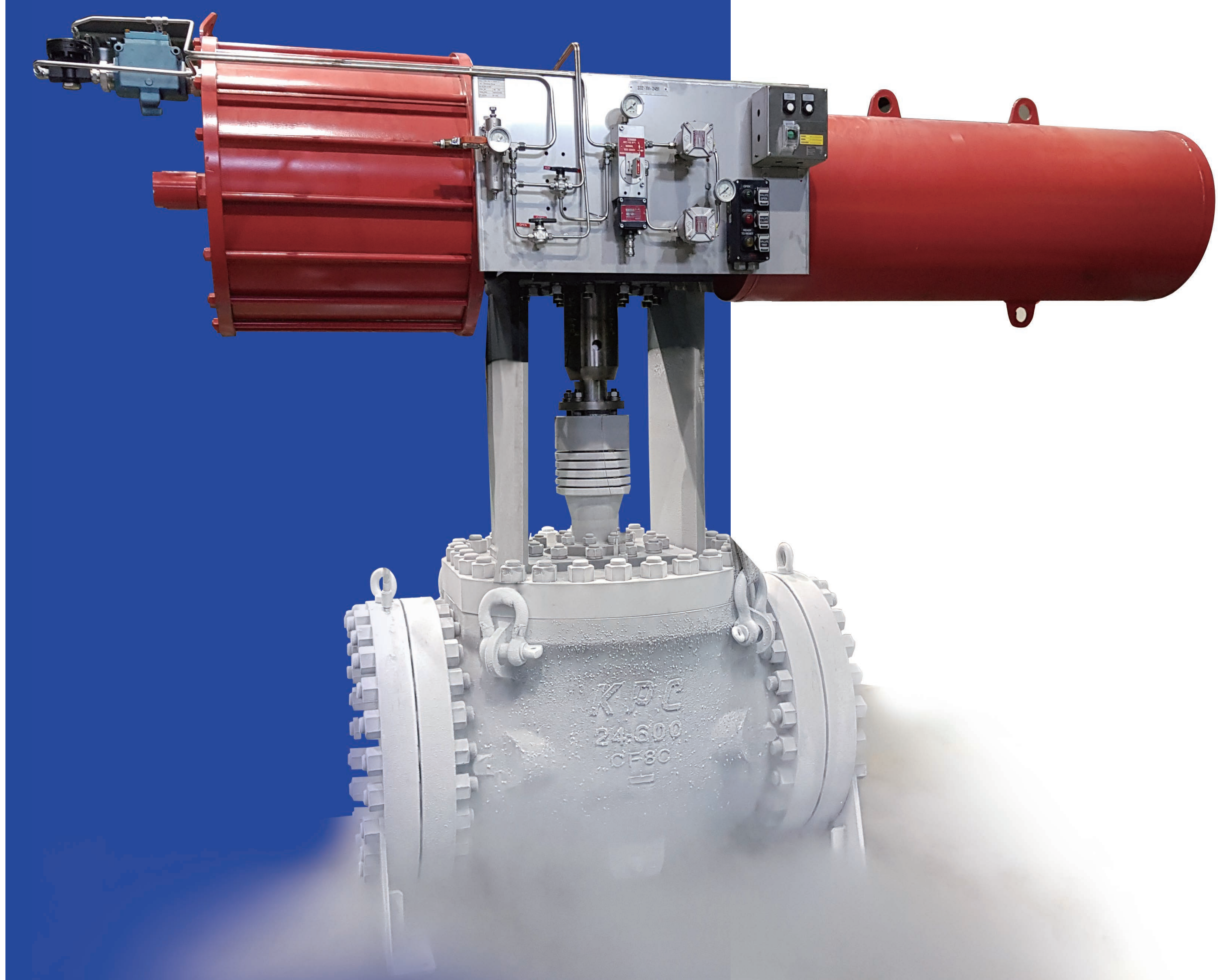
CRYOGENIC BALL VALVE

|The integrated solution|

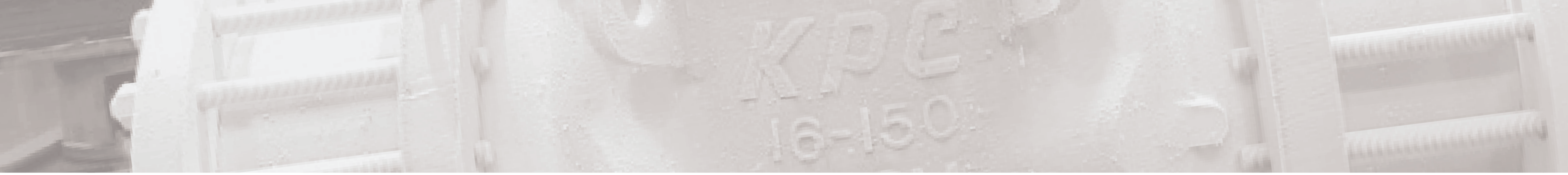
KPC



KPC VALVE

Main office & factory
8 Ansim-ro 59 gil, Dong-gu, Daegu, 41081, South Korea
TEL : 82-53-962-4839 FAX : 82-53-962-6383
E-MAIL : info@kpccorp.co.kr

Seoul office
13F, Dongwha Bldg, 106 Seosomun-ro, Jung-gu, Seoul, 04513, South Korea
TEL : 82-2-2637-9188 FAX : 82-2-2637-9118



WORLD LEADER IN BALL VALVES

KPC is one of the world's leading manufacturers of industrial ball valves, offering a full range of forged and cast ball valves in a wide range of critical applications for chemical, petrochemical, oil and gas, thermal and nuclear power generation, and cryogenic industries. The core competence of KPC is its capability to deliver ball valves that would add value to the customer's process industry.

OPTIMAL DESIGN

Finite Element Analysis and 3D parametric Design program of CATIA are rigorously utilized for analysis and verification of design in an effort to provide the optimum valve design that would best meet design requirements of customers.

VERTICALLY INTERGRATED PRODUCTION

KPC's production system is vertically integrated to cover the whole production process from material production to final assembly and in house testing. This advantage provides unparalled competitiveness in terms of price, quality and delivery.

PRODUCTION AND WAREHOUSE AUTOMATION

Contract handling at every stage is geared to meet the fast response time, with proven records in supplying special design valves in short lead times to meet the customer's requirements. Through rigorous ERP program and automated warehouse we are fully utilizing the resources of the company to offer timely and cost saving service in design, procurement, production and test to satisfy even the most stringent requirements of cryogenic environment.

QUALITY MANAGEMENT

In addition to its own highly strict company quality standards, KPC is ISO 9001 certified and has a manufacturing ability to comply with ASME, DIN, API, and other internationally recognized standards. KPC ensures that each valve fulfills all engineering specifications, including the most demanding applications. Our goal is to provide the best product at the most competitive price with in-time delivery with the backing of a full service program.

MATERIAL TESTING

· Nondestructive testing, such as radiography, ultrasonic, magnetic particle and liquid penetrant test.
· Chemical analysis by computer controlled direct reading emission spectrometer.
· Mechanical testing for tensile properties at ambient and cryogenic temperatures, bend and hardness testing, Charpy testing at ambient, elevated and cryogenic temperatures.

VALVE TESTING

All pressure containing items are hydrostatically tested, seat leakage tested and functionally tested. We can also perform high pressure gas test, packing emission, cryogenic, and advanced funtional testing.

AFTER MARKET SOLUTIONS

The aftermarket solutions are based on our engineering know-hows and expertise for maintenance strategies, life extensions and project upgrades.

CRYOGENIC VALVE TECHNOLOGY

DESIGN AND STRUCTURE

- The production, transport and storage of liquified gases such as oxygen, argon, natural gas, or nitrogen (down to -320˚F (-196˚C) poses serveral technical problems.
- KPC cryogenic Top entry ball valve is specifically designed for in-line maintenance. Ball and seat can be easily replaced with new ones by removing the bonnet from the valve.

TEMPERATURES OF LIQUIFIED GAS

Type	Boiling point		Liquid Density	Type	Boiling point		Liquid Density
	0°C	0°F			0°C	0°F	
Natural gas(LNG)	-168	-270	26	Air	-194.4	-318	57.87
Methane(CH_4)	-161.5	-258	26.20	Nitrogen(N2)	-195.8	-320	50.45
Oxygen(O_2)	-182.9	-296	71.20	Argon(A)	-185.9	-303	87.40
Carbon Dioxide(CO_2)	-78.5	-109	50.60				

SURFACE FINISHES AND HARDNESS FOR HARDWARE

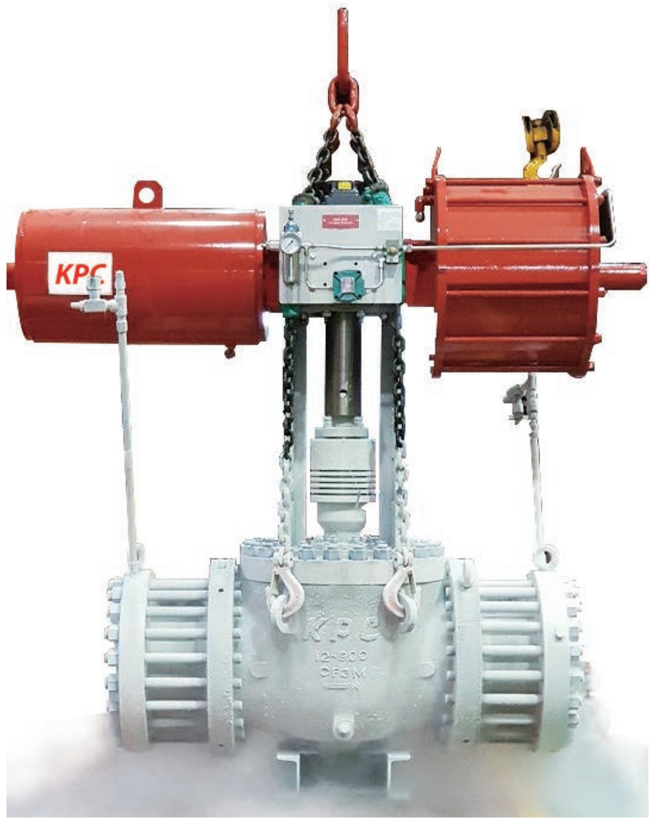
Fluid Being Sealed	Surface Finish	
	Dynamic Surface	Static Surface
Cryogenics Helium gas Hydrogen gas	0.05 to 0.2 Ra	0.1 to 0.2 Ra 0.15 to 0.3 Ra
Air Nitrogen gas Argon gas Natural gas Petro	0.15 to 0.3 Ra	0.4 to 1.6 Ra
Water Hydraulic oil Crude oil Greases	0.2 to 0.4 Ra	0.4 to 1.6 Ra

Valves for natural gas liquefaction plants and receiving terminals as well as cargo systems to LNG requires safe and efficient service. KPC's special extended bonnet valves offer safe and efficient service with extended bonnets for sufficient gas column length, keeping the stem seal packings exposed only to vapor and not the cold liquid to ensure functional integrity,

MATERIAL

BODY & BONNET

Forged austenitic stainless steel used for bodies and bonnets offers excellent impact strength, minimal heat loss and protection against corrosion at extremely low temperature. For cast steel valves radiographed castings are used from in house foundry.

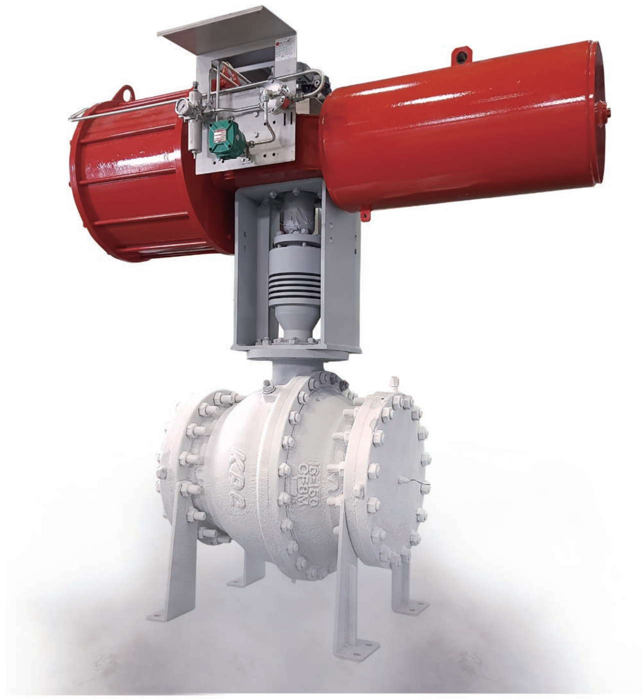


STEM

To reduce galling, stems are made from austenitic stainless steel, high manganese steel or high performance nickel alloy. CF3M(316L) are used alternatively at less demanding applications.

WETTED PARTS

All Austenitic stainless steel



SOFT SEAT

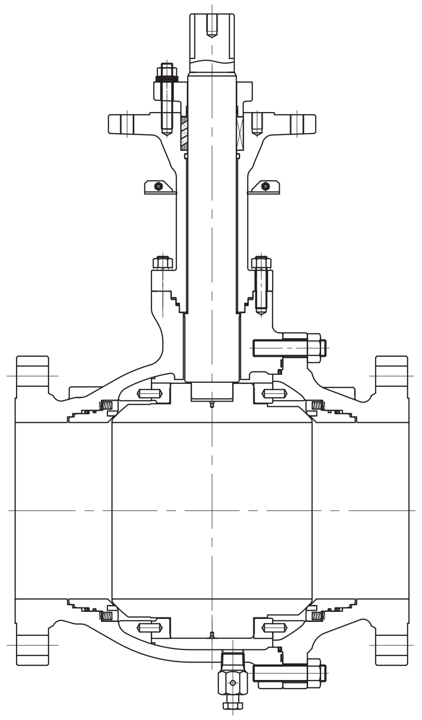
PCTFE

PACKING

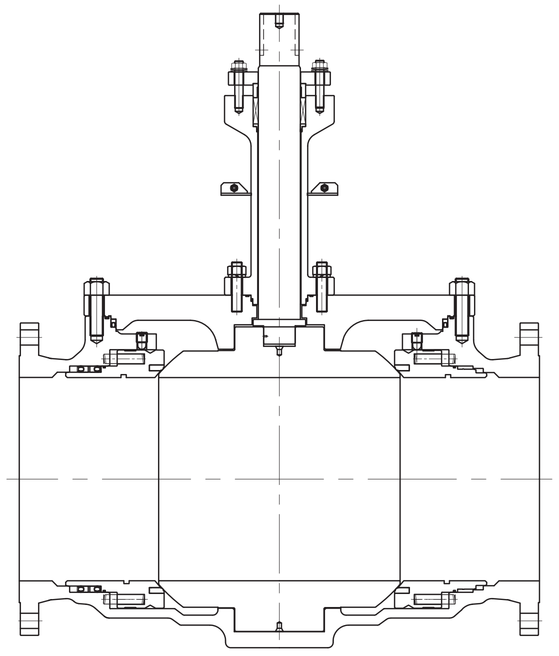
PTFE Chevron Type or VOC packing or other plastic packing protected from freezing by a column of insulating gas. For fire safe operation a secondary packing is provided using graphite.

GASKET

Lip Seal, PTFE Chevron type, or Metal O Ring + Spring



TTO



	Standard	Optional
Body	A182 F316	Austenitic Steel (CF8, CF8C, CF3M)
Cap/Bonnet	A182 F316	Austenitic Steel (CF8, CF8C, CF3M)
Ball	A182 F316	Austenitic Steel (CF8, CF8C, CF3M)
Seat	Soft : PCTFE Matal Under 300 Pounds : Austenitic Steel Over 600 Pounds : High Manganese Steel or Nickel Alloy(In 625 or In 718)	TFM1600
Thrust Washer	Reinforced Teflon	
Body Seal	Sprial Wound SS/TFE or SS Graphite	
Stem Bushing	TFE or RTFE	
Packing	VOC Packing, PTFE Chevron Type	
Packing Nut	SS 304	Xylene coating
Packing Nut Sleeve	TFE or RTFE	Xylene coating
Bonnet Studes	SS B8M Class 2	Xylene coating
Bonnet Nuts	SS Gr. 8(SH)	Xylene coating
Handle	Malleable Iron	
Handle Nut	Stainless Steel	
Belleville Washer /Coil Spring	Stainless Steel	
Gasket	Lip Seal PTFE Chevron Type Metal O Ring + Spring	

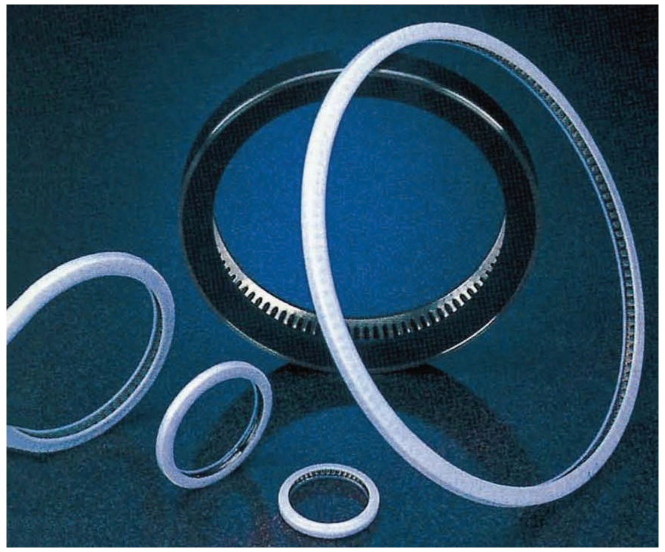
OPTIONAL BODY MATERIALS

ASTM SPEC.	Type	Temp °F(°C)
A352 LCC	LCC	-50°F(-46°C)
A351 CF3M	316L	-425°F(-254°C)
A351 CF8C	347	-425°F(-254°C)

BONNET GASKET MATERIALS

Alloy Valves	ASME CLASS					Stainless Valves	ASME CLASS				
Type-Material	150	300	600	900	1500	Type-Material	150	300	600	900	1500
Corrugated steel /Graphite	V					lipseal with Egiloy	V	V	V	V	V
Corrugated steel /TFE	V					Spiral wound /SS PTFE		V	V	V	V
Spiral wound SS / Graphite		V	V	V	V	PTFE(Teflon)	V	V			
lipseal with Egiloy	V	V	V	V	V						

LIPSEALS FOR CRYOGENIC BALL VALVE



GLAND PACKING MATERIALS

Material	Service
TFE or RTFE	NON FIRE SAFE
RTFE & GRAPHITE	FIRE SAFE

QUALIFICATION TESTS

Bottom left
; Functional cryogenic testing of a 10"150LB 2PCS Side entry Ball valve at - 196˚C (-320˚F) / 20Bar

Bottom right
; Functional cryogenic testing of a 20'900LB TOP entry Ball valve at - 196˚C (-320˚F) / 104Bar

Before test

Testing

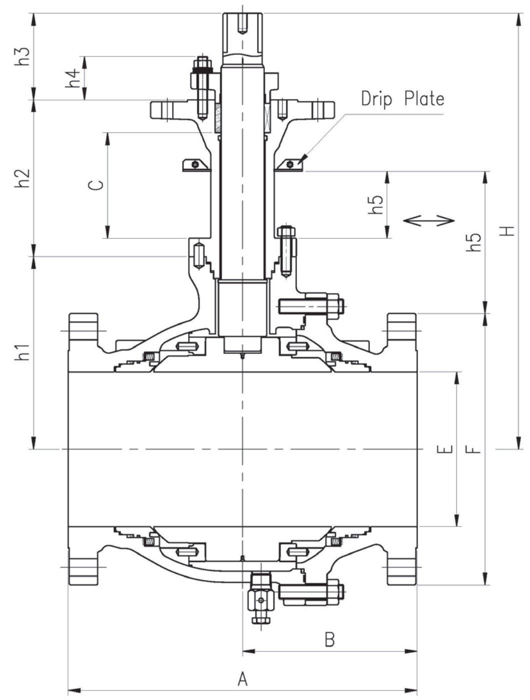

After test

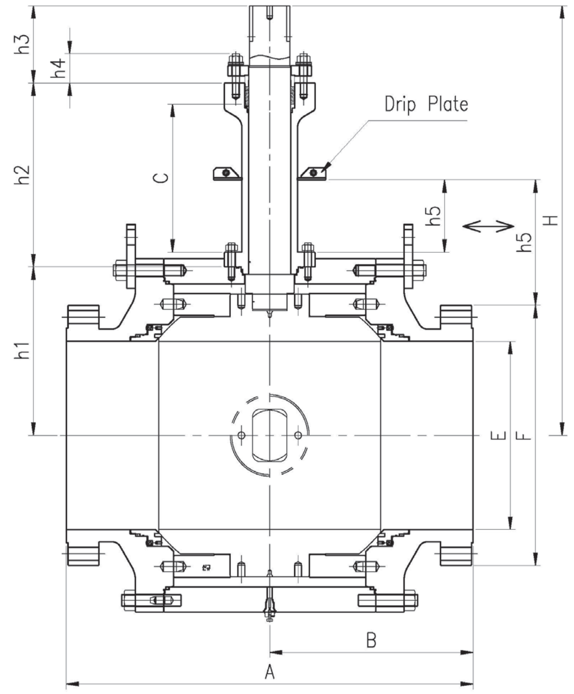
After test

2PCS/3PCS CRYOGENIC BALL VALVE DIMENSION TABLE(150LB)

Size	150# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)	4.25(108)	-	-	2FC	2.40(61)	7.87(200)	0.51(13)	3.54(90)	1.36(35)	9.09(231)	1.13(29)	0.91(23)	11.58(294)
3/4(15)	4.65(118)	-	-	2FC	2.65(67)	7.87(200)	0.75(19)	3.86(98)	1.50(38)	9.09(231)	1.13(29)	0.91(23)	11.72(298)
1(25)	5.04(128)	5.51(140)	5.04(128)	2FC	2.91(74)	7.87(200)	0.98(25)	4.25(108)	1.79(46)	9.21(234)	1.28(33)	1.06(27)	12.28(312)
1 1/2(15)	6.50(165)	7.01(178)	7.48(190)	2FC	3.58(91)	3.58(91)	1.50(38)	4.92(125)	2.40(61)	11.38(289)	1.63(42)	1.34(34)	15.41(392)
2(50)	7.01(178)	7.52(191)	8.50(216)	2FC	4.02(102)	9.84(250)	1.93(50)	5.91(150)	2.76(70)	11.38(289)	1.63(42)	1.34(34)	15.77(401)
2 1/2(65)	7.48(190)	7.99(203)	9.49(241)	2FC	4.13(105)	11.81(300)	2.44(62)	7.01(178)	3.66(93)	13.74(349)	1.93(49)	1.54(39)	19.33(491)
3(80)	7.99(203)	8.50(216)	11.14(283)	2FC	4.02(102)	11.81(300)	2.91(74)	7.48(190)	4.37(111)	13.74(349)	1.93(49)	1.54(39)	20.04(509)
4(100)	9.02(229)	9.49(241)	12.01(305)	2TC	4.61(117)	11.81(300)	3.94(100)	9.02(229)	5.33(135.5)	13.98(355)	2.48(63)	1.65(42)	21.79(554)
6(150)	15.51(394)	15.98(406)	17.99(457)	2TC	8.27(210)	13.78(350)	5.91(150)	11.02(280)	8.07(205)	15.94(405)	3.54(90)	1.73(44)	27.56(700)
8(200)	17.99(457)	18.50(470)	20.51(521)	2TC	8.88(225.5)	13.78(350)	7.91(201)	13.58(345)	9.65(245)	15.94(405)	3.54(90)	1.73(44)	29.13(740)
10(250)	20.98(533)	21.50(546)	22.01(559)	2TC	10.51(267)	15.75(400)	9.92(252)	15.94(405)	12.44(316)	18.70(475)	4.33(110)	2.36(60)	35.47(901)
12(300)	24.02(610)	224.49(622)	25.00(635)	2TC	12.01(305)	15.75(400)	12(305)	19.90(485)	14.80(475)	18.70(475)	4.33(110)	2.36(60)	37.83(961)
14(350)	27.01(686)	27.52(699)	30.00(762)	2TC	13.50(343)	17.72(450)	13.27(337)	21.06(535)	15.02(382)	20.87(530)	4.92(125)	2.76(70)	40.81(1037)
16(400)	30.00(762)	30.51(775)	32.99(838)	2TC	150.00(381)	17.72(450)	15.16(385)	23.43(595)	17.36(441)	20.87(530)	4.92(125)	2.76(70)	43.15(1096)
18(450)	34.02(864)	34.49(876)	35.98(914)	2TC	17.01(432)	19.69(500)	17.17(436)	25.00(635)	19.33(491)	23.03(585)	5.91(150)	2.76(70)	48.27(1226)
20(500)	35.98(914)	36.50(927)	39.02(991)	2TC	17.99(457)	19.69(500)	19.17(487)	27.56(700)	20.03(585)	23.03(585)	5.91(150)	2.76(70)	49.67(1262)
24(600)	42.01(1067)	42.52(1080)	45.00(1143)	2TC	21.00(533.5)	19.69(500)	23.19(589)	32.09(815)	24.17(614)	23.03(585)	6.69(170)	3.15(80)	54.09(1374)
30(750)	50.98(1295)	52.01(1321)	55.00(1397)	2TC	25.49(647.5)	21.65(550)	28.94(735)	38.78(985)	28.19(716)	25.59(650)	7.09(180)	3.54(90)	60.87(1546)
32(800)	54.02(1372)	55.12(1400)	60.00(1524)	3TF	27.01(686)	21.65(550)	30.67(779)	41.73(1060)	27.44(697)	25.59(650)	7.09(180)	3.54(90)	6.012(1527)
34(850)	57.99(1473)	59.13(1502)	64.02(1626)	3TF	29.00(737)	21.65(550)	32.68(830)	43.70(1110)	30.75(781)	25.98(660)	7.48(190)	3.94(100)	64.21(1631)
36(900)	60.00(1524)	61.10(1552)	67.99(1727)	3TF	30.00(762)	23.62(600)	34.41(874)	46.06(1170)	30.22(768)	27.95(710)	7.48(190)	3.94(100)	65.65(1668)

2FC : 2 PIECE SIDE ENTRY FLOATING / 2TC : 2 PIECE SIDE ENTRY TRUNNION / 3TF : 3PIECE TRUNNION FORGED





2PCS/3PCS CRYOGENIC BALL VALVE DIMENSION TABLE(300LB)

Size	300# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)	5.51(140)	5.94(151)	-	2FC	3.31(84)	7.87(200)	0.51(13)	3.74(95)	1.36(35)	9.09(231)	1.13(29)	0.91(23)	11.58(294)
3/4(15)	5.98(152)	6.50(165)	-	2FC	3.15(80)	7.87(200)	0.75(19)	4.61(117)	1.50(38)	9.09(231)	1.13(29)	0.91(23)	11.72(298)
1(25)	6.50(165)	7.01(178)	6.50(165)	2FC	3.80(96.4)	7.87(200)	0.98(25)	4.88(124)	1.79(46)	9.21(234)	1.28(33)	1.06(27)	12.28(312)
1 1/2(15)	7.48(190)	7.99(203)	7.48(190)	2FC	4.29(109)	9.84(250)	1.50(38)	6.14(156)	2.40(61)	11.38(289)	1.63(42)	1.34(34)	15.41(392)
2(50)	8.50(216)	9.13(232)	8.50(216)	2FC	4.61(117)	9.84(250)	1.93(49)	6.50(165)	3.39(86)	11.38(289)	1.63(42)	1.34(34)	16.40(417)
2 1/2(65)	9.49(241)	10.12(257)	9.49(241)	2FC	5.55(141)	11.81(300)	2.44(62)	7.50(190.5)	366(93)	13.74(349)	1.93(49)	1.54(39)	19.33(491)
3(80)	11.14(283)	11.73(293)	11.14(283)	2FC	5.16(131)	11.81(300)	2.91(74)	8.27(210)	4.37(111)	13.74(349)	1.93(49)	1.54(39)	20.04(509)
4(100)	12.01(305)	12.64(321)	12.01(305)	2TC	6.14(156)	11.81(300)	3.94(100)	10.00(254)	5.33(136)	13.98(355)	2.49(63)	1.96(50)	21.80(554)
6(150)	15.87(403)	16.50(419)	15.87(403)	2TC	7.05(179)	13.78(350)	5.91(150)	12.06(320)	8.07(205)	15.94(405)	3.54(90)	1.73(44)	27.56(700)
8(200)	19.76(502)	20.39(518)	19.76(502)	2TC	9.13(232)	13.78(350)	7.91(201)	14.96(380)	10.63(270)	15.94(405)	3.54(90)	1.73(44)	30.12(765)
10(250)	22.36(568)	26.14(664)	22.36(568)	2TC	11.18(284)	15.75(400)	9.92(252)	17.72(445)	12.44(316)	18.70(475)	4.33(110)	2.36(60)	35.47(901)
12(300)	25.51(648)	30.63(778)	25.51(648)	2TC	12.76(324)	12.7(305)	14.57(370)	20.47(520)	14.80(376)	18.70(475)	4.33(110)	2.36(60)	37.83(961)
14(350)	30.00(762)	36.62(854)	30.00(762)	2TC	15.76(381)	13.26(337)	15.02(381.5)	23.03(585)	15.02(382)	20.87(530)	4.92(125)	2.76(70)	40.81(1037)
16(400)	32.99(838)	36.61(930)	32.99(838)	2TC	16.50(419)	17.72(450)	15.16(385)	25.59(650)	17.36(441)	20.87(530)	4.92(125)	2.76(70)	43.15(1096)
18(450)	35.98(914)	39.76(1010)	35.98(914)	2TC	17.91(455)	19.69(500)	17.17(436)	27.99(711)	19.33(491)	23.03(585)	5.91(150)	2.76(70)	48.27(1226)
20(500)	39.02(991)	45.87(1165)	39.02(991)	2TC	19.51(495.5)	19.69(500)	19.17(487)	30.51(775)	23.37(594)	23.03(585)	5.91(150)	2.76(70)	52.30(1329)
24(600)	45.00(1143)	55.98(1165)	45.00(1143)	2TC	22.50(571.5)	19.69(500)	23.19(589)	36.02(915)	24.17(614)	23.23(590)	6.69(170)	3.15(80)	45.09(1374)
30(750)	55(1397)	61.14(1422)	44.84(1139)	2TC	27.42(696.5)	21.65(550)	28.94(735)	42.91(1090)	28.19(716)	25.59(650)	7.09(180)	3.54(90)	60.87(1546)
32(800)	60.00(1524)	64.14(1553)	60.00(1524)	3TF	30.00(762)	21.65(550)	30.67(779)	45.28(1150)	27.44(697)	25.59(650)	7.09(180)	3.54(90)	60.12(1527)
34(850)	64.02(1626)	64.02(1626)	64.02(1626)	2TC	32.01(813)	21.65(550)	32.67(830)	47.44(1205)	30.75(781)	25.98(660)	7.48(197)	3.94(95)	64.49(1538)
36(900)	67.99(1727)	67.99(1727)	67.99(1727)	3TF	34.00(863.5)	23.62(600)	34.41(874)	50.00(1270)	30.22(768)	27.95(710)	7.48(270)	3.94(109)	68.81(1748)

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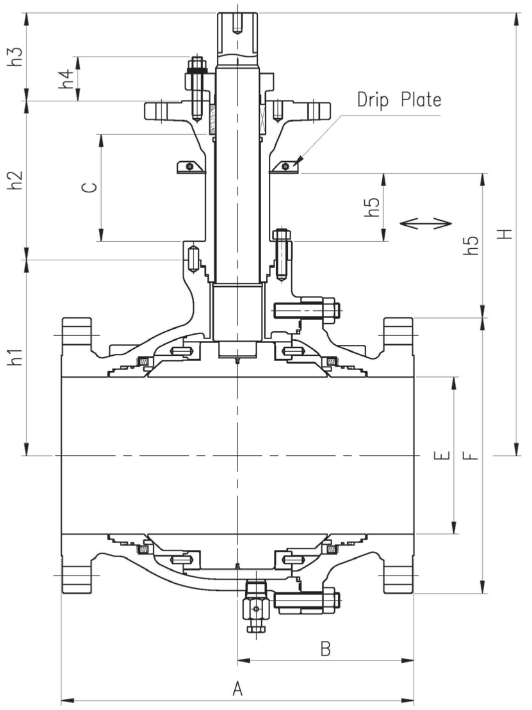
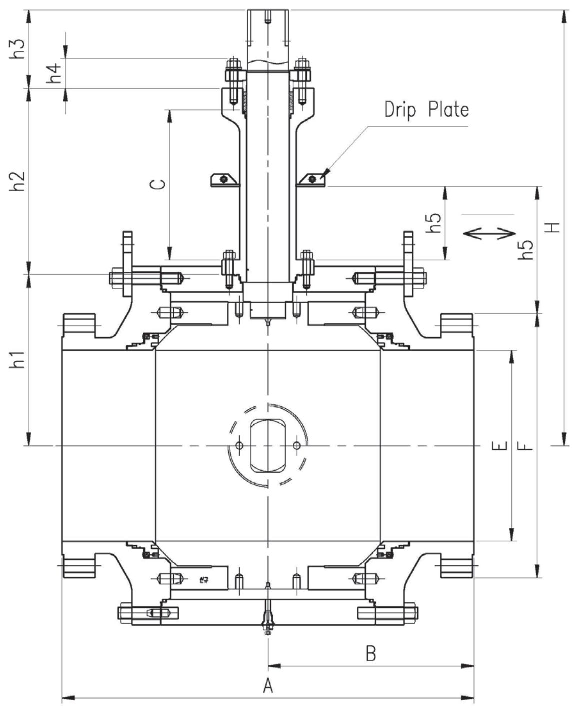
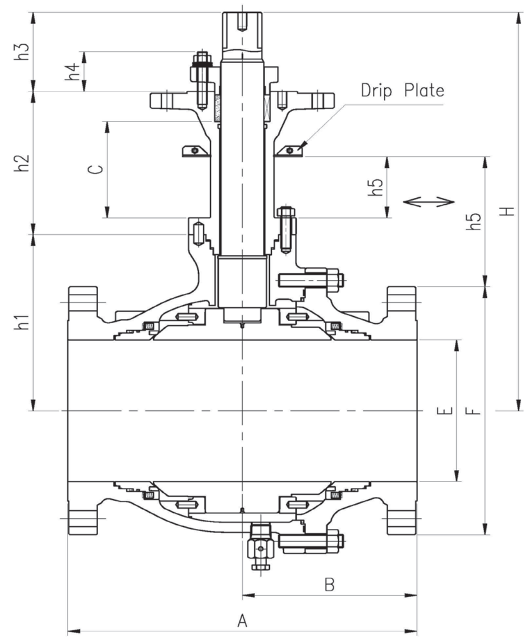


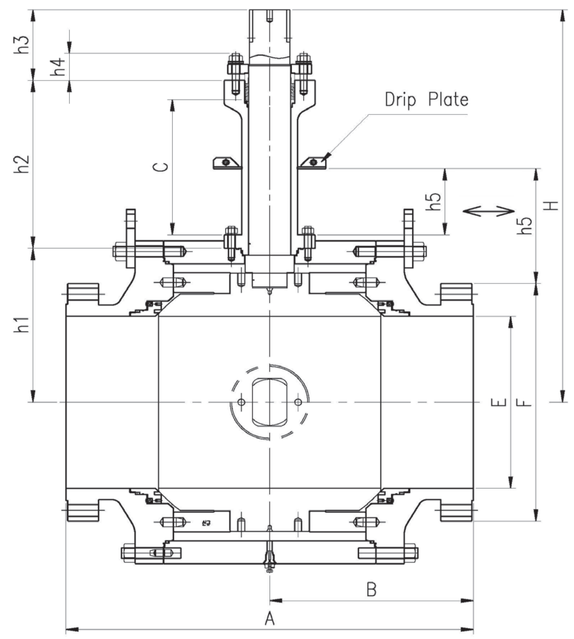


2PCS/3PCS CRYOGENIC BALL VALVE DIMENSION TABLE(600LB)

Size	600# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)	6.50(165)	6.42(163)	6.50(165)	2FC	2.68(68)	7.87(200)	0.51(13)	3.74(95)	2.13(54)	9.37(238)	1.32(34)	1.10(28)	12.82(326)
3/4(15)	7.52(191)	7.48(190)	7.52(191)	2FC	3.96(101)	7.87(200)	0.75(19)	4.53(115)	2.33(59)	9.37(238)	1.32(34)	1.10(28)	13.02(331)
1(25)	8.50(216)	8.50(216)	8.50(216)	2FC	4.41(112)	7.87(200)	0.98(25)	4.92(125)	2.89(74)	9.65(245)	1.56(40)	1.30(33)	14.10(358)
1 1/2(15)	9.49(241)	9.49(241)	9.49(241)	2FC	4.94(126)	9.84(250)	1.50(38)	6.12(156)	3.11(79)	11.65(296)	2.03(52)	1.38(35)	16.80(427)
2(50)	11.50(292)	11.61(295)	11.50(292)	2FC	5.79(147)	9.84(250)	1.93(49)	6.50(165)	3.88(99)	11.65(296)	2.03(52)	1.38(35)	17.56(446)
2 1/2(65)	12.99(330)	13.11(333)	12.99(330)	2FC	6.50(165)	11.81(300)	2.44(62)	7.52(191)	5.12(130)	13.98(355)	2.34(60)	1.77(45)	21.4495450
3(80)	14.02(356)	14.13(359)	14.02(356)	2TC	6.65(169)	11.81(300)	2.91(74)	8.27(210)	5.35(136)	13.98(355)	2.34(60)	1.77(45)	21.67(551)
4(100)	17.01(432)	17.13(435)	17.01(432)	2TC	9.11(232)	11.81(300)	3.94(100)	10.38(275)	7.36(187)	14.17(360)	3.30(84)	1.97(50)	24.83(631)
6(150)	22.01(559)	22.13(562)	22.01(559)	2TC	11.00(280)	13.78(350)	5.91(150)	14.02(356)	8.70(221)	16.34(415)	4.33(110)	2.36(60)	29.37(746)
8(200)	25.98(660)	26.10(663)	25.98(660)	2TC	13.52(344)	13.78(350)	7.91(201)	14.96(380)	11.14(283)	16.34(415)	4.33(110)	2.36(60)	31.81(808)
10(250)	30.98(787)	31.10(790)	30.98(787)	2TC	16.06(408)	15.75(400)	9.92(252)	20.08(510)	13.54(344)	18.70(475)	6.52(166)	2.68(68)	38.76(985)
12(300)	32.99(838)	33.11(841)	32.99(838)	2TC	16.50(419)	15.75(400)	11.93(303)	22.05(560)	14.23(362)	18.70(475)	6.52(166)	2.68(68)	39.45(1002)
14(350)	35.00(889)	35.12(892)	35.00(889)	2TC	17.50(445)	17.72(450)	13.15(334)	23.82(605)	17.24(438)	20.87(530)	8.27(210)	3.31(84)	46.38(1178)
16(400)	39.02(991)	39.13(994)	39.02(991)	2TC	19.51(496)	17.72(450)	15.16(385)	26.97(685)	18.31(465)	20.87(530)	8.27(210)	3.31(84)	47.44(1205)
18(450)	42.99(1092)	43.11(1095)	42.99(1092)	2TC	21.50(546)	19.69(500)	17.17(436)	29.33(745)	17.11(435)	23.62(600)	10.02(255)	3.94(100)	50.76(1289)
20(500)	47.01(1194)	47.24(1200)	47.01(1194)	2TC	23.50(597)	19.69(500)	19.17(487)	32.09(815)	17.72(450)	23.62(600)	10.02(255)	3.94(100)	51.36(1305)
24(600)	55.00(1397)	55.35(1406)	55.00(1397)	2TC	27.50(699)	19.69(500)	23.19(589)	37.01(940)	21.36(543)	24.02(610)	1043(265)	4.33(110)	55.81(1418)
30(750)	65.00(1651)	65.51(1664)	65.00(1651)	2TC	32.76(832)	21.65(550)	28.94(735)	44.49(1130)	26.30(668)	26.38(670)	10.83(275)	4.72(120)	63.50(1613)
32(800)	70.00(1778)	70.63(1794)	70.00(1778)	2TC	35.00(889)	21.65(550)	30.67(779)	47.05(1195)	31.57(802)	26.38(670)	10.83(275)	4.72(120)	68.78(1747)
34(850)	75.98(1930)	76.61(1946)	75.98(1930)	3TF	37.99(965)	21.65(550)	32.68(830)	49.21(1250)	30.57(777)	26.77(680)	11.22(285)	5.12(130)	68.56(1742)
36(900)	82.01(2083)	82.64(2099)	82.01(2083)	3TF	41.01(1042)	23.62(600)	34.41(874)	51.77(1315)	30.69(780)	28.74(730)	11.22(285)	5.12(130)	70.65(1795)

2FC : 2 PIECE SIDE ENTRY FLOATING / 2TC : 2 PIECE SIDE ENTRY TRUNNION / 3TF : 3PIECE TRUNNION FORGED

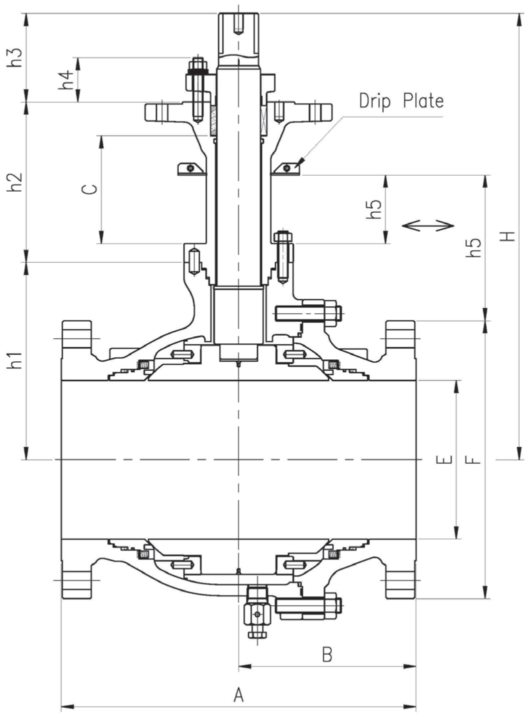


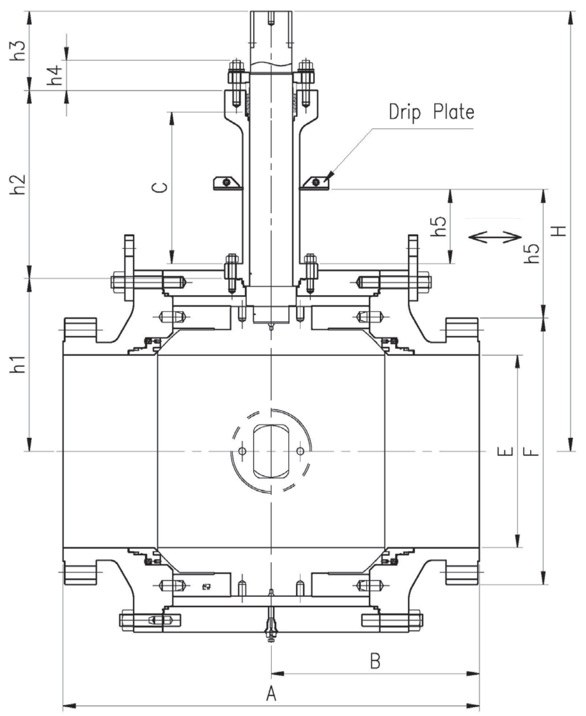


2PCS/3PCS CRYOGENIC BALL VALVE DIMENSION TABLE(900LB)

Size	900# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)													
3/4(15)													
1(25)													
1 1/2(15)													
2(50)													
2 1/2(65)	16.50(419)	16.61(422)	16.50(419)	2FC	8.25(210)	11.81(300)	2.44(62)	9.65(245)	5.28(134)	13.98(355)	3.23(82)	2.76(70)	22.48(571)
3(80)	15.00(381)	15.12(384)	15.00(381)	2FC	7.52(191)	11.81(300)	2.91(74)	9.45(240)	5.80(147.3)	13.98(355)	3.23(82)	2.76(70)	23.00(584)
4(100)	17.99(457)	18.11(460)	17.99(457)	2TC	10.06(255.5)	11.81(300)	3.94(100)	11.42(290)	7.99(203)	14.17(360)	4.13(105)	2.95(75)	26.30(668)
6(150)	24.02(610)	24.13(613)	24.02(610)	2TC	12.76(324)	13.78(350)	5.91(150)	15.96(380)	8.82(224)	16.34(415)	5.31(135)	3.35(85)	30.47(774)
8(200)	29.02(737)	29.13(740)	29.02(737)	2TC	15.16(385)	13.78(350)	7.91(201)	18.50(470)	11.65(296)	16.34(415)	5.31(135)	3.35(85)	39.31(846)
10(250)	32.99(838)	33.11(841)	32.99(838)	2TC	16.52(419.5)	15.75(400)	9.92(252)	21.46(545)	13.54(344)	18.70(475)	7.09(180)	3.54(90)	39.33(999)
12(300)	37.99(965)	38.11(968)	37.99(965)	2TC	19.72(501)	15.75(400)	11.93(303)	24.02(610)	15.73(399.5)	18.70(475)	7.09(180)	3.54(90)	41.52(1055)
14(350)	40.51(1029)	40.87(1038)	40.51(1029)	2TC	20.24(514)	17.72(450)	12.68(322)	25.20(640)	16.97(431)	20.87(530)	9.25(235)	4.13(105)	47.09(1196)
16(400)	44.49(1130)	44.88(1140)	44.49(1130)	2TC	22.20(564)	17.72(450)	14.69(373)	27.26(705)	19.09(485)	20.87(530)	11.02(280)	4.13(105)	50.98(1295)
18(450)	47.99(1219)	48.50(1232)	47.99(1219)	2TC	24.00(609.5)	19.69(500)	16.65(423)	31.02(788)	16.89(429)	23.62(600)	11.02(280)	4.92(125)	51.54(1309)
20(500)	52.01(1321)	52.52(1334)	52.01(1321)	2TC	26.00(660.5)	19.69(500)	18.54(471)	33.66(855)	18.90(480)	23.62(600)	11.42(290)	4.92(125)	53.94(1370)
24(600)	60.98(1549)	61.73(1568)	60.98(1549)	2TC	30.49(774.5)	19.69(500)	22.44(570)	40.94(1040)	22.17(563)	24.02(610)	11.42(290)	5.31(135)	57.60(1463)
30(750)	74.02(1880)	71.85(1825)	74.02(1880)	2TC	37.01(940)	21.65(550)	28.03(712)	48.43(1230)	27.44(697)	26.38(670)	11.81(300)	5.71(145)	65.63(1667)
32(800)	75.00(1905)	75.87(1927)	75.00(1905)	3TF	37.50(952.5)	21.65(550)	29.92(760)	51.75(1315)	29.92(760)	26.38(670)	11.81(300)	5.71(145)	68.11(1730)
34(850)	95.98(2438)	81.10(2060)	95.98(2438)	2TC	47.99(1219)	21.65(550)	31.81(808)	55.00(1397)	30.57(776.5)	26.77(680)	12.20(310)	6.10(155)	69.55(1767)
36(900)	90.00(2286)	87.13(2213)	90.00(2286)	3TF	45.00(1143)	23.62(600)	33.66(855)	57.50(1461)	33.46(850)	28.74(730)	12.20(310)	6.10(155)	74.41(1890)

2FC : 2 PIECE SIDE ENTRY FLOATING / 2TC : 2 PIECE SIDE ENTRY TRUNNION / 3TF : 3PIECE TRUNNION FORGED

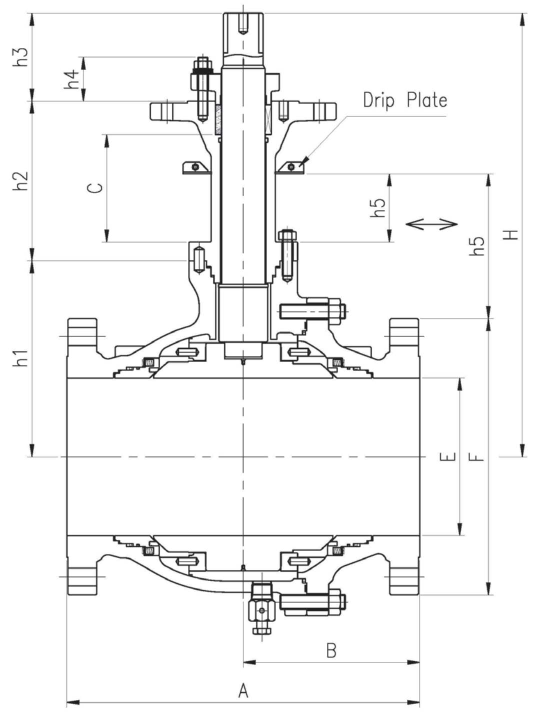


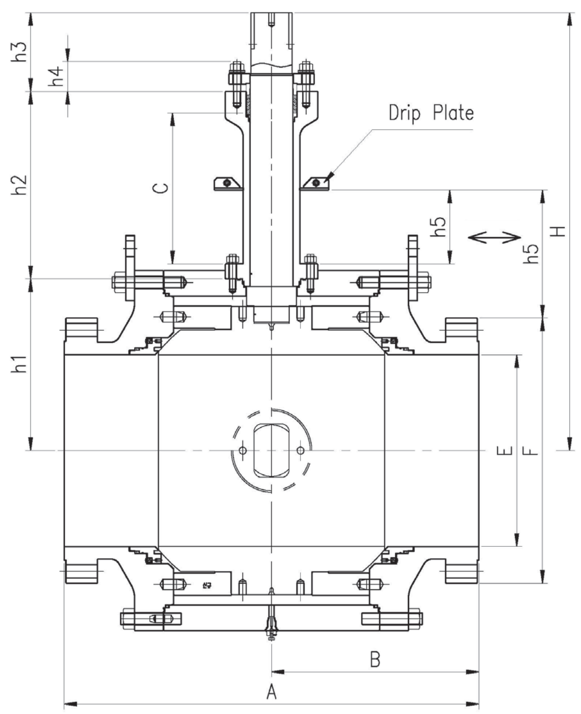


2PCS/3PCS CRYOGENIC BALL VALVE DIMENSION TABLE(1500LB)

Size	1500# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)	8.50(216)	8.50(216)	8.50(216)	2FC	4.80(122)	7.87(200)	0.51(13)	4.72(120)	2.97(75.5)	9.35(238)	1.30(33)	0.91(23)	13.62(346)
3/4(15)	9.02(229)	9.02(229)	9.02(229)	2FC	5.18(131.5)	7.87(200)	0.75(19)	5.12(130)	3.15(80)	9.35(238)	1.30(33)	0.91(23)	13.80(351)
1(25)	10.00(254)	10.00(254)	10.00(254)	2FC	5.28(134)	7.87(200)	0.98(25)	5.91(150)	3.78(96)	10.33(263)	1.64(42)	1.38(35)	14.76(375)
1 1/2(15)	12.01(305)	12.01(305)	12.01(305)	2FC	6.20(157.6)	9.84(250)	1.50(38)	7.09(180)	4.61(117.1)	12.03(306)	2.00(51)	1.61(41)	18.63(473)
2(50)	14.49(368)	14.61(371)	14.49(368)	2FC	7.50(190.6)	9.84(250)	1.93(49)	8.46(215)	5.39(137)	12.24(311)	2.00(51)	1.61(41)	19.63(499)
2 1/2(65)	16.50(419)	16.61(422)	16.50(419)	2FC	8.25(210)	11.81(300)	2.44(62)	9.65(245)	5.28(134)	13.98(355)	3.23(82)	2.76(70)	22.48(571)
3(80)	18.50(470)	18.62(473)	18.50(470)	2TC	9.31(236.5)	11.81(300)	2.91(74)	10.43(265)	7.00(177.8)	13.98(355)	3.23(82)	2.76(70)	24.20(615)
4(100)	21.50(546)	21.61(549)	21.50(546)	2TC	11.77(299)	11.81(300)	3.94(100)	12.20(310)	7.22(183.5)	14.17(360)	4.13(105)	2.95(75)	25.53(649)
6(150)	27.76(705)	27.99(711)	27.76(705)	2TC	14.69(373)	13.78(350)	5.67(144)	15.55(395)	10.04(255)	16.43(415)	5.31(135)	3.35(85)	31.69(805)
8(200)	32.76(832)	29.13(740)	32.76(832)	2TC	15.16(385)	13.78(350)	7.56(192)	18.50(470)	11.65(296)	16.43(415)	5.31(135)	3.35(85)	33.31(846)
10(250)	39.02(991)	39.37(1000)	39.02(991)	2TC	19.51(496)	15.75(400)	9.41(239)	23.03(585)	13.19(335)	18.70(475)	7.09(180)	3.54(90)	38.98(990)
12(300)	44.49(1130)	45.12(1146)	44.49(1130)	2TC	22.24(565)	15.75(400)	11.30(287)	26.57(675)	13.92(353.5)	18.70(475)	7.09(180)	3.54(90)	39.70(1009)
14(350)	49.49(1257)	50.24(1276)	49.49(1257)	2TC	24.74(629)	17.72(450)	12.40(315)	29.53(750)	14.96(380)	20.87(530)	9.25(235)	4.13(105)	45.08(1145)
16(400)	54.49(1384)	55.39(1407)	54.49(1384)	2TC	27.24(692)	17.72(450)	14.17(360)	32.48(835)	16.30(414)	20.87(530)	11.02(280)	4.13(105)	48.19(1224)
18(450)	60.51(1537)	61.38(1559)	60.51(1537)	2TC	30.36(769)	19.69(500)	15.98(406)	36.02(915)	19.29(490)	23.62(600)	11.02(280)	4.92(125)	53.94(1370)
20(500)	65.51(1664)	66.38(1686)	65.51(1664)	2TC	32.76(832)	19.69(500)	17.87(454)	38.78(985)	20.79(528)	23.62(600)	11.42(290)	4.92(125)	55.83(1418)
24(600)	76.50(1943)	66.60(1971)	76.50(1943)	2TC	38.25(972)	19.69(500)	21.50(546)	46.06(1170)	25.83(656)	24.02(610)	11.42(290)	5.31(135)	61.26(1556)
30(750)	91.81(2332)	92.91(2360)	91.81(2332)	2TC	45.91(1166)	21.65(550)	27.01(686)	-	32.17(817)	26.38(670)	11.81(300)	5.71(145)	70.35(1787)
32(800)	92.36(2346)	93.70(2380)	92.36(2346)	2TC	46.18(1173)	21.65(550)	28.74(730)	-	33.46(850)	26.38(670)	11.81(300)	5.71(145)	71.65(1820)
34(850)	96.46(2450)	9543(2424)	96.46(2450)	3TF	48.23(1225)	21.65(550)	20.51(775)	-	35.43(900)	26.77(680)	12.20(310)	6.10(155)	74.41(1890)
36(900)	106.38(2702)	107.48(2730)	106.38(2702)	3TF	53.19(1351)	23.62(600)	32.24(819)	55.12(1400)	37.17(944)	28.74(730)	12.20(310)	6.10(155)	78.11(1984)

2FC : 2 PIECE SIDE ENTRY FLOATING / 2TC : 2 PIECE SIDE ENTRY TRUNNION / 3TF : 3PIECE TRUNNION FORGED

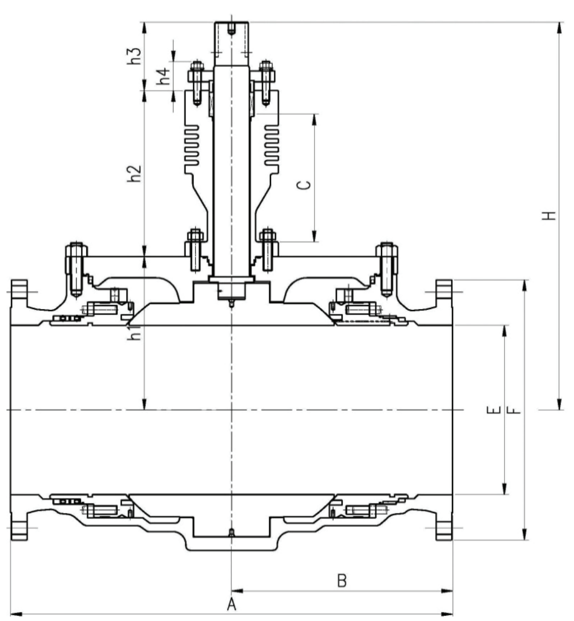


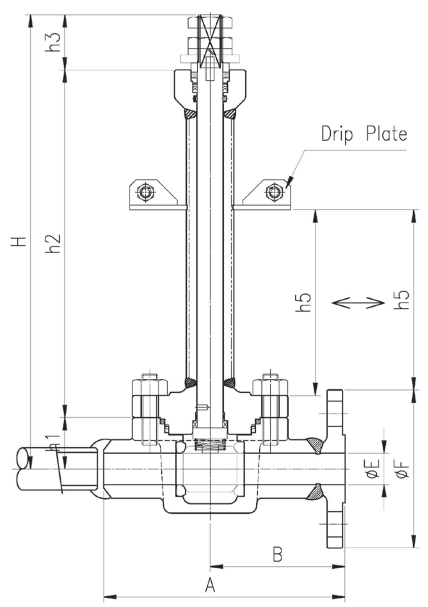


TOP ENTRY CRYOGENIC BALL VALVE DIMENSION TABLE(150 LB)

Size	150# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)	4.25(108)	-(-)	4.25(108)	WTO	2.13(54)	7.87(200)	0.51(13)	3.50(89)	1.10(28)	8.66(220)	0.83(21)	1.40(35.5)	11.16(284)
3/4(15)	4.61(117)	-(-)	4.61(117)	WTO	2.30(58.5)	7.87(200)	0.75(19)	3.90(99)	1.57(40)	8.66(220)	0.83(21)	1.40(35.5)	11.63(296)
1(25)	5.98(152)	6.49(165)	5.98(152)	TFF	2.99(76)	7.87(200)	0.98(25)	4.25(108)	1.69(43)	8.66(220)	1.02(26)	1.57(40)	11.93(303)
1 1/2(15)	7.48(190)	7.98(203)	7.48(190)	TFF	3.74(95)	9.84(250)	1.50(38)	4.92(125)	3.50(89)	10.63(270)	1.57(40)	1.97(50)	16.10(409)
2(50)	11.50(292)	12.00(305)	11.50(292)	TFF	5.75(146)	9.84(250)	1.93(49)	5.91(150)	5.04(128)	10.63(270)	1.57(40)	1.97(50)	17.64(448)
2 1/2(65)	12.99(330)	13.50(343)	12.99(330)	TTO	4.53(115)	11.81(300)	2.44(62)	7.01(178)	4.17(106)	12.60(320)	1.97(50)	2.17(55)	18.94(481)
3(80)	14.02(356)	14.52(369)	14.02(356)	TTO	7.01(178)	11.81(300)	2.91(74)	7.48(190)	4.90(124.5)	12.60(320)	1.97(50)	2.17(55)	19.67(500)
4(100)	17.01(432)	17.51(445)	17.01(432)	TTO	8.50(216)	11.81(300)	3.94(100)	9.02(229)	5.49(139.5)	12.60(320)	2.05(52)	2.95(75)	21.04(535)
6(150)	22.01(559)	22.51(572)	22.01(559)	TTO	11.00(279.5)	13.78(350)	5.91(150)	11.02(280)	7.42(188.5)	14.57(370)	2.05(52)	3.94(100)	25.93(659)
8(200)	25.98(660)	26.49(673)	25.98(660)	TTO	12.99(330)	13.78(350)	7.91(201)	13.58(345)	8.66(220)	14.57(370)	2.36(60)	3.94(100)	27.17(690)
10(250)	30.98(787)	31.49(800)	30.98(787)	TTO	15.49(393.5)	15.57(400)	9.92(252)	15.94(405)	9.65(245)	16.54(420)	2.36(60)	5.31(135)	31.50(800)
12(300)	32.99(838)	33.50(851)	32.99(838)	TTO	16.50(419)	15.57(400)	12.00(305)	19.09(485)	11.99(304.5)	16.54(420)	2.66(66)	5.31(135)	33.84(860)
14(350)	3500(889)	35.00(902)	3500(889)	TTO	17.50(444.5)	17.72(450)	13.26(337)	21.06(535)	12.68(322)	18.50(470)	2.66(66)	6.30(160)	37.48(952)
16(400)	39.02(991)	39.52(1004)	39.02(991)	TTO	19.51(495.5)	17.72(450)	15.16(385)	23.43(595)	13.80(350.5)	18.50(470)	2.95(75)	6.30(160)	38.60(981)
18(450)	42.99(1092)	43.50(1105)	42.99(1092)	TTO	21.50(546)	19.69(500)	17.17(436)	25.00(635)	15.75(400)	20.47(520)	2.95(75)	7.09(180)	43.31(1100)
20(500)	47.01(1194)	47.51(1207)	47.01(1194)	TTO	23.50(597)	19.69(500)	19.17(487)	27.56(700)	16.69(424)	20.47(520)	3.54(90)	7.09(180)	44.25(1124)
24(600)	55.00(1397)	55.50(1410)	55.00(1397)	TTO	27.50(698.5)	19.69(500)	23.19(589)	32.09(815)	19.88(505)	20.47(520)	3.54(90)	8.46(25)	48.82(1240)
30(750)	65.00(1651)	66.02(1677)	65.00(1651)	TTO	32.50(825.5)	21.65(550)	28.94(735)	38.78(985)	26.77(680)	22.44(570)	3.94(100)	9.06(230)	58.27(1480)
32(800)	70.00(1778)	71.10(1806)	70.00(1778)	TTO	35.00(889)	21.65(550)	30.67(779)	41.73(1060)	28.94(735)	22.44(570)	3.94(100)	9.06(230)	60.43(1535)
34(850)	75.98(1930)	77.13(1959)	75.98(1930)	TTO	37.99(965)	21.65(550)	32.68(830)	43.70(1110)	29.33(745)	22.44(570)	3.94(100)	9.06(230)	60.83(1545)
36(900)	82.01(2083)	83.11(2111)	82.01(2083)	TTO	41.00(1041.5)	23.62(600)	34.41(874)	46.06(1170)	29.92(760)	24.41(620)	3.94(100)	9.06(230)	63.39(1610)

WTO : WEDGE SEAL FLOATING / TFF : TOP ENTRY FLOATING / TTO : TOP ENTRY TRUNNION

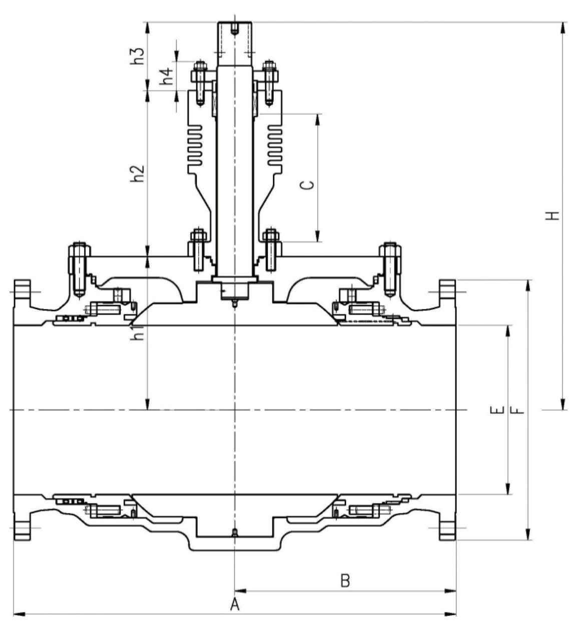


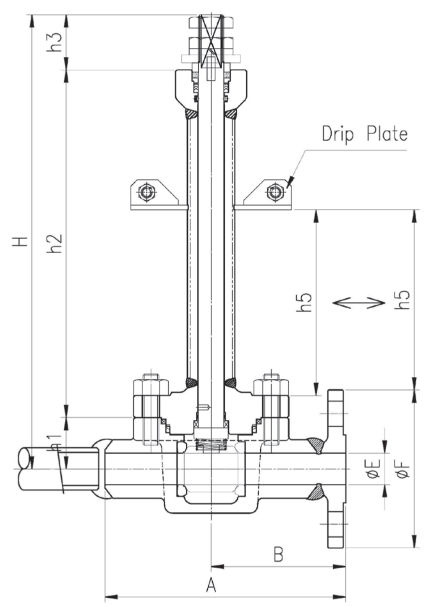


TOP ENTRY CRYOGENIC BALL VALVE DIMENSION TABLE(300 LB)

Size	300# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)	5.63(143)	6.07(154.2)	5.63(143)	WTO	2.81(71.5)	7.87(200)	1.10(28)	3.74(95)	1.10(28)	8.66(220)	0.83(21)	1.40(35.5)	11.16(284)
3/4(15)	5.98(152)	6.49(165)	5.98(152)	WTO	2.99(76)	7.87(200)	1.10(28)	4.61(117)	1.57(40)	8.66(220)	0.83(21)	1.40(35.5)	11.63(296)
1(25)	5.98(152)	6.49(165)	5.98(152)	TFF	2.99(76)	7.87(200)	0.98(25)	4.92(125)	1.69(43)	8.66(220)	1.02(26)	1.57(40)	11.93(303)
1 1/2(15)	9.94(241)	9.99(254)	9.94(241)	TFF	4.74(120.5)	9.84(250)	1.50(38)	6.14(156)	3.50(89)	10.63(270)	1.57(40)	1.97(50)	16.10(409)
2(50)	11.50(292)	12.12(308)	11.50(292)	TFF	5.75(146)	9.84(250)	1.93(49)	6.50(165)	5.04(128)	10.63(270)	1.57(40)	1.97(50)	17.64(448)
2 1/2(65)	12.99(330)	13.61(346)	12.99(330)	TTO	6.50(165)	11.81(300)	2.44(62)	7.50(190.5)	4.17(106)	12.60(320)	1.97(50)	2.17(55)	18.94(481)
3(80)	14.02(356)	14.64(372)	14.02(356)	TTO	7.01(178)	11.81(300)	2.91(74)	8.27(210)	4.90(124.5)	12.60(320)	1.97(50)	2.17(55)	19.67(500)
4(100)	17.01(432)	17.63(448)	17.01(432)	TTO	8.50(216)	11.81(300)	3.94(100)	10.00(254)	5.49(139.5)	12.60(320)	2.05(52)	2.95(75)	21.04(535)
6(150)	22.01(559)	22.63(575)	22.01(559)	TTO	11.00(279.5)	13.78(350)	5.91(150)	12.60(320)	7.42(188.5)	14.57(370)	2.05(52)	3.94(100)	25.93(659)
8(200)	25.98(660)	26.61(676)	25.98(660)	TTO	12.99(330)	13.78(350)	7.91(201)	14.96(380)	8.66(220)	14.57(370)	2.36(60)	3.94(100)	27.17(690)
10(250)	30.98(787)	31.61(803)	30.98(787)	TTO	15.49(393.5)	15.57(400)	9.92(252)	17.52(445)	9.65(245)	16.54(420)	2.36(60)	5.31(135)	31.50(800)
12(300)	32.99(838)	33.61(854)	32.99(838)	TTO	16.50(419)	15.57(400)	12.00(305)	20.47(520)	12.32(313)	16.54(420)	2.66(66)	5.31(135)	34.17(868)
14(350)	35.00(889)	35.62(905)	35.00(889)	TTO	17.50(444.5)	17.72(450)	13.26(337)	23.03(585)	13.44(341.5)	18.50(470)	2.66(66)	6.30(160)	38.25(972)
16(400)	39.02(991)	39.64(1007)	39.02(991)	TTO	19.51(495.5)	17.72(450)	15.16(385)	25.59(650)	14.37(365)	18.50(470)	2.95(75)	6.30(160)	39.17(995)
18(450)	42.99(1092)	43.61(1108)	42.99(1092)	TTO	21.50(546)	19.69(500)	17.17(436)	27.99(711)	16.54(420)	20.47(520)	2.95(75)	7.09(180)	44.09(1120)
20(500)	47.01(1194)	47.76(1213)	47.01(1194)	TTO	23.50(597)	19.69(500)	19.17(487)	30.51(775)	17.22(437.5)	20.47(520)	3.54(90)	7.09(180)	44.78(1138)
24(600)	55.00(1397)	55.87(1419)	55.00(1397)	TTO	27.50(698.5)	19.69(500)	23.19(589)	36.02(915)	19.88(505)	20.47(520)	3.54(90)	8.46(25)	48.82(1240)
30(750)	65.00(1651)	65.98(1676)	65.00(1651)	TTO	32.50(825.5)	21.65(550)	28.94(735)	42.91(1090)	27.76(705)	22.44(570)	3.94(100)	9.06(230)	59.25(1505)
32(800)	70.00(1778)	71.14(1807)	70.00(1778)	TTO	35.00(889)	21.65(550)	20.67(779)	45.28(1150)	29.33(745)	22.44(570)	3.94(100)	9.06(230)	60.83(1545)
34(850)	75.98(1930)	77.13(1959)	75.98(1930)	TTO	37.99(965)	21.65(550)	32.68(830)	47.44(1205)	29.72(755)	22.44(570)	3.94(100)	9.06(230)	61.22(1555)
36(900)	82.01(2083)	83.15(2112)	82.01(2083)	TTO	41.00(1041.5)	23.62(600)	34.41(874)	50.00(1270)	30.35(771)	24.41(620)	3.94(100)	9.06(230)	63.82(1621)

WTO : WEDGE SEAL FLOATING / TFF : TOP ENTRY FLOATING / TTO : TOP ENTRY TRUNNION

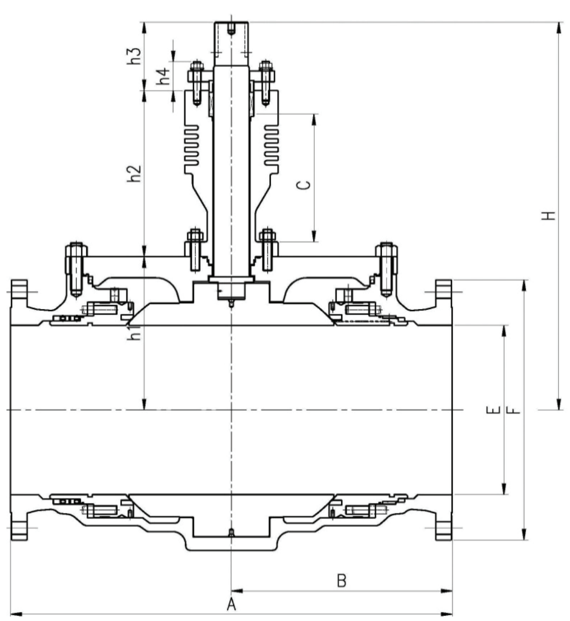


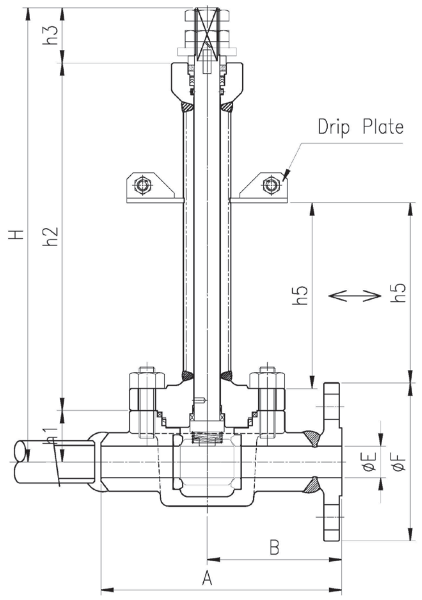


TOP ENTRY CRYOGENIC BALL VALVE DIMENSION TABLE(600 LB)

Size	600# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)	6.50(165)	6.42(163)	6.50(165)	TTF	3.25(82.5)	7.87(200)	0.51(13)	3.74(95)	1.81(46)	8.86(225)	0.83(21)	1.65(42)	12.32(313)
3/4(15)	7.52(191)	7.48(190)	7.52(191)	TTF	3.76(95.5)	7.87(200)	0.75(19)	4.53(115)	1.81(46)	8.86(225)	0.83(21)	1.65(42)	12.32(313)
1(25)	8.50(216)	8.50(216)	8.50(216)	TTF	4.25(108)	7.87(200)	0.98(25)	4.92(125)	2.52(64)	8.86(225)	0.91(23)	1.65(42)	13.03(331)
1 1/2(15)	9.49(241)	9.49(241)	9.49(241)	TTF	4.74(120.5)	9.84(250)	1.50(38)	6.12(155.5)	3.50(89)	10.83(275)	1.54(39)	2.17(55)	16.50(419)
2(50)	11.50(292)	11.61(295)	11.50(292)	TTF	5.75(146)	9.84(250)	1.93(150)	6.50(165)	4.25(108)	10.83(275)	1.54(39)	2.17(55)	17.24(438)
2 1/2(65)	12.99(330)	13.11(333)	12.99(330)	TTO	6.50(165)	11.81(300)	2.44(62)	7.52(191)	4.57(116)	12.80(325)	1.89(48)	2.44(62)	19.80(503)
3(80)	14.02(356)	14.13(359)	14.02(356)	TTO	7.01(178)	11.81(300)	2.91(74)	8.27(210)	4.90(124.5)	12.80(325)	1.89(48)	2.44(62)	20.14(512)
4(100)	17.01(432)	17.13(435)	17.01(432)	TTO	8.50(216)	11.81(300)	3.94(100)	10.83(275)	6.08(154.5)	12.80(325)	2.05(52)	3.54(90)	22.42(570)
6(150)	22.01(559)	22.13(562)	22.01(559)	TTO	11.00(279.5)	13.78(350)	5.91(150)	14.02(356)	78.78(2001)	14.76(375)	2.17(55)	4.33(110)	97.87(2486)
8(200)	25.98(660)	26.10(663)	25.98(660)	TTO	12.99(330)	13.78(350)	7.91(201)	14.96(380)	8.66(220)	14.76(375)	2.17(55)	4.33(110)	27.76(705)
10(250)	30.98(787)	31.10(790)	30.98(787)	TTO	15.49(393.5)	15.75(400)	9.92(252)	20.08(510)	10.98(279)	17.72(450)	2.36(60)	5.12(130)	33.82(859)
12(300)	32.99(838)	33.11(841)	32.99(838)	TTO	16.50(419)	15.75(400)	11.93(303)	22.05(560)	12.99(330)	17.72(450)	2.36(60)	5.12(130)	35.83(910)
14(350)	35.00(889)	35.12(892)	35.00(889)	TTO	17.50(444.5)	17.72(450)	13.15(334)	23.82(605)	14.41(366)	19.69(500)	2.95(75)	5.91(150)	40.00(1016)
16(400)	39.02(991)	39.13(994)	39.02(991)	TTO	19.51(495.5)	17.72(450)	15.16(385)	26.97(685)	17.42(442.5)	19.69(500)	2.95(75)	5.91(150)	43.01(1093)
18(450)	42.99(1092)	43.11(1095)	42.99(1092)	TTO	21.50(546)	19.69(500)	17.17(436)	29.33(745)	18.50(470)	22.05(560)	3.35(85)	6.69(170)	47.24(1200)
20(500)	47.01(1194)	47.24(1200)	47.01(1194)	TTO	23.50(597)	19.69(500)	19.17(487)	32.09(815)	18.54(471)	22.05(560)	3.35(85)	6.69(170)	48.28(1201)
24(600)	55.00(1397)	55.35(1406)	55.00(1397)	TTO	27.50(698.5)	19.69(500)	23.19(589)	37.01(940)	22.44(570)	22.83(580)	3.74(95)	7.48(190)	52.76(1340)
30(750)	65.00(1651)	65.51(1664)	65.00(1651)	TTO	32.50(825.5)	21.65(550)	28.94(735)	44.49(1130)	29.45(748)	24.80(630)	4.13(105)	8.27(210)	62.52(1588)
32(800)	70.00(1778)	70.63(1794)	70.00(1778)	TTO	35.00(889)	21.65(550)	30.67(779)	47.05(1195)	29.65(756)	24.80(630)	4.13(105)	8.27(210)	62.72(1593)
34(850)	75.98(1930)	76.61(1946)	75.98(1930)	TTO	37.99(965)	21.65(550)	32.68(830)	49.21(1250)	30.12(765)	24.80(630)	4.53(115)	9.06(230)	63.98(1625)
36(900)	82.01(2083)	82.60(2098)	82.01(2083)	TTO	41.00(1041.5)	23.62(600)	34.41(874)	51.77(1315)	30.51(775)	26.77(680)	4.53(115)	9.06(230)	66.34(1685)

WTO : WEDGE SEAL FLOATING / TFF : TOP ENTRY FLOATING / TTO : TOP ENTRY TRUNNION

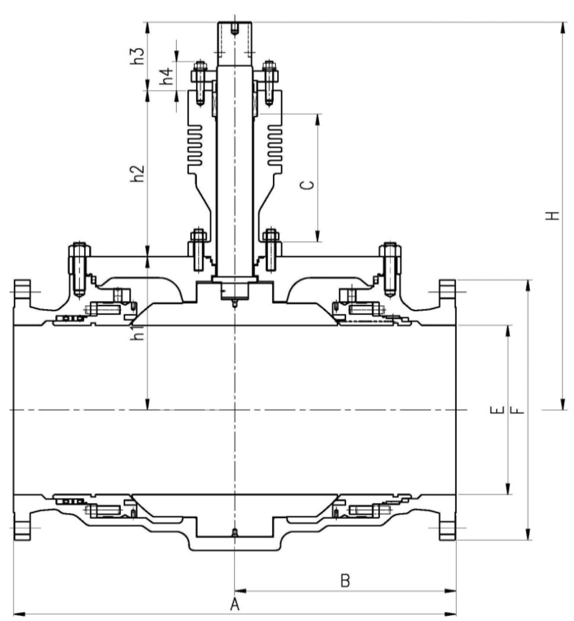


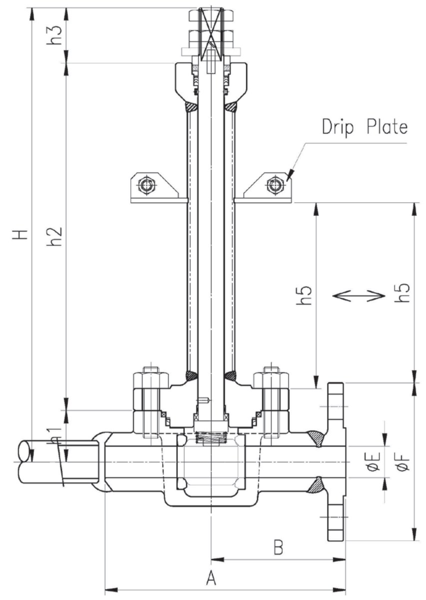


TOP ENTRY CRYOGENIC BALL VALVE DIMENSION TABLE(900 LB)

Size	900# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)													
3/4(15)													
1(25)													
1 1/2(15)													
2(50)													
2 1/2(65)	16.50(419)	16.61(422)	16.50(419)	TTO	8.25(209.5)	11.81(300)	2.44(62)	9.65(245)	5.20(132)	13.39(340)	1.97(50)	2.56(65)	21.14(537)
3(80)	15.00(381)	15.12(384)	15.00(381)	TTO	7.50(190.5)	11.81(300)	2.91(74)	9.45(240)	5.49(139.5)	13.39(340)	1.97(50)	2.56(56)	21.44(545)
4(100)	17.99(457)	18.11(460)	17.99(457)	TTO	9.00(228.5)	11.81(300)	3.94(100)	11.42(290)	7.54(191.5)	13.39(340)	2.36(60)	4.33(110)	25.26(642)
6(150)	24.02(610)	24.13(613)	24.02(610)	TTO	12.01(305)	13.78(350)	5.91(150)	14.96(380)	9.57(243)	16.14(410)	2.56(65)	5.31(135)	31.02(788)
8(200)	29.02(737)	29.13(740)	29.02(737)	TTO	14.51(368.5)	13.78(350)	7.91(201)	18.50(470)	11.57(294)	16.14(410)	2.56(65)	5.31(135)	33.03(839)
10(250)	32.99(838)	33.11(841)	32.99(838)	TTO	16.50(419)	15.75(400)	9.92(252)	21.46(545)	12.07(306.5)	18.11(460)	2.95(75)	6.30(160)	36.48(927)
12(300)	37.99(965)	38.11(968)	37.99(965)	TTO	19.00(482.5)	15.75(400)	11.93(303)	24.02(610)	14.57(370)	18.11(460)	2.95(75)	6.30(160)	38.98(990)
14(350)	40.51(1029)	40.87(1038)	56.26(1429)	TTO	20.26(514.5)	17.72(450)	12.68(322)	25.20(640)	19.27(489.5)	20.47(520)	3.35(85)	7.87(200)	47.62(1210)
16(400)	44.49(1130)	44.88(1140)	44.49(1130)	TTO	22.24(565)	17.72(450)	14.69(373)	27.76(705)	20.30(515.5)	20.47(520)	3.35(85)	7.87(200)	48.64(1236)
18(450)	47.99(1219)	48.50(1232)	47.99(1219)	TTO	24.00(609.5)	19.69(500)	16.65(423)	31.02(788)	20.16(512)	22.83(580)	4.13(105)	9.45(240)	52.44(1332)
20(500)	52.01(1321)	52.52(1334)	52.01(1321)	TTO	26.00(660.5)	19.69(500)	18.54(471)	33.66(855)	22.24(565)	22.83(580)	4.13(105)	9.45(240)	54.53(1385)
24(600)	60.98(1549)	61.73(1568)	60.98(1549)	TTO	30.49(774.5)	19.69(500)	22.44(570)	40.94(1040)	27.56(700)	22.83(580)	4.92(125)	10.24(260)	60.63(1540)
30(750)	74.02(1880)	71.85(1825)	91.34(2320)	TTO	37.01(940)	21.65(550)	28.03(712)	48.43(1230)	33.46(850)	24.80(630)	5.51(140)	11.02(280)	69.29(1760)
32(800)	74.88(1902)	75.87(1927)	74.88(1902)	TTO	37.44(951)	21.65(550)	29.92(760)	51.77(1315)	33.86(860)	24.80(630)	5.51(140)	11.02(280)	69.69(1770)
34(850)	95.98(2438)	81.10(2060)	95.98(2438)	TTO	47.99(1219)	21.65(550)	31.81(808)	54.92(1395)	34.65(880)	24.80(630)	5.91(150)	11.81(300)	71.26(1810)
36(900)	90.00(2286)	87.13(2213)	90.00(2286)	TTO	45.00(1143)	23.62(600)	33.66(855)	57.48(1460)	35.04(890)	26.77(680)	5.91(150)	11.81(300)	73.62(1870)

WTO : WEDGE SEAL FLOATING / TFF : TOP ENTRY FLOATING / TTO : TOP ENTRY TRUNNION

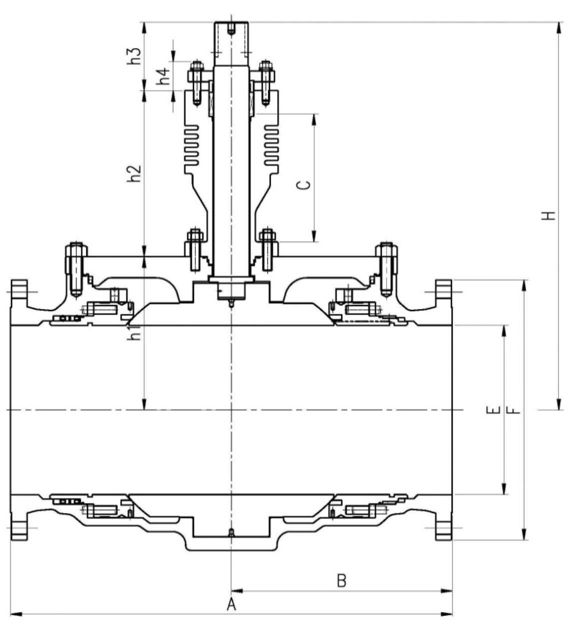


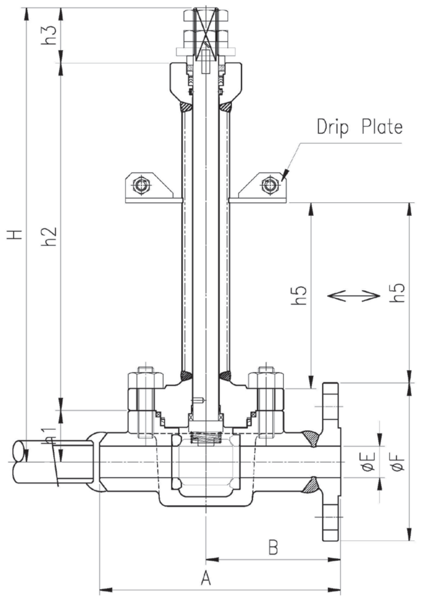


TOP ENTRY CRYOGENIC BALL VALVE DIMENSIONS TABLE(1500 LB)

Size	1500# FULL PORT(in/mm)												
Inch (mm)	FACE TO FACE(A)				DIMENSION								
	RF	RJ	BW	MODEL	B	C	E	F	h1	h2	h3	h4	H
1/2(15)	8.50(216)	8.50(216)	8.50(216)	TFF	4.25(108)	7.87(200)	0.51(13)	4.72(120)	1.81(46)	9.06(230)	0.83(21)	1.65(42)	12.52(318)
3/4(15)	9.02(229)	9.02(229)	9.02(229)	TFF	4.51(114.5)	7.87(200)	0.75(19)	5.12(130)	1.81(46)	9.06(230)	0.83(21)	1.65(42)	12.52(318)
1(25)	10.00(254)	10.00(254)	10.00(254)	TFF	5.00(127)	7.87(200)	0.98(25)	5.91(150)	2.76(70)	9.84(250)	1.26(32)	2.15(54.5)	14.74(375)
1 1/2(15)	12.01(305)	12.01(305)	12.01(305)	TFF	6.00(152.5)	9.84(250)	1.50(38)	7.09(180)	3.15(80)	12.01(305)	1.50(38)	2.05(52)	17.20(437)
2(50)	14.49(368)	14.61(371)	14.49(368)	TFF	7.24(184)	9.84(250)	1.93(150)	8.46(215)	5.12(130)	12.01(305)	1.50(38)	2.05(52)	19.17(487)
2 1/2(65)	16.50(419)	16.61(422)	16.50(419)	TTO	8.25(209.5)	11.81(300)	2.44(62)	9.65(245)	5.20(132)	13.39(340)	1.97(50)	2.56(65)	21.14(537)
3(80)	18.50(470)	18.62(473)	18.50(470)	TTO	9.25(235)	11.81(300)	2.91(74)	10.43(265)	5.98(152)	13.39(340)	1.97(50)	3.74(95)	23.11(587)
4(100)	21.50(546)	21.61(549)	21.50(546)	TTO	10.75(273)	11.81(300)	3.94(100)	12.20(310)	7.85(199.3)	13.78(350)	2.36(60)	4.98(125)	26.55(674)
6(150)	27.76(705)	27.99(711)	27.76(705)	TTO	13.88(352.5)	13.78(350)	5.67(144)	15.55(395)	11.34(288)	16.14(410)	2.76(70)	5.91(150)	33.39(848)
8(200)	32.76(832)	29.13(740)	32.76(832)	TTO	16.38(416)	13.78(350)	7.56(192)	18.50(470)	13.48(342.5)	16.14(410)	2.76(70)	5.91(150)	35.53(903)
10(250)	39.02(991)	39.37(1000)	39.02(991)	TTO	19.51(495.5)	15.75(400)	9.41(239)	23.03(585)	14.65(372)	18.50(470)	3.15(80)	6.89(175)	40.04(1017)
12(300)	44.49(1130)	45.12(1146)	44.49(1130)	TTO	22.24(565)	15.75(400)	11.30(287)	26.57(675)	17.20(437)	18.50(470)	3.15(80)	6.89(175)	42.60(1082)
14(350)	49.49(1257)	50.24(1276)	49.49(1257)	TTO	24.74(628.5)	17.72(450)	12.40(315)	29.53(750)	21.46(545)	20.47(520)	3.54(90)	8.46(215)	50.39(1280)
16(400)	54.49(1384)	55.39(1407)	54.49(1384)	TTO	27.24(692)	17.72(450)	14.17(360)	32.48(825)	22.26(565.5)	20.47(520)	3.54(90)	8.46(215)	51.20(1301)
18(450)	60.51(1537)	61.38(1559)	60.51(1537)	TTO	30.26(768.5)	19.69(500)	15.98(406)	36.02(915)	23.23(590)	22.83(580)	4.33(110)	10.24(260)	56.30(1430)
20(500)	65.51(1664)	66.38(1686)	65.51(1664)	TTO	32.76(832)	19.69(500)	17.87(454)	38.78(985)	25.39(645)	22.83(580)	4.33(110)	10.24(260)	58.46(1485)
24(600)	76.50(1943)	77.60(1971)	76.50(1943)	TTO	38.25(971.5)	19.69(500)	21.50(546)	46.06(1170)	30.71(780)	22.83(580)	5.12(130)	11.02(280)	64.57(1640)
30(750)	91.81(2332)	92.91(2360)	91.81(2332)	TTO	45.91(1166)	21.65(550)	27.01(686)	-(-)	36.42(925)	24.80(630)	5.71(145)	11.81(300)	73.03(1855)
32(800)	92.36(2346)	93.70(2380)	92.36(2346)	TTO	46.18(1173)	21.65(550)	28.74(730)	-(-)	38.58(980)	24.80(630)	5.71(145)	11.81(300)	75.20(1910)
34(850)	96.46(2450)	95.43(2424)	96.46(2450)	TTO	48.23(1225)	21.65(550)	30.51(775)	-(-)	39.76(1010)	24.80(630)	6.10(155)	12.60(320)	77.17(1960)
36(900)	106.38(2702)	107.48(2730)	106.38(2702)	TTO	53.19(1351)	23.62(600)	32.24(819)	55.12(1400)	40.55(1030)	26.77(680)	6.10(155)	12.60(320)	79.92(2030)

WTO : WEDGE SEAL FLOATING / TFF : TOP ENTRY FLOATING / TTO : TOP ENTRY TRUNNION





HOW TO SPECIFY KPC BALL VALVES

①- ①- ②- ③- ④- ⑤- ⑥- ⑦- ⑧- ⑨

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① VALVE MODEL

CODE	DESCRIPTION
2FC	2PC FLOATING
3TC	3PCS TRUNNION SIDE ENTRY CASTING
2TC	2PC TRUNNION CASTING
WTC	WEDGE SEAL TOP ENTRY CASTING
WSC	WEDGE SEAL SIDE ENTRY CASTING
TTC	TOP ENTRY TRUNNION CASTING
2FF	2PCS FLOATING FORGING
3FF	3PCS FLOATING FORGING
2TF	2PCS TRUNNION FORGING
3TF	3PCS TRUNNION FORGING

② SIZE

CODE	SIZE	CODE	SIZE
OA	1/4	20	20"
OB	1/2	22	22"
OC	3/4	24	24"
01	1"	26	26"
1A	1 1/4	28	28"
1B	1 1/2	30	30"
02	2"	32	32"
2B	2 1/2	34	34"
03	3"	63	63"
04	4"	40	40"
05	5"	42	42"
06	6"	44	44"
08	8"	46	46"
10	10"	48	48"
12	12"	54	54"
14	14"	56	56"
16	16"	60	60"
18	18"		

③ ANSI CLASS & PORT

CODE	CLASS
1	150# FB
2	150# RB
3	300# FB
4	300# RB
5	600# FB
6	600# RB
7	900# FB
8	900# RB
9	1500# FB
0	1500# RB
A	2500# FB
B	2500# RB
C	4500# FB

④ BODY MATERIAL

CODE	CLASS
1	CARBON STEEL(HIGH TEMP)
2	CARBON STEEL(LOW TEMP)
3	STAINLESS STEEL
4	DUPLEX STAINLESS STEEL
5	SUPER DUPLEX 5/5
6	TITANIUM
7	MONEL
8	HASTELLOY

⑤ TRIM MATERIAL

CODE	CLASS
1	CF8(F304)
2	CF8M(F316)
3	CA15(F410)
4	DUPLEX STAINLESS STEEL
5	SUPER DUPLEX S/S
6	TITANIUM
7	MONEL
8	HASTELLOY

⑥ SEAT MATERIAL

CODE	CLASS
1	PTFE
2	GLASS FIELD PTFE
3	CARBON FIELD PTFE
4	PCTFE
5	PEEK
6	DEVLON
7	METAL SEAT
8	SPECIAL

⑦ OPTERATING

CODE	CLASS
0	BARE STEM
1	WRENCH HANDLE
2	ENCLOSED GEAR
3	PNEUMATIC
4	ELECTRIC MOTOR
5	HYDRAULIC
6	OVER HANDLE
X	SPECIAL

⑧ OPTERATING

CODE	CLASS
0	BARE STEM
1	WRENCH HANDLE
2	ENCLOSED GEAR
3	PNEUMATIC
4	ELECTRIC MOTOR
5	HYDRAULIC
6	OVER HANDLE
X	SPECIAL

⑨ OPTERATING

CODE	CLASS
1	STANDARD
2	NACE MR 0175
3	EXTENDED BONNET
4	CRYOGENIC SERVICE
5	LOW TEMPERATURE SERVICE
6	INCONEL 625 OVERLAY FOR WET PART
7	INCONEL 625 OVERLAY FOR TRIM PART
8	DOUBLE PISTON EFFECT
9	DOUBLE BLOCK AND BLEED
0	CLEANING SERVICE
A	VOC PACKING

APPLICABLE STANDARDS

KPC ball valves are in accordandce with API, ANSI, ASME, and BS requirements. The following list contains the most important applicable standards for ball valves
KPC valves may be designed, manufactured and tested in accordance with other international standards on request.

API-American Petroleum institute	
Spec. 6A	Specification for wellhead and christmas tree equipment.
Spec. 6D	Specification for pipeline valves.
Spec. 6FA	Specification for fire testing of valves
Spec. RP6F	Recommended parcgtice for fire testing of valves.
Spec. 598	Valve inspection and test.
Spec. 605	Large diameter carbon steel flanges.
Spec. 607	Fire test for soft seated quarter-trun valves.

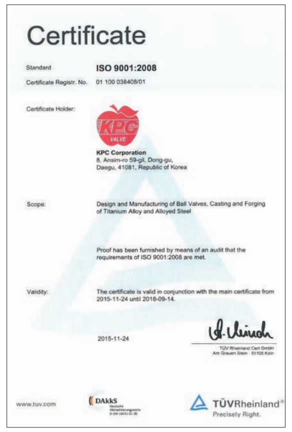
ANSI-American National Standard Institute	
B 16.5	Steel pipe flanges and flanged fittings.
B 16.10	Face-to-face and end-to-end dimemsions ends of Ferrous valves.
B 16.25	Butt welding ends.
B 16.34	Steel vlaves-flanged and butt welding ends.
B 31.3	Chemical plant and petroleum refinery piping.
B 31.4	Liquid petroleum transportation piping systems.
B 31.8	Gas Transmission and distribution piping systems.
B 46.1	Surface texture.

BSI-British Standard institute	
BS 1503	Specification for steel forgings for pressure purposes.
BS 1504	Specification for steel castings for pressure purpo
BS 1560	Steel pipe flanges and flanged fittings.
BS 2080	Face-to-face, centre-to-end,end-to-end and entre-to-end dimensions of flanged and butt-welding end stell valves for the petroleum, petrochemical and allied industries.
BS 4504	Flanges and boltings for pipes valves and fittings.
BS 5146	Inspection and test of steel valves for the pertroleum petrochemical and allied industries.
BS 5351	Steel ball valves for the petroleum, petrochemical and allied industries.
BS 5750	Quality system.
BS 6755	testing of valves.

MSS-Manufactures Standardization Society	
SP 6	Standard finishes for contact faces of pipe flanges and connecting-end flages and unions.
SP 25	standard marking system for valves, fittings flages and unions.
SP 44	Steel pipe line flages.
SP 45	By-pass and drain connection standard.
SP 55	Quality standard for steel castings visual method
SP 61	Hydrostatic testing of steel-vlaves
SP 72	Ball valves with flanged for butt-welding general service.

Application for Cryogenic valve	
BS 6364	Valves for cryogenic service.
SPE 77/306	Production testing of valves in low tenperatine service.
SPE 77/200	Valves in low tenperatine and cryogenic service.

QUALITY CERTIFICATES


Certificate
ISO 9001:2008


Certificate
ISO 14001:2004 + Cor. 1:2009


Certificate
BS OHSAS 18001:2007


Certificate
Quality-Assurance System

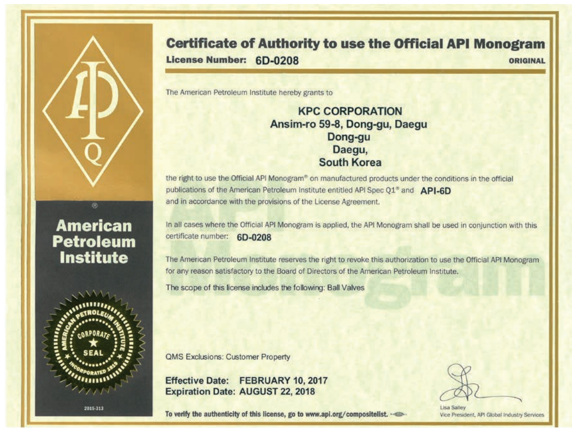

CERTIFICATE
CERTIFICATE NO FS/71/220/12/0009


CERTIFICATE
CERTIFICATE NO FS/71/220/12/0008


CERTIFICATE
CERTIFICATE NO FS/71/220/12/0007

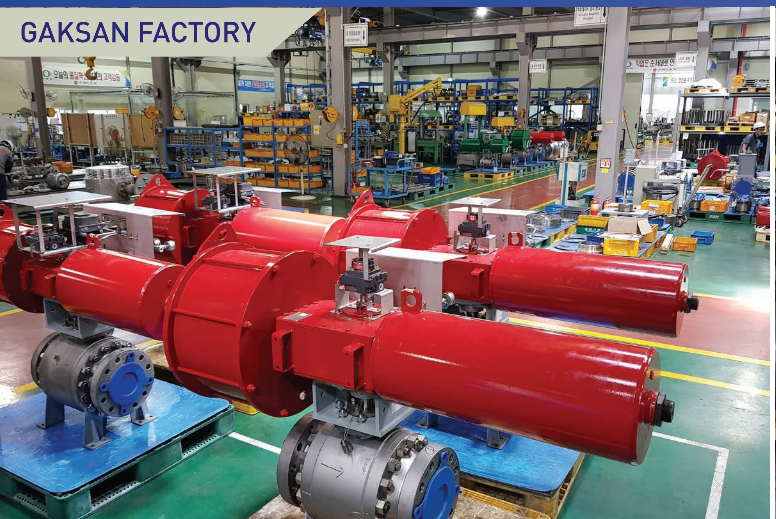

CERTIFICATE
CERTIFICATE NO FS/71/220/12/0013


CERTIFICATE
CERTIFICATE NO FS/71/220/12/0012


Certificate of Authority to use the Official API Monogram
License Number: 6D-0208
KPC CORPORATION
Ansim-ro 59-8, Dong-gu, Daegu
Dong-gu
Daegu,
South Korea
Effective Date: FEBRUARY 10, 2017
Expiration Date: AUGUST 22, 2018

BRIEF HISTORY

1977. 10 Established Korea Precision Casting Co.
1981. 08 Changed to KPC Corporation, a corporate company
1982. 03 Started Ball Valve Division
1987. 05 Started Special Alloy steel Division
1988. 06 Started Vacuum Arc Re-melting Division
1990. 05 Started Forging Division
1992. 05 Developed and produced Bell Valves for NACE and High Temperature Service
1994. 08 Authorized to use the API Monograms for API 6D
1997. 02 ISO 9001 : 1994 certified by QCB
1997. 12 Started Titanium Casting & Forging
2000. 08 Started Valve Automation Center
2002. 12 QA System for Material Manufacturing-certified by TÜV to European Directive 97/23/EC
2003. 03 Established Material Division Factory
2003. 06 QA System for Valve Manufacturing-certified by TÜV to European Directive 97/23/EC
2003. 11 Newly certified ISO 9001 : 2000 for Valves and Alloy Steel Castings by TÜV
2007. 06 Established a Factory for Large Size Valve Assembly
2008. 01 Established a Factory for Machining Facilities
2011. 01 Separated a KPCM(KPC Metal) from KPC Corporation
2012. 06 SIL certified by TÜV
2014. 03 ISO 14001, OHSAS 18001 certified by TÜV
2015. 10 Awarded the gold tower order of Industrial service Merit


GAKSAN FACTORY


DONGHO FACTORY

MEMO