

KTM LOW TEMPERATURE AND CRYOGENIC BALL VALVES

FLOATING AND TRUNNION TYPE

KTM ball valves have been widely used in low temperature and cryogenic applications, including LNG (Liquefied Natural Gas) which is fast becoming a better alternative source of energy



FEATURES

- Two types of extension bonnet lengths available to optimize the location of the gland packing at ambient temperature thus preventing freeze-damage by low temperature fluid
- Cavity pressure self relief construction
- Excellent seat and seal design minimizes leakage
- Low operating torque for smooth operations
- Fire safe design available for flammable applications
- Fugitive emissions control for flammable and non-flammable applications
- Rigid body construction to minimize thermal shrinkage

GENERAL APPLICATIONS

Propane, Ethane, Ethylene, Methane, Liquefied Natural Gas (LNG), Oxygen, Nitrogen

Options

- Special tests
 - X-ray (RT)
 - Liquid penetrant test (PT)
 - Positive material inspection (PMI)
 - Low temperature pressure test

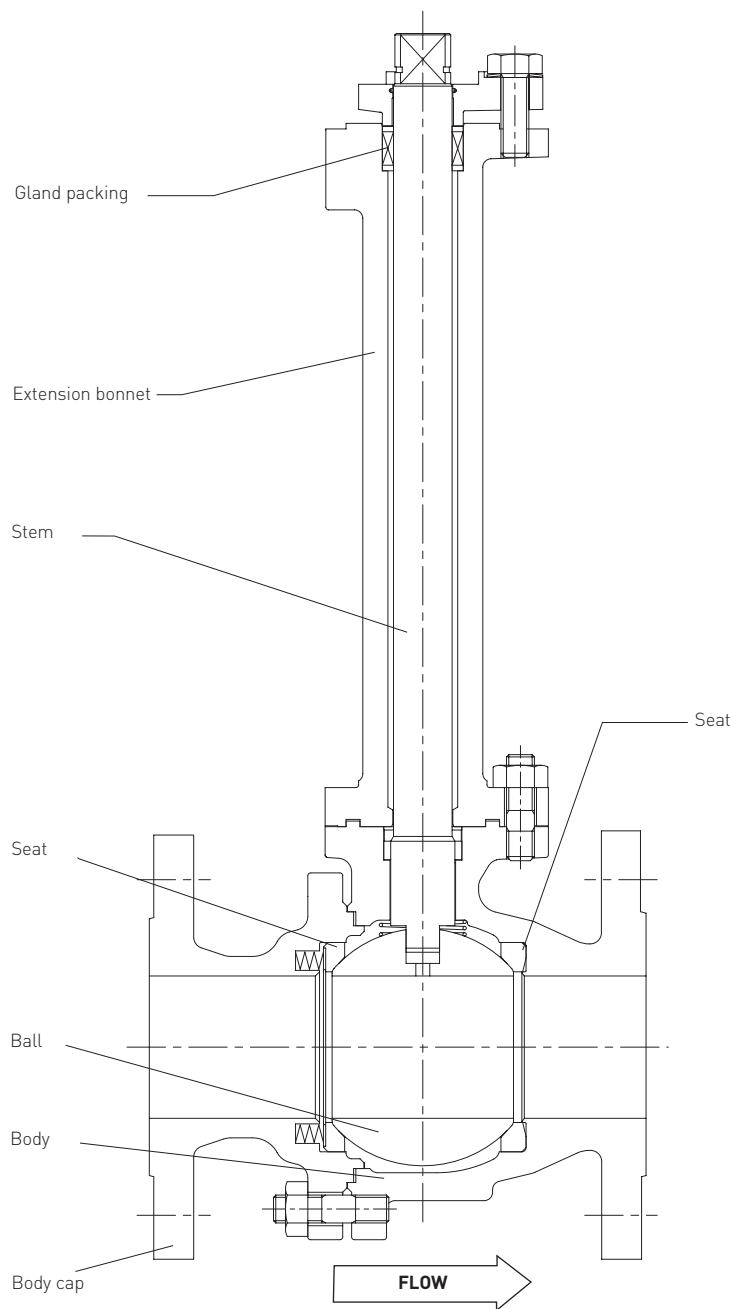
TECHNICAL DATA

Models:	Series EB and Series E0 (with extension bonnet)
Sizes:	DN 15 to 750 (NPS ½ to 30)
Pressure rating:	JIS 10K, 20K / ASME Class 150, 300 and 600 (JPI available)
Temperature:	Room temperature to -196°C (DN 15 - 300 / NPS ½ - 12) -46°C (DN 15 - 750 / NPS ½ - 30)
Design:	ASME B 16.34, JPI-7S-48
Face to face:	JIS B2002, ASME B16.10, JPI-7S-67
End connection:	JIS B2220, ASME B16.5, JPI-7S-15
Testing:	JIS B2003, ASME B16.34, JPI-7S-39*, API 6D*, MSS-SP61*
Quality assurance:	ISO 9001 CE Marking (PED) 97/23/EC*, API6D*

*Available as option

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FLOATING TYPE BALL VALVES STRUCTURE (LONG BONNET)



ASME CLASS 150, 300, JIS 10K, 20K

Sizes: DN 15 to 200 (NPS ½ to 8)

ASME CLASS 600

Sizes: DN15 to 40 (NPS ½ to 1½)

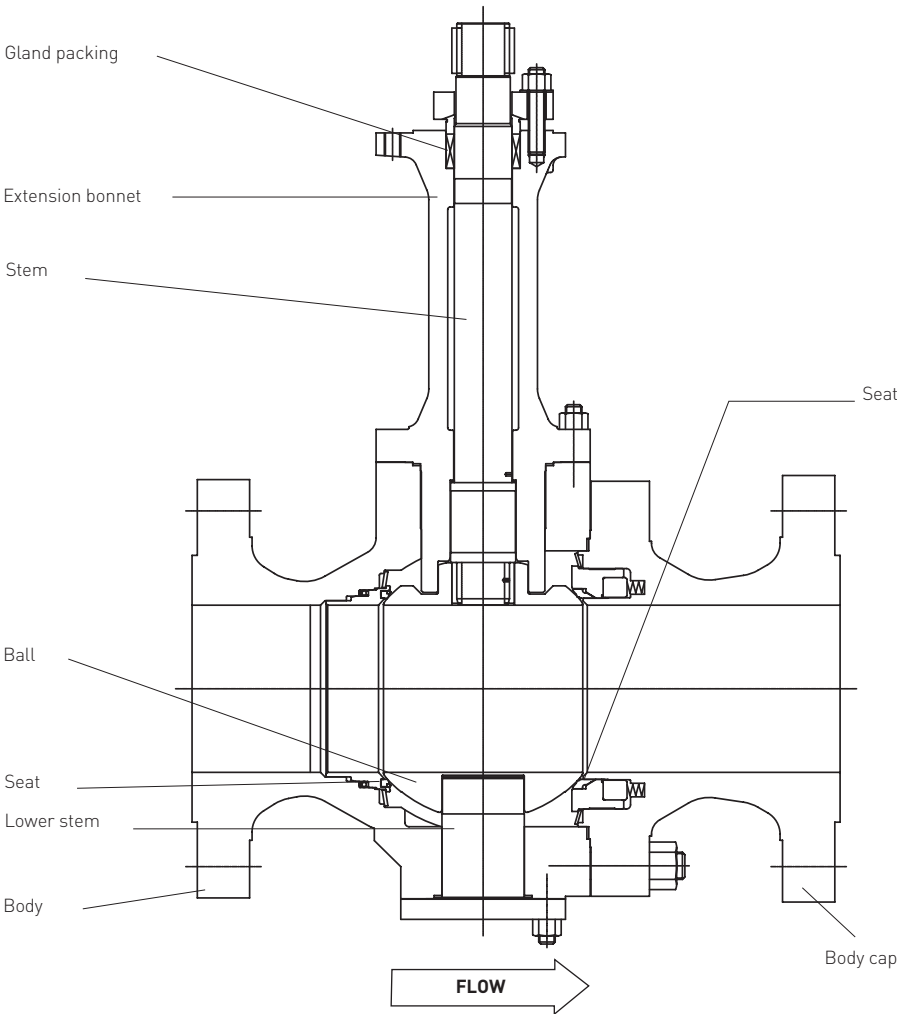
PARTS LIST (FLOATING TYPE)

No. Parts name		Body material						
		Carbon steel				Stainless steel		
		Material code						
		50-1T / 50-1E	55-1T / 55-1E	50-5E	55-5E	31-1T / 31-1E	31-5T / 31-5E	32-1T / 32-1E
1	Body	LCB [SCPL1]	LCC	LCB [SCPL1]	LCC	CF8 [SCS13A]		CF8M [SCS14A]
2	Body cap	LCB [SCPL1]	LCC	LCB [SCPL1]	LCC	CF8 [SCS13A]		CF8M [SCS14A]
3	Ball	CF8 [SCS13A]		CF8M [SCS14A]		CF8 [SCS13A]	CF8M [SCS14A]	
4	Stem	304SS [SUS304]		316SS [SUS316]		304SS [SUS304]	316SS [SUS316]	
5	Seat	PTFE or PTFE / PFA copolymer		PTFE / PFA copolymer		PTFE or PTFE / PFA copolymer		
6	Gland packing	PTFE or graphite				PTFE or graphite		

• Materials in parentheses indicate equivalent JIS material

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TRUNNION TYPE BALL VALVE STRUCTURE (SHORT BONNET)



ASME CLASS 150, 300, JIS 10K, 20K
Sizes: DN 150 to 300 (NPS 6 to 12)
ASME CLASS 600
Sizes: DN 50 to 300 (NPS 2 to 12)

PARTS LIST (TRUNNION TYPE)

No. Parts name		Body material						
		Carbon steel				Stainless steel		
		Material code						
		50-1H	55-1H	50-5H	55-5H	31-1H	31-5H	32-1H
1	Body	LCB (SCPL1)	LCC	LCB (SCPL1)	LCC	CF8 (SCS13A)		CF8M (SCS14A)
2	Body cap	LCB (SCPL1)	LCC	LCB (SCPL1)	LCC	CF8 (SCS13A)		CF8M (SCS14A)
3	Ball	CF8 (SCS13A)		CF8M (SCS14A)		CF8 (SCS13A)	CF8M (SCS14A)	
4	Stem / Lower stem	304SS (SUS304)		316SS (SUS316)		304SS (SUS304)	316SS (SUS316)	
5	Seat	RPTFE				RPTFE		
6	Gland packing	PTFE or graphite				PTFE or graphite		

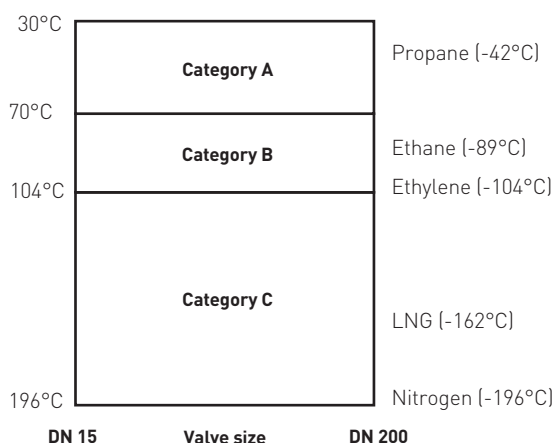
• Materials in parentheses indicate equivalent JIS material

KTM LOW TEMPERATURE AND CRYOGENIC BALL VALVES

FLOATING AND TRUNNION TYPE

PRESSURE - TEMPERATURE CLASSIFICATION (FLOATING TYPE)

Category	Min fluid temperature (°C)	Valve size DN (NPS)	Pressure rating	Extension bonnet code (refer to page 8)	Seat	Maximum allowable seat leakage ^[1] at cryogenic temperatures (Scc / min / inch ^[2])	Flow direction
A	-30 to -50	15 to 200 (½ to 8)	JIS 10K, 20K ASME Class 150, 300	E1	E	0	Bi- direction
A	-51 to -70	15 to 200 (½ to 8)	JIS 10K, 20K ASME Class 150, 300	E2	E	0	Bi- direction
B	-71 to -104	15 to 200 (½ to 8)	JIS 10K, 20K ASME Class 150, 300	E3	E (with spring at upstream side)	25 ^[3]	Uni- direction
C	-105 to -196	15 to 200 (½ to 8)	JIS 10K, 20K ASME Class 150, 300	E5	T (with spring at upstream side)	50 ^[4]	Uni- direction

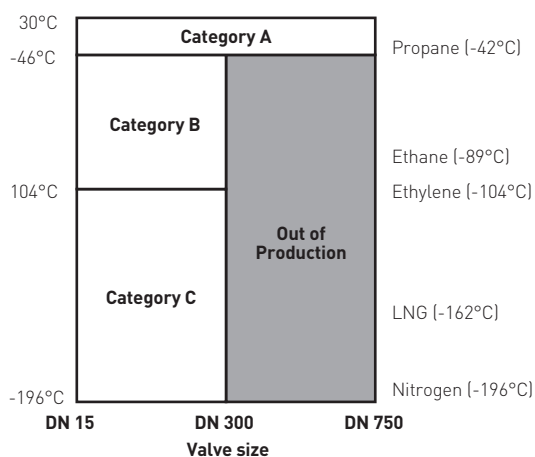


NOTES

- Under test pressure of 1.0 MPa by Nitrogen or Helium gas
- Leakage (cc) per valve size (inch) under room temperature at 1 atm for 1 minute
Example: Category B, Valve size DN 100 (NPS 4), ASME Class 150
Max. allowable seat leakage = 25 cc / min / inch X 4" = 100 cc / minute
- 25 cc / min for sizes up to DN 25 (NPS 1)
- 50 cc / min for sizes up to DN 25 (NPS 1)

PRESSURE - TEMPERATURE CLASSIFICATION (TRUNNION TYPE)

Category	Min fluid temperature (°C)	Valve size DN NPS	Pressure rating	Extension bonnet code	Seat / Seal	Maximum allowable seat leakage ^[1] at cryogenic temperatures (Scc / min / inch ^[2])	Flow direction
A	-30 to -46	150 to 750 (6 to 30)	JIS10K, 20K ASME Class 150, 300	E1	RPTFE (H) / O-ring	5	Bi- direction
A	-30 to -46	15 to 750 ^[5] (½ to 30)	ASME Class 600	E1	RPTFE (H) / O-ring	5	Bi- direction
B	-47 to -104	150 to 300 (6 to 12)	JIS10K, 20K ASME Class 150, 300	E3	RPTFE / Special seal	25 ^[3]	Uni- direction
B	-47 to -104	15 to 300 ^[5] (½ to 12)	ASME Class 600	E3	RPTFE / Special seal	25 ^[3]	Uni- direction
C	-105 to -196	150 to 300 (6 to 12)	JIS10K, 20K ASME Class 150, 300	E5	RPTFE / Special seal	50 ^[4]	Uni- direction
C	-105 to -196	15 to 300 ^[5] (½ to 12)	ASME Class 600	E5	RPTFE / Special seal	50 ^[4]	Uni- direction



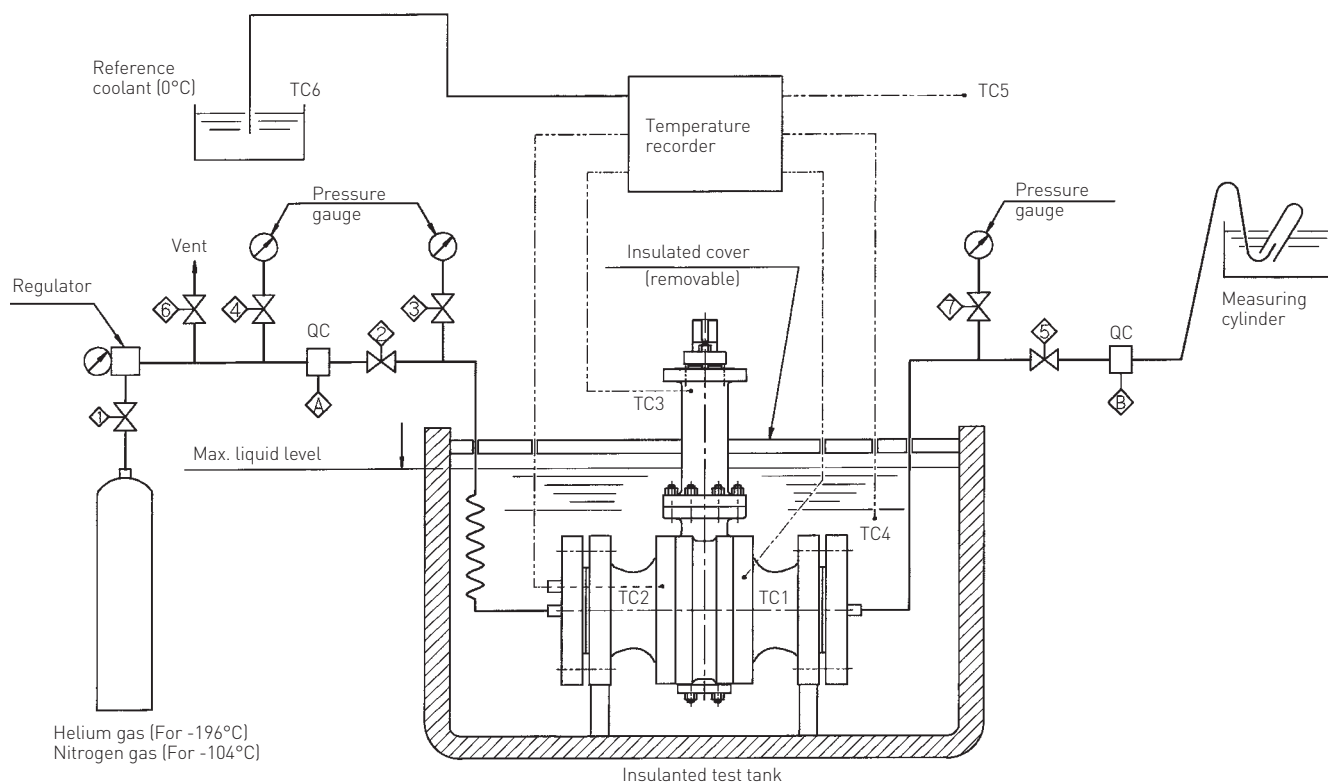
NOTES

- Under test pressure of 1.0 MPa by Nitrogen or Helium gas
- Leakage (cc) per valve size (inch) under room temperature at 1 atm for 1 minute
Example: Category C, Valve size DN 250 (NPS 10), ASME Class 150
Max. allowable seat leakage = 50 cc / min / inch X 10" = 500 cc / minute
- 25 cc / min for sizes up to DN 25 (NPS 1)
- 50 cc / min for sizes up to DN 25 (NPS 1)
- Floating type for sizes DN15 to 40 (½ to 1½)

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SCHEMATIC OF TEST-RIG ARRANGEMENT FOR LOW TEMPERATURE AND CRYOGENIC TYPE APPROVAL TEST

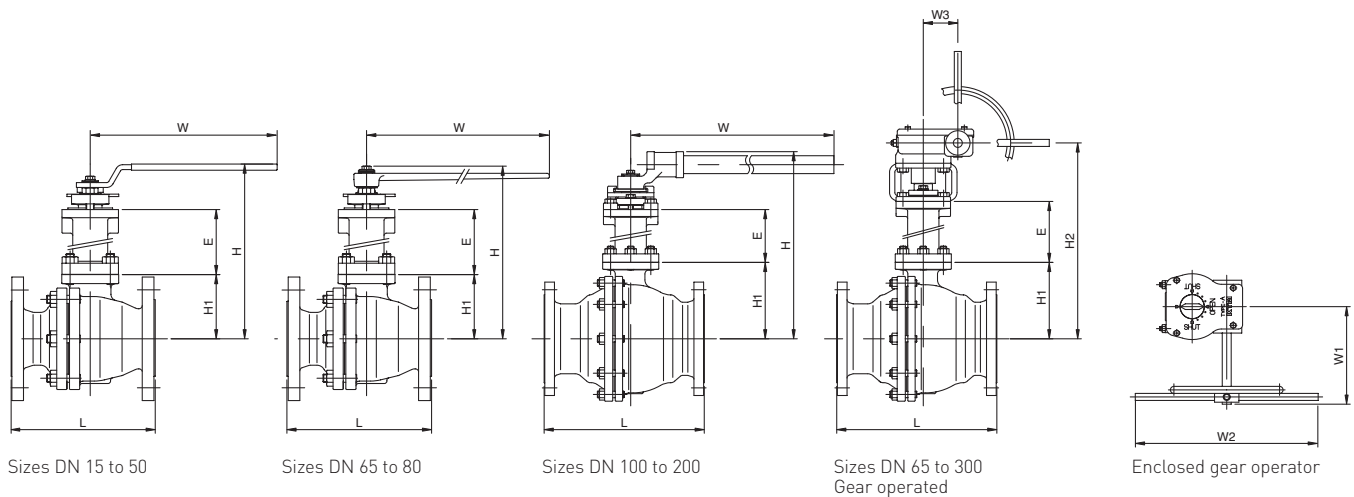


Thermocouples (Connections)

- TC1 Valve body (Outside)
- TC2 Closure member (Ball near)
- TC3 Bonnet (Stuffing box near)
- TC4 Coolant
- TC5 Room temperature
- TC6 Reference coolant (0°C)
- QC Quick coupling

KTM LOW TEMPERATURE AND CRYOGENIC BALL VALVES

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DIMENSION (mm) FOR EXTENSION BONNET (SHORT / LONG)

Valve size (DN)	Bore (d)	JIS10K/ ASME 150	JIS20K/ ASME 300	Extension bonnet												
		L	Short ⁽¹⁾				Long ⁽²⁾									
			H	Option code: E1			Option code: E2, E3, E5				W	W1	W2	W3	Type	
Floating																
15	13	108	140	181	37	-	100	281	37	-	200	130	-	-	-	-
20	19	117	152	185	41	-	100	285	41	-	200	130	-	-	-	-
25	25	127	165	198	49	-	100	298	49	-	200	160	-	-	-	-
40	38	165	190	250	69	-	125	375	69	-	250	230	-	-	-	-
50	51	178	216	260	79	-	125	385	79	-	250	230	-	-	-	-
65	64	190	241	315	104	386	150	465	104	536	300	400	180	300	55	FO
80	76	203	283	324	113	395	150	474	113	545	300	400	180	300	55	FO
100	102	229	305	390	138	420	150	540	138	570	300	715	180	300	55	FO
125	127	356	381	440	168	487	175	615	168	662	350	1140	240	450	85	FA
150	152	394	403	506	188	507	175	681	188	682	350	1140	240	450	85	FA
200	203	457	502	589	248	590	175	764	248	765	350	1510	350	600	115.5	B
Trunnion ⁽⁴⁾																
150	152	394	403	531	214	533	175	706	214	708	350	1140	240	450	85	FA
200	203	457	502	635	303	645	175	810	303	802	350	1510	350	600	115.5	B
250	254	533	568	-	338 / 330 ⁽³⁾	603 / 697 ⁽³⁾	200	-	-	-	-	-	350	600	115.5	B
250	254	533	568	-	338 / 330 ⁽³⁾	603 / 697 ⁽³⁾	200	-	330	923	400	-	420	800	171	C
300	305	610	648	-	392 / 390 ⁽³⁾	654 / 783 ⁽³⁾	200	-	390	983	400	-	420	800	171	C

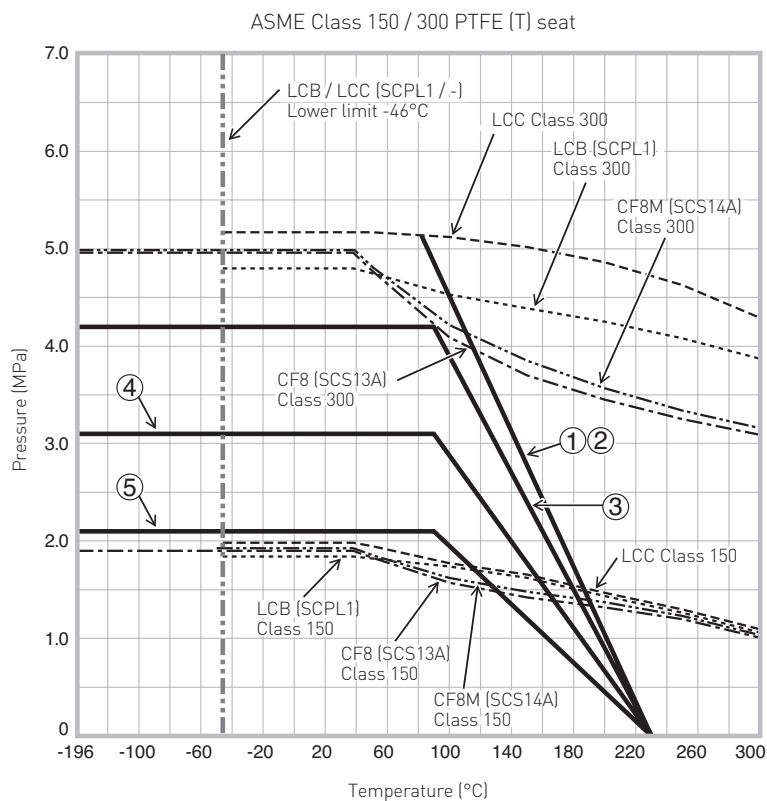
NOTES

- Short: DN 100 to 175 (NPS 4 to 7). Valve dimensions and sizes are in accordance with Shell MESC.
It is available for stainless steel body only.
- Long: DN 200 to 350 (8 to 14). Valve dimensions and sizes are in accordance with Shell MESC
- The values show for carbon steel / stainless steel
- Trunnion type for ASME Class 600 also available. Please consult for the details.

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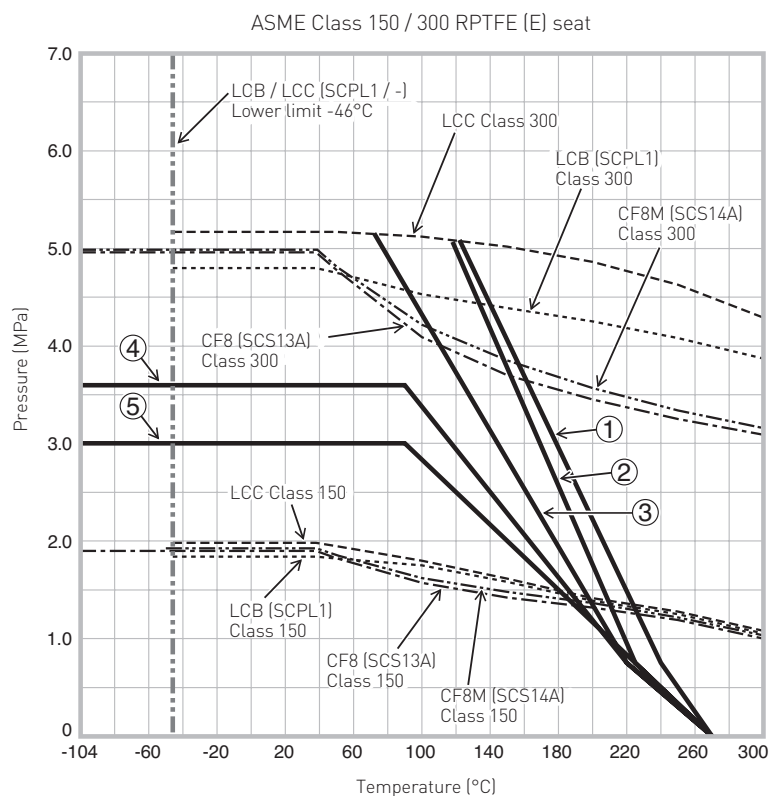
PRESSURE - TEMPERATURE RATING (FLOATING TYPE)



NOTE

- This chart shows Pressure-Temperature rating for floating type.
- For details of Trunnion type, please consult us.
- For size DN 250 (NPS 10) and larger of ASME Class 150, 300 (JIS 10K, 20K), please consult us.
- For ASME Class 600, please consult us.

- Solid line — indicate trim rating
 - ① Size DN 15, 20 (NPS ½, ¾)
 - ② Size DN 25 TO 65 (NPS 1 to 2 ½)
 - ③ Size DN 80, 100 (NPS 3, 4)
 - ④ Size DN 125, 150 (NPS 5, 6)
 - ⑤ Size DN 200 (NPS 8)
- Dashed lines indicate body ratings.
 - LCB (SCPL1)
 - LCC
 - CF8 (SCS13A)
 - CF8M (SCS14A)
- Materials in parentheses indicate equivalent JIS material. (BODY RATING: ASME B16.34-2004)



C_v FLOW COEFFICIENT

Valve size (DN)	C _v value
15	26
20	50
25	94
40	260
50	480
65	750
80	1300
100	2300
150	5400
200	10000
250	16000
300	24000

K_v FLOW COEFFICIENT

Valve size (NPS)	K _v value
½	22.49
¾	43.25
1	81.31
1½	224.90
2	415.20
2½	648.75
3	1124.50
4	1989.50
6	4671.00
8	8650.00
10	13840.00
12	20760.00

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KTM MODEL CODING SYSTEM

Example:			E1101																				-	-	31	1H	A15	SF	250	GG
Valve code	Class		Description																											
	ASME	JIS																												
EB11	150	10K	Full bore, Floating type DN 15 to 200 (NPS ½ to 8)																											
EB12	300	20K	Full bore, Floating type DN 15 to 200 (NPS ½ to 8)																											
E1101	150	10K	Full bore, Trunnion DN 250 to 750 (NPS 10 to 30)																											
E1102	300	20K	Full bore, Trunnion DN 250 to 750 (NPS 10 to 30)																											
E1108	600	-	Full bore, Floating type DN 15 to 40 (NPS ½ to 1½)																											
			Full bore, Trunnion type DN 50 to 750 (NPS 2 to 30)																											
Sub code	Description																													
Blank	Soft seat																													
Special features	Description																													
Blank	No special feature																													
E	Extension bonnet (For valve code EB)																													
Body code	Material																													
	JIS		ASTM																											
31	SCS13A (304SS)		CF8 (304SS)																											
32	SCS14A (316SS)		CF8M (316SS)																											
50	SCPL1		LCB																											
55	-		LCC																											
Trim code																														
See trim code table																														
Flange code																														
ASME	Description		JIS	Description																										
A15	ASME Class 150		J10	JIS 10K																										
A30	ASME Class 300		J20	JIS 20K																										
A60	ASME Class 600																													
(JPI also available)																														
Connection code	Description																													
Blank	Raised Face																													
SF	Smooth finish 125 to 250 AARH																													
Size code	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	550	600	650	700	750								
DN	15	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	550	600	650	700	750								
NPS	½	¾	1	1½	2	2½	3	4	5	6	8	10	12	14	16	18	20	22	24	26	28	30								
Option code	Description																													
Blank	No additional option																													
GG	Packing / Gasket-graphite																													
Extension bonnet	Floating		Trunnion																											
E1	-30°C to -50°C		-30°C to -46°C																											
E2	-51°C to -70°C		-																											
E3	-71°C to -104°C		-47°C to -104°C																											
E5	-105°C to -196°C		-105°C to -196°C																											

TRIM CODE

	Ball		Seat	Packing	Stem
	JIS	ASTM			
AY⁽¹⁾	SCS13A ⁽²⁾ or SCS14A ⁽³⁾	CF8 ⁽²⁾ or CF8M ⁽³⁾	PTFE	PTFE	304 ⁽²⁾ or 316 ⁽³⁾
5T⁽¹⁾ or ⁽²⁾	SCS14A	CF8M	PTFE	PTFE	316
1E	SCS13A ⁽²⁾ or SCS14A ⁽³⁾	CF8 ⁽²⁾ or CF8M ⁽³⁾	PTFE / PFA Copolymer or PTFE	PTFE	304 ⁽²⁾ or 316 ⁽³⁾
5E⁽⁴⁾	SCS14A	CF8M	PTFE / PFA Copolymer or PTFE	PTFE	316
1H	SCS13A ⁽²⁾ or SCS14A ⁽³⁾	CF8 ⁽²⁾ or CF8M ⁽³⁾	PTFE	PTFE	304 ⁽²⁾ or 316 ⁽³⁾
5H⁽⁴⁾	SCS14A	CF8M	PTFE	PTFE	316

- For extension bonnet code (E5) only
- For body code (31) only
- For body code (32) only
- For body code (31), (32) and (55) only

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