cylinder Spring	INCONEL X750	INCONEL X750	INCONEL X750
Belleville Spring	S17700	S17700	S17700
Spring Washer	304	304	304
Vent Bleeder	A182 F316L	A182 F316L	A182 F316L
Drain Plug	A182 F316L	A182 F316L	A182 F316L
Bushing	316L+PTFE	316L+PTFE	316L+PTFE
Thrust Washer	316L+PTFE	316L+PTFE	316L+PTFE
Pin	316	316	316
Body Yoke	Carbon Steel	Carbon Steel	Carbon Steel
Lifting Lug	Carbon Steel	Carbon Steel	Carbon Steel
Valve Leg	Carbon Steel	Carbon Steel	Carbon Steel

Torque (Nm)

Class 150

Size		**Differential Pressure (bar)**					
NPS	DN	10			20		
		BTO,ETC	RTO,RTC	ETO,BTC	BTO,ETC	RTO,RTC	ETO,BTC
3	80	100	60	75	122	73	92
4	100	192	115	144	215	129	161
6	150	569	341	223	655	393	315
8	200	845	507	480	1139	683	687
10	250	1136	682	644	1690	1014	923
12	300	1843	1106	902	2168	1301	1071
14	350	2732	1639	2049	3138	1883	2353
16	400	3270	1962	2452	3858	2315	2893
18	450	4458	2675	3344	5620	3372	4215
20	500	4980	2988	3735	6458	3875	4843
24	600	8594	5157	6446	10649	6389	7986

Class 300

Size		Differential Pressure (bar)											
NPS	DN	10			20			30			50		
		BTO,ETC	RTO,RTC	ETO,BTC	BTO,ETC	RTO,RTC	ETO,BTC	BTO,ETC	RTO,RTC	ETO,BTC	BTO,ETC	RTO,RTC	ETO,BTC
3	80	100	60	75	122	73	92	144	79	108	188	103	141
4	100	192	115	144	215	129	161	296	163	222	379	208	284
6	150	569	341	427	655	393	491	741	408	556	914	503	685
8	200	845	507	634	1139	683	854	1296	713	972	1794	987	1345
10	250	1136	682	852	1690	1014	1267	1727	950	1295	2488	1368	1866
12	300	1843	1106	1382	2168	1301	1626	2492	1371	1869	3141	1727	2355
14	350	2732	1639	2049	3138	1883	2353	3543	1949	2657	4356	2396	3267
16	400	3270	1962	2452	3858	2315	2893	4443	2444	3332	5613	3087	4210
18	450	4458	2675	3344	5620	3372	4215	6282	3455	4712	7605	4183	5704
20	500	4980	2988	3735	6458	3875	4843	7390	4064	5542	9983	5491	7488
24	600	8594	5157	6446	10649	6389	7986	11699	6434	8774	15138	8326	11353

Class 600

Size		Differential Pressure (bar)											
NPS	DN	20			50			70			100		
		BTO,ETC	RTO,RTC	ETO,BTC	BTO,ETC	RTO,RTC	ETO,BTC	BTO,ETC	RTO,RTC	ETO,BTC	BTO,ETC	RTO,RTC	ETO,BTC
3	80	128	77	96	232	128	174	293	147	220	374	187	281
4	100	233	140	174	324	178	243	386	193	289	476	238	404
6	150	680	408	510	908	499	681	1128	564	846	1458	729	1093
8	200	1184	710	888	1747	961	1310	2119	1060	1589	2773	1386	2080
10	250	1825	1095	1369	2451	1348	1838	2966	1483	2225	3936	1968	2952
12	300	2717	1630	2038	3164	1740	2373	3841	1920	2880	4985	2492	3739
14	350	3139	1883	2354	4492	2470	3369	5409	2704	4056	6762	3381	5071
16	400	4108	2465	3081	5921	3256	4441	7128	3564	5346	8939	4470	6705
18	450	6111	3667	4584	8532	4693	6399	10786	5393	8090	13808	6904	10356
20	500	7289	4373	5466	10702	5886	8026	12998	6499	9748	16791	8396	12593
24	600	11702	7021	8777	16026	8814	12019	19069	9535	14302	24061	12031	18046

Assumptions:

- Seat sealing: PEEK, Class 150- Class 300 ≤ NPS6 is RPTFE.
- Medium characteristic: Lubricating
- Cycle frequency: Daily
- Operating temperature: −29 to 38°C
- Stem sealing: ISO 15848

Flow Rates (Cv and Kv) — Full Bore

NPS	DN	Class 150		Class 300		Class 600	
		Cv	Kv	Cv	Kv	Cv	Kv
2	50	447	387	447	387	359	311
3	80	1191	1030	1191	1030	924	799
4	100	2377	2056	2377	2056	1773	1534
6	150	5074	4389	5074	4389	4577	3959
8	200	10103	8740	10103	8740	8950	7742
10	250	17037	14738	17037	14738	14324	12391
12	300	26163	22632	26163	22632	22729	19662
14	350	30597	26468	30597	26468	28277	24461
16	400	41459	35864	41459	35864	38076	32938
18	450	56221	48634	56221	48634	51368	44436
20	500	71060	61471	71060	61471	64559	55847
24	600	106055	91743	106055	91743	95605	82703

Data for Calculation of Flow:
The coefficient of flow Cv expresses the rate of flow in gallons per minute at 60°F water with a pressure drop 1 psig across the valve. The Cv coefficients for the various types and sizes. Shown in the tables, have been determined from actual flow tests.
NOTE: The relationship between Cv and Kv can be expressed as: Cv=1.156Kv.

Torque — MAST (Ambient Temperature)

NPS	Material	Class150	Class300	Class600
		MAST(Nm)	MAST(Nm)	MAST(Nm)
3	XM-19	841	841	1315
4	XM-19	1672	1672	1915
6	XM-19	4746	4746	6601
8	XM-19	8393	8393	11054
10	XM-19	11054	11054	14226
12	XM-19	14226	14226	17953
14	XM-19	17953	17953	27251
16	XM-19	22279	22279	32911
18	XM-19	32911	32911	52810
20	XM-19	52810	52810	71092
24	XM-19	71092	71092	90781

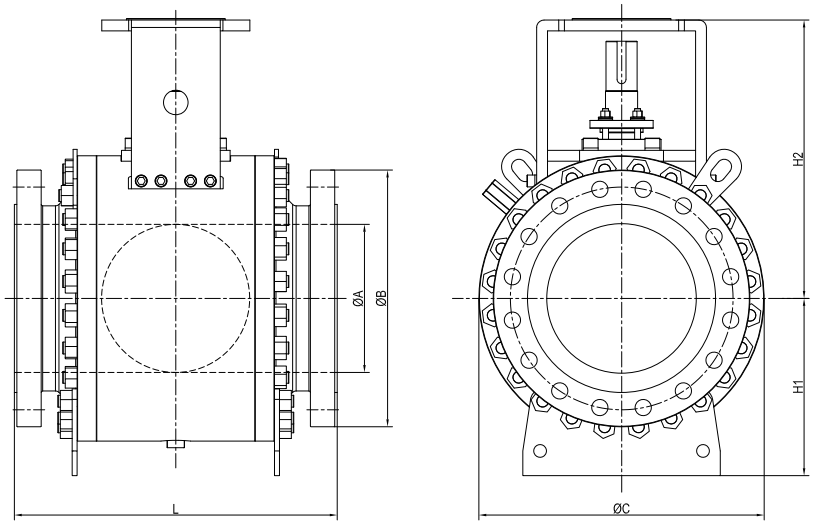
Leakage Rates

Size		ISO 5208			API 6D		
NPS	DIN	Rate A Water (ml/min)	Rate A Gas (ml/min)	Testing Time (s)	Test Water (ml/min)	Test Gas (ml/min)	Testing Time (s)
2	50	0	0	15	0	0	300
3	80	0	0	60	0	0	300
4	100	0	0	60	0	0	60
6	150	0	0	60	0	0	60
8	200	0	0	120	0	0	120
10	250	0	0	120	0	0	120
12	300	0	0	120	0	0	120
14	350	0	0	120	0	0	120
16	400	0	0	120	0	0	120
18	450	0	0	120	0	0	120
20	500	0	0	120	0	0	120
24	600	0	0	120	0	0	120

Test Procedures

ISO 5208	Rate A water	Water	1.1 PN	/	/
ISO 5208	Rate A gas	Air-N2	1.1 PN or 6 bar	/	/
API 6D	Test water	Water	1.1 PN	DBB (Caverne)	DIB
API 6D	Test gas	Air-N2	1.1 PN or 6 bar	DBB (Caverne)	DIB

Ball Valve Dimensions



ASME Class Series

Size	ASME Class 150 Approximate Dimensions in mm								
NPS	L		∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)	
	RF	RJ						RF	RJ
3	203	216	76	190	210	225	242	61	63
4	229	242	102	229	245	243	282	98	101
5	356	369	127	254	275	288	316	135	139
6	394	406	152	279	325	220	345	169	172
8	457	470	203	343	390	245	416	258	263
10	533	546	254	406	475	300	480	418	426
12	610	622	305	483	565	360	536	664	677
14	686	699	337	533	585	473	644	1019	1029
16	762	775	387	597	696	528	766	1778	1796
18	864	876	438	635	765	563	842	1858	1877
20	914	927	489	698	855	628	941	2442	2466
24	1067	1080	591	813	1005	703	1106	4298	4341

Size	ASME Class 300 Approximate Dimensions in mm								
NPS	L		∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)	
	RF	RJ						RF	RJ
3	282	298	76	210	210	225	242	73	76
4	305	321	102	254	255	248	293	121	125
5	381	397	127	279	280	290	322	165	170
6	403	419	152	318	330	220	345	196	200
8	502	518	203	381	400	250	421	302	308
10	568	584	254	444	485	310	479	492	502
12	648	664	305	521	578	360	562	783	799
14	762	778	337	584	620	490	682	1222	1234
16	838	854	387	648	695	528	765	1832	1850
18	914	930	438	711	750	555	825	2058	2079
20	991	1010	489	775	850	625	935	2724	2778
24	1143	1165	591	914	1020	710	1122	5528	5694

Size	ASME Class 600 Approximate Dimensions in mm								
NPS	L		∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)	
	RF	RJ						RF	RJ
2	292	295	51	165	165	183	198	60	60
2-1/2	330	333	64	190	190	195	228	68	68
3	356	359	76	210	210	118	256	74	74
4	432	435	102	273	273	152	303	141	142
5	508	511	127	330	330	315	396	200	201
6	559	562	152	356	356	328	427	261	262
8	660	663	203	419	425	273	458	488	490
10	787	790	254	508	540	338	560	900	904
12	838	841	305	559	625	381	618	1218	1223
14	889	892	337	603	640	500	768	1372	1377
16	991	994	387	686	725	543	870	2471	2481
18	1092	1095	438	743	840	600	1008	2590	2600
20	1194	1200	489	813	880	640	1056	3182	3196
24	1397	1407	591	940	1060	730	1272	6249	6277

DIN-EN Series

Size	DIN-EN PN10 Approximate Dimensions in mm						
DN	L	∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)
	RF						RF
80	203	76	200	210	225	242	63
100	229	102	220	245	243	282	96
125	356	127	250	275	288	316	134
150	394	152	285	325	220	345	172
200	457	203	340	390	245	416	255
250	533	254	395	475	300	480	406
300	610	305	445	565	360	536	621
350	686	337	505	585	473	644	970
400	762	387	565	696	528	766	1693
450	864	438	615	765	563	842	1770
500	914	489	670	855	628	941	2326
600	1067	591	780	1005	703	1106	4093

Size	DIN-EN PN16 Approximate Dimensions in mm							
DN	L		∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)
	RF							RF
80	203		76	200	210	225	242	63
100	229		102	220	245	243	282	96
125	356		127	250	275	288	316	134
150	394		152	285	325	220	345	172
200	457		203	340	390	245	416	255
250	533		254	405	475	300	480	418
300	610		305	460	565	360	536	651
350	686		337	520	585	473	644	999
400	762	/	387	580	696	528	766	1743
450	864	/	438	640	765	563	842	1877
500	914	/	489	715	855	628	941	2492
600	1067	/	591	840	1005	703	1106	4431

Size	DIN-EN PN25 Approximate Dimensions in mm						
DN	L	∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)
	RF						RF
80	282	76	200	210	225	242	72
100	305	102	235	255	248	293	117
125	381	127	270	280	290	322	162
150	403	152	300	330	220	345	188
200	502	203	360	400	250	421	290
250	568	254	425	485	310	479	473
300	648	305	485	578	360	562	739
350	762	337	555	620	490	682	1164
400	838	387	620	695	528	765	1745
450	914	438	670	750	555	825	1923
500	991	489	730	850	625	935	2546
600	1143	591	845	1020	710	1122	5119

Size	DIN-EN PN40 Approximate Dimensions in mm						
DN	L	∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)
	RF						RF
80	282	76	200	210	225	242	72
100	305	102	235	255	248	293	119
125	381	127	270	280	290	322	163
150	403	152	300	330	220	345	191
200	502	203	375	400	250	421	299
250	568	254	450	485	310	479	497
300	648	305	515	578	360	562	775
350	762	337	580	620	490	682	1210
400	838	387	660	695	528	765	1869
450	914	438	685	750	555	825	2008
500	991	489	755	850	625	935	2671
600	1143	591	890	1020	710	1122	5420

Size	DIN-EN PN63 Approximate Dimensions in mm						
DN	L	∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)
	RF						RF
50	292	51	180	165	183	198	61
65	330	64	205	190	195	228	69
80	356	76	215	210	118	256	75
100	406	102	250	273	152	303	131
125	508	127	295	330	315	396	194
150	495	152	345	356	328	427	230
200	597	203	415	425	273	458	434
250	673	254	470	540	338	560	714
300	762	305	530	625	381	618	1056
350	826	337	600	640	500	768	1224
400	902	387	670	725	543	870	2144

Size	DIN-EN PN100 Approximate Dimensions in mm						
DN	L	∅ A	∅ B	∅ C	H1	H2	Approx. Weight (Kg)
	RF						RF
50	292	51	195	165	183	198	63
65	330	64	220	190	195	228	71
80	356	76	230	210	118	256	76
100	432	102	265	273	152	303	140
125	508	127	315	330	315	396	196
150	559	152	355	356	328	427	261
200	660	203	430	425	273	458	493
250	787	254	505	540	338	560	896
300	838	305	585	625	381	618	1243
350	889	337	655	640	500	768	1414
400	991	387	715	725	543	870	2521

Bolting Torque

Body Stud Torque (Nm)															
MATERIAL ASTM	Stud Size														
	M8	M10	M12	M14	M16	M20	M24	M27	M30	M33	M36×3	M39×3	M42×3[a]	M45×3[a]	M48×3[a]
A193 B7	20	38	64	103	157	305	527	768	1048	1409	1888	2425	3054	3783	4621
A193 B8M Class 2	23	44	74	118	181	354	513	613	836	864	1162	1494	1420	1761	2153

Body Stud Torque (Nm)									
MATERIAL ASTM	Stud Size								
	5/16UNC	3/8UNC	7/16UNC	1/2UNC	9/16UNC	5/8UNC	3/4UNC	7/8 UNC	1-8 UNC
A193 B7	19	33	53	79	112	154	269	429	640
A193 B8M Class 2	23	38	61	91	130	178	311	417	510

Body Stud Torque (Nm)									
MATERIAL ASTM	Stud Size								
	1-1/8 UNC	1-1/4 UNC	1-3/8 UNC	1-1/2 UNC	1-5/8 UNC[a]	1-3/4 UNC[a]	1-7/8 UNC[a]	2UNC[a]	3UNC[a]
A193 B7	962	1266	1728	2262	2895	3637	4495	5477	17158
A193 B8M Class 2	739	789	1062	1392	1345	1691	2092	2552	8824

NOTE: [a] >40mm for A193 B8M Class1

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