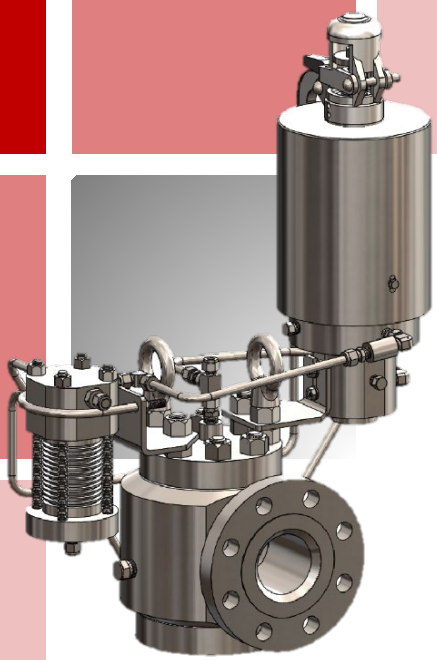


FUKUI

RPE Series

Contents

Features

The RPE series is a pilot-operated pressure relief valve dedicated for boiler economizers. It accommodates an excessive pressure of 3% and the service of water and steam.

Certification

Certification	Range				
	Service	Size	Pressure range	Discharge coefficient	
			MPa	Steam	Water
ASME BPVC SECTION I & SECTION VIII Division 1	Steam	1.1/2*28.8*3 1.1/2*36*3 2*45*3 3*72*6	0.34–41.3	0.875	0.681
	Water	4*90*6 6*135*8	0.34–17.2		
		8*180*10	0.34–10.3		

* In addition to the above-mentioned pressure and size, the ASME STAMP V and ASME UV STAMP also specify minimum requirements for temperature, construction, materials, etc. If all of these requirements are satisfied, the product can be certified as ASME STAMP V or ASME UV STAMP.

* For the actual manufacturing range, refer to the pressure–temperature rating. The products exceeding this pressure–temperature rating may also be manufactured.

Type Code

RPE	4	6	1		(T)

Cap code

(C)	Open lever	(T)	(C) + Test gag

Material code

Blank	SA105M, SCPH2 or A216M-WCB

Connection code

1-	ASME Flange	5-	Special
2-	JPI Flange	6-	Screwing
3-	Welding	9-	JIS B 8210 (1994) Flange
4-	JIS Flange	0-	JIS B 8210 (1986) Flange

Temperature class code (determined by discharge temperature) Unit: °C (°F)

3	T ≤ 350 (662)

Pressure class code

3	Class 300 or JIS 30K or JIS B 8210 30K	6	Class 1500
4	Class 600	7	Class 2500
5	Class 900	—	—

Type Code	
RPE	

Cap Code

The cap structure is available in two types: with a test gag and without a test gag.

Cap		Figure	Airtightness	Lever	Test gag
(C)	Open lever	1	X	○	X
(T)		2	X	○	○

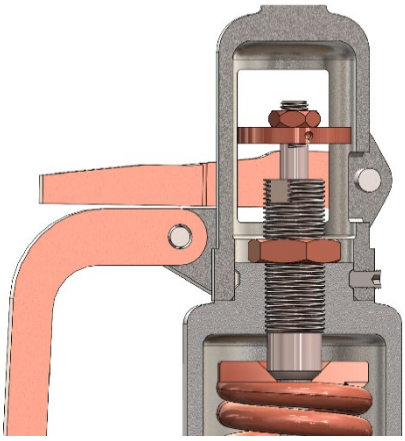


Figure 1　Open lever

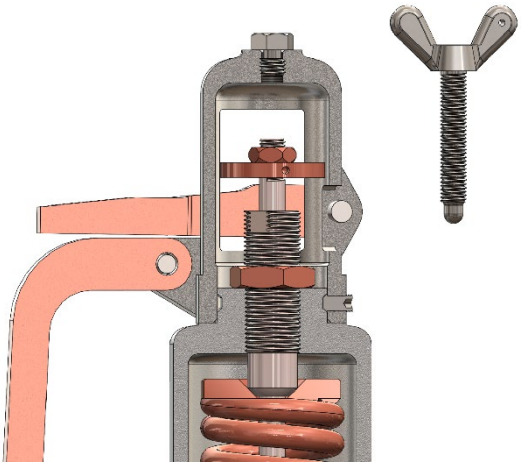
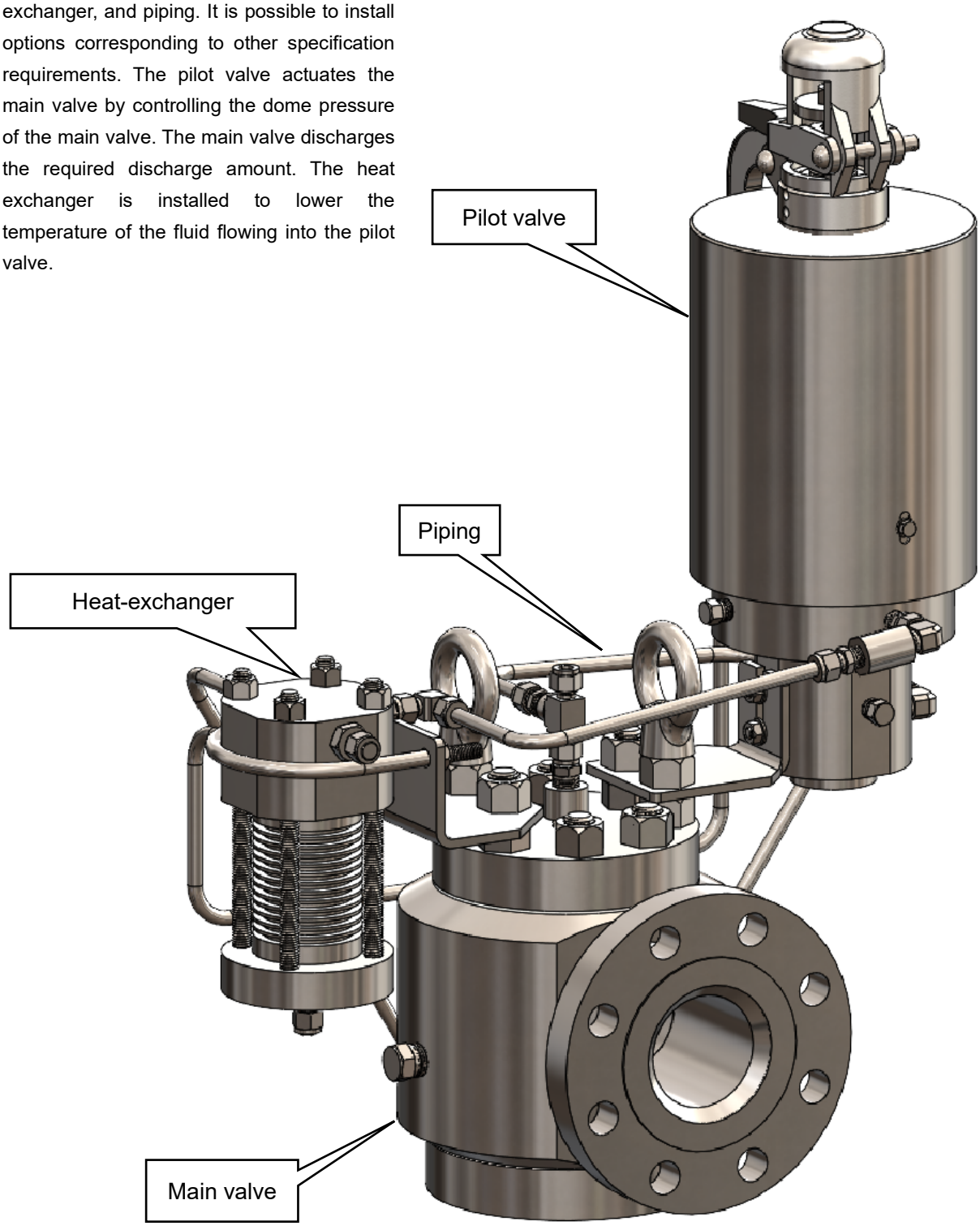


Figure 2　Open lever + Test gag

The lever is lifted to activate the pressure relief valve when the pressure on the inlet side of the pressure relief valve is 75% of the set pressure.

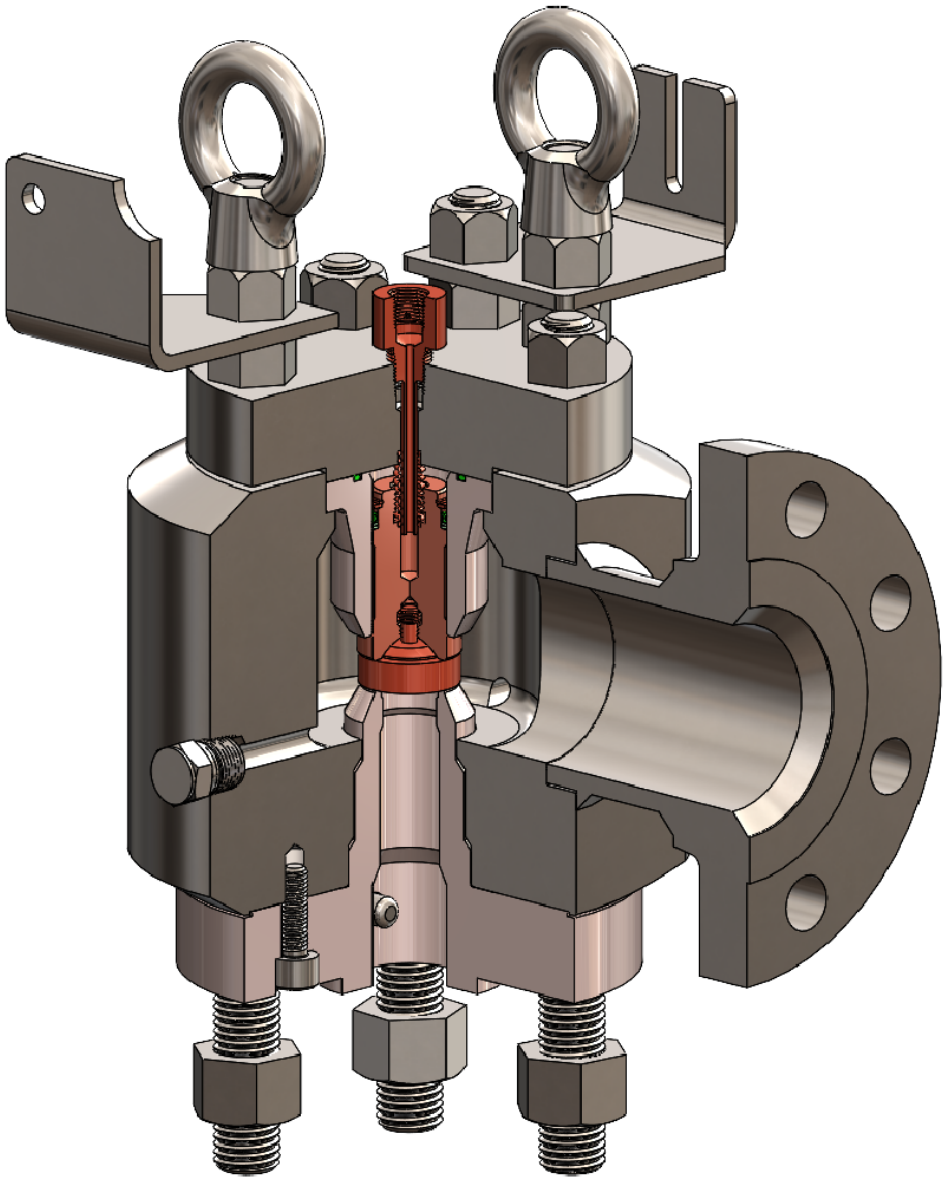
Configuration of Pilot-Operated Pressure Relief Valve

The pilot-operated pressure relief valve consists of the main valve, pilot valve, heat-exchanger, and piping. It is possible to install options corresponding to other specification requirements. The pilot valve actuates the main valve by controlling the dome pressure of the main valve. The main valve discharges the required discharge amount. The heat exchanger is installed to lower the temperature of the fluid flowing into the pilot valve.



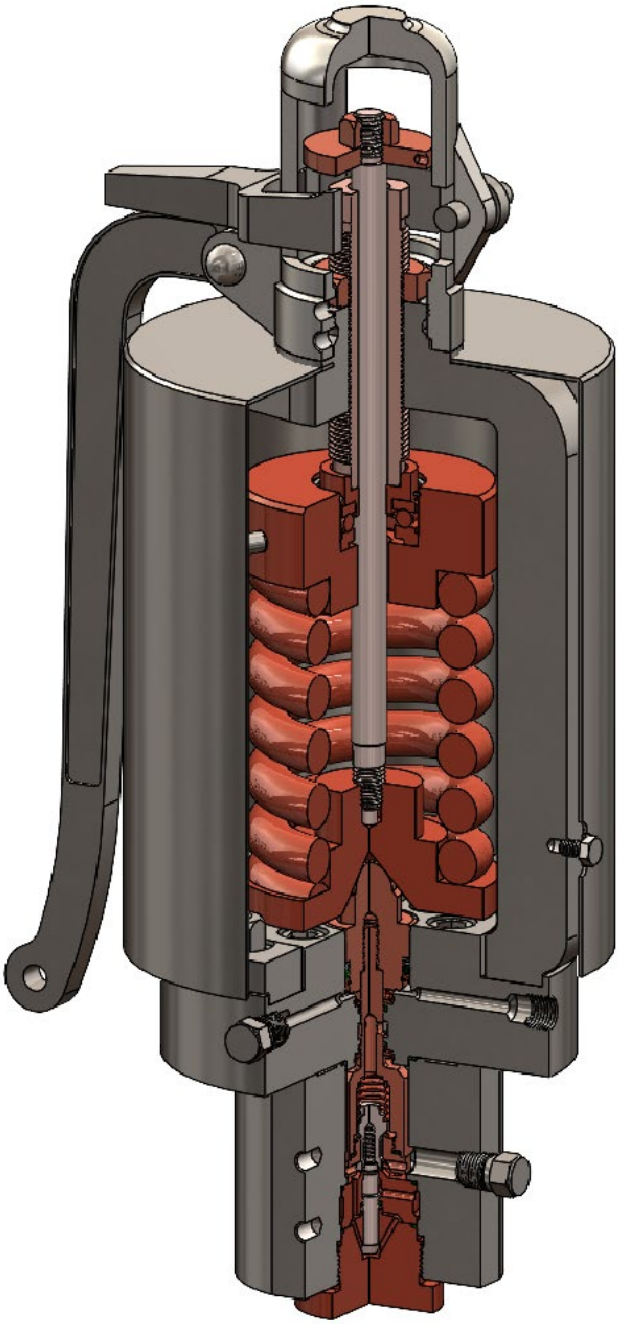
Structure of Main Valve

- Size 1.1/2, 2: Forged body
  Size 3, 4, 6: Cast body
- Internal pickup



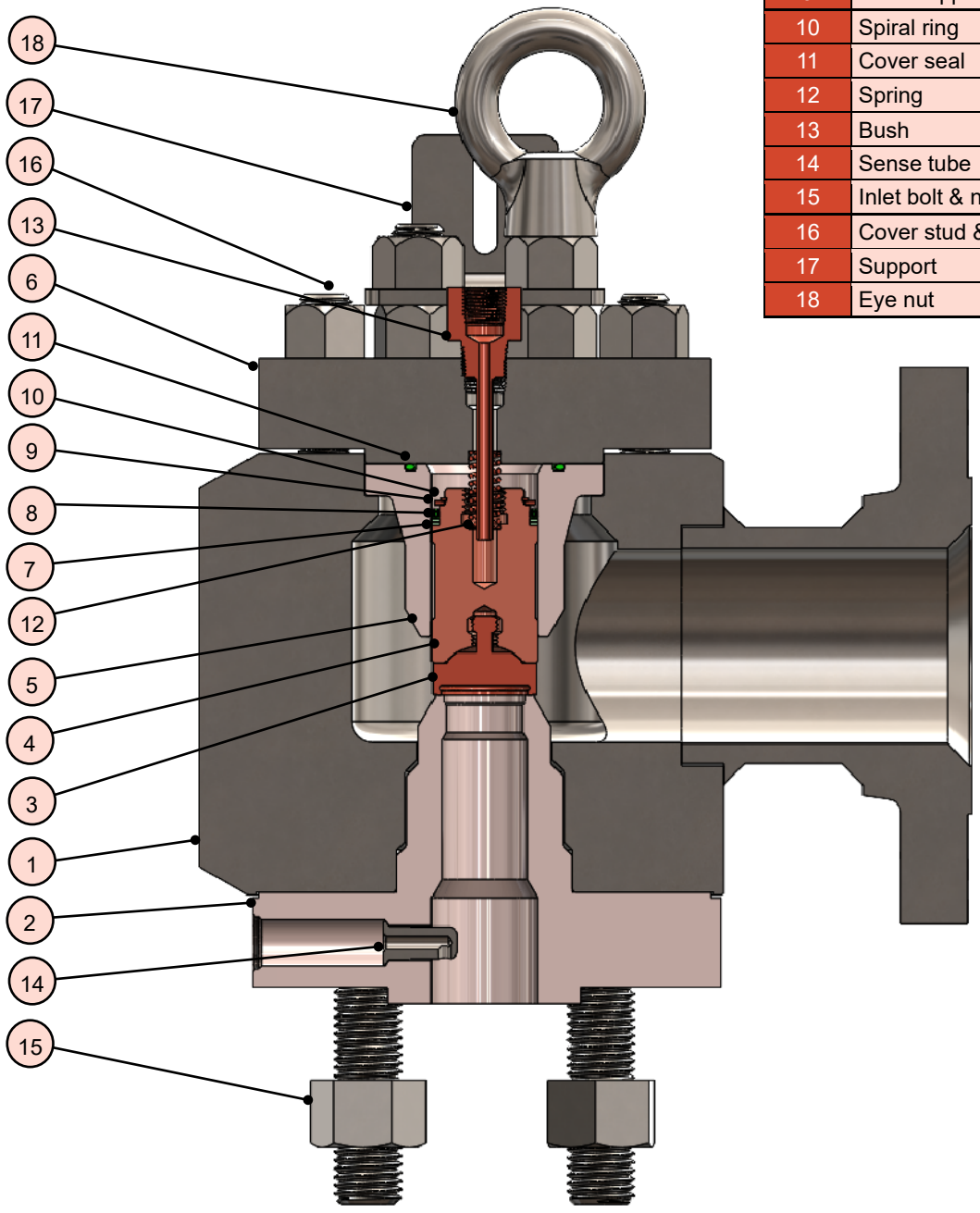
Structure of Pilot Valve

- Non-flowing modulation pilot
- With open lever
- Accommodating the service of water and steam



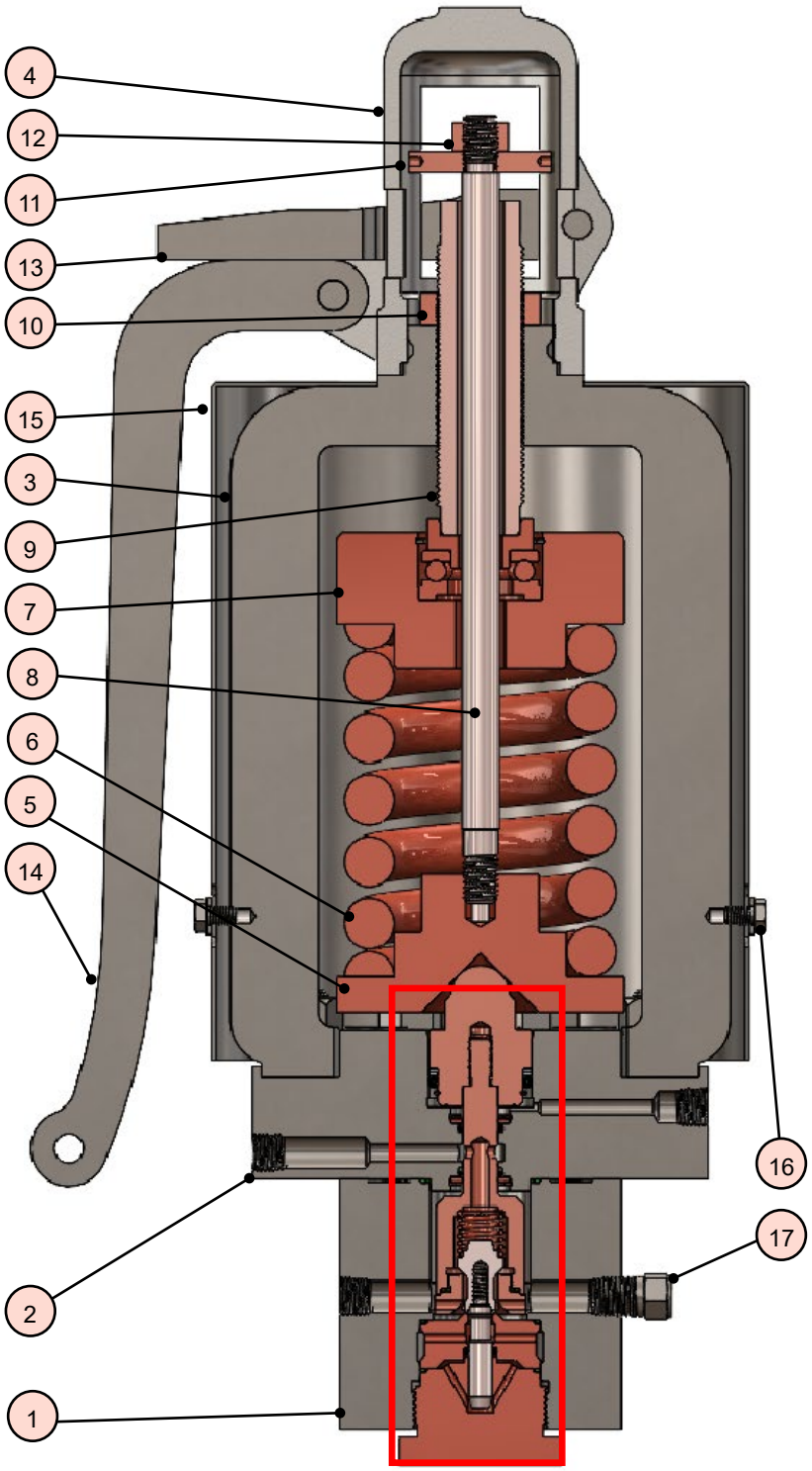
Cross-sectional View of Main Valve

No.	Part name
1	Body
2	Nozzle
3	Disc
4	Piston
5	Guide
6	Cover
7	Backup ring
8	Piston seal
9	Seal stopper
10	Spiral ring
11	Cover seal
12	Spring
13	Bush
14	Sense tube
15	Inlet bolt & nut
16	Cover stud & nut
17	Support
18	Eye nut

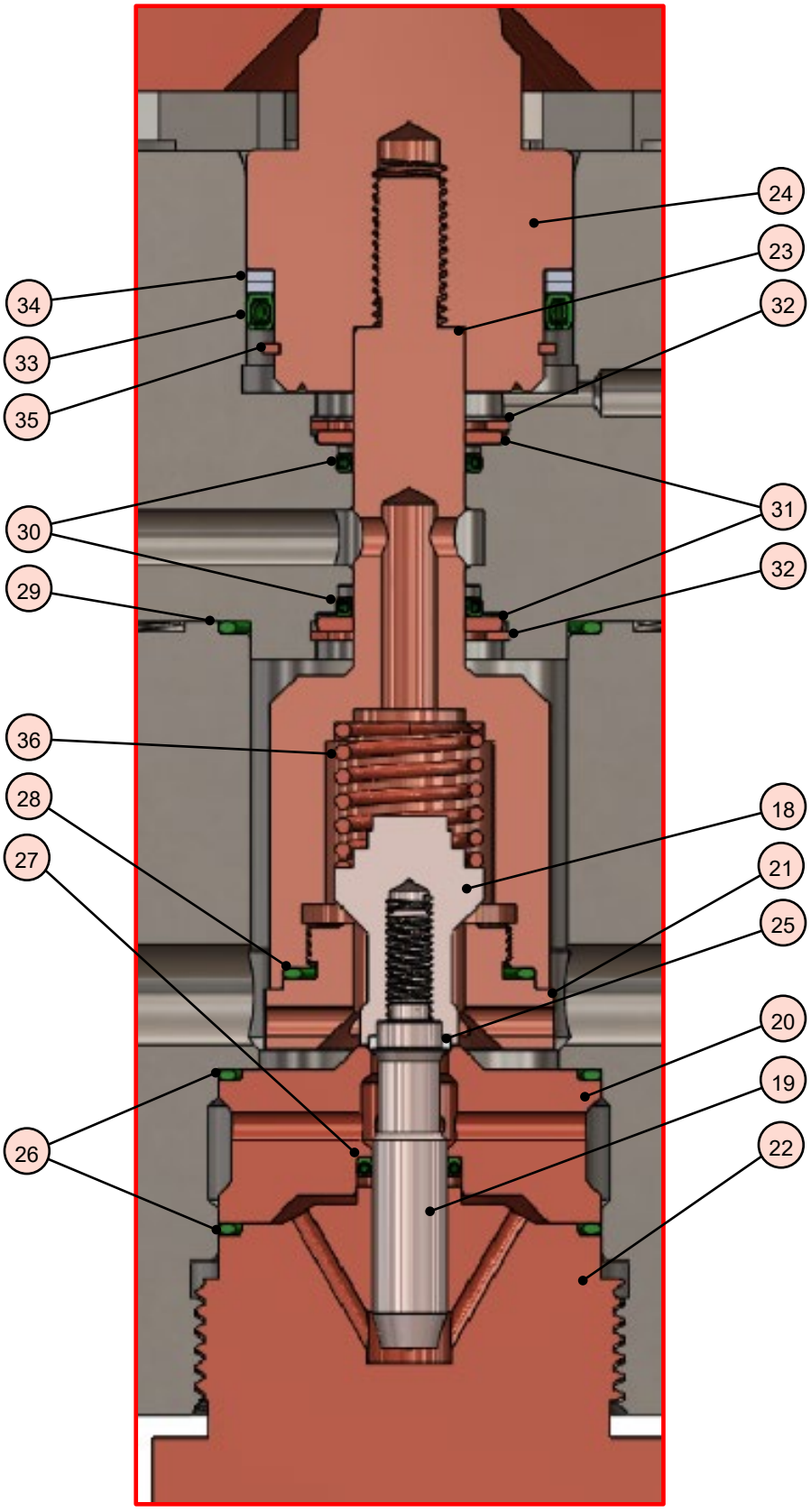


* This shows a general structure. The structure may vary depending on the size.

Cross-sectional View of Main Valve



No.	Part name
1	Body
2	Piston base
3	Yoke
4	Cap
5	Spring receiver
6	Spring
7	Spring retainer
8	Lifting rod
9	Adjust screw
10	Adjust screw lock nut
11	Lifting washer
12	Rod nut
13	Fork lever
14	Lever
15	Weather hood
16	Lock bolt
17	Plug
18	Disc
19	Spool
20	Outlet nozzle
21	Inlet nozzle
22	Bush
23	Inner piston
24	Outer piston
25	Seat
26	O-ring
27	Spool seal
28	O-ring
29	O-ring
30	Inner piston seal
31	Seal cover
32	C-clip
33	Outer piston seal
34	Backup ring
35	Spiral ring
36	Inner spring



* This shows a general structure. The structure may vary depending on the size.

Standard Material

Standard material (main valve)

No.	Inlet size	1.1/2, 2	3, 4, 6
1	Body	SA105M	SA216M-WCB
2	Nozzle	SA105M	
3	Disc	SUS630 (≤320°C), B637-N07750 (>320°C)	
4	Piston	SUS630	
5	Guide	SUS304	
6	Cover	SA479M-304	
7	Backup ring	PTFE	
8	Piston seal	SUS304. GRAPHITE	
9	Seal stopper	SUS304	
10	Spiral ring	SUS304	
11	Cover seal	FFKM	
12	Spring	SUS304-WPB	
13	Bush	SUS304	
14	Sense tube	SUS304	
15	Inlet bolt & nut	SA193-B7, SA194-2H	
16	Cover stud & nut	SA193-B7, SA194-2H	
17	Support	SS400	
18	Eye nut	SUS304	

Standard material (pilot valve)

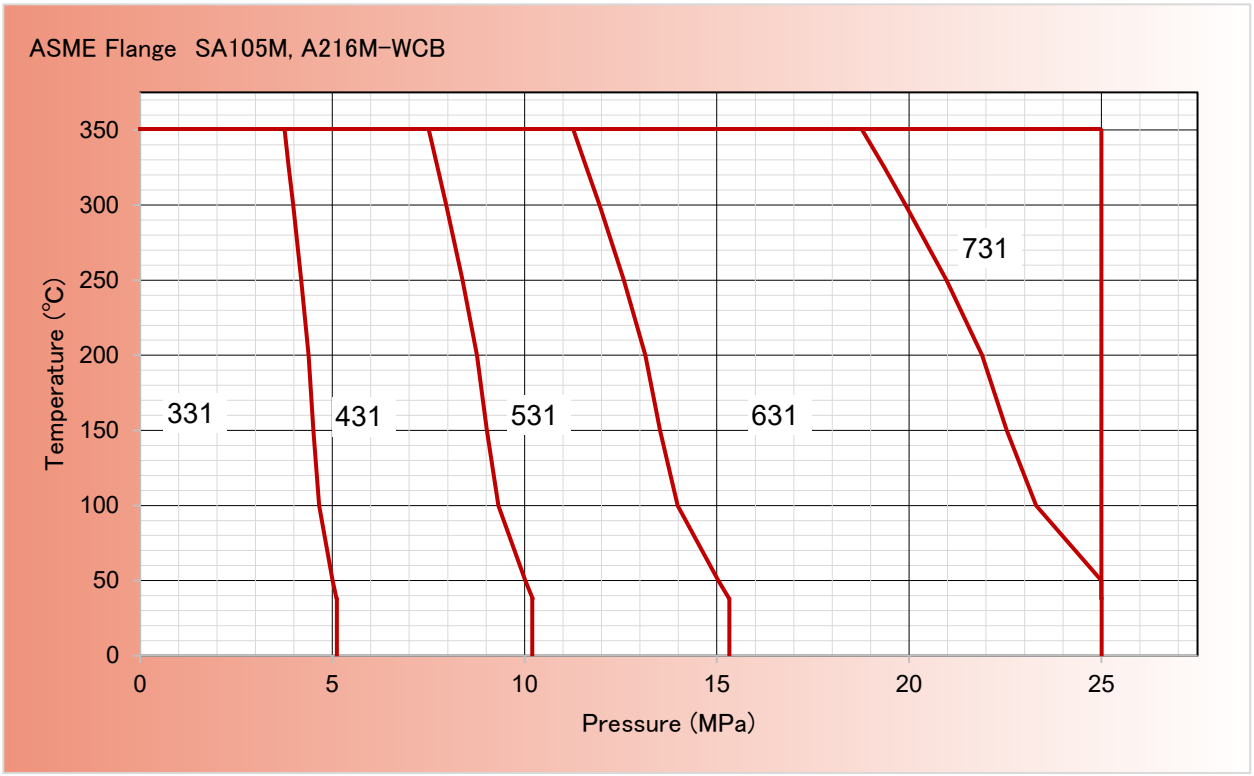
No.	Part name	Material	No.	Part name	Material
1	Body	SA479-316	19	Spool	SUS630
2	Piston base	SA479-316	20	Outlet nozzle	SUS630
3	Yoke	A216-WCB	21	Inlet nozzle	SUS630
4	Cap	FCMB31-08	22	Bush	SA479-316
5	Spring receiver	SUS304	23	Inner piston	SUS630
6	Spring	SUP10	24	Outer piston	SUS630
7	Spring retainer	SUS304	25	Seat	PTFE graphite filled
8	Lifting rod	SUS630	26	O-ring	FFKM
9	Adjust screw	SUS403	27	Spool seal	SUS316. GRAPHITE
10	Adjust screw lock nut	SUS304	28	O-ring	FFKM
11	Lifting washer	SS400	29	O-ring	FFKM
12	Rod nut	SS400	30	Inner piston seal	SUS316. GRAPHITE
13	Fork lever	FCMB31-08	31	Seal cover	SUS304
14	Lever	FCMB31-08	32	C-clip	SUS304
15	Weather hood	SS400	33	Outer piston seal	SUS316. GRAPHITE
16	Lock bolt	SUS304	34	Backup ring	PTFE Glass fiber filled
17	Plug	SUS304	35	Spiral ring	SUS304
18	Disk	SUS630	36	Inner spring	B637-N07750 eq.

Actual Area

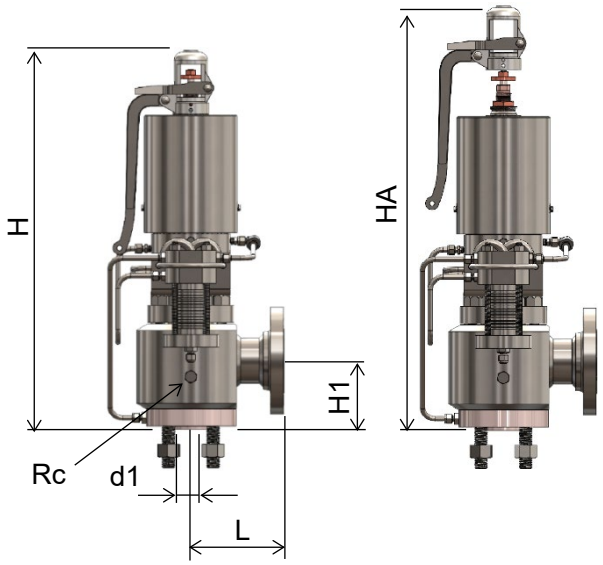
Size	Throat diameter (mm)	Seat diameter (mm)	Nominal lift (mm)	Area ($mm^{2)}$
1.1/2*28.8*3	28.8	32.5	8.5	651.1
1.1/2*36*3	36.0	41.0	10.0	1017.3
2*45*3	45.0	51.0	13.0	1589.6
3*72*6	72.0	78.0	20.0	4069.4
4*90*6	90.0	95.0	24.0	6358.5
6*135*8	135.0	140.0	36.0	14306.6

Pressure–temperature Rating

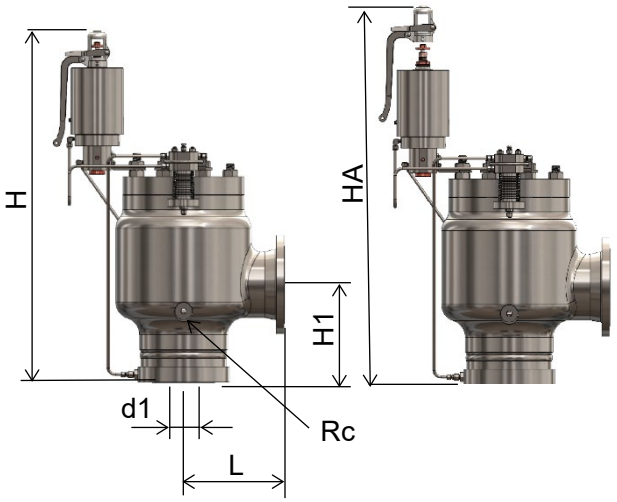
Pressure–temperature Rating RPE Flange												
Body material	Size	Flange class		Maximum pressure limit (MPa)								
				Temperature T (°C)								
		Inlet	Outlet	38	50	100	150	200	250	300	325	350
SA105M or A216M -WCB	All sizes	300	150	5.11	5.01	4.66	4.51	4.38	4.19	3.98	3.87	3.76
		600		10.21	10.02	9.32	9.02	8.76	8.39	7.96	7.74	7.51
		900		15.32	15.04	13.98	13.52	13.14	12.58	11.95	11.61	1.1/27
		1500	300	25.00	25.00	23.30	22.54	21.90	20.97	19.91	19.36	18.78
		2500		25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00



Dimensions and Weight



Size 1.1/2, 2



Size 3, 4, 6

ASME, JPI Flange Dimensions and Weight Units: mm, kg

Size	Pressure class code	Flange class		Inlet diameter	Center-to-face dimension		Overall length	Disassembly height	Thread	Approximate weight
		Inlet	Outlet	d1	H1	L	H	HA	Drain Rc	
1.1/2*32.5*3	3	300	150	40	125	165	720	920	1/2	90
	4	600	150		125	165	720	920		90
	5	900	150		135	175	760	960		100
	6	1500	300		135	185	760	960		100
	7	2500	300		135	200	770	970		110
1.1/2*36*3	3	300	150	40	125	165	720	920	1/2	100
	4	600	150		125	165	720	920		100
	5	900	150		135	175	760	960		110
	6	1500	300		135	185	760	960		110
	7	2500	300		135	200	770	970		120
2*41*3	3	300	150	50	125	190	780	980	1/2	120
	4	600	150		125	190	780	980		120
	5	900	150		135	200	820	1020		130
	6	1500	300		135	210	820	1020		130
	7	2500	300		135	230	830	1030		140
3*51*6	3	300	150	80	230	239	950	1150	1/2	180
	4	600	150		230	239	950	1150		180
	5	900	150		240	239	960	1160		190
	6	1500	300		270	250	1000	1200		200
4*78*6	3	300	150	100	245	274	1000	1200	1/2	220
	4	600	150		255	274	1010	1210		230
	5	900	150		275	274	1030	1230		240
	6	1500	300		285	285	1050	1250		250
6*95*8	3	300	150	150	340	350	1200	1400	1/2	350
	4	600	150		355	350	1220	1420		370

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