

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 & 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



Standards

Design : ASME B 16.34, B16.5
Face to face : JIS B2002, ASME B16.10
End connection : JIS B2220, ASME B16.5
Testing : JIS B2003, ASME B16.34,
API 598, API 6D
Quality assurance : ISO 9001
CE Marking (PED) 97 / 23 / EC

General applications

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

Options

Special tests
Liquid penetrant test (PT)
Positive material identification (PMI)
Radiography test (RT)
Low temperature pressure test

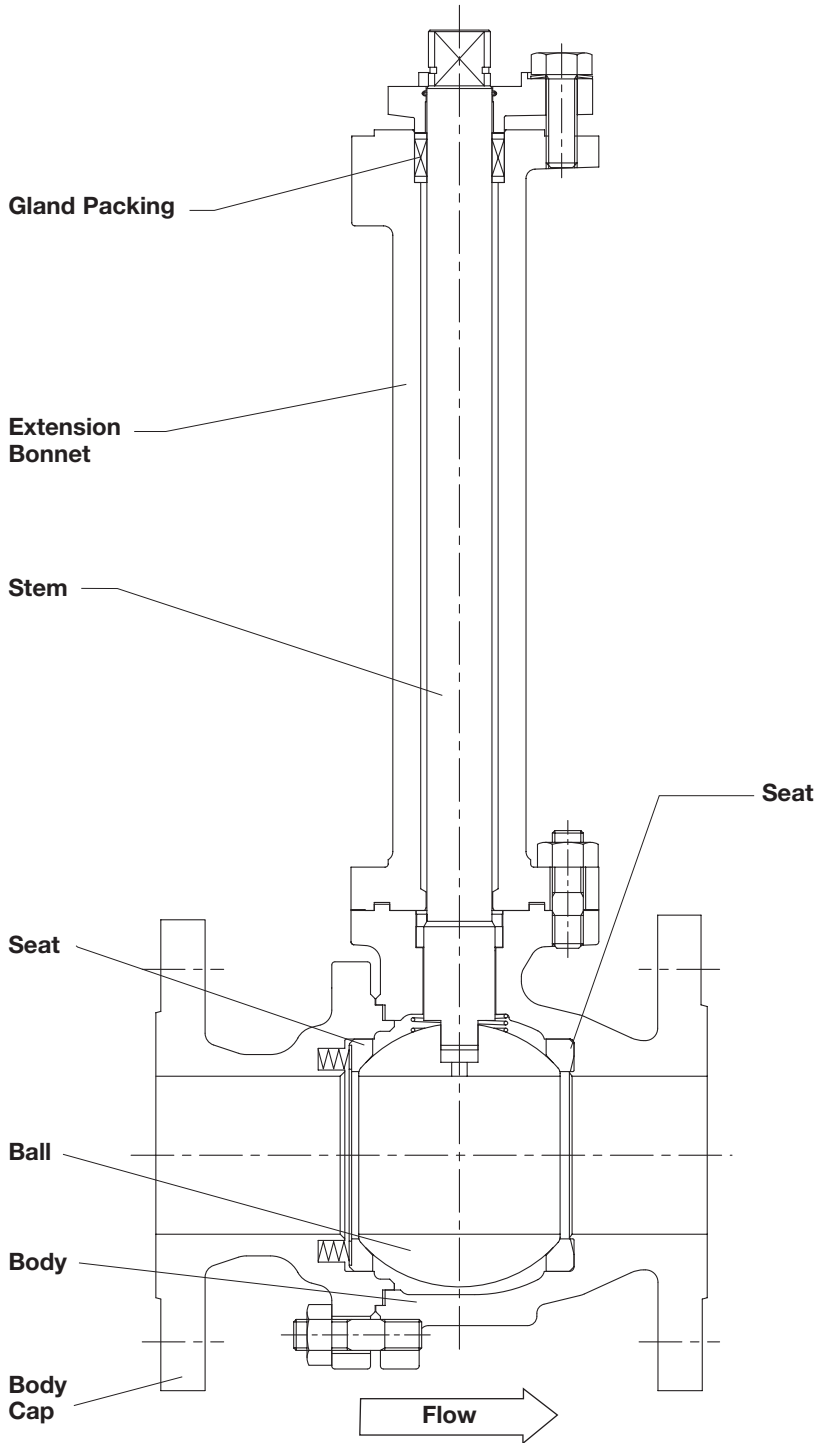
Technical Data

Model : EB11, EB12
E1101, E1102, E0108
(with extension bonnet)
Size : $\frac{1}{2}$ " to 30"
(15mm to 750mm)
Pressure rating : ASME Class 150, 300 and
600
JIS 10K, 20K
(JPI also available)
Temperature : Room temperature to
-196°C ($\frac{1}{2}$ " to 12")
-46°C ($\frac{1}{2}$ " to 30")

KTM Low Temperature and Cryogenic Ball Valves

Floating and Trunnion type

Floating Type Ball Valves Structure (Long Bonnet)



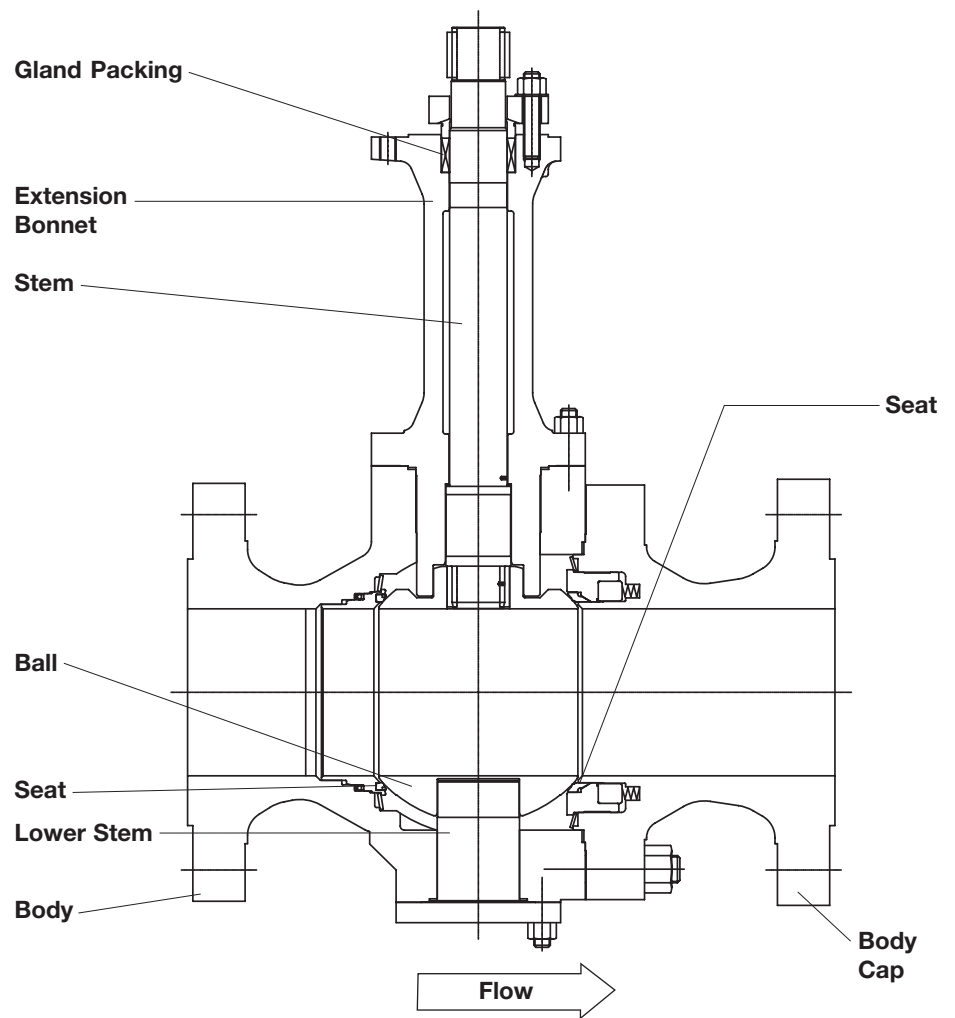
ASME Class 150, 300, JIS 10K, 20K
 Sizes : ½" to 8" (15mm to 200mm)
 ASME Class 600
 Sizes : ½" to 1½" (15mm to 40mm)

Parts list (Floating type)

No.	Body material Material code Parts name	Carbon steel				Stainless steel		
		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

Trunnion Type Ball Valve Structure (Short Bonnet)



ASME Class 150, 300, JIS 10K, 20K
 Sizes : 6" to 12" (150mm to 300mm)
 ASME Class 600
 Sizes : 2" to 12" (50mm to 300mm)

Parts list (Trunnion type)

No.	Parts name	Carbon steel				Stainless steel		
		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

Pressure - Temperature Classification (Floating type)

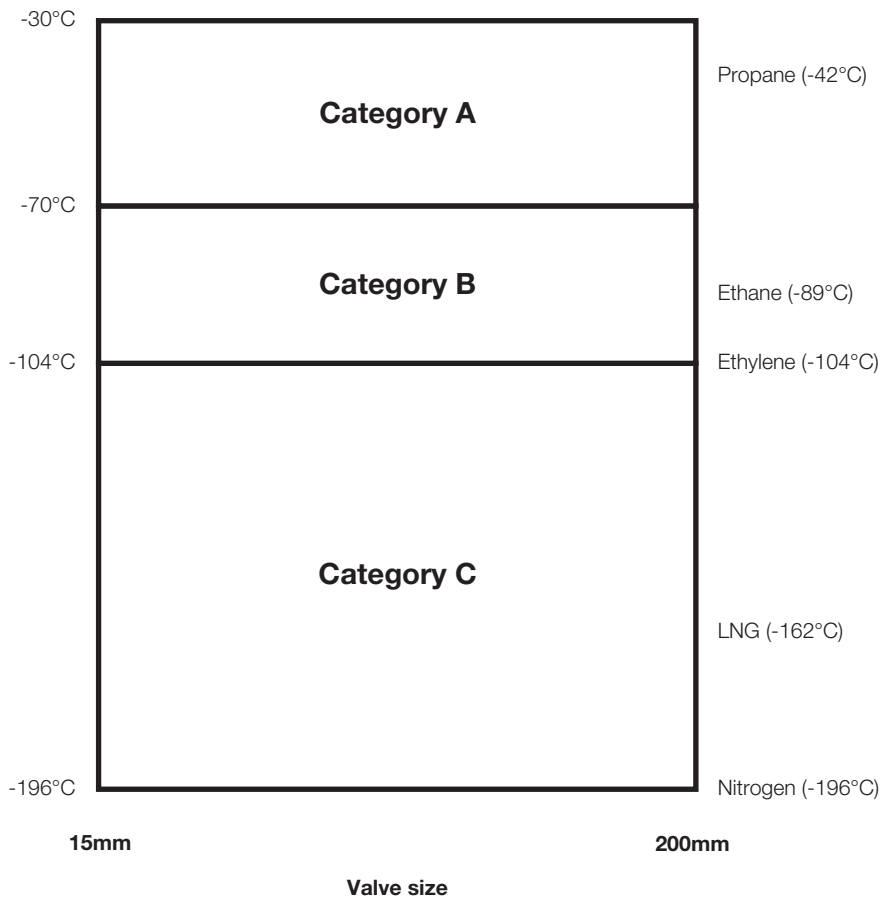
Category	Min fluid temperature (°C)	Valve size Inch (mm)	Pressure rating	Extension bonnet code (refer to page8)	Seat	Maximum allowable seat leakage*1 at cryogenic temperatures (Scc / min / inch*2)	Flow direction
A	-30 to -50	½ to 8 (15 to 200)	ASME Class 150, 300 JIS 10K, 20K	E1	E	0	Bi-direction
	-51 to -70			E2			
B	-71 to -104			E3	E (with spring at upstream side)	25*3	Uni-direction
C	-105 to -196			E5	T (with spring at upstream side)	50*4	

*1 Under test pressure of 1.0MPa by Nitrogen or Helium gas

*2 Leakage (cc) per valve size (inch) under room temperature at 1atm for 1 minute
 Example : Category B, Valve size 4" (100mm), ASME Class 150
 Max. allowable seat leakage = 25cc / min / inch X 4" = 100cc / minute

*3 25cc / min for sizes up to 1" (25mm)

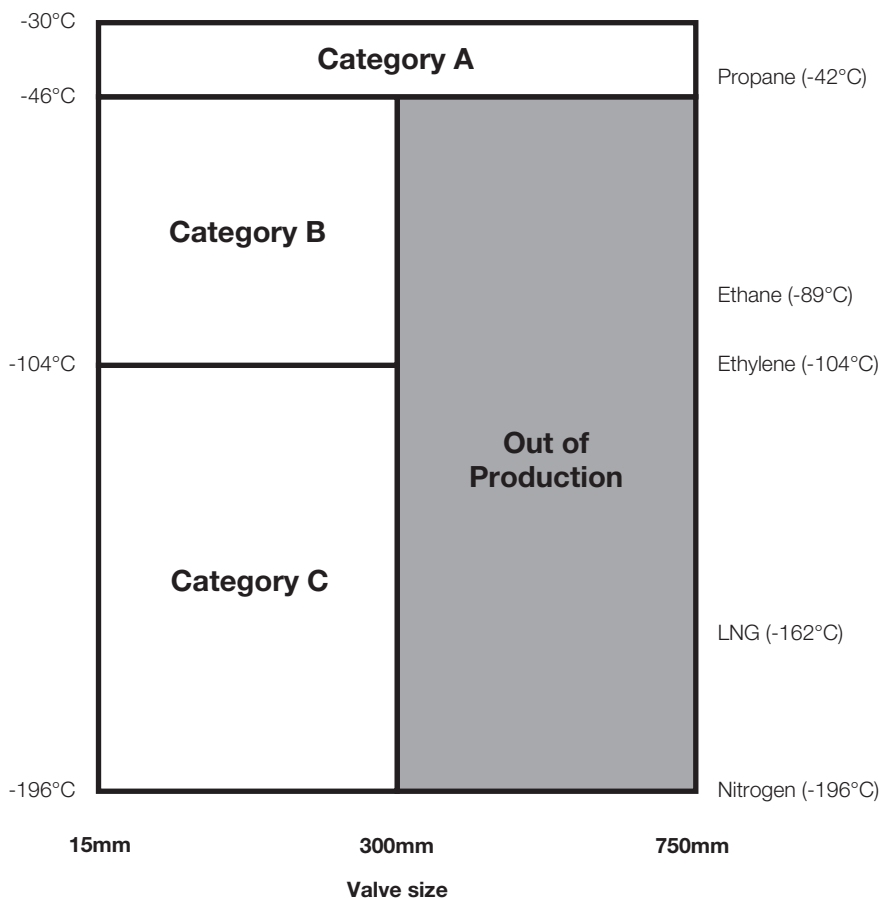
*4 50cc / min for sizes up to 1" (25mm)



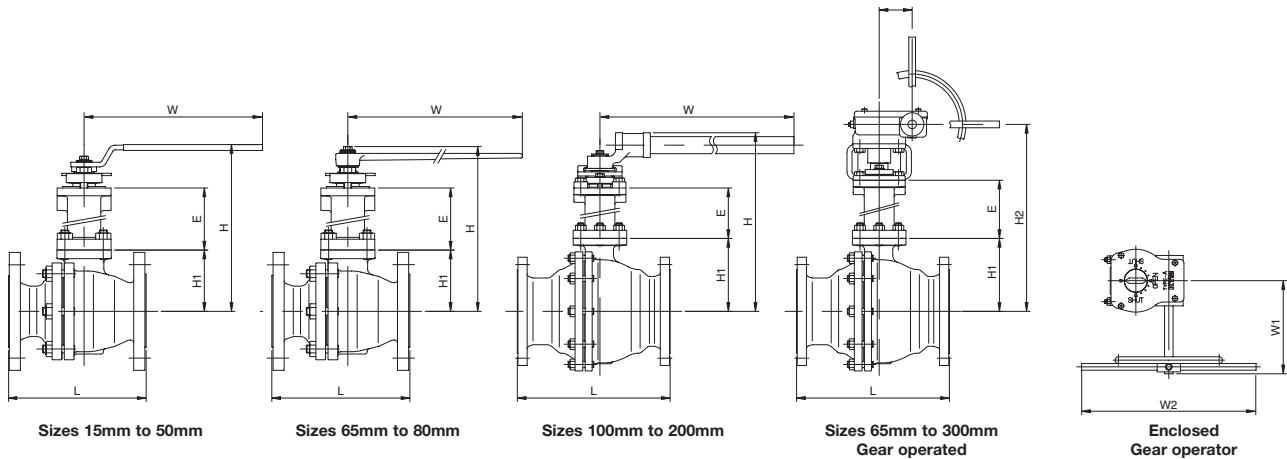
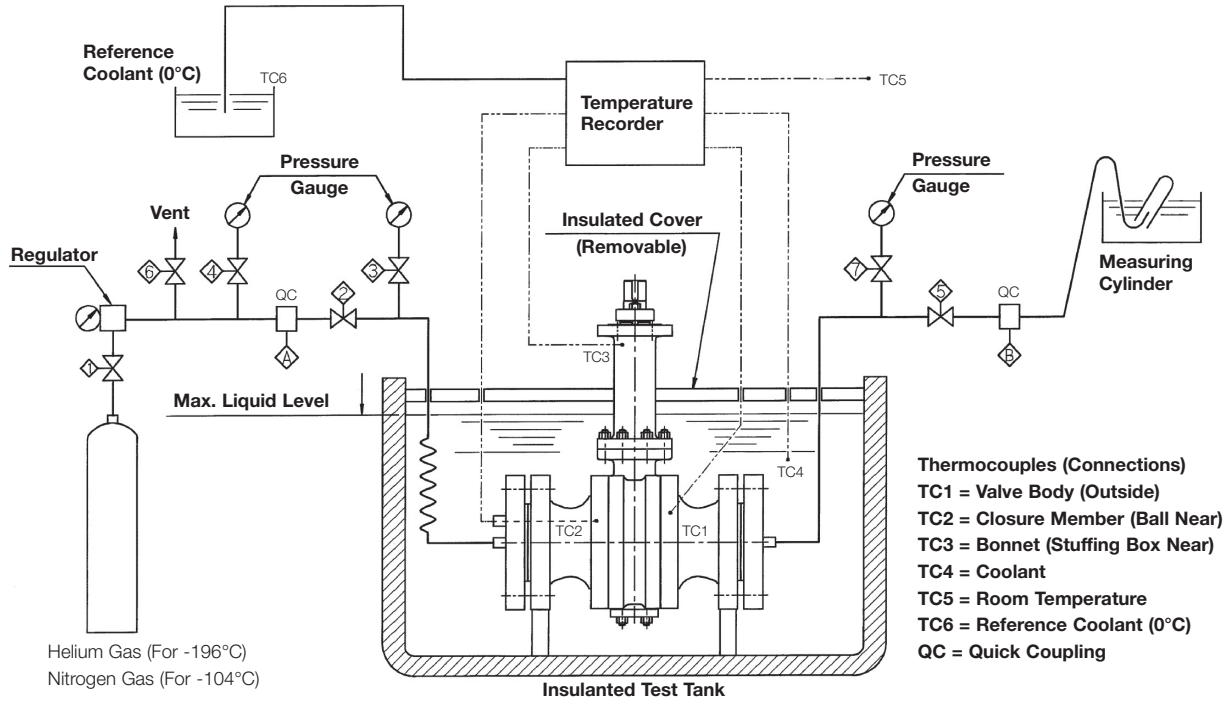
Pressure - Temperature Classification (Trunnion type)

Category	Min fluid temperature (°C)	Valve size Inch (mm)	Pressure rating	Extension bonnet code (refer to page8)	Seat / Seal	Maximum allowable seat leakage*1 at cryogenic temperatures (Scc / min / inch*2)	Flow direction
A	-30 to -46	6 to 30 (150 to 750)	ASME Class 150, 300 JIS10K, 20K	E1	RPTFE (H) / O-ring	5	Bi-direction
		½ to 30 (15 to 750) *5	ASME Class 600				
B	-47 to -104	6 to 12 (150 to 300)	ASME Class 150, 300 JIS10K, 20K	E3	RPTFE / PTFE Seal ring	25*3	Uni-direction
		½ to 12 (15 to 300) *5	ASME Class 600				
C	-105 to -196	6 to 12 (150 to 300)	ASME Class 150, 300 JIS10K, 20K	E5	RPTFE / Special seal	50*4	Uni-direction
		½ to 12 (15 to 300) *5	ASME Class 600				

- *1 Under test pressure of 1.0MPa by Nitrogen or Helium gas
- *2 Leakage (cc) per valve size (inch) under room temperature at 1atm for 1 minute
Example : Category C, Valve size 10" (250mm), ASME Class 150
Max. allowable seat leakage = 50cc / min / inch X 10" = 500cc / minute
- *3 25cc / min for sizes up to 1" (25mm)
- *4 50cc / min for sizes up to 1" (25mm)
- *5 Floating type for sizes ½" to 1½" (15mm to 40mm)



Schematic of test-rig arrangement for low temperature and cryogenic type approval test



Dimension (mm) for Extension bonnet (Short / Long)

	Valve size (mm)	Bore (d)	ASME 150 / JIS10K L	ASME 300 / JIS20K L	Extension bonnet								W	W ₁	W ₂	W ₃	Type
					Short ^{*1}				Long ^{*2}								
					H	Option code : E1	E	H	H1	H2	E	H					
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
Trunnion ^{*4}	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
	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

*1. Short : 4" to 7" (100mm to 175mm). Valve dimensions and sizes are in accordance with Shell MESC. It is available for stainless steel body only.

*2. Long : 8" to 14" (200mm to 350mm). Valve dimensions and sizes are in accordance with Shell MESC

*3. The values show for Carbon steel / Stainless steel

*4. Trunnion type for ASME Class 600 also available. Please consult for the details.

Note.

- This chart shows Pressure-Temperature Rating for floating type.
- For details of Trunnion type, please consult us.
- For size 10" (250mm) 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 1/2", 3/4" (15mm, 20mm)
- ② Size 1" to 2 1/2" (25mm to 65mm)
- ③ Size 3", 4" (80mm, 100mm)
- ④ Size 5", 6" (125mm, 150mm)
- ⑤ Size 8" (200mm)

- Dashed lines indicate body ratings.

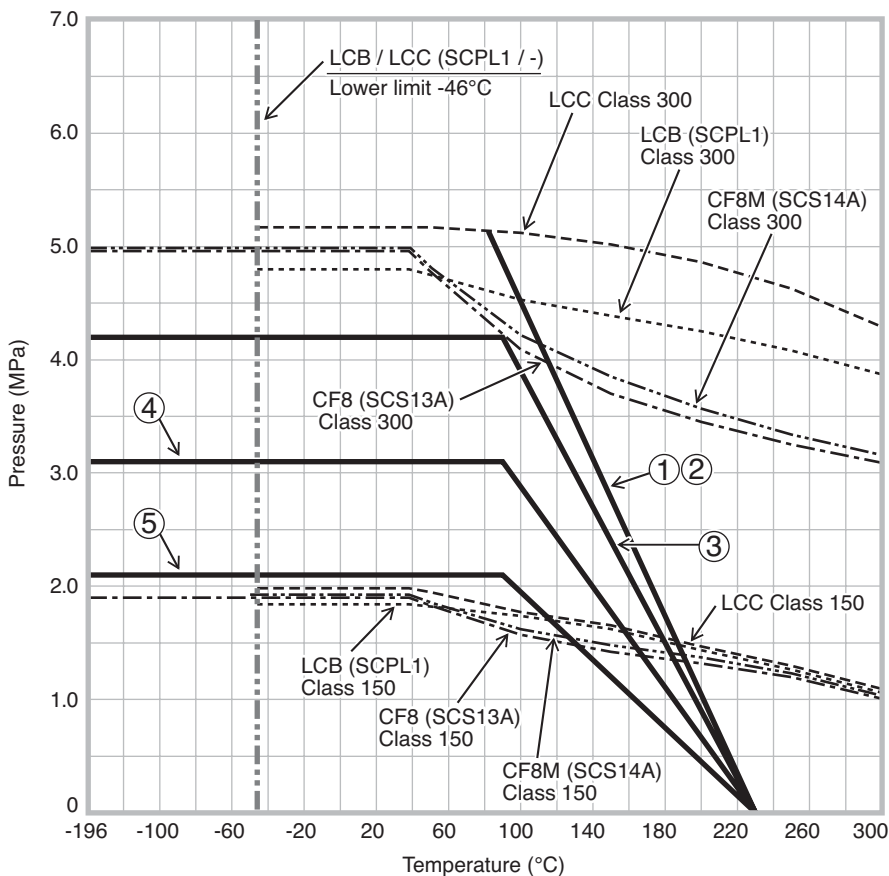
- LCB (SCPL1)
- LCC
- - - - - CF8 (SCS13A)
- · - · - CF8M (SCS14A)

- Materials in parentheses indicate equivalent JIS material.

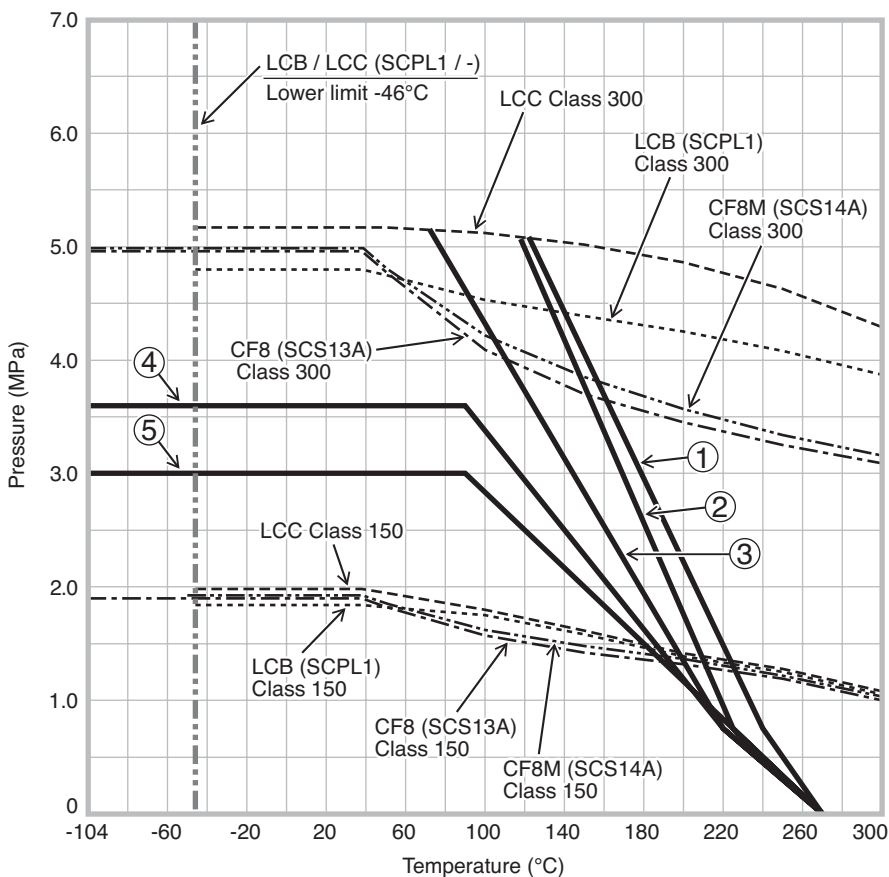
(BODY RATING : ASME B16.34-2004)

Pressure-Temperature Rating (Floating Type)

ASME Class 150 / 300 PTFE (T) Seat



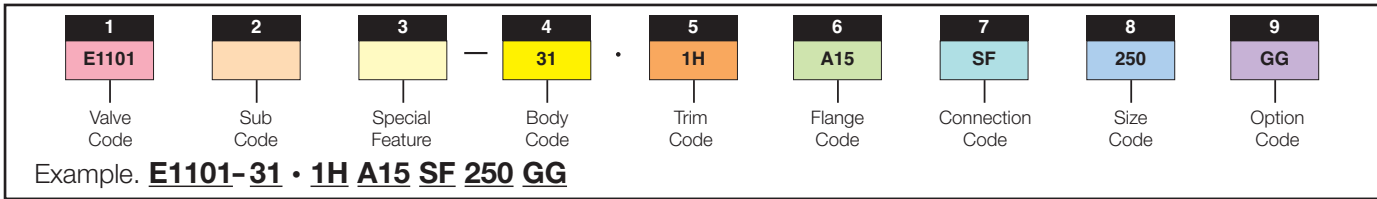
ASME Class 150 / 300 RPTFE (E) Seat



Cv Value

Valve Size (mm)	Cv Value
15	26
20	50
25	94
40	260
50	480
65	750
80	1,300
100	2,300
150	5,400
200	10,000
250	16,000
300	24,000

KTM Model Coding System



1			
Valve Code	Class	Description	
	ASME	JIS	
EB11	150	10K	Full bore, Floating type ½" to 8"
EB12	300	20K	Full bore, Floating type ½" to 8"
E1101	150	10K	Full bore, Trunnion 10" to 30"
E1102	300	20K	Full bore, Trunnion 10" to 30"
E1108	600	-	Full bore, Floating type ½" to 1½" Full bore, Trunnion type 2" to 30"

2	
Sub Code	Description
Blank	Soft Seat

3	
Special Features	Description
Blank	No Special Feature
E	Extension Bonnet (For valve code EB)

4		
Body Code	Material	
	JIS	ASTM
31	SCS13A (304SS)	CF8 (304SS)
32	SCS14A (316SS)	CF8M (316SS)
50	SCPL1	LCB
55	-	LCC

5					
Trim Code	Ball	Seat	Packing	Stem	
	JIS	ASTM			
1T*1	SCS13A*2 or SCS14A*3	CF8*2 or CF8M*3	PTFE	PTFE	304*2 or 316*3
5T*1or*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	RPTFE	PTFE	304*2 or 316*3
5H*4	SCS14A	CF8M	RPTFE	PTFE	316

*1. For extension bonnet code [E5] only
 *2. For Body code [31] only
 *3. For Body code [32] only
 *4. For Body code [31], [32] and [55] only

6	
Flange Code	Description
ASME	
A15	ASME Class 150
A30	ASME Class 300
A60	ASME Class 600
JIS	
J10	JIS 10K
J20	JIS 20K
(JPI also available)	

7	
Connection Code	Description
Blank	Raised Face
SF	Smooth Finish 125 to 250 AARH

8			
Size Code	mm	Inch	
15	15	½	
20	20	¾	
25	25	1	
40	40	1½	
50	50	2	
65	65	2½	
80	80	3	
100	100	4	
125	125	5	
150	150	6	
200	200	8	
250	250	10	
300	300	12	
350	350	14	
400	400	16	
450	450	18	
500	500	20	
550	550	22	
600	600	24	
650	650	26	
700	700	28	
750	750	30	

9		
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