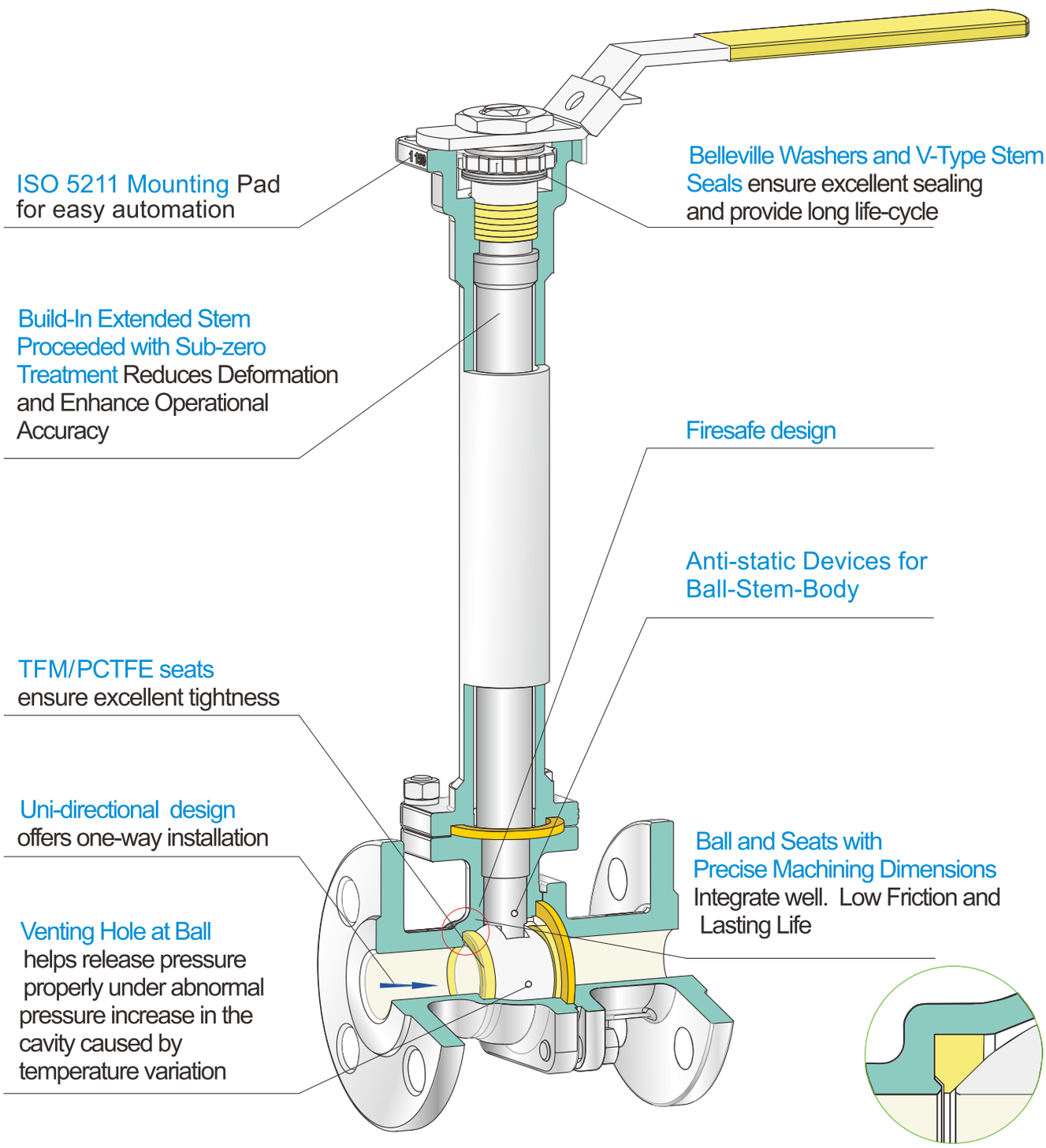
KI Kingdom

FLOW CONTROL CO., LTD.

Low Temperature &
Cryogenic Valves

Design Features



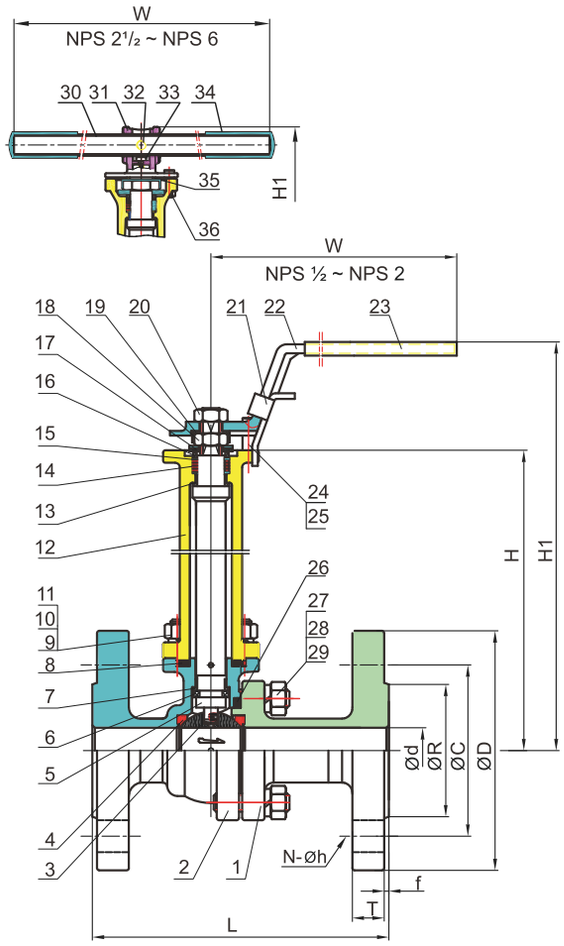
Kingdom
FLOW CONTROL CO., LTD.

Low Temperature Ball Valve, ASME
2-PC Body, Full Port, Flanged Ends Ball Valve

KV-D41 Class 150 / KV-D42 Class 300 Standard Type
KV-D61 Class 150 / KV-D62 Class 300 FireSafe Type

Applicable Standards:

- Design : ASME B16.34
- Face to Face : ASME B16.10
- Flange Ends : ASME B16.5
- Wall Thickness : ASME B16.34
- Inspection & Testing : API 598 BS 6364
- Temperature : -100°C ≤ T ≤ +150°C



No.	PARTS NAME		MATERIASL	
1	End Cap		CF8M	CF8
2	Body		CF8M	CF8
3	Ball		316	304
4	Ball Seat		TFM1600	
5	Stem(Anti-Static Device)		316	304
6	Split Ring		316	304
7	L-stem Sleeve		TFM1600+25%GF	
8	Extended Bonnet Gasket		TFM1600/316 Spiral Wound+Graphite*	
9	Bolting		A2-70	
10	Bolt Nut		A2-70	
11	Washer		304	
12	Extended Bonnet		CF8M	CF8
13	L-Stem Sleeve		TFM1600+25%GF	
14	Packing		TFM1600/Graphite*	
15	Bushing		304	
16	Gland		316	
17	Belleville Washer		301	
18	Stem Nut		A194-8	
19	Stop-lock-cap		304	
20	Handle Nut	(NPS: ½~2)	A194-8	
21	Lock Device	(NPS: ½~2)	304	
22	Handle	(NPS: ½~2)	304	
23	Handle Sleeve	(NPS: ½~2)	Vinyl Plastic	
24	Stop Bolt	(NPS: ½~6)	A2-70	
25	Stop Washer	(NPS: ½~2)	304	
26	Body Gasket		TFM1600/316 Spiral Wound+Graphite*	
27	Bolting		A320-B8	
28	Bolt Nut		A194-8	
29	Washer		304	
30	Pipe Handle	(NPS: 2½~6)	A53+PLATED Zn	
31	Handle Adapter	(NPS: 2½~6)	CF8	
32	Set Screwed	(NPS: 2½~6)	A2-70	
33	Bolting	(NPS: 2½~6)	A2-70	
34	Handle Sleeve	(NPS: 2½~6)	VINYL PLASTIC	
35	Handle Washer	(NPS: 2½~6)	304	
36	Stop Nut	(NPS: 2½~6)	A2-70	

*Materials for KV-D61/D62 Series(Fire Safe Models)

ASME Class 150 KV-D41/KV-D61

Unit:mm

NPS	d	L	R	C	D	f	T	N	h	W	H	H1	ISO5211
½	15.0	108	35	60.3	90	2	8.0	4	16.0	137	180	228	F04
¾	20.0	117	43	69.9	100	2	8.9	4	16.0	137	183	231	F04
1	25.0	127	51	79.4	110	2	9.6	4	16.0	172	192	241	F05
1¼	32.0	140	64	88.9	115	2	11.2	4	16.0	172	196	245	F05
1½	38.0	165	73	98.4	125	2	12.7	4	16.0	202	233	276	F07
2	50.0	178	92	120.7	150	2	14.3	4	19.0	202	243	286	F07
2½	63.5	190	105	139.7	180	2	15.9	4	19.0	400	300	371	F10
3	76.0	203	127	152.4	190	2	17.5	4	19.0	400	310	381	F10
4	100.0	229	157	190.5	230	2	22.3	8	19.0	400	332	403	F10
5	125.0	356	186	215.9	255	2	22.3	8	22.3	800	388	468	F12
6	150.0	394	216	241.3	280	2	23.9	8	22.3	800	408	488	F12

ASME Class 300 KV-D42/KV-D62

Unit:mm

NPS	d	L	R	C	D	f	T	N	h	W	H	H1	ISO5211
½	15.0	140	35	66.7	95	2	12.7	4	16.0	137	180	228	F04
¾	20.0	152	43	82.6	115	2	14.3	4	19.0	137	183	231	F04
1	25.0	165	51	88.9	125	2	15.9	4	19.0	172	192	241	F05
1¼	32.0	178	64	98.4	135	2	17.5	4	19.0	172	196	245	F05
1½	38.0	190	73	114.3	155	2	19.1	4	22.3	202	233	276	F07
2	50.0	216	92	127.0	165	2	20.7	8	19.0	202	243	286	F07
2½	63.5	241	105	149.2	190	2	23.9	8	22.3	400	300	371	F10
3	76.0	282	127	168.3	210	2	27.0	8	22.3	400	310	381	F10
4	100.0	305	157	200.0	255	2	30.2	8	22.3	400	332	403	F10
5	125.0	381	186	235.0	280	2	33.4	8	22.3	800	388	468	F12
6	150.0	403	216	269.9	320	2	35.0	12	22.3	800	408	488	F12

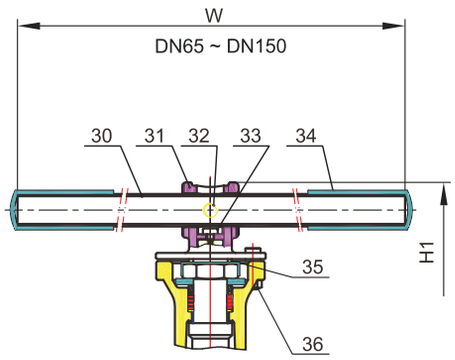
Kingdom
FLOW CONTROL CO., LTD.

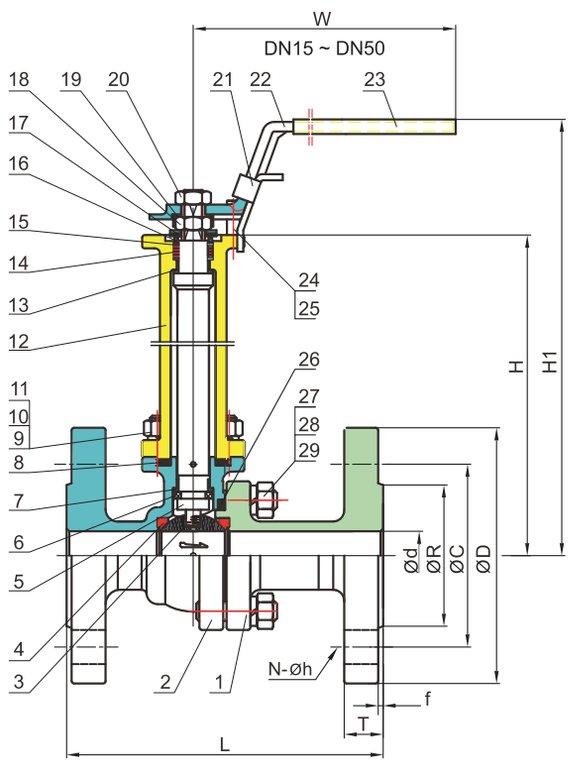
Low Temperature Ball Valve, EN
2-PC Body, Flanged Ends, Full Port

KV-D4K PN16 / KV-D4N PN40 Standard Type
KV-D6K PN16 / KV-D6N PN40 FireSafe Type

Applicable Standards:

- Design : EN 12516
- Face to Face : EN 558
- Flange Ends : EN 1092-1
- Wall Thickness : EN 12516-2
- Inspection & Testing : EN 12266-1 BS 6364
- Temperature : -100°C ≤ T ≤ +150°C





No.	PARTS NAME	MATERIALS	
1	End Cap	1.4408	1.4308
2	Body	1.4408	1.4308
3	Ball	316	304
4	Ball Seat	TFM1600	
5	Stem(Anti-Static Device)	316	304
6	Split Ring	316	304
7	L-stem Sleeve	TFM1600+25%GF	
8	Extended Bonnet Gasket	TFM1600/316 Spiral Wound+Graphite*	
9	Bolting	A2-70	
10	Bolt Nut	A2-70	
11	Washer	304	
12	Extended Bonnet	1.4408	1.4308
13	L-Stem Sleeve	TFM1600+25%GF	
14	Packing	TFM1600/ Graphite*	
15	Bushing	304	
16	Gland	316	
17	Belleville Washer	301	
18	Stem Nut	A194-8	
19	Stop-lock-cap	304	
20	Handle Nut (DN15~DN50)	A194-8	
21	Lock Device (DN15~DN50)	304	
22	Handle (DN15~DN50)	304	
23	Handle Sleeve (DN15~DN50)	Vinyl Plastic	
24	Stop Bolt (DN15~DN150)	A2-70	
25	Stop Washer (DN15~DN50)	304	
26	Body Gasket	TFM1600/316 Spiral Wound+Graphite*	
27	Bolting	A2-70	
28	Bolt Nut	A2-70	
29	Washer	304	
30	Pipe Handle (DN65~DN150)	A53+PLATED Zn	
31	Handle Adapter (DN65~DN150)	CF8	
32	Set Screwed (DN65~DN150)	A2-70	
33	Bolting (DN65~DN150)	A2-70	
34	Handle Sleeve (DN65~DN150)	VINYL PLASTIC	
35	Handle Washer (DN65~DN150)	304	
36	Stop Nut (DN65~DN150)	A2-70	

*Materials for KV-D6K/D6N Series(Fire Safe Models)

EN PN16 / 40

Unit:mm

DN	PN	d	L	R	C	D	f	T	N	h	W	H	H1	ISO5211
15	16	15.0	130	45	65	95	2	16	4	14	135	180	228	F04
20		20.0	130	58	75	105	2	18	4	14	135	183	231	F04
25		25.0	140	68	85	115	3	18	4	14	170	192	241	F05
32	40	32.0	165	78	100	140	3	18	4	18	170	196	245	F05
40		38.0	165	88	110	150	3	18	4	18	200	233	276	F07
50		50.0	203	102	125	165	3	20	4	18	200	243	286	F07
65	16	63.5	222	122	145	185	3	18	4 (a)	18	400	300	371	F10
	40							22	8					
80	16	76.0	241	138	160	200	3	20	8	18	400	310	381	F10
	40							24						
100	16	100.0	305	158	180	220	3	20	8	18	400	332	403	F10
	40			162	190	235		24		22				
125	16	125.0	356	188	210	250	3	22	8	18	800	388	468	F12
	40		381		220	270		26		26				
150	16	150.0	394	212	240	285	3	22	8	22	800	408	488	F12
	40		403	218	250	300		28		26				

KV-D4K, KV-D6K – PN16 **KV-D4N, KV-D6N** – PN40

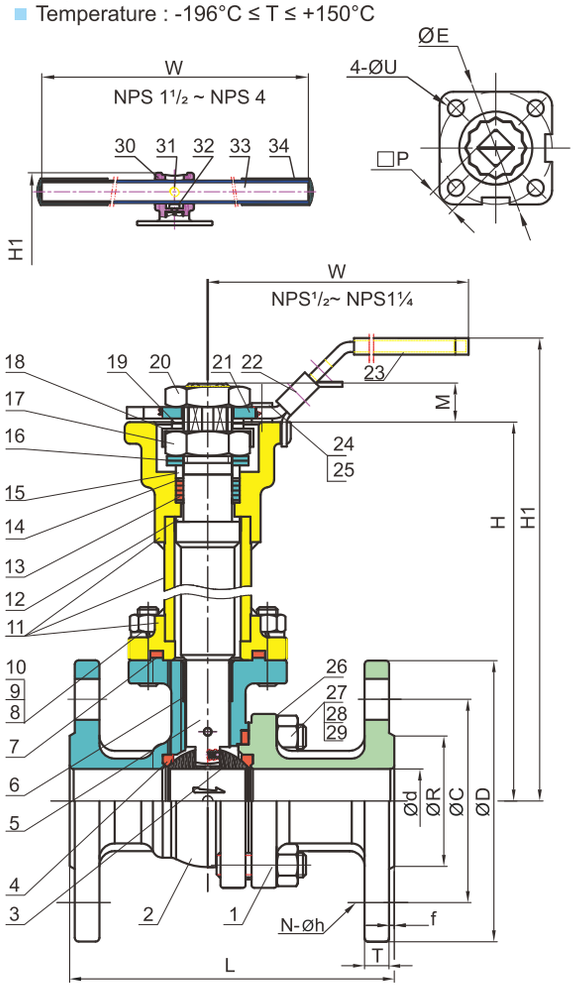
(a):4 holes is factory standard for DN65 PN16 valve and 8 holes is optional.

Kingdom
FLOW CONTROL CO., LTD.

Cryogenic Ball Valve, ASME
2-PC Body, Flanged Ends, Full Port
KV-C41 Class 150 / KV-C42 Class 300

Applicable Standards:

- Design : ASME B16.34, BS 6364
- Face to Face : ASME B16.10
- Flange Ends : ASME B16.5
- Wall Thickness : ASME B16.34
- Inspection & Testing : API 598, BS 6364
- Temperature : -196°C ≤ T ≤ +150°C



No.	PARTS NAME	MATERIALS	
1	End Cap	CF8M	CF8
2	Body	CF8M	CF8
3	Ball	316	304
4	Ball Seat	PCTFE	
5	Stem(Anti-Static Device)	316	304
6	Stem Sleeve	50%SS+50%PTFE	
7	Extended Bonnet Gasket	316 Spiral Wound+Graphite	
8	Bolting	A2-70	
9	Bolt Nut	A2-70	
10	Washer	304	
11	Extended Bonnet	CF8M	CF8
12	L-Stem Sleeve	50%SS+50%PTFE	
13	Packing	Graphite	
14	Bushing	304	
15	Gland	316	
16	Belleville Washer	301	
17	Stem Nut	A194-8	
18	Stop-lock-cap	304	
19	Handle Washer	304	
20	Handle Nut (NPS: 1/2~1 1/4)	A194-8	
21	Handle (NPS: 1/2~1 1/4)	304	
22	Lock Device (NPS: 1/2~1 1/4)	304	
23	Handle Sleeve (NPS: 1/2~1 1/4)	Vinyl Plastic	
24	Stop Bolt	A2-70	
25	Stop Nut	A2-70	
26	Body Gasket	316 Spiral Wound+Graphite	
27	Bolting	A320-B8	
28	Bolt Nut	A194-8	
29	Washer	304	
30	Handle Adapter (NPS: 1½~4)	CF8	
31	Set Screwed (NPS: 1½~4)	A2-70	
32	Bolting (NPS: 1½~4)	A2-70	
33	Pipe Handle (NPS: 1½~4)	A53+PLATED Zn	
34	Handle Sleeve (NPS: 1½~4)	VINYL PLASTIC	

ASME Class 150 DIMENSION TABLE KV-C41

Unit:mm

NPS	d	L	R	D	C	T	f	N	h	W	H	H1	P	M	E	U	ISO5211
½	15	108	35.0	90	60.3	8.0	2	4	16.0	177	290	322	11	11	50	7	F05
¾	20	117	43.0	100	69.9	8.9	2	4	16.0	177	293	325	11	11	50	7	F05
1	25	127	51.0	110	79.4	9.6	2	4	16.0	197	320	350	14	14	50 70	7 9	F05~F07
1¼	32	140	63.5	115	88.9	11.2	2	4	16.0	197	323	355	14	14	50 70	7 9	F05~F07
1½	38	165	73.2	125	98.4	12.7	2	4	16.0	300	365	429	17	17	102	11	F10
2	50	178	92.0	150	120.7	14.3	2	4	19.0	300	372	436	17	17	102	11	F10
2½	63	190	104.7	180	139.7	15.9	2	4	19.0	400	457	528	22	22	102	11	F10
3	76	203	127.0	190	152.4	17.5	2	4	19.0	400	465	536	22	22	102	11	F10
4	100	229	157.0	230	190.5	22.3	2	8	19.0	600	580	660	27	27	125	14	F12

ASME Class 300 DIMENSION TABLE KV-C42

Unit:mm

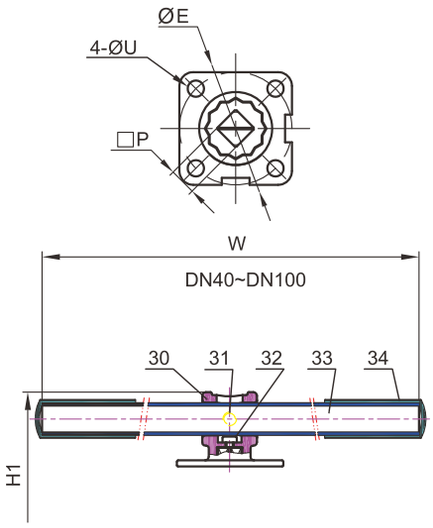
NPS	d	L	R	D	C	T	f	N	h	H	H1	W	P	M	E	U	ISO5211
½	15	140	35	95	66.7	12.7	2	4	16.0	290	322	177	11	11	50	7	F05
¾	20	152	43	115	82.6	14.3	2	4	16.0	293	325	177	11	11	50	7	F05
1	25	165	51	125	88.9	15.9	2	4	22.3	318	350	197	14	14	50 70	7 9	F05~F07
1¼	32	178	63.5	135	98.4	17.5	2	4	22.3	323	355	197	14	14	50 70	7 9	F05~F07
1½	38	190	73.2	155	114.3	19.1	2	4	22.3	365	429	300	17	17	102	11	F10
2	50	216	92	165	127.0	20.7	2	8	19.0	372	436	300	17	17	102	11	F10
2½	63	241	105	190	149.2	23.9	2	8	22.3	457	528	400	22	22	102	11	F10
3	76	283	127	210	168.3	27.0	2	8	22.3	465	536	400	22	22	102	11	F10
4	100	305	157	255	200.0	30.2	2	8	22.3	580	660	600	27	27	125	14	F12

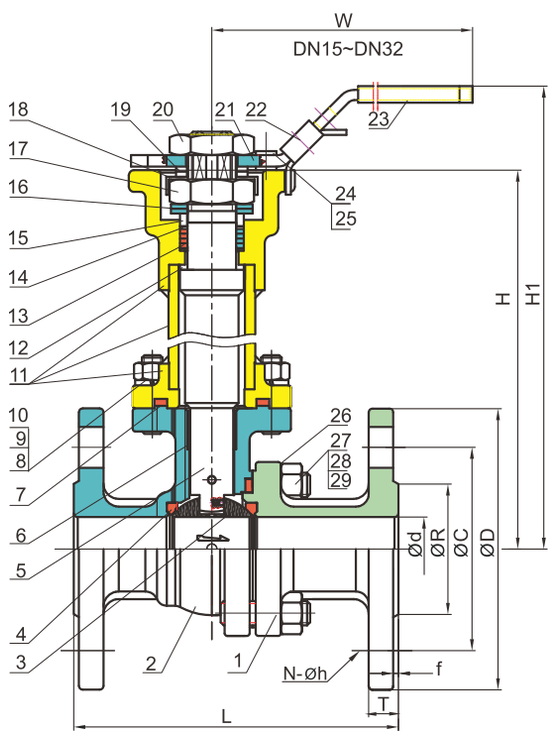
Kingdom
FLOW CONTROL CO., LTD.

Cryogenic Ball Valve, EN
2-PC Body, Flanged Ends, Full Port
KV-C4K PN16 / KV-C4N PN40

Applicable Standards:

- Design : EN 12516, BS 6364
- Face to Face : EN 558
- Flange Ends : EN 1092-1
- Wall Thickness : EN 12516
- Inspection & Testing : EN 12266-1, BS 6364
- Temperature : -196°C ≤ T ≤ +150°C





No.	PARTS NAME	MATERIALS	
1	End Cap	1.4408	1.4308
2	Body	1.4408	1.4308
3	Ball	316	304
4	Ball Seat	PCTFE	
5	Stem(Anti-Static Device)	316	304
6	Stem Sleeve	50%SS+50%PTFE	
7	Extended Bonnet Gasket	316 Spiral Wound+Graphite	
8	Bolting	A2-70	
9	Bolt Nut	A2-70	
10	Washer	304	
11	Extended Bonnet	1.4408	1.4308
12	L-Stem Sleeve	50%SS+50%PTFE	
13	Packing	Graphite	
14	Bushing	304	
15	Gland	316	
16	Belleville Washer	301	
17	Stem Nut	A194-8	
18	Stop-lock-cap	304	
19	Handle Washer	304	
20	Handle Nut (DN15~DN32)	A194-8	
21	Handle(DN15~DN32)	304	
22	Lock Device (DN15~DN32)	304	
23	Handle Sleeve (DN15~DN32)	Vinyl Plastic	
24	Stop Bolt	A2-70	
25	Stop Nut	A2-70	
26	Body Gasket	316 Spiral Wound+Graphite	
27	Bolting	A2-70	
28	Bolt Nut	A2-70	
29	Washer	304	
30	Handle Adapter (DN40~DN100)	CF8	
31	Set Screwed (DN40~DN100)	A2-70	
32	Bolting (DN40~DN100)	A2-70	
33	Pipe Handle (DN40~DN100)	A53+PLATED Zn	
34	Handle Sleeve (DN40~DN100)	VINYL PLASTIC	

EN PN 16 / 40 DIMENSION TABLE — KV-C4K / KV-C4N

Unit:mm

DN	PN	d	L	R	C	D	f	T	N	h	H	H1	W	P	M	E	U	ISO5211
15	16	15	130	45	65	95	2	16	4	14	290	322	177	11	11	50	7	F05
20	16	20	130	58	75	105	2	18	4	14	293	323	177	11	11	50	7	F05
25	16	25	140	68	85	115	2	18	4	14	318	350	197	14	14	50 70	7 9	F05~F07
32	40	32	165	78	100	140	2	18	4	18	323	355	197	14	14	50 70	7 9	F05~F07
40	40	38	165	88	110	150	3	18	4	18	365	429	300	17	17	102	11	F10
50	40	50	203	102	125	165	3	20	4	18	372	436	300	17	17	102	11	F10
65	16	63.5	222	122	145	185	3	20	4 (a)	18	457	528	400	22	22	102	11	F10
	40							22	8									
80	16	76	241	138	160	200	3	20	8	18	465	536	400	22	22	102	11	F10
	40							24										
100	16	100	305	158	180	220	3	20	8	18	580	660	600	27	27	125	14	F12
	40				190	235		24		22								

KV-C4K — PN16 KV-C4N — PN40

(a):4 holes is factory standard for DN65 PN16 valve and 8 holes is optional.

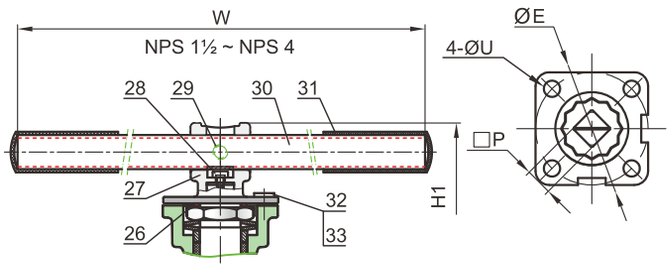
Kingdom
FLOW CONTROL CO., LTD.

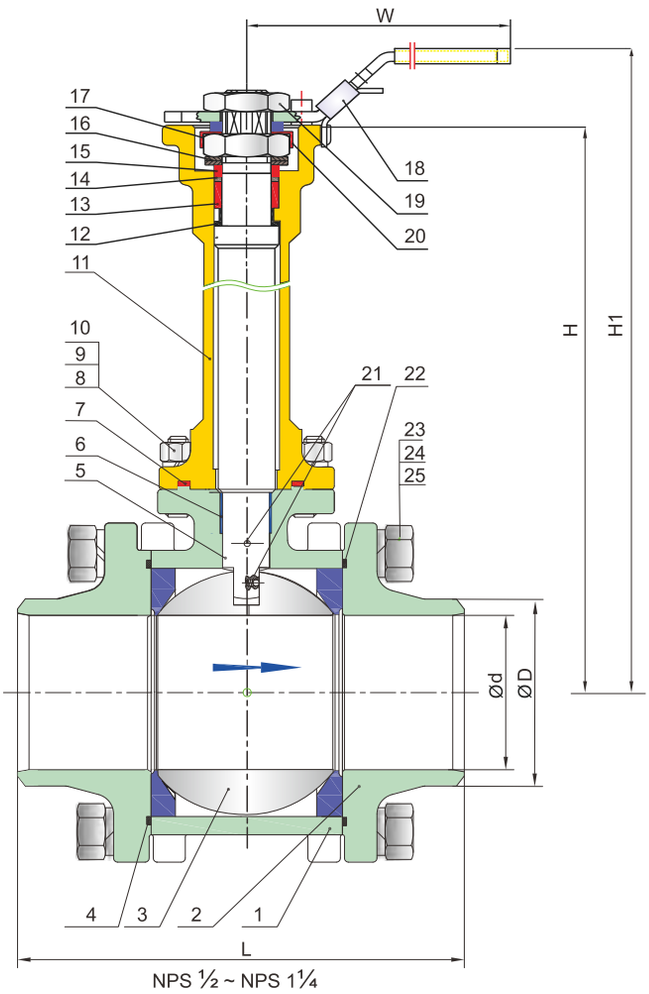
3-PC Body, 1000PSI, Welding Ends, Full Port

KV-C31 Cryogentic ball valve
KV-D31 Low Temperature ball valve

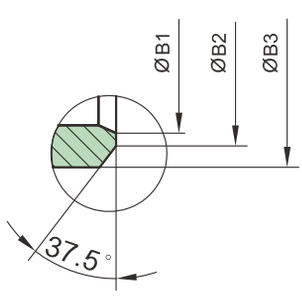
Applicable Standards:

- Design : ASME B16.34, BS 6364
- Face to Face : DIN 3202 S13
- Welding Ends : ASME B16.25
- Wall Thickness : ASME B16.34
- Inspection & Testing : API 598, BS 6364
- Temperature : -196°C ≤ T ≤ +150°C (KV-C31)
  -100°C ≤ T ≤ +150°C (KV-D31)





No.	Parts Name	Material	
1	Body	CF8M	CF8
2	Cap	CF3M	CF8
3	Ball	316	304
4	Ball Seats	PCTFE (KV-C31)	
		TFM1600 (KV-D31)	
5	Stem	F316	F304
6	Stem Sleeve	50%SS+50%PTFE	
7	Extended Bonnet Gasket	316 Spiral Wound+Graphite	
8	Bolt	A320-B8	
9	Nut	A194-8	
10	Bushing	304	
11	Extention Bonnet	CF8M	CF8
12	Sleeve	50%SS+50%PTFE	
13	Packing	Graphite	
14	Bushing	304	
15	Gland	316	304
16	Belleville Washer	301	
17	Stem Nut	A194-8	
18	Handle (NPS: ½ ~ 1¼)	304	
19	Handle Nut (NPS: ½ ~ 1¼)	A194-8	
20	Handle Washer	304	
21	Anti-Static Device	304	
22	Body Gasket	316 Spiral Wound+Graphite	
23	Bolt	A320-B8	
24	Nut	A194-8	
25	Washer	304	
26	Stop-lock Cap	304	
27	Handle Adaptor (NPS: 1½ ~ 4)	CF8	
28	Bolting (NPS: 1½ ~ 4)	A2-70	
29	Set Screwed (NPS: 1½ ~ 4)	A2-70	
30	Pipe Handle (NPS: 1½ ~ 4)	A53+Zn Plated	
31	Handle Sleeve (NPS: 1½ ~ 4)	VINYL PLASTIC	
32	Stop Nut	A2-70	
33	Stop Bolt	A2-70	



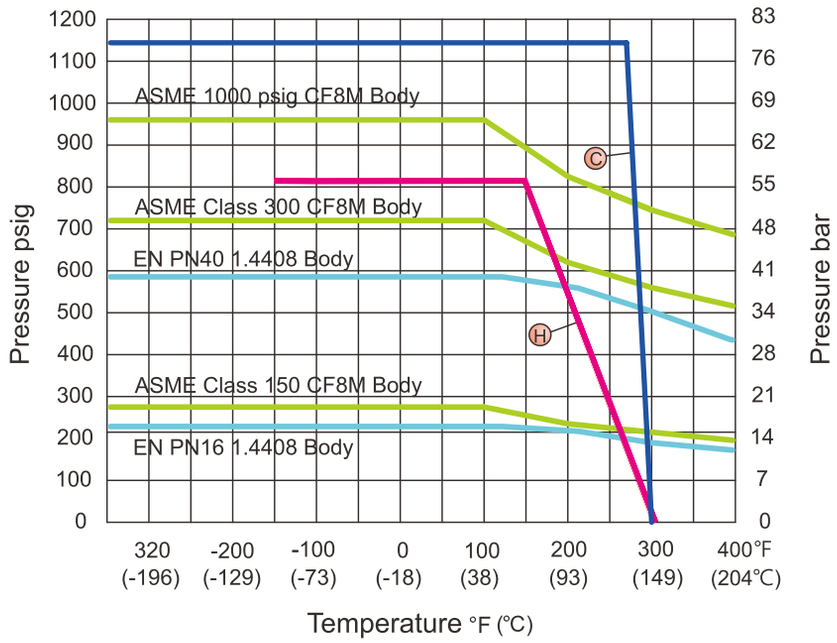
ANSI 1000WOG DIMENSION TABLE KV-C31/KV-D31

Unit: mm

NPS	d	L	B1	B2	B3	H	H1	W	M	P	E	U	ISO5211
½	15	140	15	18	23	45	320	175	11	11	50	7	F05
¾	20	152	20	23	28	48	323	175	11	11	50	7	F05
1	25	165	26.7	29	34	56	350	190	14	14	50 / 70	7 / 9	F05~F07
1¼	32	178	35.1	37.3	43	60	355	190	14	14	50 / 70	7 / 9	F05~F07
1½	38	190	40.9	43	50	65	428	300	17	17	102	11	F10
2	50	216	52.5	54.5	63	72	435	300	17	17	102	11	F10
2½	63.5	190	62.7	66.7	78	92	526	400	22	22	102	11	F10
3	76	220	78.0	82.0	92	100	534	400	22	22	102	11	F10
4	100	270	102.4	106.4	115	130	660	600	27	27	125	14	F12

Pressure-Temperature Data

The pressure-temperature data of ball valves is determined not only by valve shell materials but also by sealing materials used for ball seats, gland packings and flange gaskets.



Seat Materials: Ⓗ TFM1600: Low Temperature Ball Valve Ⓒ PCTFE: Cryogenic Ball Valve

Torque Figure

Unit: Nm

NPS / Seat Material	1/2	3/4	1	11/4	11/2	2	21/2	3	4	5	6	8
TFM1600	7	9	15	20	30	45	70	110	170	300	450	600
PCTFE	15	20	30	40	55	80	120	200	300	400	600	1000

Remarks:
Please consult with KI for any further information.

Kingdom FLOW CONTROL CO., LTD.

Headquarters (International Dept.)
14F-4, 120, Jhongjheng 1st Rd., Kaohsiung 80284, Taiwan
Tel: +886-7-7713121 Fax: +886-7-7235165
E-mail: sales@kifc.com

Zhongshan Factory
23-1, Nan-hou West Rd., Nan-tou Zhongshan City, Guangdong 528427, China
Tel: +86-760-23132179 23116839 Fax: +86-760-23110582

Fujian Factory
Hengshan Industrial Park, Huangtian Town,
Gutian County, Fujian 352251, China
Tel: +86-593-3761598 Fax: +86-593-3762688

www.kifc.com

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