

# UV664Q Metal-Seated Trunnion Ball Valve

The UV664Q ball valve from UNIVALS is designed with an advanced innovation concept, which includes unique design and high-quality manufacturing processes. The UV664Q ball valve is capable of delivering 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), high temperature, cryogenic service, etc.



## 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 Self-cleaning 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: Hard Faced

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

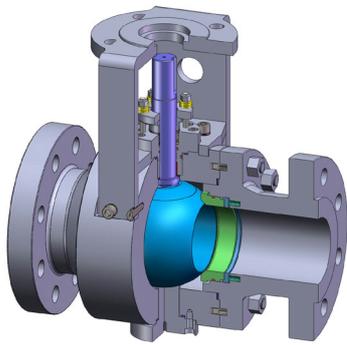
## Available Configurations

UV664Q ball valves are easily adapted to a variety of standard and severe service applications.

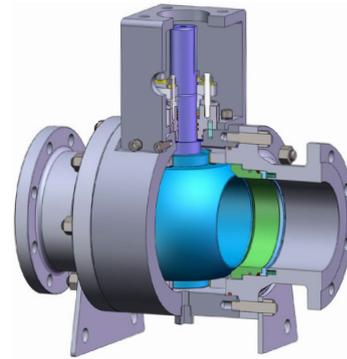
Configurable elements include:

- Low temperature
- High temperature
- Multiple end connection types
- Customized designs

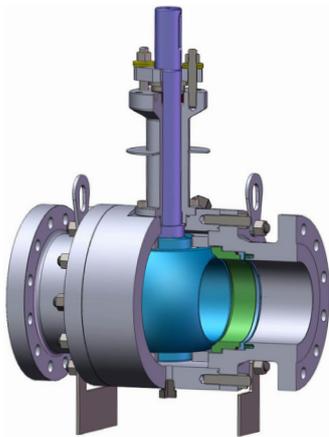
# Configurations



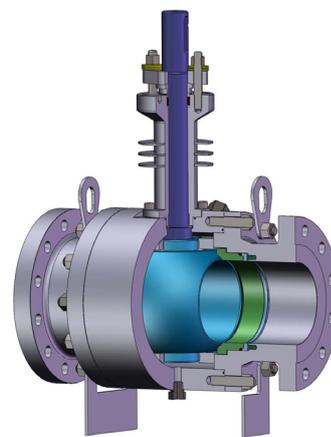
**STANDARD (NPS≤4)**



**STANDARD (NPS≥6)**



**LOW TEMPERATURE**



**HIGH TEMPERATURE**

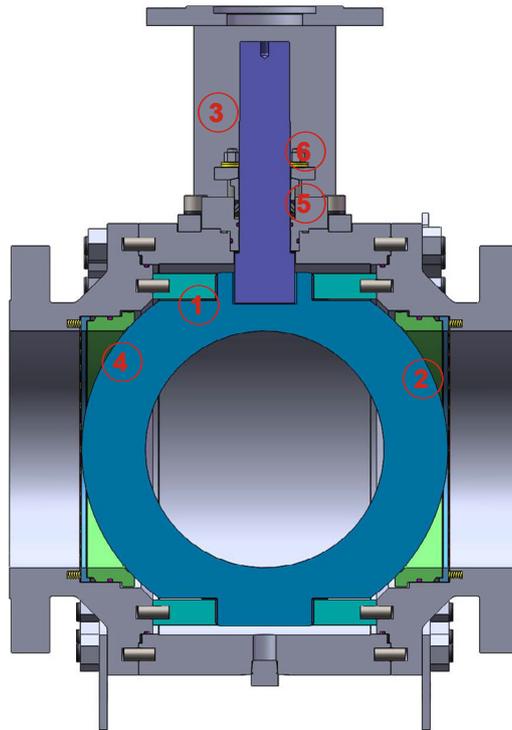
## Size and Pressure Range

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 over pressure 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  $\geq 33\text{Hz}$ .

### 4. Resilient Self-Cleaning Valve Seat

Resilient metal seat can be adapted to a wider range of temperatures, the scraper-type seat cleans the surface of ball during switching.

### 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.

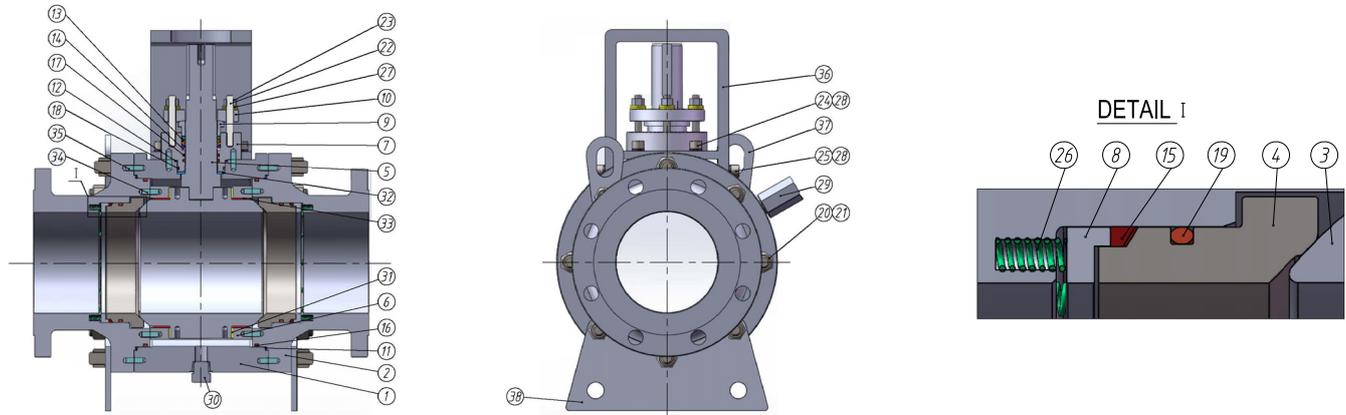
### 6. Clear Indication of Switch Position

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 Ni layer, optional such as TCC, CrC, etc., as well as special needs ceramic, super coating and so on.

# 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

<b>Max. Temperature</b>	180°C	180°C	180°C
<b>Min. Temperature</b>	-29°C	-45°C	-45°C
<b>Body</b>	A105N	A182 F316	A182 F316L
<b>Ball</b>	F316/Ni60 F51/Ni60	F316/Ni60 F51/Ni60	F316L/Ni60 F51/Ni60
<b>Seat</b>	F316/Ni55 F51/Ni55	F316/Ni55 F51/Ni55	F316L/Ni55 F51/Ni55
<b>Stem</b>	S17400 S20910	S17400 S20910	S17400 S20910
<b>Trunnion Plate</b>	A182 F316L	A182 F316L	A182 F316L
<b>Stem Cover Flange</b>	A105N	A182 F316	A182 F316L
<b>Seat-Press Ring</b>	A182 F316L	A182 F316L	A182 F316L
<b>Packing Follower</b>	316L+Nitrided	316L+Nitrided	316L+Nitrided
<b>Packing Gland</b>	A276 304	A276 304	A276 304
<b>Spiral-Wound Gasket</b>	316L+Graphite	316L+Graphite	316L+Graphite
<b>Low Emission Packing Kit</b>	Graphite	Graphite	Graphite
<b>Packing Metal Ring</b>	A276 316L	A276 316L	A276 316L
<b>Seat Packing Ring</b>	Graphite	Graphite	Graphite
<b>O-Ring</b>	FKM	FKM-LT	FKM-LT
<b>Stud</b>	A193 B7	A193 B8M	A193 B8M
<b>Nut</b>	A194 2H	A194 8M	A194 8M
<b>Cylinder Spring</b>	INCONEL X750	INCONEL X750	INCONEL X750
<b>Belleville Spring</b>	S17700	S17700	S17700
<b>Spring Washer</b>	304	304	304
<b>Vent Bleeder</b>	A182 F316L	A182 F316L	A182 F316L
<b>Drain Plug</b>	A182 F316L	A182 F316L	A182 F316L
<b>Bushing</b>	316L+PTFE	316L+PTFE	316L+PTFE
<b>Thrust Washer</b>	316L+PTFE	316L+PTFE	316L+PTFE
<b>Pin</b>	316	316	316
<b>Body Yoke</b>	Carbon Steel	Carbon Steel	Carbon Steel
<b>Lifting Lug</b>	Carbon Steel	Carbon Steel	Carbon Steel
<b>Valve Leg</b>	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	194	116	145	236	142	177
4	100	372	223	279	415	249	311
6	150	1100	680	825	1267	799	950
8	200	1225	734	919	1651	991	1238
10	250	1648	1185	1236	2450	1447	1838
12	300	2672	1553	2004	3143	1827	2357
14	350	3962	2376	2971	4550	2730	3412
16	400	4741	2853	3556	5594	3357	4195
18	450	6464	3879	4848	8149	4889	6112
20	500	7220	4333	5415	9364	5618	7023
24	600	12462	7478	9346	15440	9264	11580

**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	194	116	145	236	142	177	278	153	209	363	200	272
4	100	372	223	279	415	249	311	572	314	429	733	403	550
6	150	1100	660	825	1267	760	950	1434	788	1075	1767	972	1325
8	200	1225	735	919	1651	991	1238	1879	1034	1410	2601	1431	1951
10	250	1648	989	1236	2450	1470	1838	2504	1377	1878	3607	1984	2705
12	300	2672	1603	2004	3143	1886	2357	3614	1988	2710	4554	2505	3416
14	350	3962	2377	2971	4550	2730	3412	5138	2826	3853	6316	3474	4737
16	400	4741	2845	3556	5594	3356	4195	6443	3544	4832	8139	4476	6104
18	450	6464	3879	4848	8149	4890	6112	9109	5010	6832	11027	6065	8270
20	500	7220	4332	5415	9364	5618	7023	10715	5893	8036	14476	7962	10857
24	600	12462	7477	9346	15440	9264	11580	16964	9330	12723	21949	12072	16462

**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	248	149	186	449	247	337	567	283	425	723	362	543
4	100	450	270	337	627	345	470	746	373	559	921	460	691
6	150	1315	789	986	1755	965	1316	2180	1090	1635	2818	1409	2114
8	200	1717	1030	1288	2533	1393	1900	3073	1536	2305	4021	2010	3015
10	250	2646	1588	1985	3553	1954	2665	4301	2151	3226	5707	2853	4280
12	300	3940	2364	2955	4588	2523	3441	5569	2784	4177	7228	3614	5421
14	350	4551	2731	3414	6513	3582	4885	7842	3921	5882	9805	4902	7354
16	400	5957	3574	4468	8585	4722	6439	10336	5168	7752	12962	6481	9722
18	450	8862	5317	6646	12371	6804	9278	15640	7820	11730	20021	10010	15016
20	500	10568	6341	7926	15517	8535	11638	18847	9423	14135	24347	12174	18261
24	600	16969	10181	12726	23238	12781	17428	27650	13825	20738	34889	17445	26167

**Assumptions:**

- Seat sealing: F316+Ni    ■ Operating temperature: -29 to 38°C    ■ Medium characteristic: Lubricating
- Cycle frequency: Daily    ■ 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

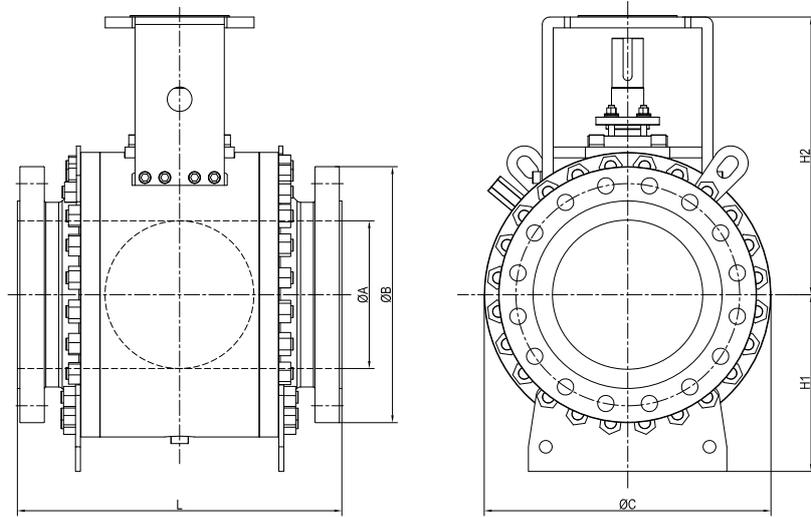
## Leakage Rates

Size		ISO 5208			API 598		
NPS	DIN	Rate D Water (ml/min)	Rate D Gas (ml/min)	Testing Time (s)	Test Water (ml/min)	Test Gas (ml/min)	Testing Time (s)
2	50	0.3	90	15	0	0	15
3	80	0.48	144	60	0.375	0.12	60
4	100	0.6	180	60	0.5	0.16	60
6	150	0.9	270	60	0.75	0.24	60
8	200	1.2	360	120	1	0.32	120
10	250	1.5	450	120	1.25	0.4	120
12	300	1.8	540	120	1.5	0.48	120
14	350	2.1	630	120	1.75	0.56	120
16	400	2.4	720	120	2	0.64	120
18	450	2.7	810	120	2.25	0.72	120
20	500	3	900	120	2.5	0.8	120
24	600	3.6	1080	120	3	0.96	120

## Test Procedures

ISO 5208	Rate D water	Water	1.1 PN	Pathway	(DBB Caverne)
ISO 5208	Rate D gas	Air-N2	1.1 PN or 6 bar	Pathway	(DBB Caverne)
API598	Test water	Water	1.1 PN	Pathway	(DBB Caverne)
API598	Test gas	Air-N2	1.1 PN or 5.5 bar	Pathway	(DBB Caverne)

# Ball Valve Dimensions



## ASME Class Series

Size	ASME Class 150 Approximate Dimensions in mm								
NPS	L		Ø A	Ø B	Ø 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		Ø A	Ø B	Ø 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		Ø A	Ø B	Ø 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	Ø A	Ø B	Ø 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	Ø A	Ø B	Ø 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					Approx. Weight (Kg)	
DN	L	Ø A	Ø B	Ø C	H1	H2	RF	
	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					Approx. Weight (Kg)	
DN	L	Ø A	Ø B	Ø C	H1	H2	RF	
	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					Approx. Weight (Kg)	
DN	L	Ø A	Ø B	Ø C	H1	H2	RF	
	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 DN	DIN-EN PN100 Approximate Dimensions in mm						Approx. Weight (Kg)
	L	Ø A	Ø B	Ø C	H1	H2	
	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 <sup>a</sup>	M45×3 <sup>a</sup>	M48×3 <sup>a</sup>
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	7/8UNC	1-8UNC	
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								
	1-1/8UNC	1-1/4UNC	1-3/8UNC	1-1/2UNC	1-5/8UNC <sup>a</sup>	1-3/4UNC <sup>a</sup>	1-7/8UNC <sup>a</sup>	2UNC <sup>a</sup>	3UNC <sup>a</sup>
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: <sup>a</sup> >40mm for A193 B8M Class1

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