

## KTM

**A single KTM 3-way ball valve replaces several 2-way saving valuable space and simplifying piping**

### Features

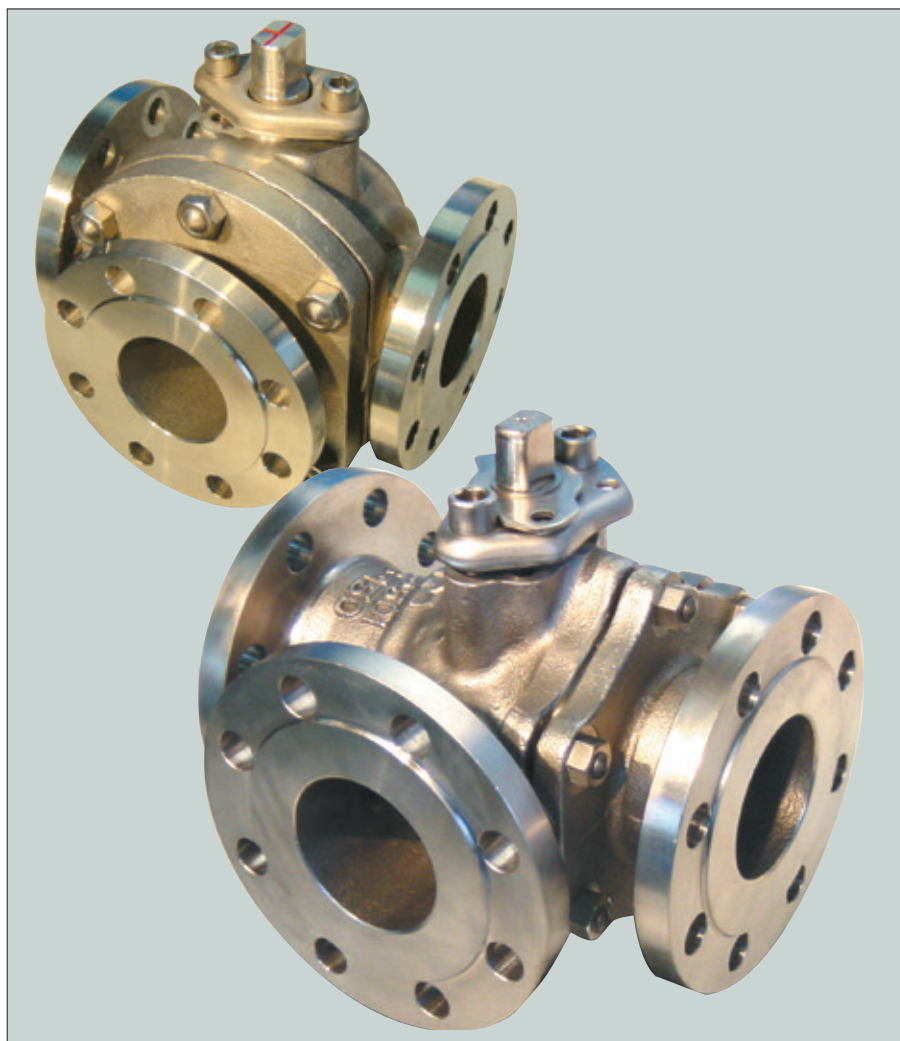
- Positive alignment of body
- Blow out-proof stem
- Sphericity tolerance of the ball is unsurpassed
- Reinforced PTFE bearing and packing
- Positive position indication
- Locking device capable
- Heavy duty body construction
- Meet NACE MR-01-75 for sulfide cracking resistance (option)

### 2-seats features

- ZERO leakage with standard PTFE seat
- Pure white PTFE seat seal relieves concern over product contamination.
- Lower operating torque, easing operation and reducing actuator cost
- Suitable for high temperature applications when equipped with exclusive Grati<sup>®</sup> seat (option)
- Extension bonnet for low temperature service (option)

### 4-seats features

- Equipped with 4-seats so that each port can be used as an inlet without leakage.
- Available with L-port and T-port
- A greater  $C_v$  value is achieved in most sizes
- Stainless steel anti-static device (for model E3900)



### General applications

Diverting or mixing fluids

### Option

- NACE MR-01-75
- Grati<sup>®</sup> seat for high temperature service (for 2-seats)
- Extension bonnet for low temperature service (for 2-seats)
- Special tests
  - X-ray (RT)
  - Liquid penetrant (PT)
  - Positive Material Identification (PMI)

### Technical data

#### 2-seats (L-port)

Model / sizes	: Full bore E3500 40 to 200 mm (1½" to 8")
	: Reduced bore E3600 125 to 250 mm (5" to 10")
Pressure rating	: ASME Class 150, 300 JIS10K, 20K (JPI available)
Temperature	: -29 to 270°C (Option: upto 500°C)

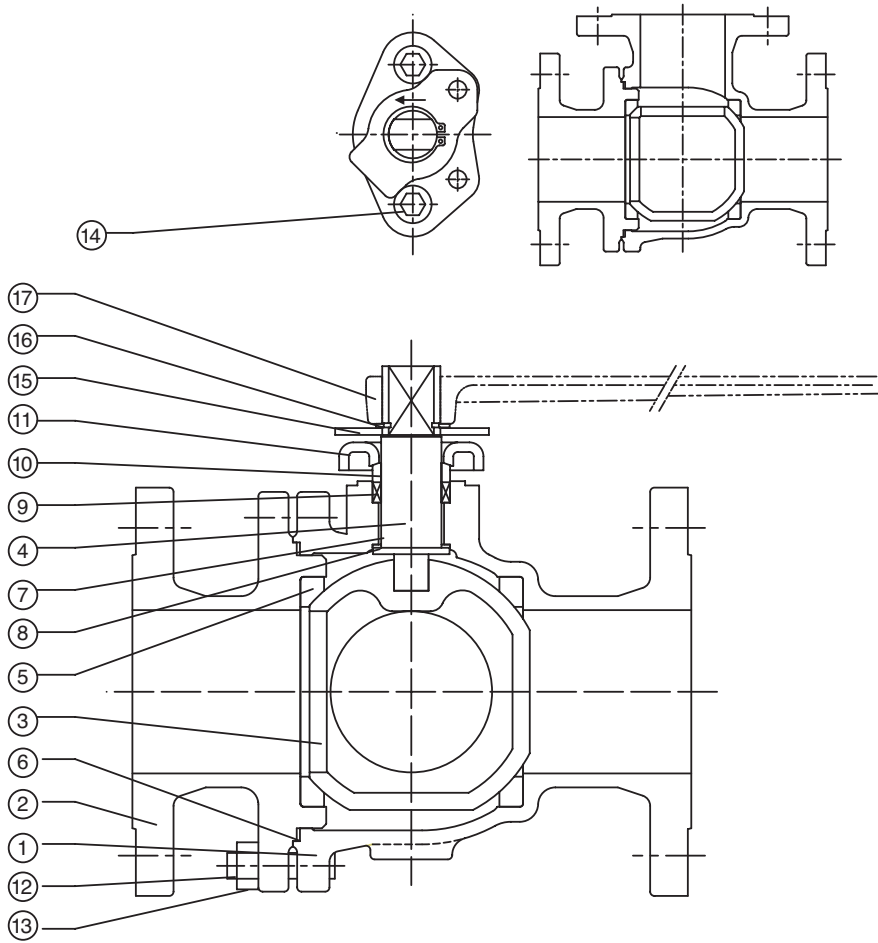
#### 4-seats (L&T-port)

Model / sizes	: Full bore E3900 15 to 200 mm (½" to 8")
	: Reduced bore E3800 125 to 200 mm (5" to 8")
Pressure rating	: ASME Class 150, JIS 10K (JPI available)
Temperature	: -29 to 150°C

# KTM Three-Way Floating Ball Valves

2-seats (L-port) and 4-seats (L&T-port)

2-seats (L-port) E3500 full bore, E3600 reduced bore



## Parts list and materials of construction

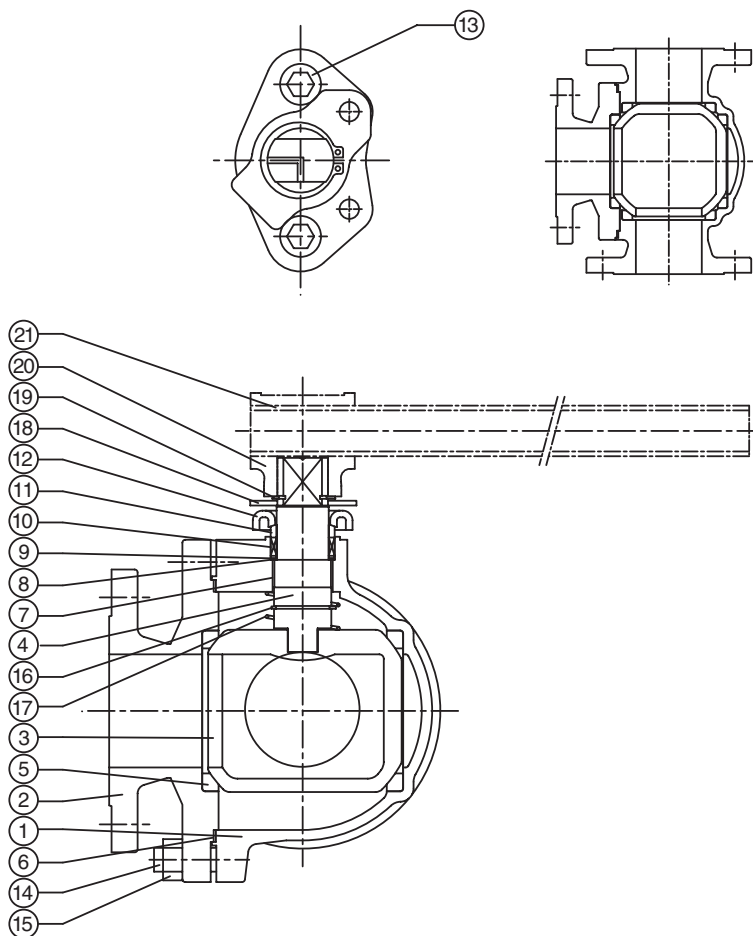
No.	Parts name	Trim code	Material			Qty
			31. 1T / 1E / 5T / 5E	32. 1T / 1E	62. 1T / 1E / 5T / 5E	
1	Body		CF8 (SCS13A)	CF8M (SCS14A)	WCB (SCPH2)	1
2	Body cap		CF8 (SCS13A)	CF8M (SCS14A)	WCB (SCPH2)	1
3	Ball		CF8 (SCS13A)	CF8M (SCS14A)	CF8 (SCS13A)	1
4	Stem		304SS (SUS304)	316SS (SUS316)	304SS (SUS304)	1
5	Seat		PTFE (T), PTFE / PFA copolymer (E)			2
6	Gasket		PTFE (Class 150), R-PTFE (Class 300)			1
7	Stem bearing		R-PTFE			1
8	Thrust bearing		PTFE			1
9	Gland packing		PTFE			1 set
10	Gland		304SS / 316LSS			1
11	Gland flange		304SS			1
12	Stud		A193Gr.B8	A193Gr.B8	A193Gr.B7	4-8
13	Nut		A194Gr.8	A194Gr.8	A194Gr.2H	4-8
14	Gland bolt		304SS			2
15	Stopper		304SS			1
16	Snap ring		304SS			1
17	Handle		Carbon steel / Ductile iron			1

• Materials in parentheses indicate equivalent JIS material

# KTM Three-Way Floating Ball Valves

2-seats (L-port) and 4-seats (L&T-port)

4-seats (L&T-port) E3900 full bore, E3800 reduced bore



## Parts list and materials of construction

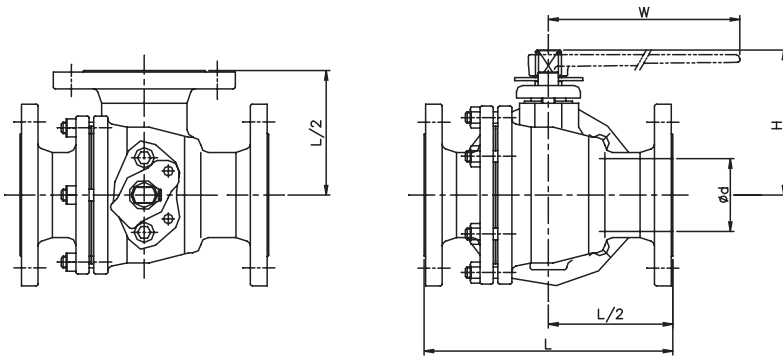
No.	Parts name	Trim code	Material		Qty
			31. 1T / 1E	32. 1T / 1E	
1	Body		CF8 (SCS13A)	CF8M (SCS14A)	1
2	Body cap		CF8 (SCS13A)	CF8M (SCS14A)	1
3	Ball		CF8 (SCS13A)	CF8M (SCS14A)	1
4	Stem		304SS (SUS304)	316SS (SUS316)	1
5	Seat		PTFE (T), PTFE / PFA copolymer (E)		4
6	Gasket		PTFE (Class 150) / R-PTFE (Class300)		1
7	Stem bearing		R-PTFE		1
8	Thrust bearing		PTFE		1
9	Thrust washer		316SS		1
10	Gland packing		PTFE		1 set
11	Gland		304SS / 316LSS		1
12	Gland flange		304SS		1
13	Gland bolt		304SS		2
14	Stud		A193Gr.B8	A193Gr.B8	4 to 12
15	Nut		A194Gr.8	A194Gr.8	4 to 12
16	Snap ring		304SS (SUS304)	316SS (SUS316)	1
17	Spring		316SS		1
18	Stopper		304SS		1
19	Snap ring		304SS		1
20	Handle head		Ductile iron		1
21	Pipe		Carbon steel		1

• Materials in parentheses indicate equivalent JIS material

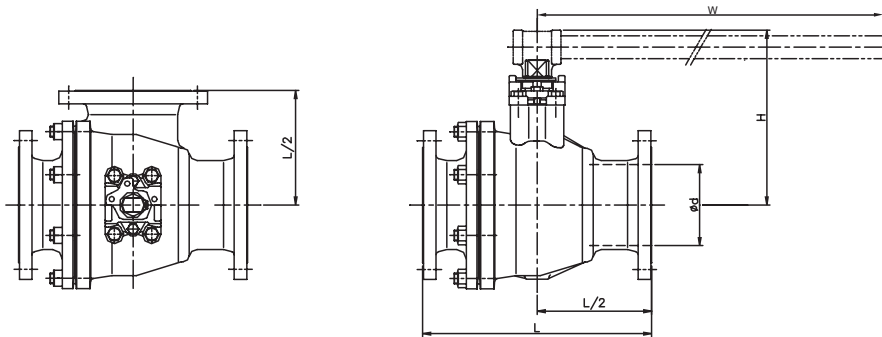
# KTM Three-Way Floating Ball Valves

2-seats (L-port) and 4-seats (L&T-port)

2-seats (L-port) E3500 full bore, E3600 reduced bore



Size 40 to 100 mm



Size 125 to 250 mm

## ASME Class 150, JIS10K dimensions (mm)

Valve size	E3501 full bore				E3601 reduced bore			
	d	L	H	W	d	L	H	W
40	38	210	97	230	-	-	-	-
50	51	220	107	230	-	-	-	-
65	64	250	142	400	-	-	-	-
80	76	260	152	400	-	-	-	-
100	102	330	178	650	-	-	-	-
125	127	370	308	1,050	127	370	178	650
150	152	430	328	1,050	152	430	308	1,050
200	203	540	395	1,410	203	540	328	1,050
250	-	-	-	-	254	670	395	1,410

## Standard materials

Body	: WCB (SCPH2)
	: CF8 (SCS13A)
	: CF8M (SCS14A)
Ball	: CF8 (SCS13A)
	: CF8M (SCS14A)
Stem	: 304SS (SUS304)
	: 316SS (SUS316)
Seat	: PTFE (T) -29 to 200°C
	: PTFE / PFA copolymer (E) -29 to 270°C
	: Grati® -29 to 500°C
	: PEEK -29 to 300°C

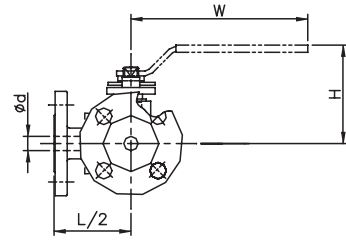
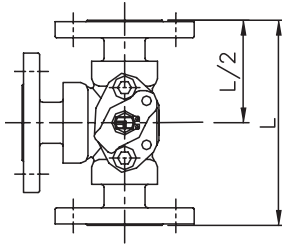
## ASME Class 300, JIS20K dimensions (mm)

Valve size	E3502 Full bore				E3602 Reduced bore			
	d	L	H	W	d	L	H	W
40	38	220	97	230	-	-	-	-
50	51	240	107	230	-	-	-	-
65	64	270	142	400	-	-	-	-
80	76	290	152	400	-	-	-	-
100	102	350	178	650	-	-	-	-
125	127	410	308	1,050	127	410	178	650
150	152	460	328	1,050	152	460	308	1,050
200	203	570	395	1,410	203	570	328	1,050
250	-	-	-	-	254	720	395	1,410

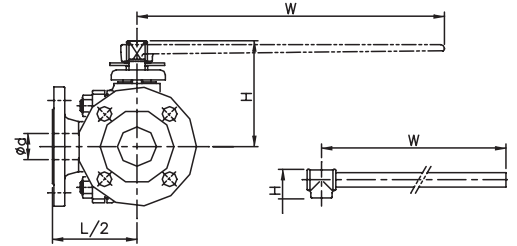
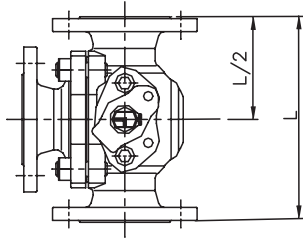
# KTM Three-Way Floating Ball Valves

2-seats (L-port) and 4-seats (L&T-port)

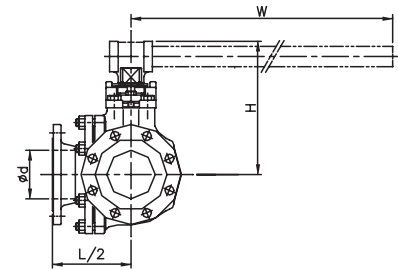
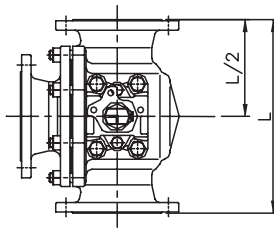
## 4-seats (L&T-port) E3900 full bore, E3800 reduced bore



Size 15 to 25 mm



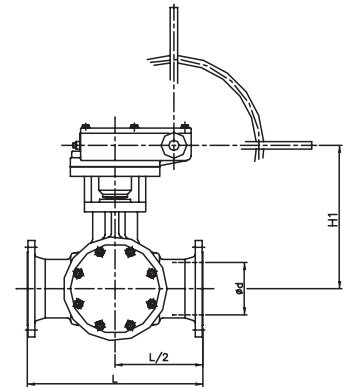
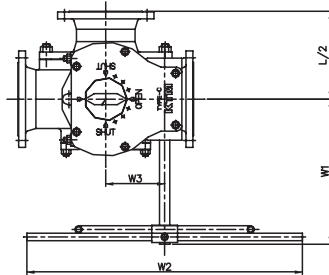
Size 40 to 80 mm



Size 100 mm

### Standard materials

- Body : CF8 (SCS13A)
- : CF8M (SCS14A)
- Ball : CF8 (SCS13A)
- : CF8M (SCS14A)
- Stem : 304SS (SUS304)
- : 316SS (SUS316)
- Seat : PTFE (T) -29 to 150°C
- : PTFE / PFA copolymer (E) -29 to 150°C



Size 125 to 200 mm

### JIS10K / ASME Class 150 dimensions (mm)

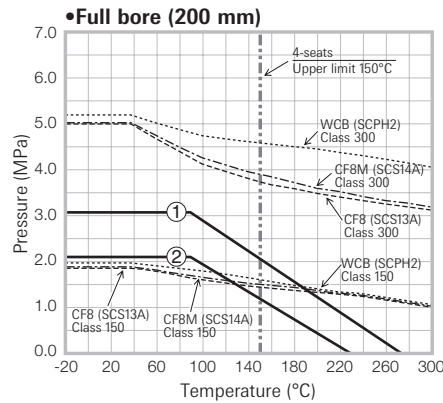
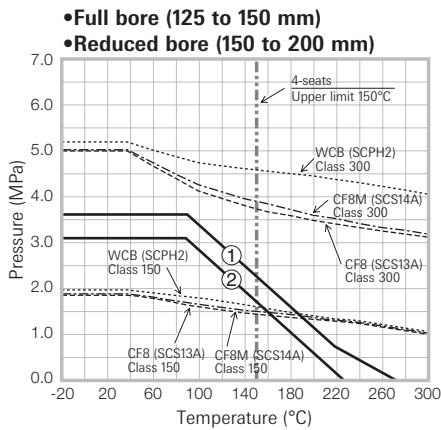
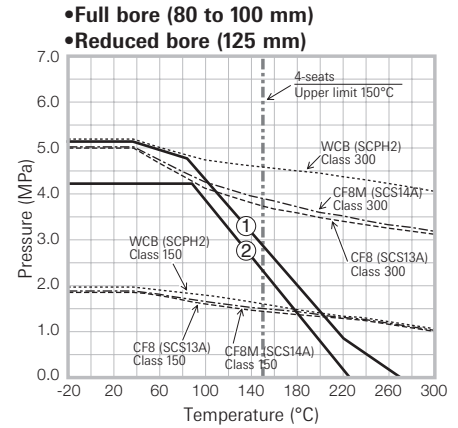
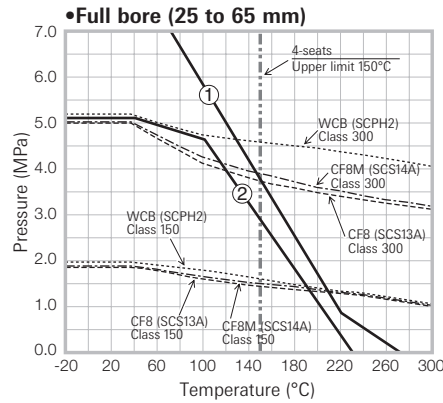
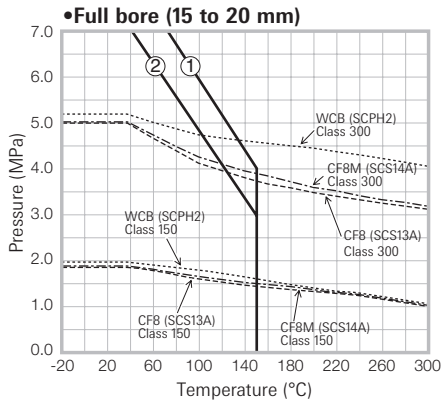
Valve size	E3901 full bore									E3801 reduced bore							
	d	L	H	W	H <sub>1</sub>	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>		d	L	H	W	H <sub>1</sub>	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>
15	13	140	89	160	-	-	-	-		-	-	-	-	-	-	-	-
20	19	150	105	230	-	-	-	-		-	-	-	-	-	-	-	-
25	25	160	108	230	-	-	-	-		-	-	-	-	-	-	-	-
40	38	210	132	400	-	-	-	-		-	-	-	-	-	-	-	-
50	51	220	137	400	-	-	-	-		-	-	-	-	-	-	-	-
65	64	250	205	650	-	-	-	-		-	-	-	-	-	-	-	-
80	76	260	214	650	-	-	-	-		-	-	-	-	-	-	-	-
100	102	330	286	1,050	-	-	-	-		-	-	-	-	-	-	-	-
125	127	430	-	-	330	349	600	116		127	370	286	1,050	-	-	-	-
150	152	510	-	-	416	421	800	171		152	430	-	-	330	349	600	116
200	203	580	-	-	474	421	800	171		203	500	-	-	416	421	800	171

# KTM Three-Way Floating Ball Valves

## 2-seats (L-port) and 4-seats (L&T-port)

### Pressure - temperature rating

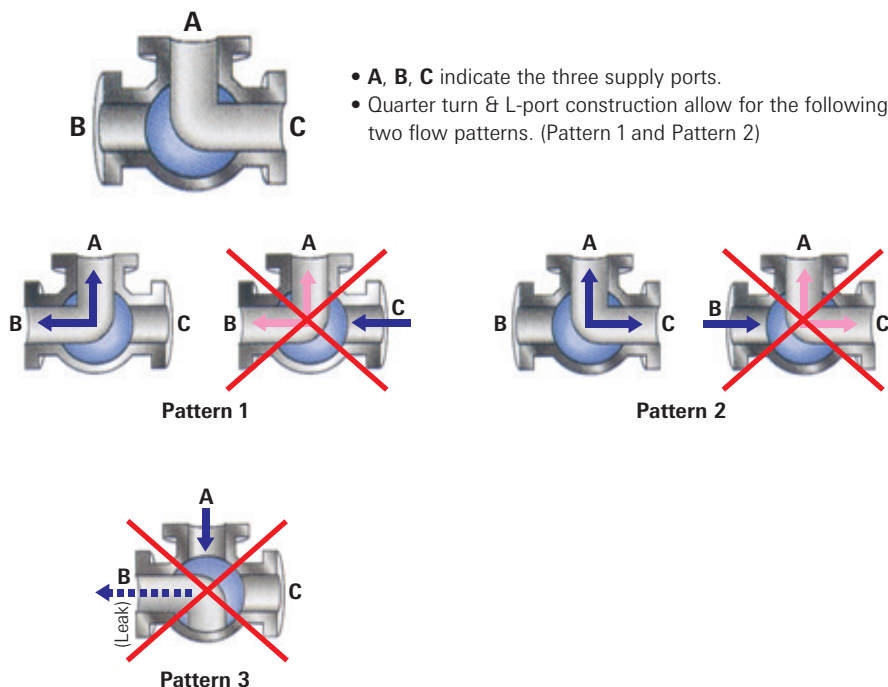
The pressure and temperature limits of various KTM seat materials are shown below for valve sizes form 15 to 250 mm. Seat ratings for High-Temperature valves with Gratite® seats are identical to ASME body ratings.



T-seat: PTFE  
E-seat: PTFE / PFA copolymer  
Note: PTFE is used for body gasket.  
(O-ring seal is used for 15 mm to 25 mm model)

- Solid line indicate seat rating ① E-seat @ T-seat.
- Dashed lines indicate body ratings.
  - WCB
  - CF8
  - CF8M
- Materials in parentheses indicate equivalent JIS material
- Lower limit temperature depending on the material  
2 SCPH2: -5°C  
2 WCB: -29°C (PED certified: -20°C)

### Operation form 2-seats (L-port) E3500 / E3600







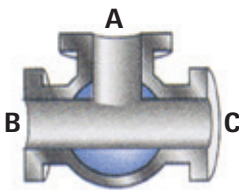
- Pattern 1 and Pattern 2 are standard flow directions for a 2-seat (L-port) valve.
- Arrows indicate pressure higher than 0 MPa. For vacuum use please inquire separately.
- Straight flow from B to C and C to B is not possible. (The operation rotates 90 degrees.)
- Crossed out forms cannot be used.
- Shut-off function is not available at the center port (A) because the seat is not installed there. Please pay attention to the direction of the flow channel when using it. In Pattern 3, the fluid pass through, both flow channel A to B, and B to A.
- Leakage occurs on the flow channel side if the pressure of arrow is higher than the flow channel side.

# KTM Three-Way Floating Ball Valves

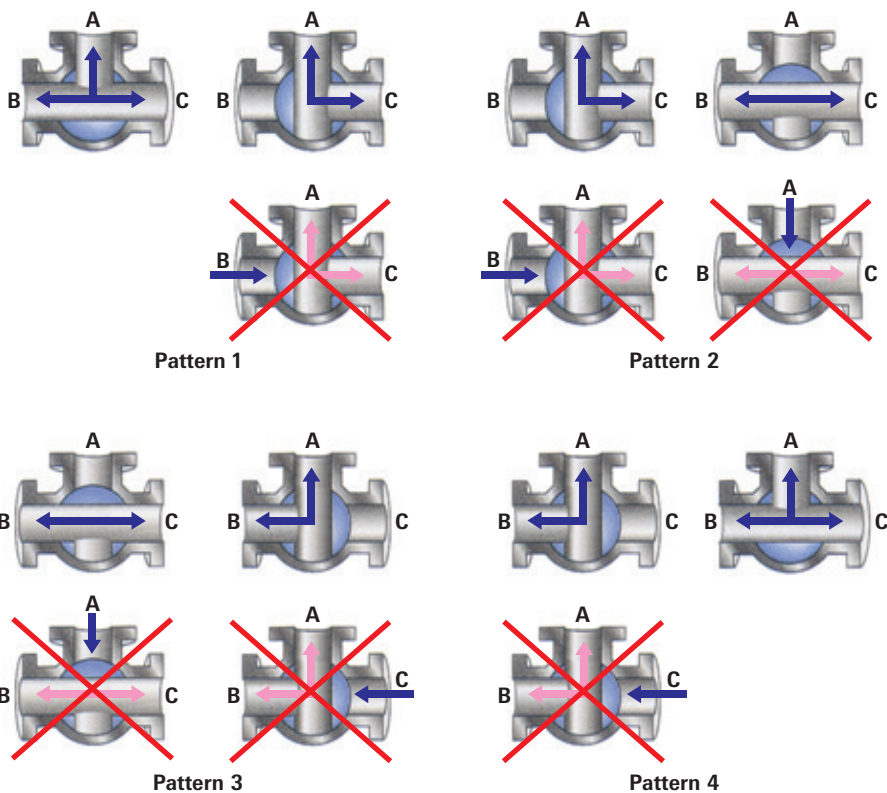
2-seats (L-port) and 4-seats (L&T-port)

## Operation form 4-seats (T-port) E3900 / E3800





- Pattern 1 to Pattern 4 are standard flow directions for a 4-seats (T-port) valve.
- Arrows  indicate pressure higher than 0 MPa. For vacuum use please inquire separately.
- Crossed out  forms cannot be used.
- Leakage occurs on the flow channel side if the pressure of arrow  is higher than the flow channel  side.

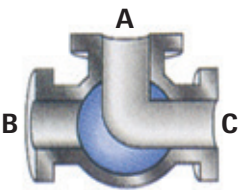


- A, B, C indicate each of the three supply ports.
- T-port available for below four patterns.

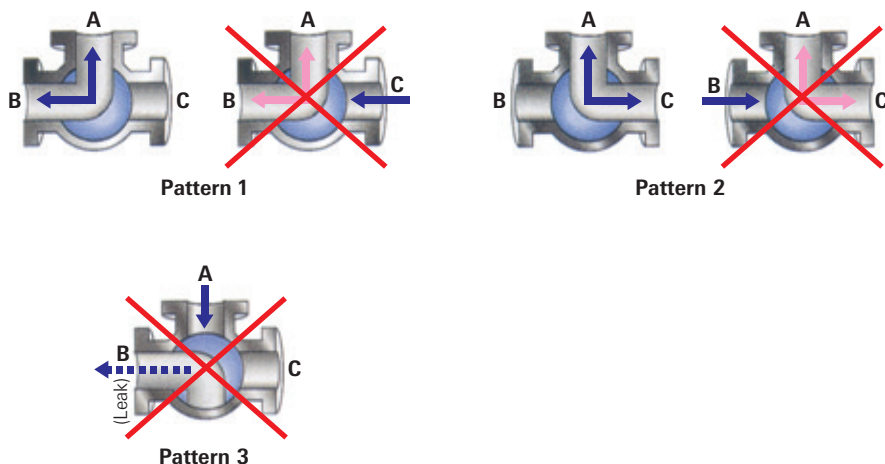


## Operation form 4-seats (L-port) E3900 / E3800

- 4-seat (L-port) for standard switching are Pattern 1 and Pattern 2.
- Arrows  indicates a pressure valve value higher than 0 MPa. For vacuum specification, please inquire separately.
- Straight flow from B to C and C to B is not possible. (The operation rotates 90 degrees.)
- Crossed out  forms cannot be used.
- Leakage occurs on the flow channel side if the pressure of arrow  is higher than the flow channel  side.



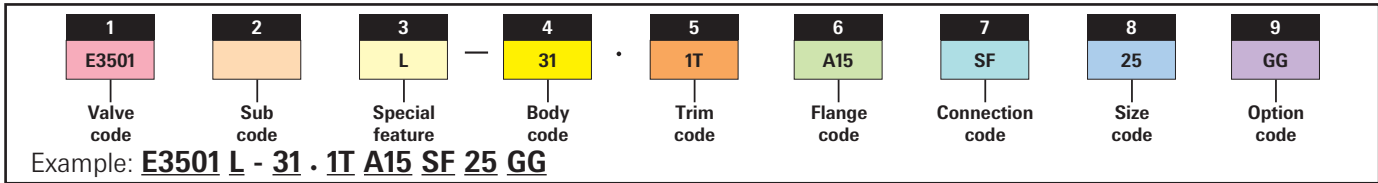
- A, B, C indicate each of the three supply ports.
- L-port and quarter turn construction allow for following two flow patterns (Pattern 1 and Pattern 2).



# KTM Three-Way Floating Ball Valves

## 2-seats (L-port) and 4-seats (L&T-port)

### KTM model coding system



1		
Valve code	Class	Description
	<b>ASME</b>	<b>JIS</b>
E3501	150 10K	2-seats full bore 40 to 200 mm
E3502	300 20K	2-seats full bore 40 to 200 mm
E3601	150 10K	2-seats reduce bore 125 to 250 mm
E3602	300 20K	2-seats reduce bore 125 to 250 mm
E3801	150 10K	4-seats reduce bore 125 to 200 mm
E3901	150 10K	4-seats full bore 15 to 200 mm

2	
Sub code	Description
Blank	Soft seat
G	Gratite® seat (For 2-seats only)

3	
Special feature	Description
L	L-port
T	T-port (For 4-seats only)

4		
Body code	Material	
	<b>JIS</b>	<b>ASTM</b>
31	SCS13A (304SS)	CF8 (304SS)
32	SCS14A (316SS)	CF8M (316SS)
62	SCPH2	WCB

5					
Trim code					
Soft seat					
Ball		Seat	Packing	Stem	
<b>JIS</b>		<b>ASTM</b>			
1E	SCS13A*1 or SCS14A*2	CF8*1 or CF8M*2	PTFE/PFA copolymer	PTFE	304*1 or 316*2
1T	SCS13A*1 or SCS14A*2	CF8*1 or CF8M*2	PTFE	PTFE	304*1 or 316*2
5E*1	SCS14A	CF8M	PTFE/PFA copolymer	PTFE	316
5T*1	SCS14A	CF8M	PTFE	PTFE	316
Gratite® seat					
Ball		Seat	Packing	Stem	
<b>JIS</b>		<b>ASTM</b>			
CC	SCS13A*1 or SCS14A*2	CF8*1 or CF8M*2	Hard graphite	Graphite	329J1

\*1 For body code 31 and 62 only  
\*2 For body code 32 only

6	
Flange code	Description
<b>JIS</b>	
J10	JIS 10K
J20	JIS 20K
<b>ASME</b>	
A15	ASME Class 150
A30	ASME Class 300
(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	For reduced bore only

9	
Option code	Description
Blank	No additional option
GG	Packing / Gasket-graphite