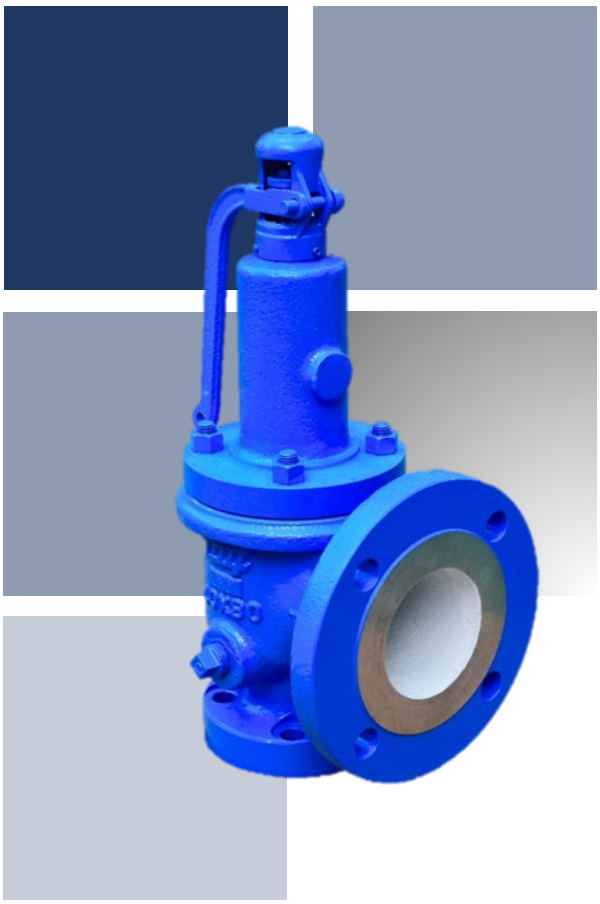


FUKUI

RE Series

Contents

Features

The RE series is a flagship spring-loaded type pressure relief valve, which has been manufactured and improved by FUKUI SEISAKUSHO for nearly half a century. It meets diverse customer needs and has a very wide range of applicability for numerous certifications, regulations and standards, fluids, pressures, and temperatures, making it usable for various services.

Certification

Certification	Range				
	Service	Size	Pressure range		Discharge coefficient
			MPa	psi	
ASME BPVC SECTION VIII Division 1	Gas	D–H	0.1–68.9	15–10000	0.869
		L	0.1–24.1	15–3500	
		J, K, M	0.1–20.6	15–3000	
		N	0.1–10.3	15–1500	
		P	0.1–13.7	15–2000	
		Q, R	0.1–5.5	15–800	
		T, TS	0.1–4.1	15–600	
	Steam	D–H	0.1–41.3	15–6000	0.869
		L	0.1–241.1	15–3500	
		J, K, M	0.1–20.6	15–3000	
		N	0.1–10.3	15–1500	
		P	0.1–13.7	15–2000	
		Q, R	0.1–5.5	15–800	
		T, TS	0.1–4.1	15–600	
	Liquid	D–H	0.1–68.9	15–10000	0.717
		L	0.1–24.1	15–3500	
		J, K, M	0.1–20.6	15–3000	
		N	0.1–10.3	15–1500	
		P	0.1–13.7	15–2000	
		Q, R	0.1–5.5	15–800	
		T, TS	0.1–4.1	15–600	

Certification	Range				
	Service	Size	Pressure range		Discharge coefficient
			MPa	psi	
ASME BPVC SECTION VIII Division 1	Gas	V–B	0.1–3.44	15–500	0.869
	Steam				
	Liquid				0.717

* In addition to the above-mentioned pressure and size, the ASME UV STAMP also specifies minimum requirements for temperature, structure, materials, etc. If all of these requirements are satisfied, the product can be certified as ASME UV STAMP. Therefore, some types cannot be certified as ASME UV STAMP.

* We have also obtained certifications from CE Mark, TS Mark, TRCU, and classification societies such as NK, LR, BV, DNV, ABS, KR, RS, CCS, and RINA. For more information, contact us.

* For the actual manufacturing range, refer to the Pressure-temperature rating. There are cases where products exceeding this Pressure-temperature rating can also be manufactured.

Structure (Conventional and Bellows)

The structure of the RE (standard) is roughly classified into two types: the conventional type and bellows type in the lineup. The latter significantly reduces the effect of backpressure. Figures 1 and 2 show the structure for inlet sizes up to NPS 8 (DN 200). This size variation is based on API 526 Flanged Steel Pressure-relief Valves.

- Full nozzle
- Bolted bonnet
- Cast integral body
- Lower adjusting ring

The pressure on the outlet side of the pressure relief valve is called backpressure. There are two types of backpressure: the superimposed backpressure, which is present before the pressure relief valve operates, and the built-up backpressure which occurs as a result of the pressure relief valve operating. When the pressure relief valve operates, the total backpressure which is the sum of the superimposed backpressure and built-up backpressure is generated. In general, the conventional type is selected when the total backpressure is less than the allowable excessive pressure (normally 10%).

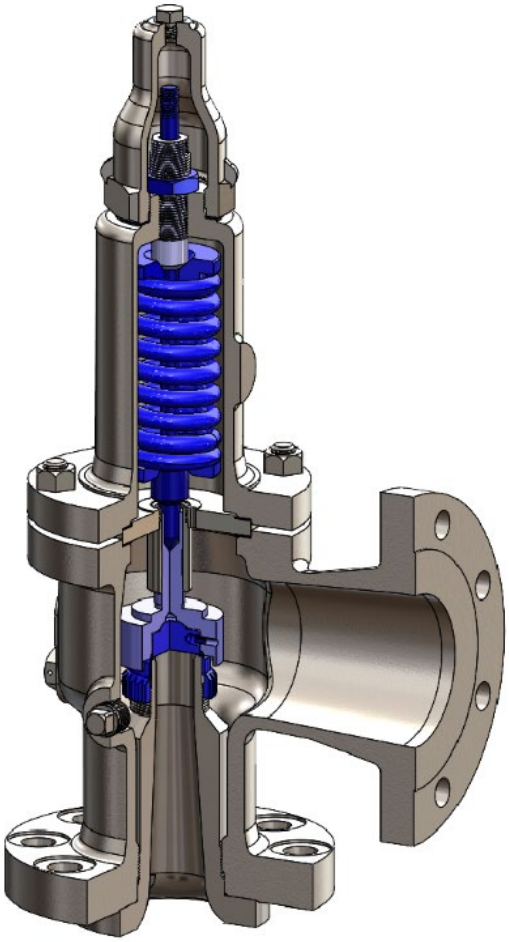


Figure 1. REC (NPS 8 or less)
Conventional type

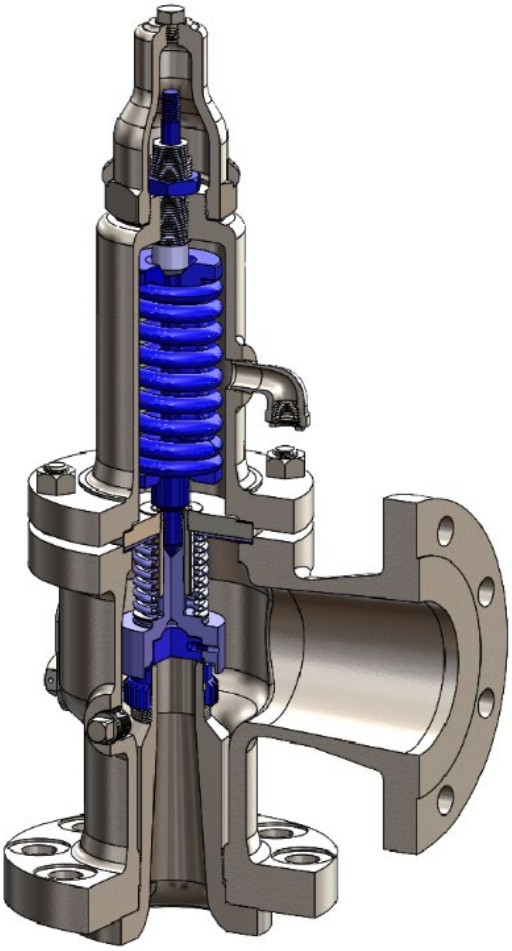


Figure 2. REB (NPS 8 or less)
Bellows type

The bellows type is selected when there is backpressure that cannot be coped with by the conventional type. It is designed to have an effective area equivalent to the disc seat diameter, whose structure makes it unaffected by backpressure on the outlet side of the pressure relief valve. If the backpressure is constant, the bellows type is not necessary. The bonnet section of the bellows type has a vent elbow (with bug screen), which need to be always open to the atmosphere. If there is a possibility that toxic gases may be released into the atmosphere when the bellows is damaged, it is necessary to pipe it to a safe location. If atmospheric components may freeze in low-temperature services, it is required to implement heat trace etc. as anti-freezing countermeasures.

Main Section Structure

The trim of the RE series adopts a structure suitable for various services. It uses a disc and holder assembly structure. The disc and holder come in contact with each other on a spherical surface, and the disc acts perpendicularly on the seat surface of the nozzle.

- Solid disc

  The solid disc has the most common disc structure, which is a seat structure used for gases and liquids except steam. The seat contact surface is standardly buildup-hardened using BISHILITE® to improve the nozzle airtightness performance and the durability performance. If buildup welding using BISHILITE® affects corrosion resistance, this buildup-hardening treatment may not be performed.

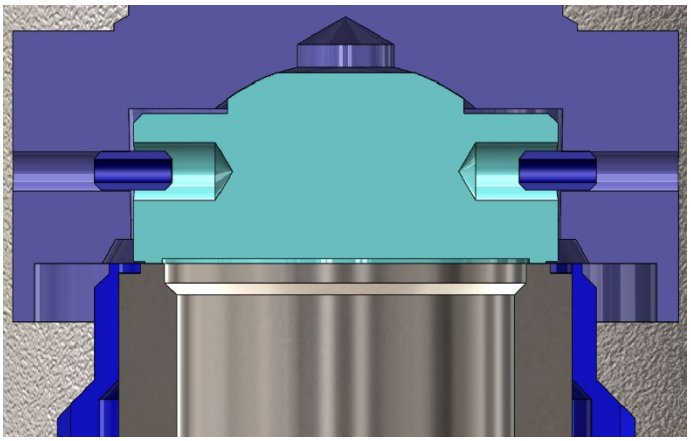


Figure 3. Solid disc

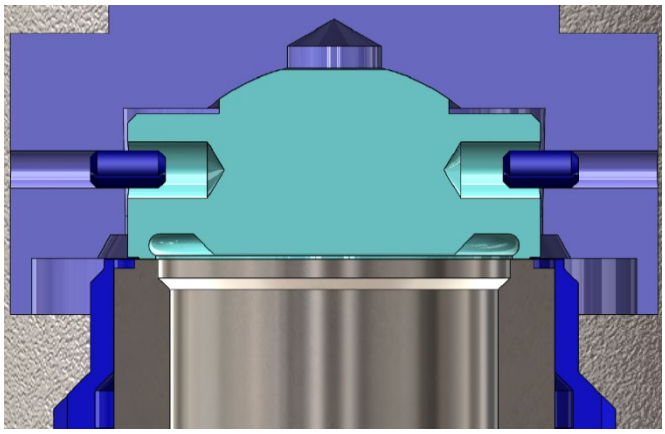


Figure 4. Feather disc

- Feather disc

  The feather disc has a seat structure mainly used for steam services. It adopts a structure that actively ensures nozzle airtightness performance by utilizing the temperature difference between the inner and outer surfaces of the feather lip section. In addition, it uses SUS630 or B637-N07750, materials excellent in hardness and toughness and suitable for this feather lip shape. These materials ensure seat surface hardness through precipitation hardening treatment.

- O-ring seat seal

  The O-ring seat seal is an option used when a stricter nozzle airtightness performance criterion is required as compared with a metal seat. Materials suitable for the fluid and temperature should be selected for the O-ring.

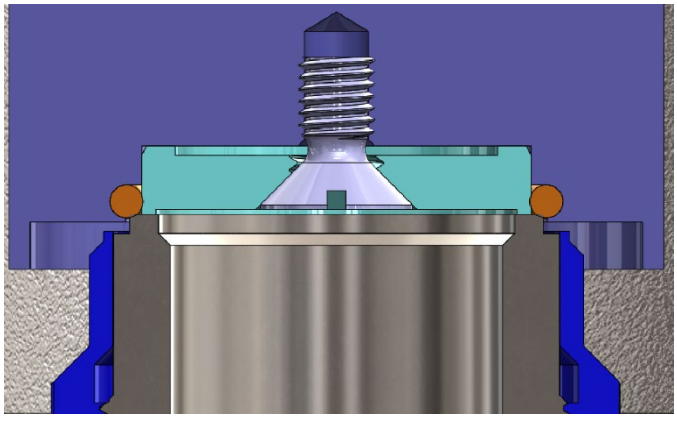


Figure 5. O-ring seat seal

Cap code

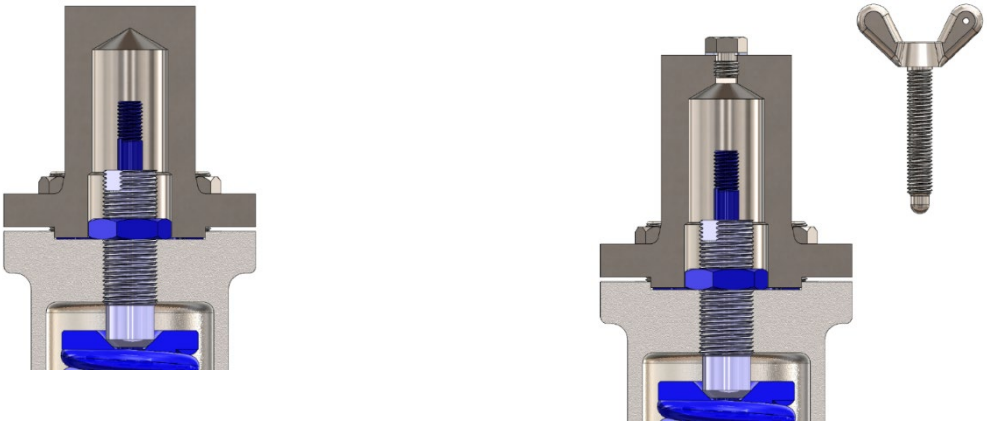
The following five types of structures, each of which is with or without a test gag, are available as the cap structure. The test gag is an option for performing an airtight test with the pressure relief valve installed on piping etc.

Cap		Figure	Airtightness	Lever	Test gag
(A)	Screwed sealed cap	6	○	X	X
(B)					○
(G)	Bolted sealed cap	7	○	X	X
(H)					○
(D)	Bolted Sealed lever cap	8	○	○	X
(E)					○
(M)	Screwed sealed lever cap	9	○	○	X
(N)					○
(C)	Open lever	10	X	○	X
(T)					○

* Applicable and manufacturable only for small diameters.

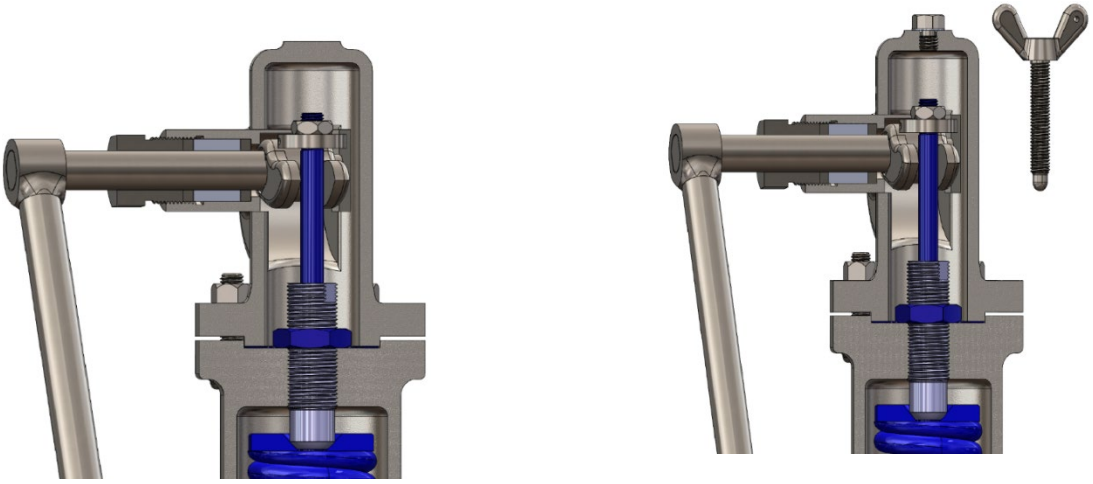
This is the most common cap structure, which is selected when airtightness is required and no lever is needed.

Figure 6. Screwed Sealed cap



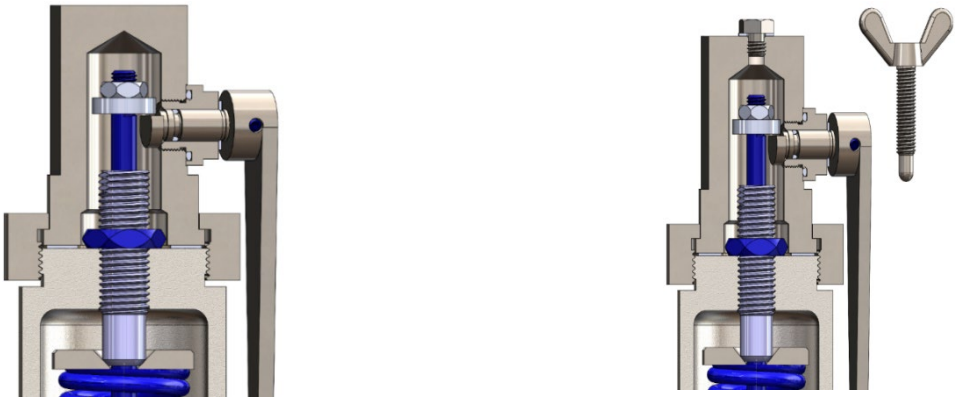
This structure is selected when a high pressure is applied on the secondary side.

Figure 7. Bolted sealed cap



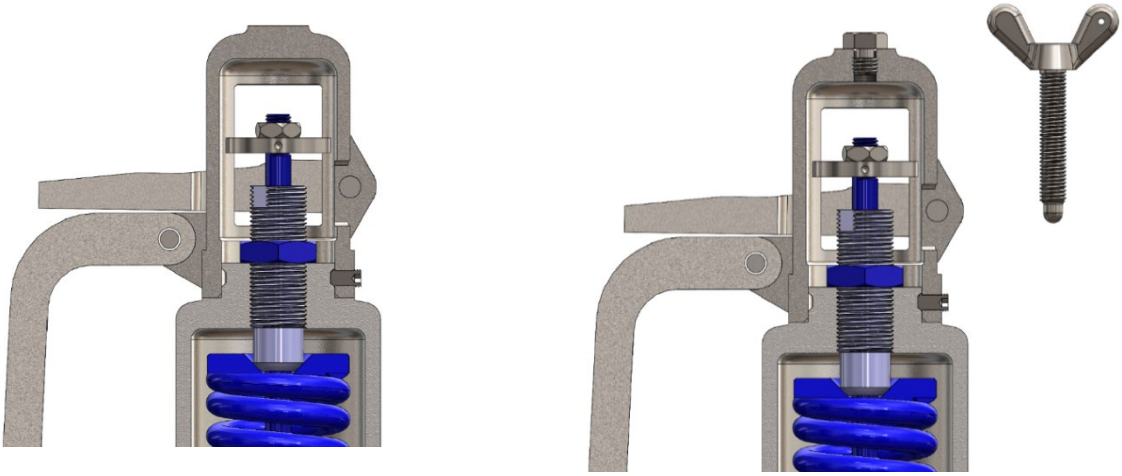
This structure is selected when tightness is required and a lever is needed. The lever is lifted to activate the pressure relief valve when the pressure on the inlet side of the pressure relief valve is 75% of the set pressure.

Figure 8. Bolted sealed lever cap



This type has the same function as the bolted sealed lever cap. Because the cap section has a cap nut structure, the lever position is not restricted.

Figure 9. Screwed sealed lever cap



The open lever is selected mainly when fluids such as steam or air will exert no influence even if they blow out from the cap section. 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.

Figure 10. Open lever

Type code

REC	4	6	1-	3	S15	-STM	(A)

Cap code

(A)	Sealed screwed	(B)	(A) + Test gag
(G)	Sealed bolted	(H)	(G) + Test gag
(D)	Sealed lever (packing)	(E)	(D) + Test gag
(M)	Sealed lever (O-ring)	(N)	(M) + Test gag
(C)	Open lever	(T)	(C) + Test gag

Option code

-STM	For steam	-STMG	Water seal type for steam
-EC	For feed-water heater	-G	Water seal type
-HT	For high temperature	-BP	Balance piston type
-HP	For high backpressure	—	—

Material code (See the table below.)

Inlet flange class (only different from pressure class) Same code as pressure class

Connection code

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

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

2	-268(-450) ≤ T< -196(-320)	5	-60(-75) ≤ T< -29(-20)	8	427(800) ≤ T< 538(1000)
3	-196(-320) ≤ T< -101(-150)	6	-29(-20) ≤ T< 232(450)	9	583(1000) ≤ T
4	101(-150) ≤ T< -60(-75)	7	232(450) ≤ T< 427(800)	—	—

Pressure class code

1	Class 150 or JIS 10K	3	Class 300 or JIS 30K	5	Class 900	7	Class 2500
2	Class 300 or JIS 20K	4	Class 600	6	Class 1500	8	Class > 2500

Type code [1]+[2]+[3]+[4]+[5]

[1]	[2]		[3]		[4]		[5]	
RE	C	Conventional	Blank	For gas and steam	Blank	Standard	Blank	Standard
	B	Bellows	L	For liquid	P	For pump relief	J	Jacket type
	DW	Weight-loaded type	—	—	—	—	—	—

Material code (The material code consists of [1] Body material code + [2] NACE code.)

[1] Body material code

Blank	A216-WCB (SCPH2)	E	SA105M	S	A351-CF8 (SCS13A)	G	SUSF304
C1	A217-WC1 (SCPH11)	E2	F11	S1	A351-CF8M (SCS14A)	G1	SUSF316
C2	A217-WC6 (SCPH21)	E3	F22	S2	A351-CF3 (SCS19A)	G2	SUSF304L
C3	A217-WC9 (SCPH32)	E5	LF2	S3	A351-CF3M (SCS16A)	G3	SUSF316L
C4	A217-WC5 (SCPH61)	M	Monel® casting	S4	A351-CF8C	G4	SUSF321
C5	A352-LCB (SCPL1)	H	Hastelloy® casting	S18	A351-CF8/A216-WCB	T	Titanium series
C6	A352-LC1 (SCPL11)	MF	Monel® forging	S19	A351-CF8M/A216-WCB	—	—
C7	A352-LC2 (SCPL21)	HF	Hastelloy® forging	S20	A351-CF3/A216-WCB	—	—
C8	A352-LC3 (SCPL31)	A	Aluminum	S21	A351-CF3M/A216-WCB	—	—
CA	A217-C12A	B	Copper alloy series	—	—	SS	Special

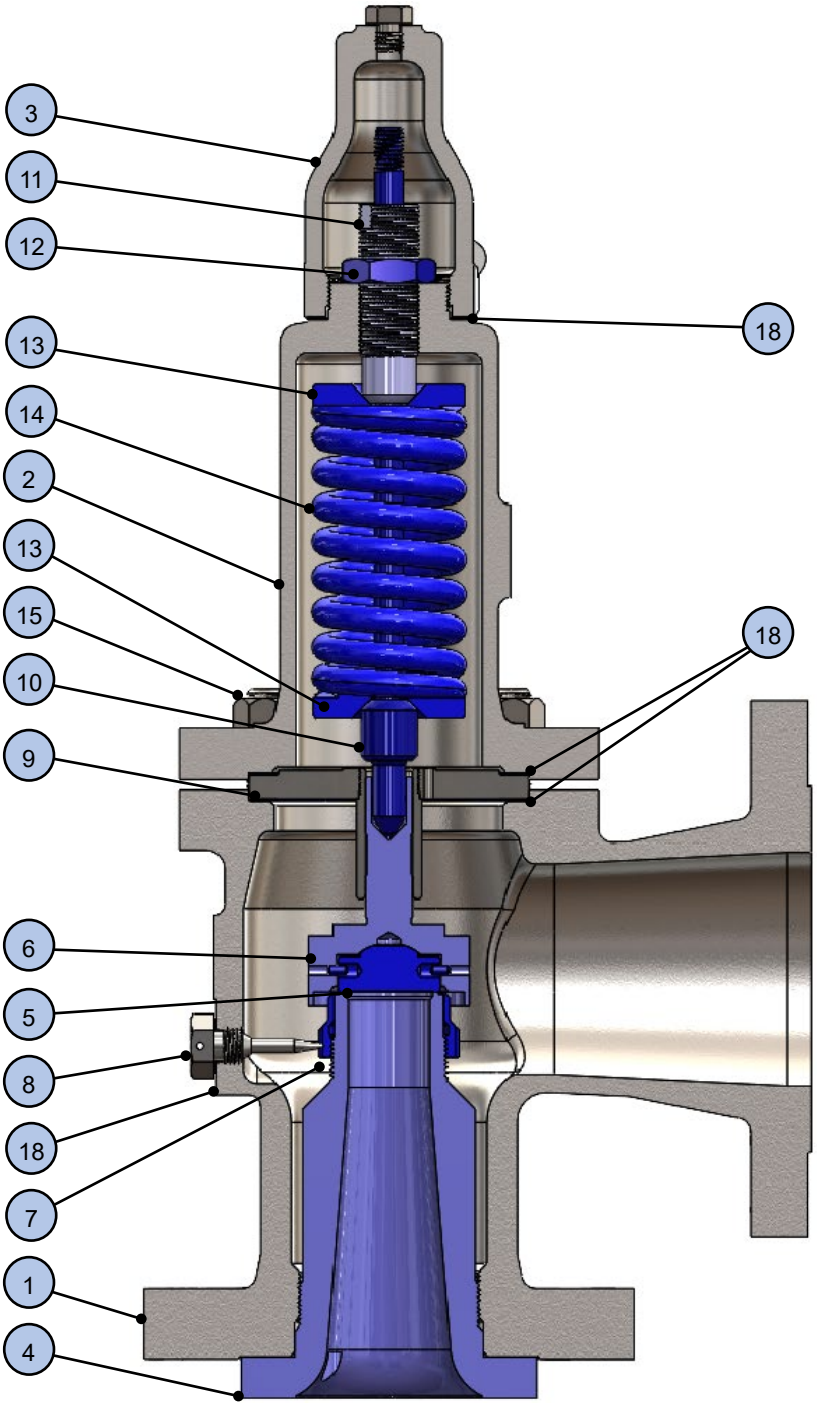
[2] NACE code

Blank	NACE not applied	P	NACE applicable grade
N	NACE applicable grade	R	NACE applicable grade

The NACE applicable grade varies depending on conditions such as the applicable standard, year, pressure, and sour gas partial pressure.

Cross-Sectional View

Conventional type

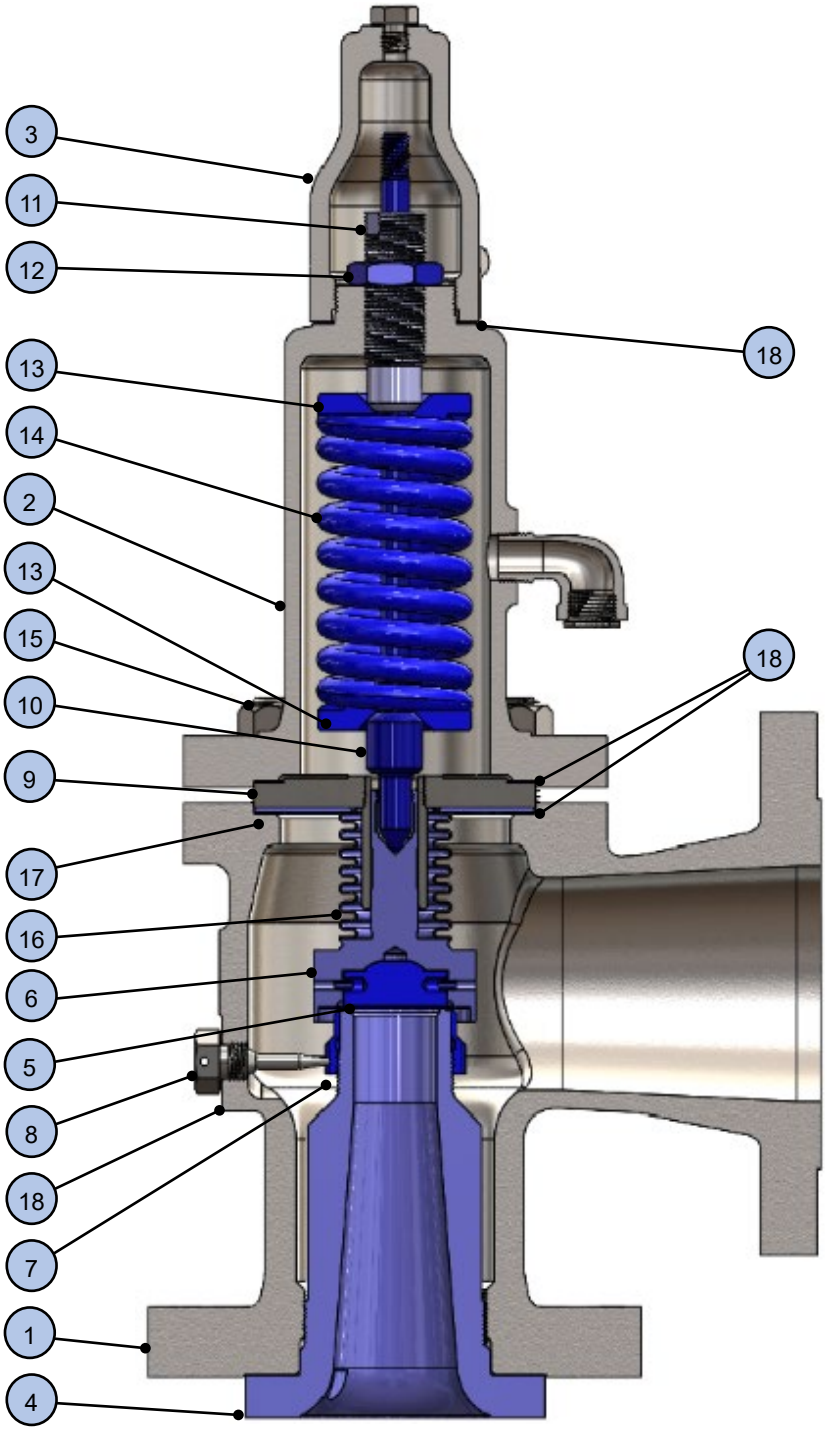


No.	Part name	
1	Body	
2	Bonnet	
3	Cap	
4	Nozzle	
5	Disc	
6	Disc holder	
7	Adjusting ring	
8	Adjusting ring lock bolt	
9	Guide	Sleeve
		Flange
10	Spindle	
11	Adjusting screw	
12	Adjusting screw lock nut	
13	Spring retainer	
14	Spring	
15	Stud bolt and nut	
18	Gasket	

Figure 11. Conventional type

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

Bellows type



No.	Part name	
1	Body	
2	Bonnet	
3	Cap	
4	Nozzle	
5	Disc	
6	Disc holder	
7	Adjusting ring	
8	Adjusting ring lock bolt	
9	Guide	Sleeve
		Flange
10	Spindle	
11	Adjusting screw	
12	Adjusting screw lock nut	
13	Spring retainer	
14	Spring	
15	Stud bolt and nut	
16	Bellows	
17	Bellows fitting	
18	Gasket	

Figure 12. Bellows type

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

Standard Material

Standard material by temperature

No.	Application temperature range °C		-196 – -101	-101 – -60	-60 – -29	-29 – 232	232 – 427	427 – 538
	Material code		S			Blank		C2
1	Body		A351-CF8 or SCS13A			A216-WCB or SCPH2		A217-WC6 or SCPH21
2	Bonnet		A351-CF8 or SCS13A			A216-WCB or SCPH2		A217-WC6 or SCPH21
3	Cap		SCS13A			SCPH2 or SA105M		
4	Nozzle		SUS(F)304					
5	Disc		Solid disc type SUS304 / Feather disc type SUS630(T ≤ 320°C), B637-N07750(T > 320°C)					
6	Disc holder		SUS304			SUS403		
7	Adjusting ring		SUS304 or SCS13A					
8	Adjusting ring lock bolt		SUS304					
9	Guide	Sleeve	SUS304					
		Flange	SUS304			SA105M		
10	Spindle		SUS304			SUS403		
11	Adjusting screw		SUS304			SUS403		
12	Adjusting screw lock nut		SUS304			SS400		
13	Spring retainer		SUS304			S25C		
14	Spring		SUS304			Spring Steel		
15	Stud bolt and nut		SUS304 / SUS304			SNB7 / S45C		
16	Bellows*		SUS316L					
17	Bellows fitting*		SUS316L					
18	Gasket		V7010(-50 ≤ T ≤ 100°C) V7020(-196 ≤ T < -50°C, 100 < T ≤ 200°C)			V6502(T ≤ 300°C) / V560(T > 300°C)		

* These parts are not included in REC (conventional type).

* The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Standard material by material code

No.	Material code		S1	S2	S3	S4
1	Body		A351-CF8M or SCS14A	A351-CF3 or SCS19A	A351-CF3M or SCS16A	A351-CF8C or SCS21
2	Bonnet		A351-CF8M or SCS14A	A351-CF3 or SCS19A	A351-CF3M or SCS16A	A351-CF8C or SCS21
3	Cap		SCS14A	SCS19A	SCS16A	SCS14A
4	Nozzle		SUS(F)316 or SCS14A	SUS(F)304L or SCS19A	SUS(F)316L or SCS16A	SUS(F)321
5	Disc		SUS316	SUS304L	SUS316L	SUS(F)321
6	Disc holder		SUS316	SUS304L	SUS316L	SUS316
7	Adjusting ring		SUS316 or SCS14A	SUS304L or SCS19A	SUS316L or SCS16A	SUS316 or SCS14A
8	Adjusting ring lock bolt		SUS316	SUS304L	SUS316L	SUS316
9	Guide	Sleeve	SUS316	SUS304L	SUS316L	SUS316
		Flange	SUS316	SUS304L	SUS316L	SUS316
10	Spindle		SUS316	SUS304L	SUS316L	SUS316
11	Adjusting screw		SUS316	SUS304L	SUS316L	SUS316
12	Adjusting screw lock nut		SUS316	SUS304L	SUS316L	SUS316
13	Spring retainer		SUS316	SUS304L	SUS316L	SUS316
14	Spring		SUS316	SUS304	SUS316	SUS316
15	Stud bolt and nut		SUS316	SUS304	SUS316	SUS316
16	Bellows		SUS316L			
17	Bellows fitting		SUS316L			
18	Gasket		V7010(-50 ≤ T ≤ 100°C) / V7020(-196 ≤ T < -50°C, 100 < T ≤ 200°C)			

* These parts are not included in REC (conventional type).

Standard material by material code

No.	Material code		S18	S19	S20	S21
1	Body		A351-CF8M or SCS14A	A351-CF3 or SCS19A	A351-CF3M or SCS16A	A351-CF8C or SCS21
2	Bonnet		A216 WCB or SCPH2			
3	Cap		SA105M			
4	Nozzle		SUS(F)316 or SCS14A	SUS(F)304L or SCS19A	SUS(F)316L or SCS16A	SUS(F)321
5	Disc		SUS316	SUS304L	SUS316L	SUS(F)321
6	Disc holder		SUS316	SUS304L	SUS316L	SUS316
7	Adjusting ring		SUS316 or SCS14A	SUS304L or SCS19A	SUS316L or SCS16A	SUS316 or SCS14A
8	Adjusting ring lock bolt		SUS316	SUS304L	SUS316L	SUS316
9	Guide	Sleeve	SUS316	SUS304L	SUS316L	SUS316
		Flange	SA105M			
10	Spindle		SUS403			
11	Adjusting screw		SUS403			
12	Adjusting screw lock nut		SS400			
13	Spring retainer		S25C			
14	Spring		Spring Steel			
15	Stud bolt and nut		SNB7 / S45C			
16	Bellows		SUS316L			
17	Bellows fitting		SUS316L			
18	Gasket		V7010(-50 ≤ T ≤ 100°C) / V7020(-196 ≤ T < -50°C, 100 < T ≤ 200°C)			

* Material codes S18, S19, S20, and S21 are for the bellows type only.

Standard material by material code

REC (conventional type)

No.	Material code		N	P	R	S1N	S1P	SSR
1	Body		A216-WCB			A351-CF8M		A494-CW12MW
2	Bonnet		A216-WCB			A351-CF8M		A494-CW12MW
3	Cap		SA105M			SCS14A		B574-N10276
4	Nozzle		SUS(F)316 or SCS14A		B574-N10276	SUS(F)316 or SCS14A		B574-N10276
5	Disc		SUS316		B574-N10276	SUS316		B574-N10276
6	Disc holder		SUS316		B574-N10276	SUS316		B574-N10276
7	Adjusting ring		SUS316		B574-N10276	SUS316		B574-N10276
8	Adjusting ring lock bolt		SUS316		B574-N10276	SUS316		B574-N10276
9	Guide	Sleeve	SUS316		B574-N10276	SUS316		B574-N10276
		Flange	SUS316		B574-N10276	SUS316		B574-N10276
10	Spindle		SUS316		B637-N07750	SUS316		B637-N07750
11	Adjusting screw		SUS316		B574-N10276	SUS316		B574-N10276
12	Adjusting screw lock nut		SUS316		B574-N10276	SUS316		B574-N10276
13	Spring retainer		SUS316		B574-N10276	SUS316		B574-N10276
14	Spring		Spring Steel*		B637-N07750	SUS316		B637-N07750
15	Stud bolt and nut		A193-B7M / A194-2HM			A193-B8MA-CL1A/A194-8MA		
18	Gasket		V6502(T ≤ 300°C) / V560(T > 300°C)			V7010(-50 ≤ T ≤ 100°C) V7020(-196 ≤ T < -50°C, 100 < T ≤ 200°C)		

* Aluminum thermal spray

REB (bellow type)

No.	Material code		N	P	R	S1N	S1P	SSR
1	Body		A216-WCB		A494-CW12MW	A351-CF8M		A494-CW12MW
2	Bonnet		A216-WCB		A494-CW12MW	A351-CF8M		A494-CW12MW
3	Cap		SA105M			SCS14A		
4	Nozzle		SUS(F)316 or SCS14A		B574-N10276	SUS(F)316 or SCS14A		B574-N10276
5	Disc		SUS316		B574-N10276	SUS316		B574-N10276
6	Disc holder		SUS316		B446-N06625	SUS316		B574-N10276
7	Adjusting ring		SUS316		B574-N10276	SUS316		B574-N10276
8	Adjusting ring lock bolt		SUS316		B574-N10276	SUS316		B574-N10276
9	Guide	Sleeve	SUS316			SUS316		
		Flange	SUS316			SUS316		
10	Spindle		SUS403			SUS316		
11	Adjusting screw		SUS403			SUS316		
12	Adjusting screw lock nut		SS400			SUS316		
13	Spring retainer		SUS316			SUS316		
14	Spring		Spring Steel*			SUS316		
15	Stud bolt and nut		A193-B7M / A194-2HM			A193-B8MA-CL1A/A194-8MA		
16	Bellows		SUS316L	B443-N06625		SUS316L	B443-N06625	
17	Bellows fitting		SUS316L		B443-N06625	SUS316L		B443-N06625
18	Gasket		V6502(T ≤ 300°C) / V560(T > 300°C)			V7010(-50 ≤ T ≤ 100°C) V7020(-196 ≤ T < -50°C, 100 < T ≤ 200°C)		

* Aluminum thermal spray

* We also handle a wide range of materials other than the standard ones. For more information, contact us.

Actual Area

The orifice represents the minimum passing area of the pressure relief valve, using letters from D to B. API Standard 526 specifies 14 types of orifices, ranging from D to T. The “API 526 specified area” shown in the table below corresponds to this. This value is a nominal value used when making an initial selection without relying on any specific pressure relief valve.

Pressure relief valve manufacturers independently determine the throat area corresponding to this orifice. In the table below, the “FUKUI column” corresponds to this. Since the ASME code specifies that the discharge coefficient should use 90% of the actual measured value, the “Throat area” shown in the “FUKUI column” is designed to be more than 10% larger than the “API 526 specified area.” For the final selection, the values in the FUKUI column, which are manufacturers’ actual valuers, should be used.

This content is also described in “API 520 5.2 Effective Area and Effective Coefficient of Discharge.”

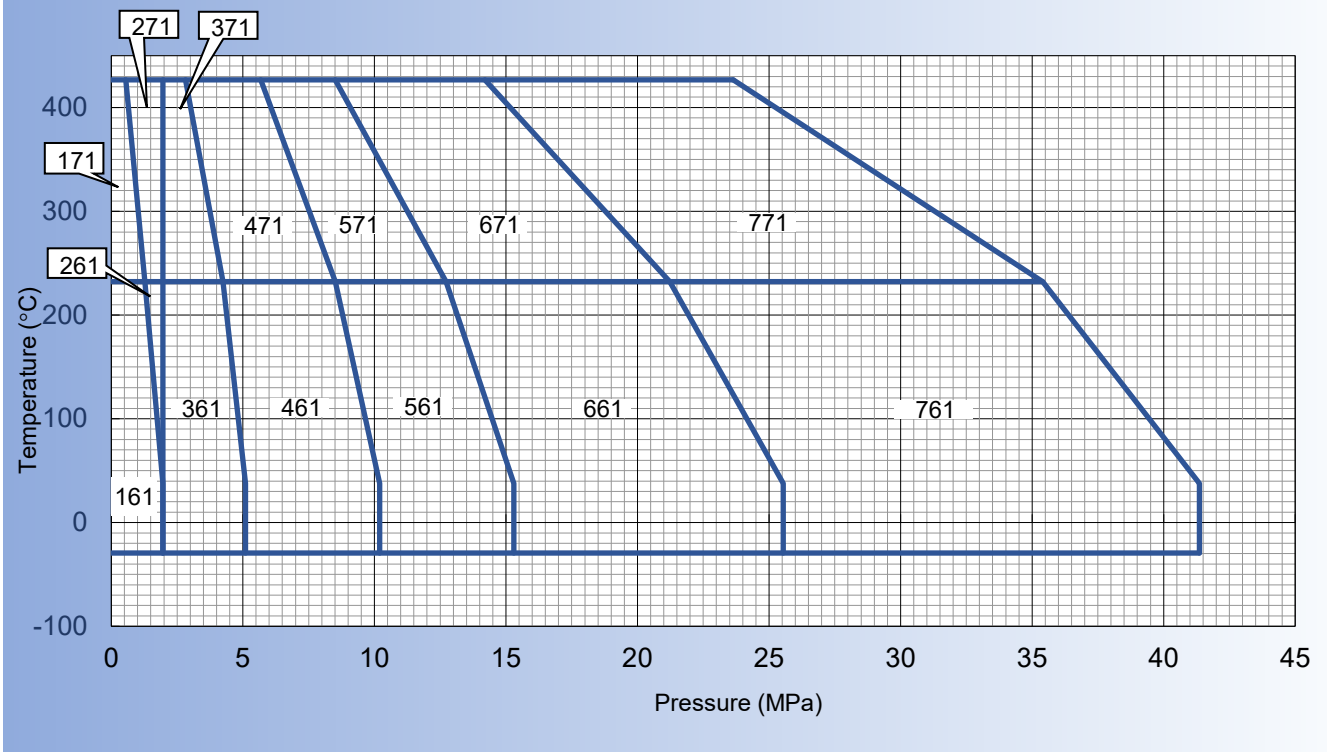
Orifice	FUKUI						API 526 Specified area	
	Throat diameter		Nominal lift		Throat area			
	mm	in	mm	in	mm^2	in^2	mm^2	in^2
D	10.6	0.4173	2.7	0.106	88.2	0.1368	71.0	0.110
E	15.2	0.5984	3.8	0.15	181.5	0.2812	126.5	0.196
F	17.6	0.693	4.4	0.174	243.3	0.3772	198.1	0.307
G	22.1	0.87	5.6	0.221	383.6	0.5645	324.5	0.503
H	27.5	1.083	6.9	0.272	594.0	0.9212	506.5	0.785
J	35.0	1.378	8.8	0.346	962.1	1.491	830.3	1.287
K	41.8	1.646	10.5	0.413	1372.3	2.128	1185.8	1.838
L	52.2	2.055	13.1	0.517	2140.0	3.317	1840.6	2.853
M	58.5	2.303	14.7	0.579	2687.8	4.165	2322.6	3.60
N	64.5	2.539	16.2	0.638	3267.5	5.063	2800.0	4.34
P	78.0	3.071	19.5	0.768	4778.4	7.407	4116.1	6.38
Q	103.5	4.075	25.9	1.02	8413.4	13.042	7129.00	11.05
R	123.3	4.854	30.9	1.216	11940.3	18.505	10322.6	16.00
T	155.0	6.102	38.8	1.528	18869.2	29.244	16774.2	26.00
TS	164.6	6.48	41.2	1.622	21278.9	32.98	-	-
V	198.5	7.815	49.7	1.957	30946	47.97	-	-
W	238.0	9.37	59.5	2.343	44488	68.96	-	-
Y	278.0	10.945	69.5	2.737	60698	94.08	-	-
Z	292.0	11.496	73.0	2.753	66966	103.8	-	-
Z2	318.5	12.539	79.7	3.138	79672	123.49	-	-
A	357.0	14.055	89.3	3.516	100090	155.15	-	-
B	397.0	15.63	99.3	3.91	123780	191.87	-	-

Pressure-temperature Rating

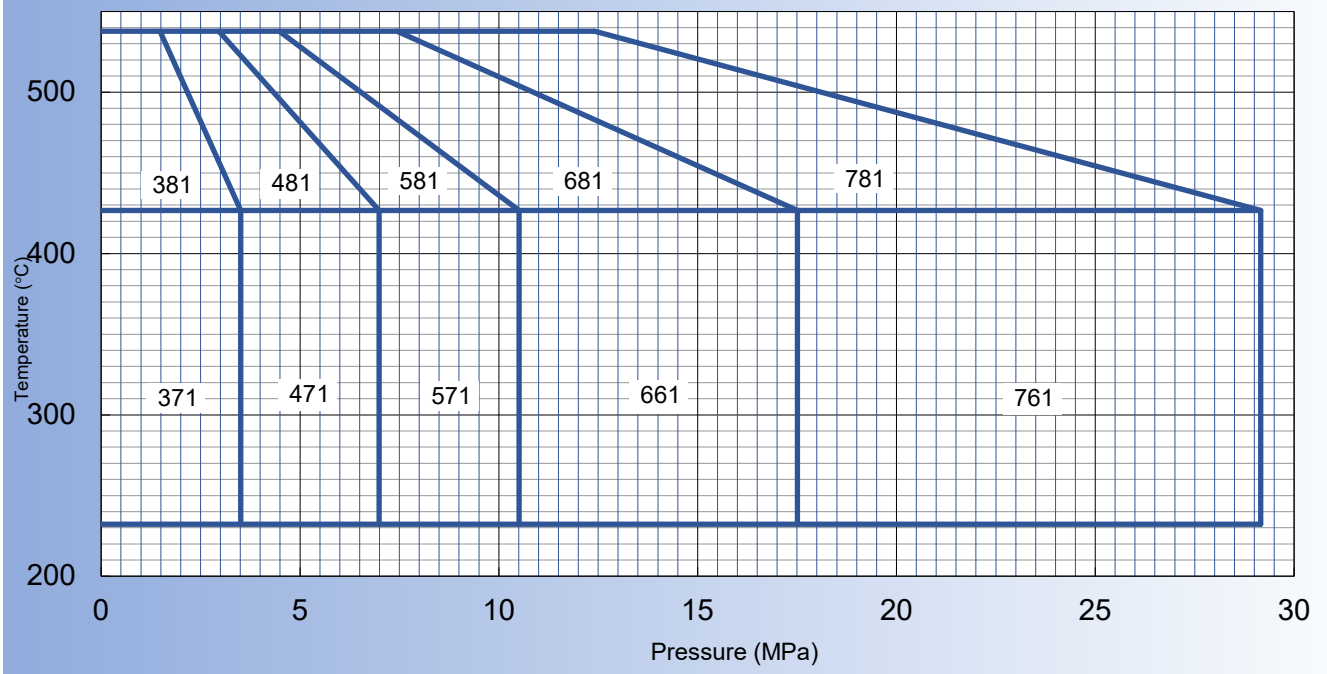
Pressure-temperature Rating ASME B16.5 Flange Orifice D

Material Body Bonnet	Size	Flange class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 / *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	1*D*2	150	150	1	-	-	1.96	1.27	0.55	-	1.96	1.58
		300		2	-	-	1.96	1.96	1.96	-		
				3	-	-	5.1	4.24	2.82	-		
		600		4	-	-	10.2	8.51	5.68	-		
	1 1/2*D*2	900	300	5	-	-	15.3	12.72	8.51	-	4.13	3.44
		1500		6	-	-	25.54	21.23	14.2	-		
	1 1/2*D*3	2500		7	-	-	41.36	41.36	23.64	-	5.1	
SCPH21 A217-WC6	1*D*2	300	150	3	-	-	-	-	3.51	1.48	1.96	1.58
		600		4	-	-	-	-	6.99	2.96		
	1 1/2*D*2	900	300	5	-	-	-	-	10.51	4.48	4.13	3.44
		1500		6	-	-	-	-	17.51	7.44		
	1 1/2*D*3	2500		7	-	-	-	-	29.16	12.41	5.1	
SCS14A A351-CF8M	1*D*2	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	1.58
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
				3	4.96	4.96	4.96	3.41	2.89	2.41		
		600		4	9.92	9.92	9.92	6.72	5.82	4.82		
	1 1/2*D*2	900	300	5	14.89	14.89	14.89	10.23	8.72	7.23	4.13	3.44
		1500		6	24.82	24.82	24.82	17.09	14.54	12.06		
	1 1/2*D*3	2500		7	27.57	41.36	41.36	28.47	24.26	20.09	4.96	

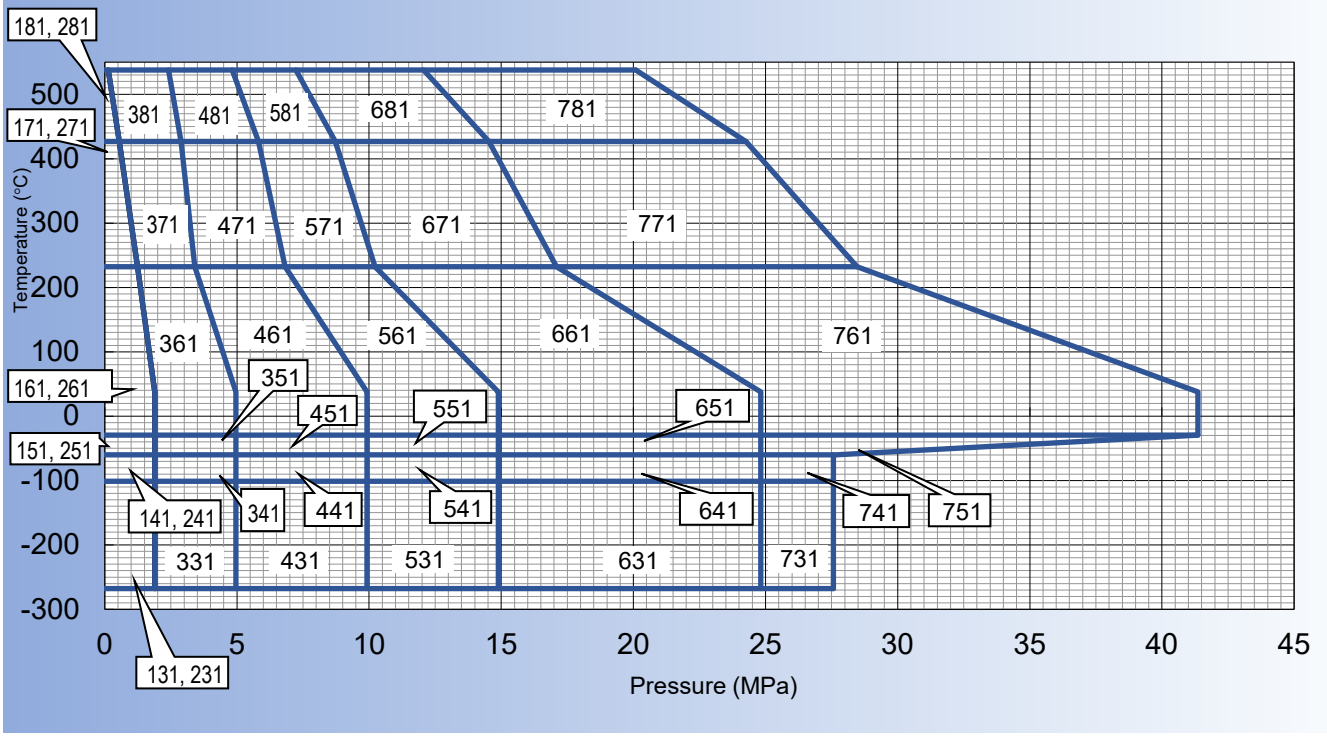
ASME Flange Orifice D SCPH2, A216-WCB



ASME Flange Orifice D SCPH21, A217-WC6



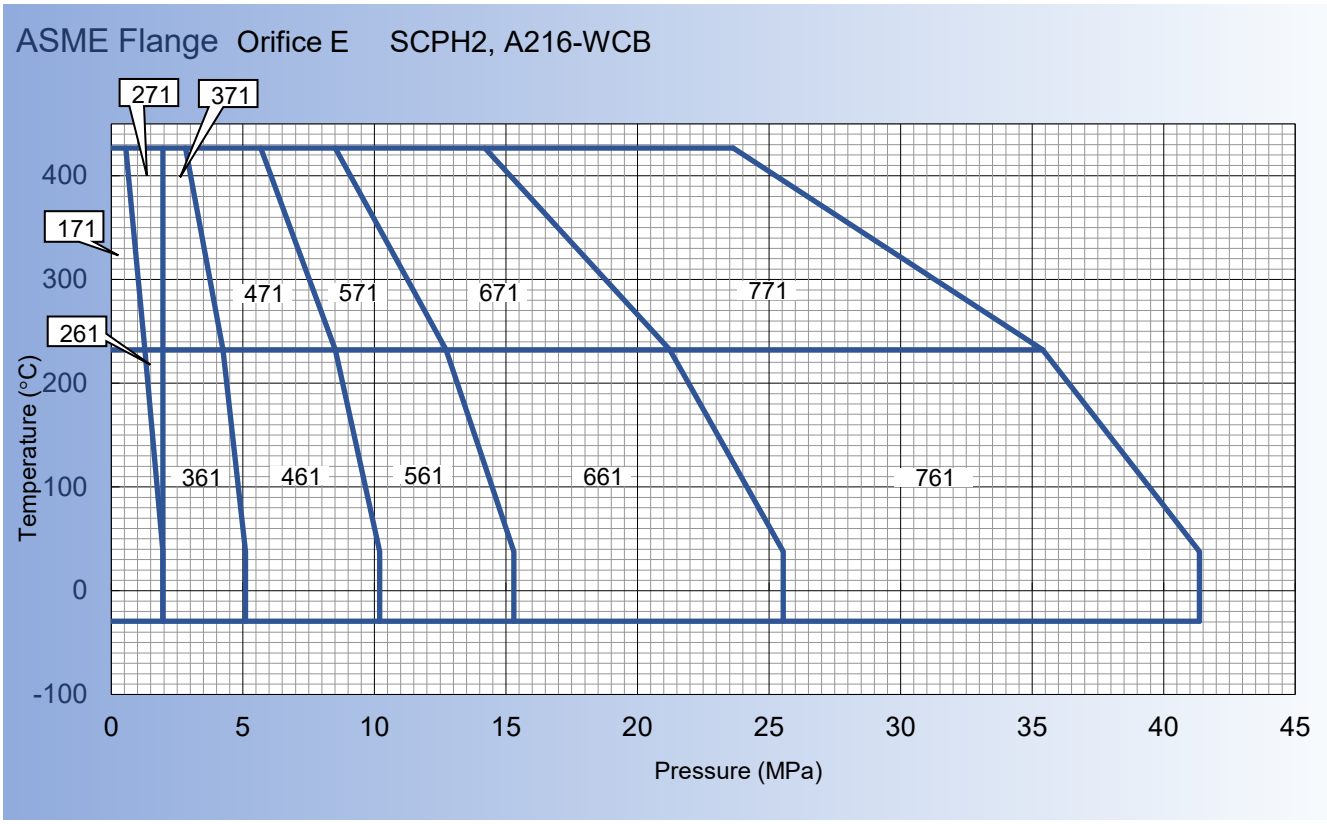
ASME Flange Orifice D SCS14A, A351-CF8M



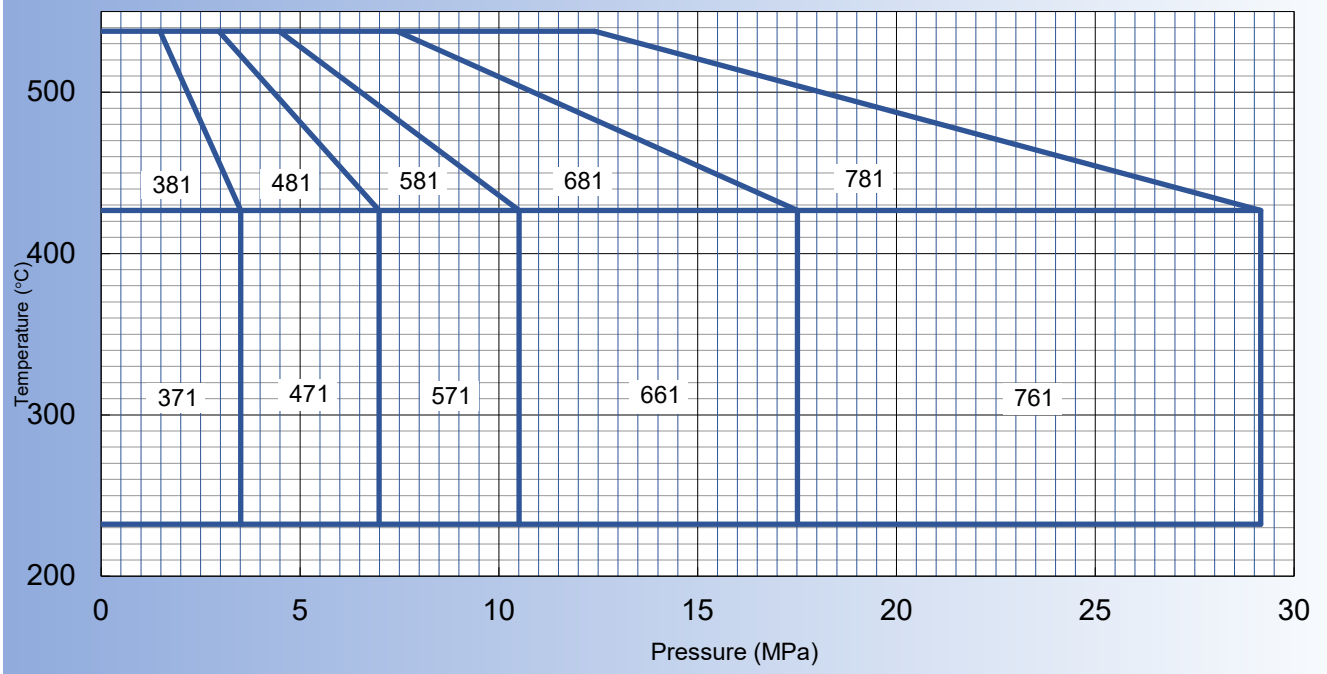
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

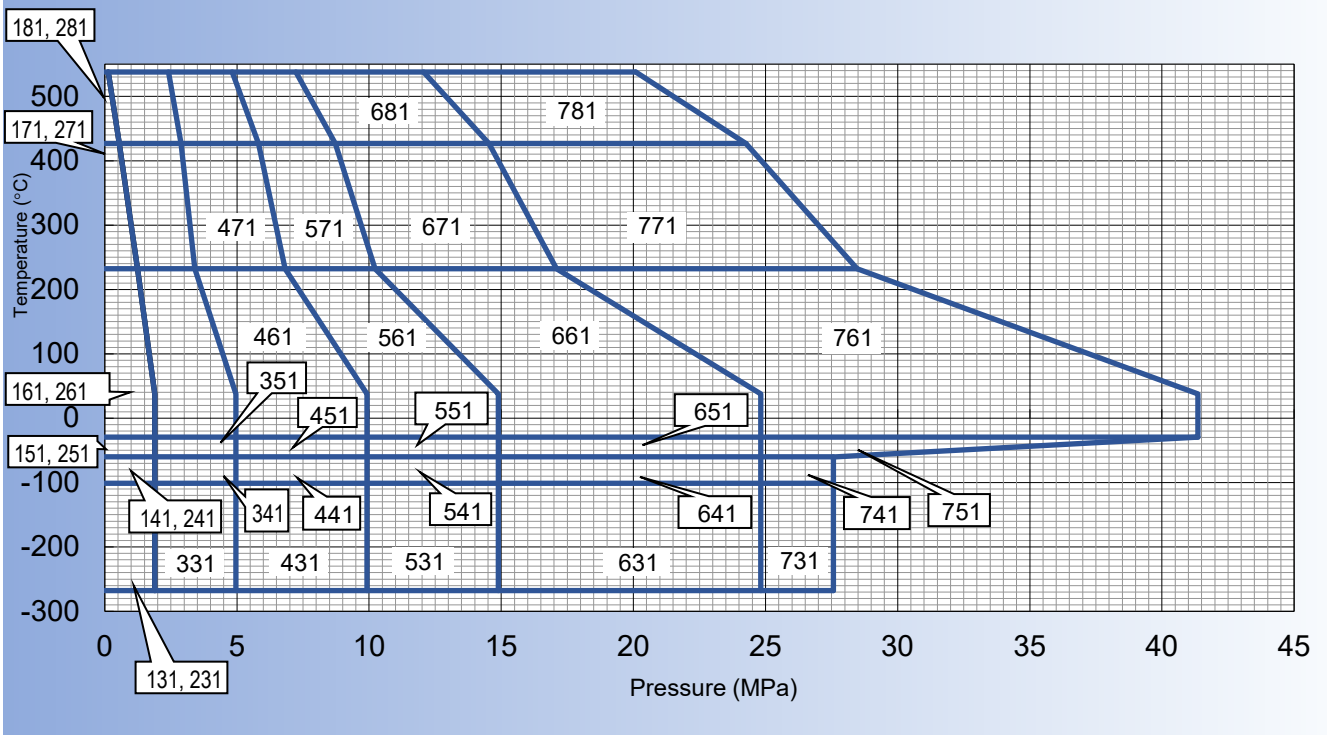
Pressure-temperature Rating ASME B16.5 Flange Orifice E												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	1*E*2	150	150	1	-	-	1.96	1.27	0.55	-	1.96	1.58
		300		2	-	-	1.96	1.96	1.96	-		
		300		3	-	-	5.1	4.24	2.82	-		
		600		4	-	-	10.2	8.51	5.68	-		
	1 1/2*E*2	900	300	5	-	-	15.3	12.72	8.51	-	4.13	3.44
		1500		6	-	-	25.54	21.23	14.2	-		
	1 1/2*E*3	2500		7	-	-	41.36	41.36	23.64	-	5.1	
SCPH21 A217-WC6	1*E*2	300	150	3	-	-	-	-	3.51	1.48	285	1.58
		600		4	-	-	-	-	6.99	2.96		
	1 1/2*E*2	900	300	5	-	-	-	-	10.51	4.48	4.13	3.44
		1500		6	-	-	-	-	17.51	7.44		
	1 1/2*E*3	2500		7	-	-	-	-	29.16	12.41	5.1	
SCS14A A351-CF8M	1*E*2	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	1.58
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
		300		3	4.96	4.96	4.96	3.41	2.89	2.41		
		600		4	9.92	9.92	9.92	6.72	5.82	4.82		
	1 1/2*E*2	900	300	5	14.89	14.89	14.89	10.23	8.72	7.23	4.13	3.44
		1500		6	24.82	24.82	24.82	17.09	14.54	12.06		
	1 1/2*E*3	2500		7	27.57	41.36	41.36	28.47	24.26	20.09	4.96	



ASME Flange Orifice E SCPH21, A217-WC6



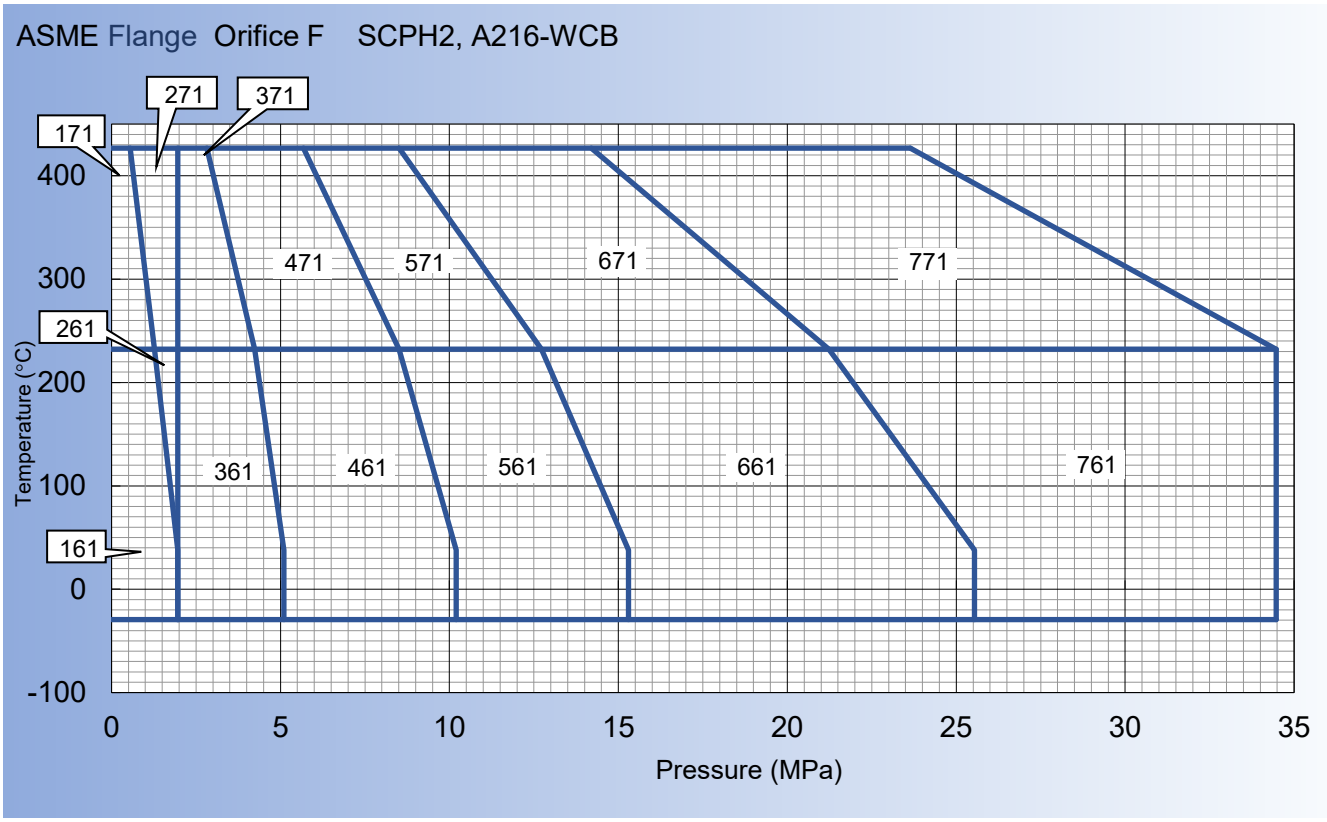
ASME Flange Orifice E SCS14A, A351-CF8M



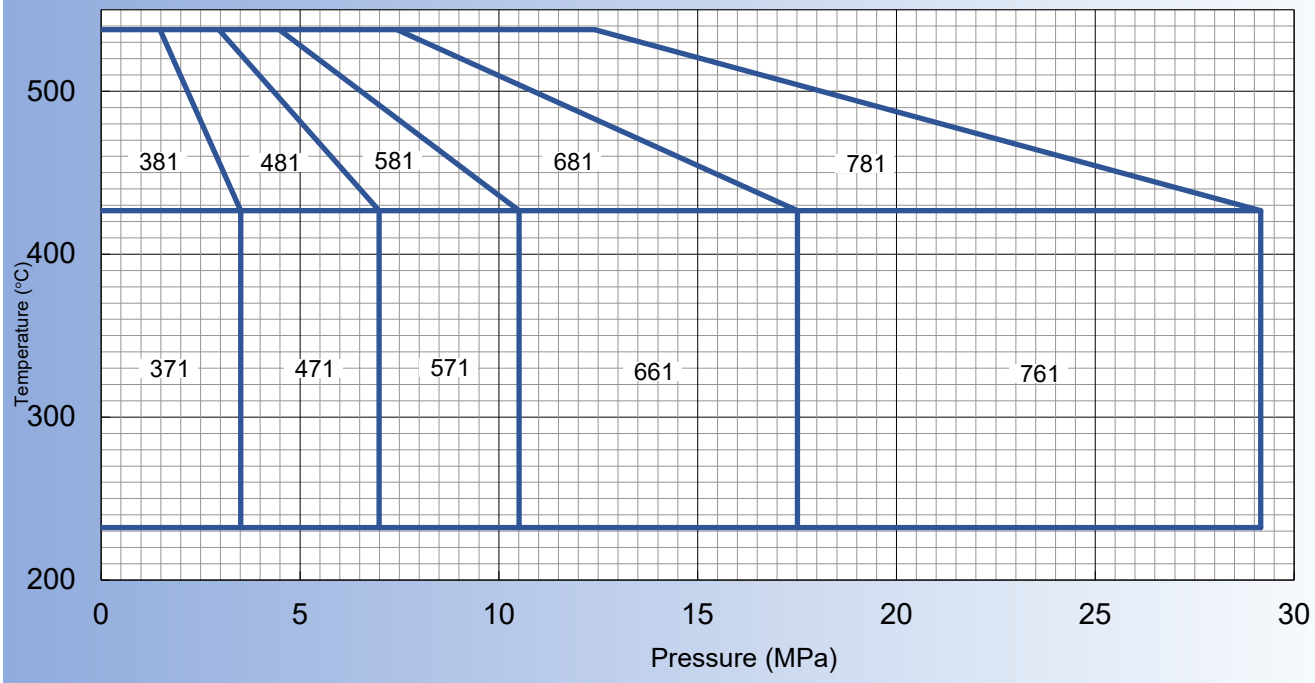
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

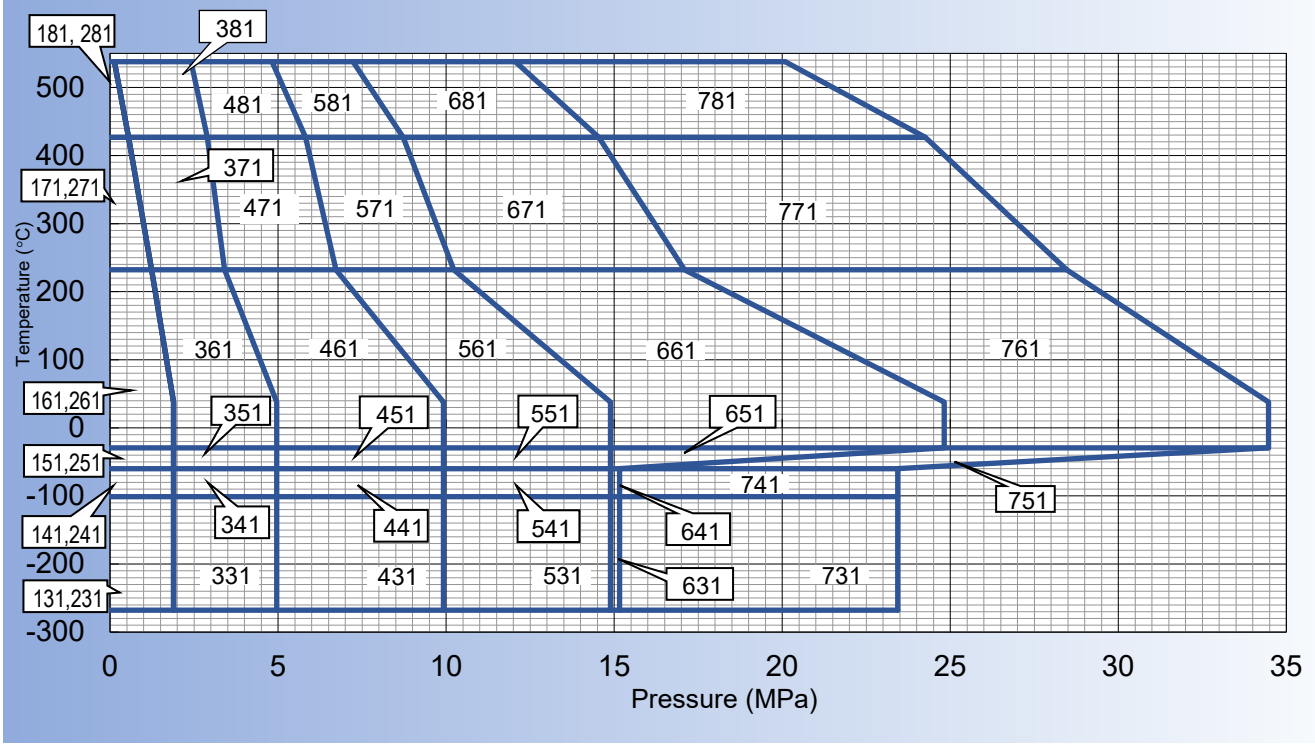
Pressure-temperature Rating ASME B16.5 Flange Orifice F												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
				Temperature T °C	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538		
		Inlet	Outlet	*1 *2	2, 3, 4	5	6		7	8	REC	REB
SCPH2 A216-WCB	1 1/2*F*2	150	150	1	-	-	1.96	1.27	0.55	-	1.96	1.58
		300		2	-	-	1.96	1.96	1.96	-		
				3	-	-	5.1	4.24	2.82	-		
		600		4	-	-	10.2	8.51	5.68	-		
	1 1/2*F*3	900	300	5	-	-	15.3	12.72	8.51	-	5.1	3.44
		1500		6	-	-	25.54	21.23	14.2	-		
		2500		7	-	-	34.47	34.47	23.64	-		
SCPH21 A217-WC6	1 1/2*F*2	300	150	3	-	-	-	-	3.51	1.48	1.96	1.58
		600		4	-	-	-	-	6.99	2.96		
	1 1/2*F*3	900	300	5	-	-	-	-	10.51	4.48	5.1	3.44
		1500		6	-	-	-	-	17.51	7.44		
		2500		7	-	-	-	-	29.16	12.41		
SCS14A A351-CF8M	1 1/2*F*2	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	1.58
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
				3	4.96	4.96	4.96	3.41	2.89	2.41		
		600		4	9.92	9.92	9.92	6.72	5.82	4.82		
	1 1/2*F*3	900	300	5	14.89	14.89	14.89	10.23	8.72	7.23	4.96	3.44
		1500		6	15.16	24.82	24.82	17.09	14.54	12.06		
		2500		7	23.44	34.47	34.47	28.47	24.26	20.09		



ASME Flange Orifice F SCPH21, A217-WC6



ASME Flange Orifice F SCS14A, A351-CF8M

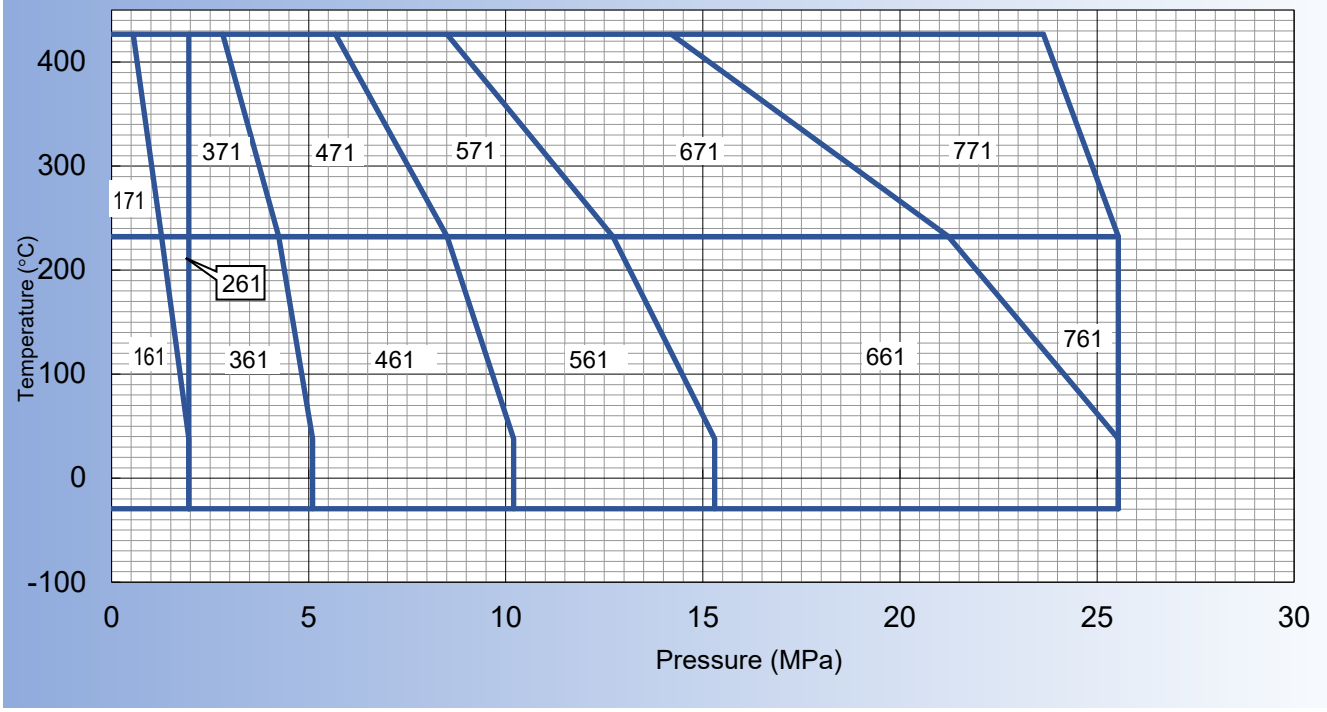


*1 Indicates the pressure class code. *2 Indicates the temperature code.

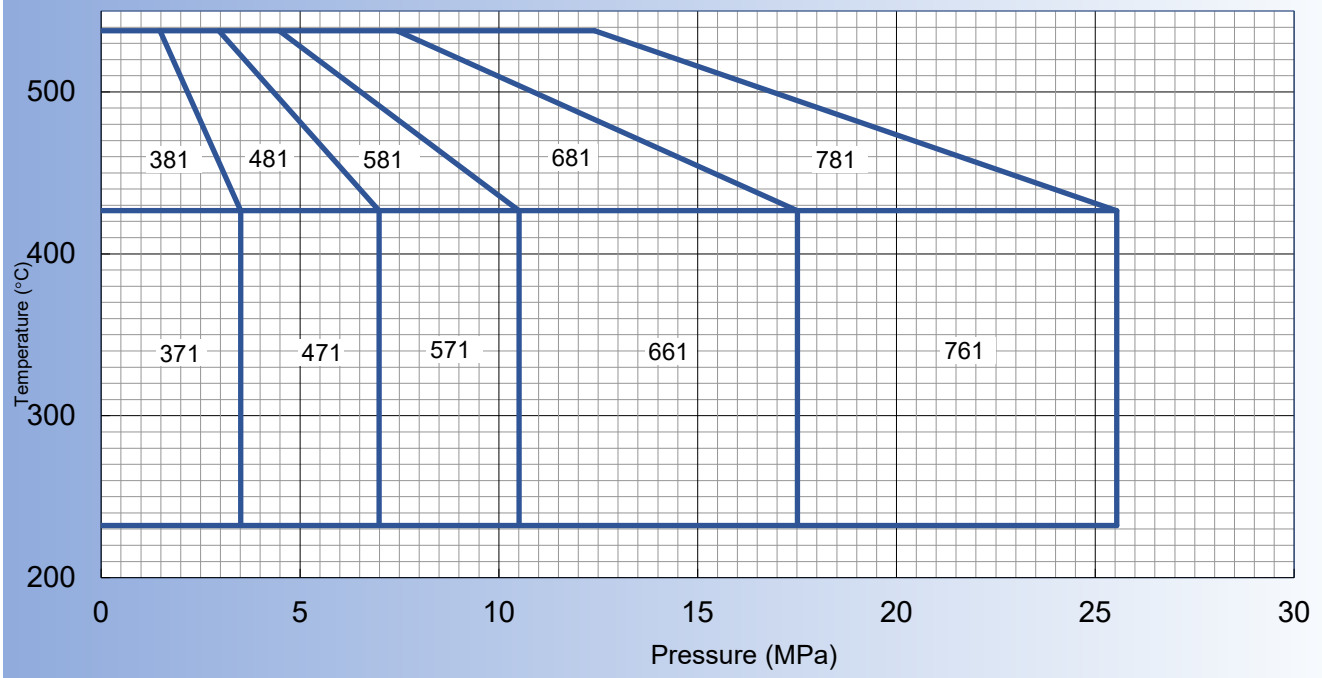
*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Pressure-temperature Rating ASME B16.5 Flange Orifice G												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 / *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	1 1/2*G*3	150	150	1	-	-	1.96	1.27	0.55	-	1.96	1.58
		300		2	-	-	1.96	1.96	1.96	-		
				3	-	-	5.1	4.24	2.82	-		
		600		4	-	-	10.2	8.51	5.68	-		
		900	300	5	-	-	15.3	12.72	8.51	-	5.1	3.24
	2*G*3	1500		6	-	-	25.54	21.23	14.2	-		
		2500		7	-	-	25.54	25.54	23.64	-		
SCPH21 A217-WC6	1 1/2*G*3	300	150	3	-	-	-	-	3.51	1.48	1.96	1.58
		600		4	-	-	-	-	6.99	2.96		
		900	300	5	-	-	-	-	10.51	4.48	5.1	3.44
	2*G*3	1500		6	-	-	-	-	17.51	7.44		
		2500		7	-	-	-	-	25.85	12.41		
SCS14A A351-CF8M	1 1/2*G*3	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	1.58
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
				3	4.96	4.96	4.96	3.41	2.89	2.41		
		600		4	9.92	9.92	9.92	6.72	5.82	4.82		
		900	300	5	14.89	14.89	14.89	10.23	8.72	7.23	4.96	3.44
	2*G*3	1500		6	16.89	24.82	24.82	17.09	14.54	12.06		
		2500		7	17.92	25.54	25.54	25.54	24.26	20.09		

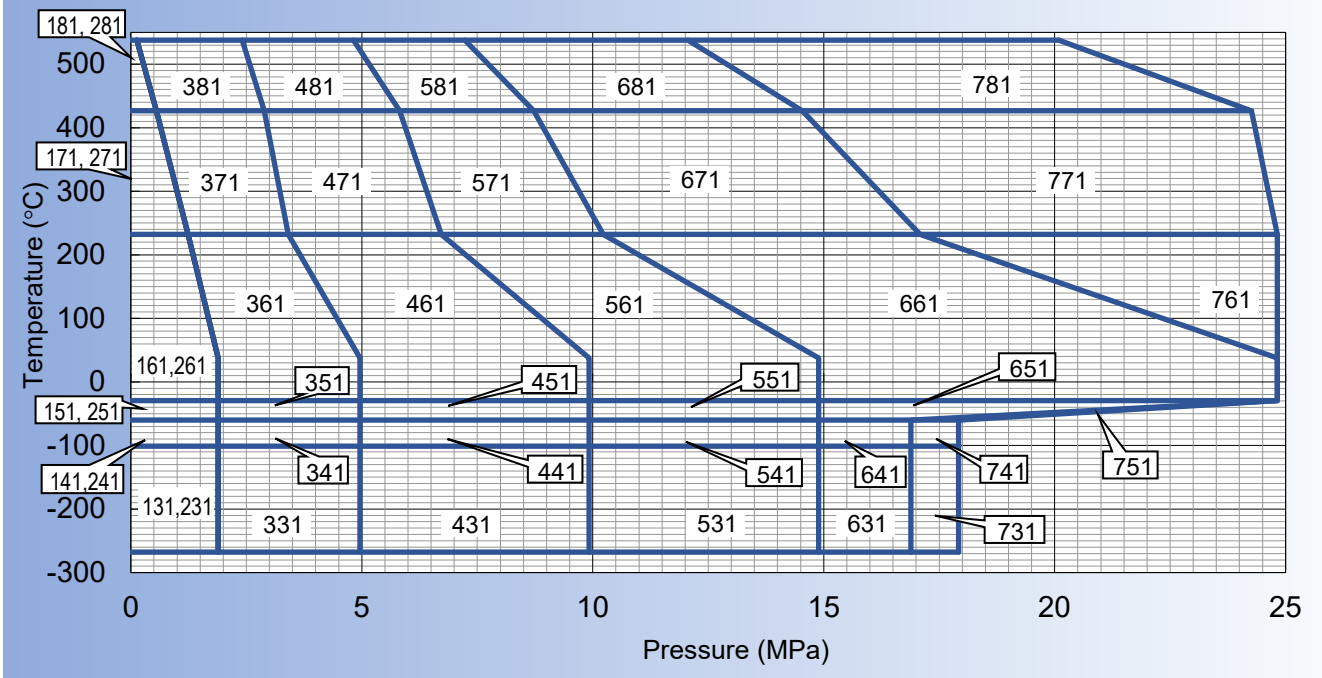
ASME Flange Orifice G SCPH2, A216-WCB



ASME Flange Orifice G SCPH21, A217-WC6



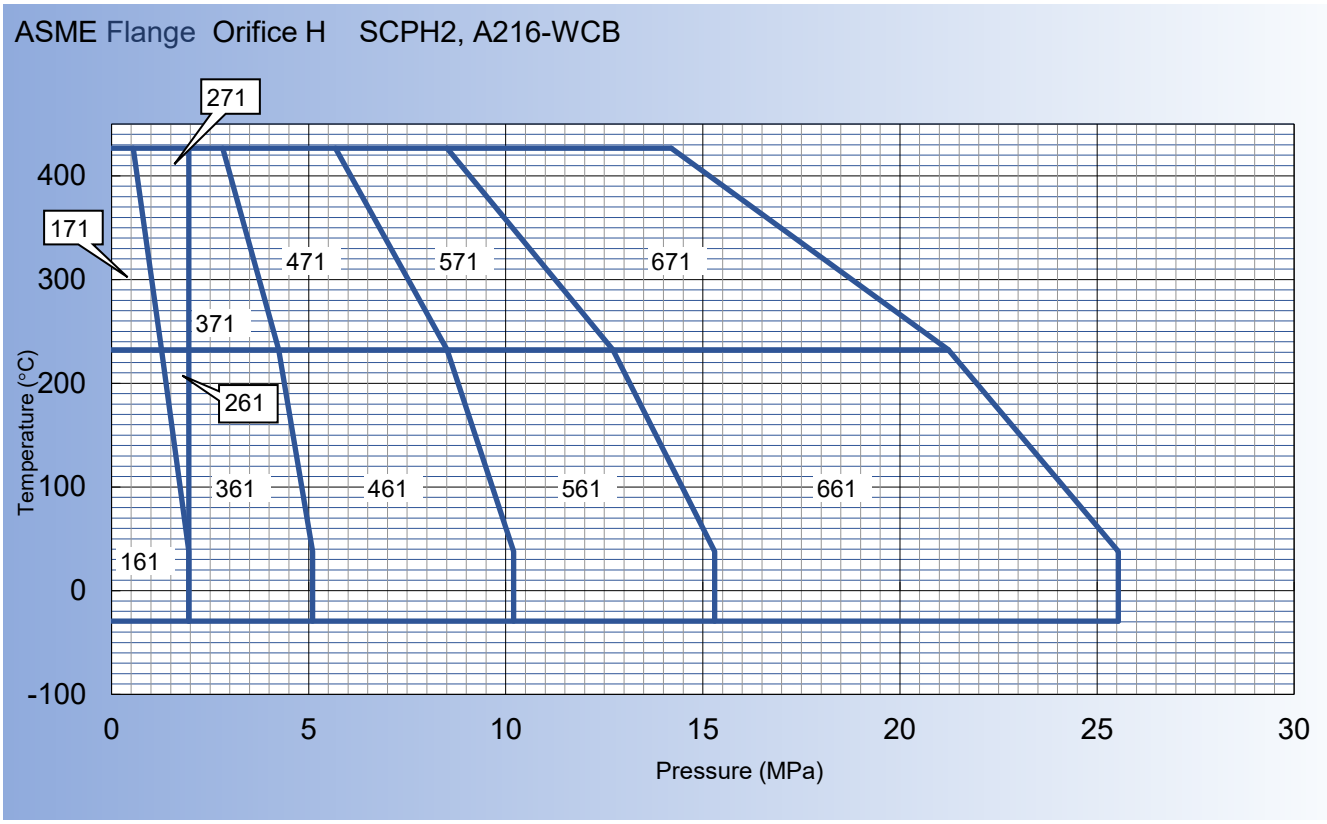
ASME Flange Orifice G SCS14A, A351-CF8M



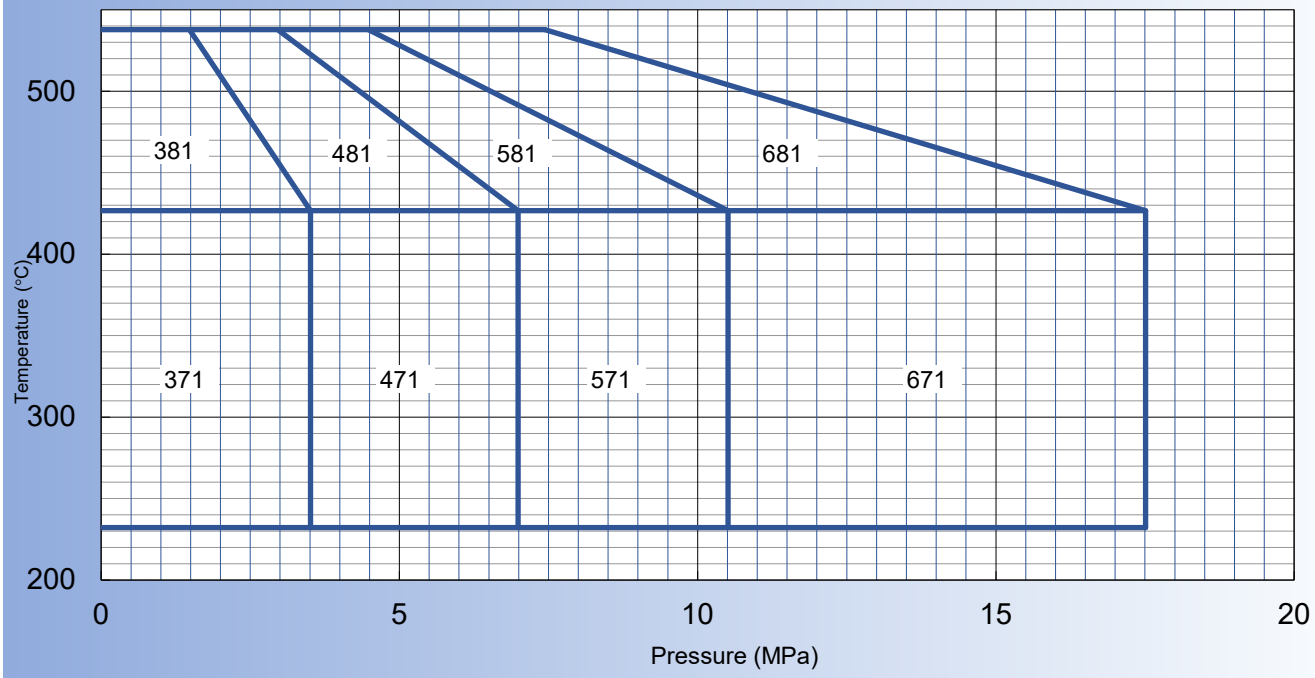
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

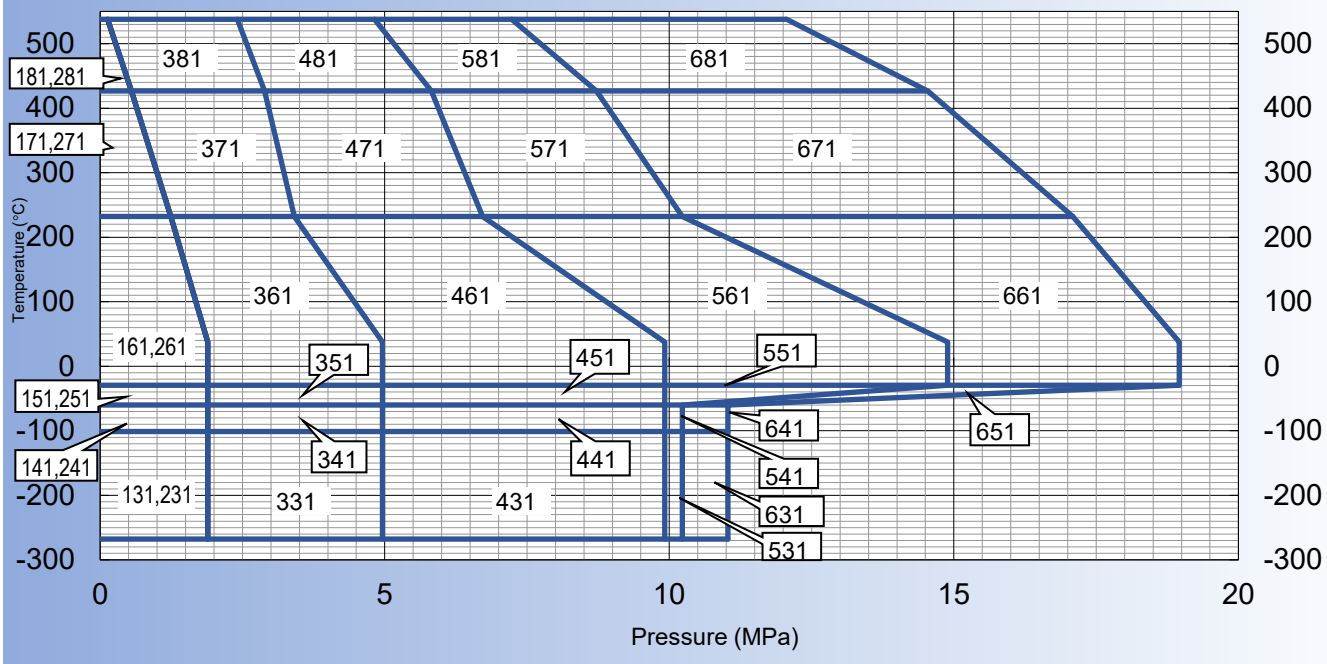
Pressure-temperature Rating ASME B16.5 Flange Orifice H												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	1 1/2*H*3	150	150	1	-	-	1.96	1.27	0.55	-	1.96	1.58
		300		2	-	-	1.96	1.96	1.96	-		
	2*H*3			3	-	-	5.1	4.24	2.82	-		
		600		4	-	-	10.2	8.51	5.68	-		
		900		5	-	-	15.3	12.72	8.51	-		
		1500	300	6	-	-	18.96	18.96	14.2	-	5.1	2.86
SCPH21 A217-WC6	2*H*3	300	150	3	-	-	-	-	3.51	1.48	1.96	1.58
		600		4	-	-	-	-	6.99	2.96		
		900		5	-	-	-	-	10.51	4.48		
		1500	300	6	-	-	-	-	17.51	7.44	5.1	2.86
SCS14A A351-CF8M	1 1/2*H*3	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	1.58
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
	2*H*3			3	4.96	4.96	4.96	3.41	2.89	2.41		
		600		4	9.92	9.92	9.92	6.72	5.82	4.82		
		900		5	10.23	14.89	14.89	10.23	8.72	7.23		
		1500	300	6	11.03	18.96	18.96	17.09	14.54	12.06	4.13	2.86



ASME Flange Orifice H SCPH21, A217-WCB6



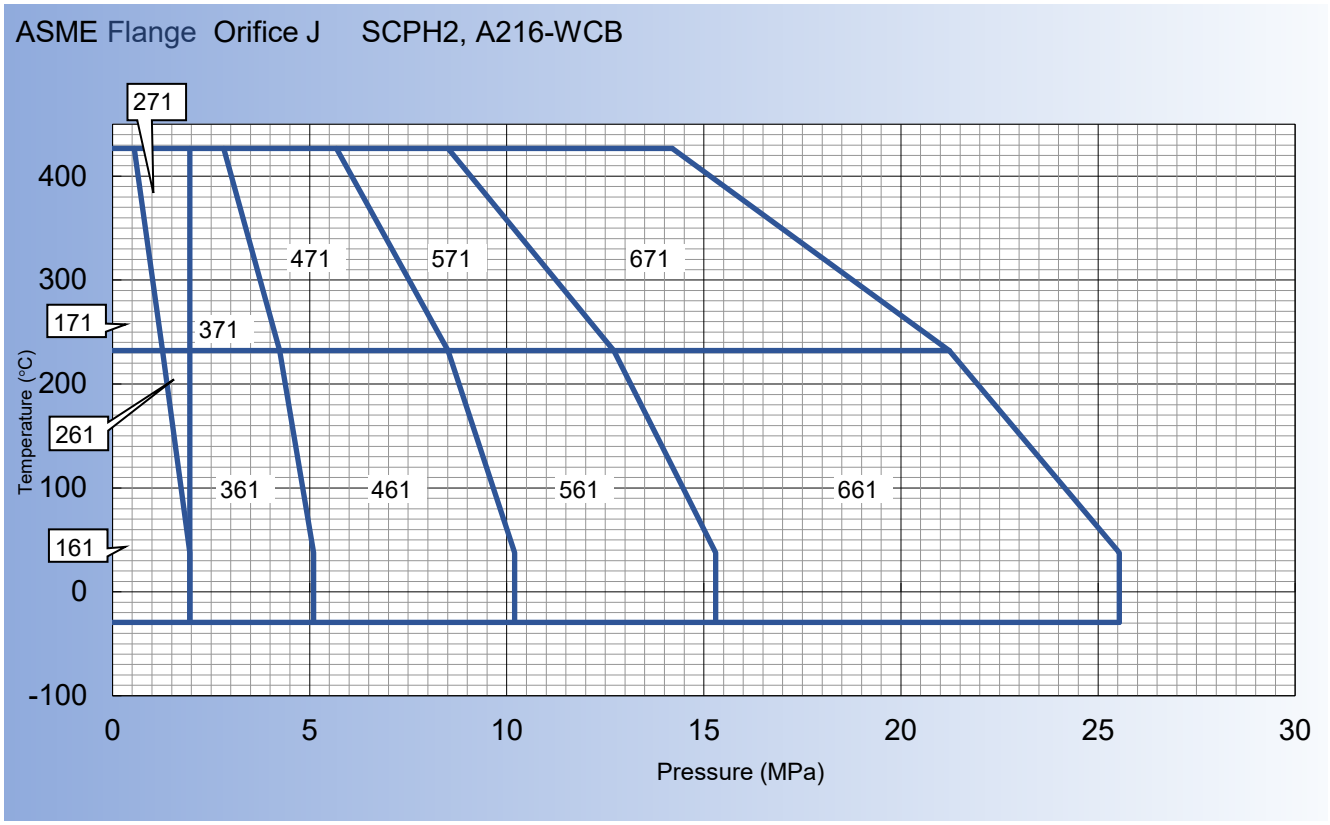
ASME Flange Orifice H SCS14A, A351-CF8



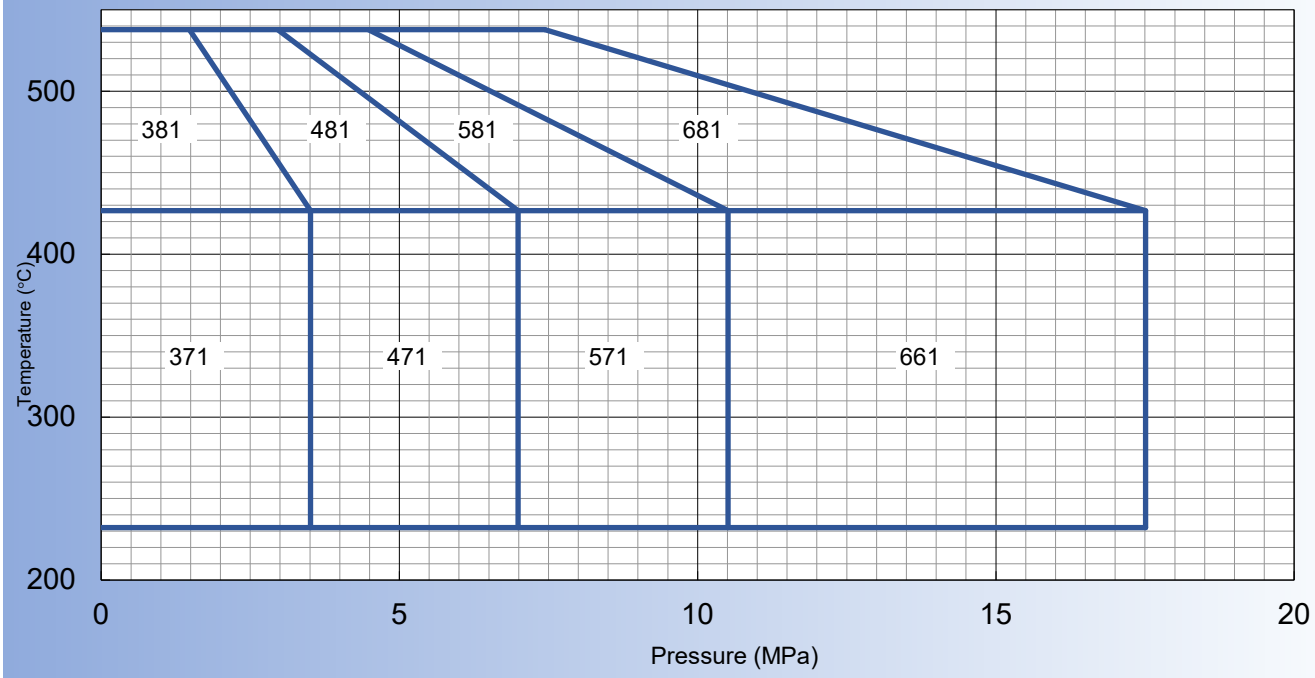
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

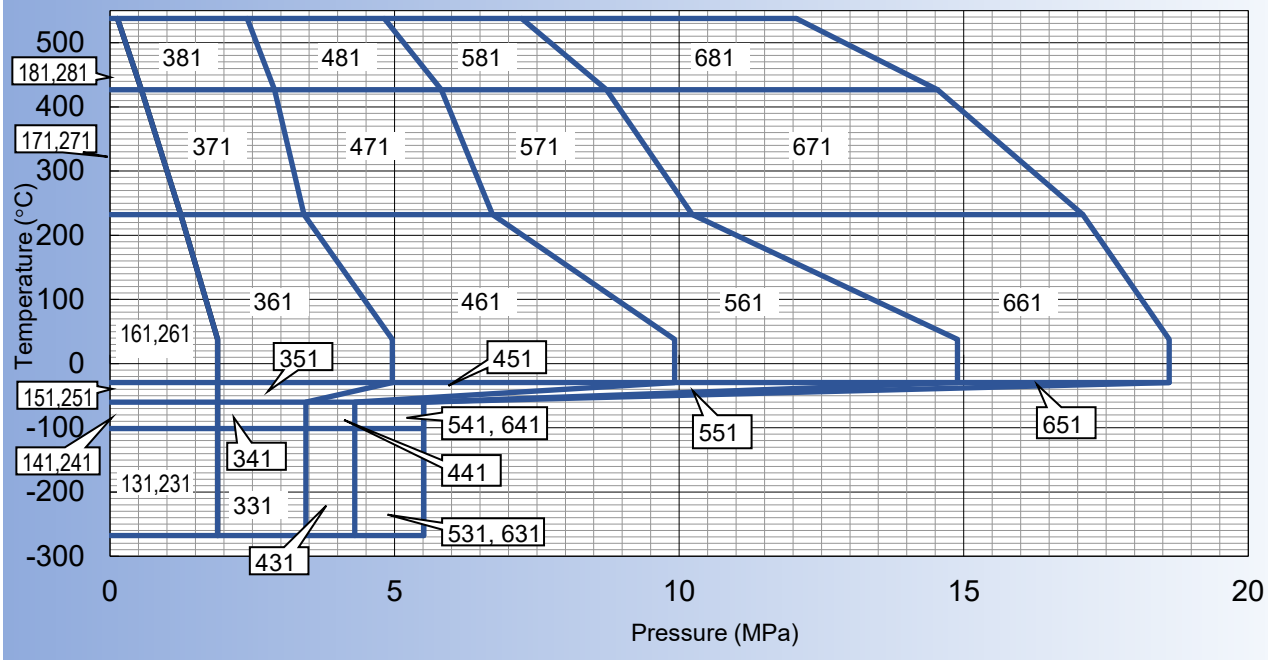
Pressure-temperature Rating ASME B16.5 Flange Orifice J												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	2*J*3	150	150	1	-	-	1.96	1.27	0.55	-	1.96	1.58
		300		2	-	-	1.96	1.96	1.96	-		
	3*J*4			3	-	-	5.1	4.24	2.82	-		
		600		4	-	-	10.2	8.51	5.68	-		
		900		5	-	-	15.3	12.72	8.51	-		
		1500	300	6	-	-	18.61	18.61	14.2	-	4.13	
SCPH21 A217-WC6	3*J*4	300	150	3	-	-	-	-	3.51	1.48	1.96	1.58
		600		4	-	-	-	-	6.99	2.96		
		900		5	-	-	-	-	10.51	4.48		
		1500	300	6	-	-	-	-	17.51	7.44	4.13	
SCS14A A351-CF8M	2*J*3	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	1.58
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
	3*J*4			3	3.44	4.96	4.96	3.41	2.89	2.41		
		600		4	4.3	9.92	9.92	6.72	5.82	4.82		
		900		5	5.51	14.89	14.89	10.23	8.72	7.23		
		1500	300	6	5.51	18.96	18.96	17.09	14.54	12.06	4.13	



ASME Flange Orifice J SPCH21, A217-WC6



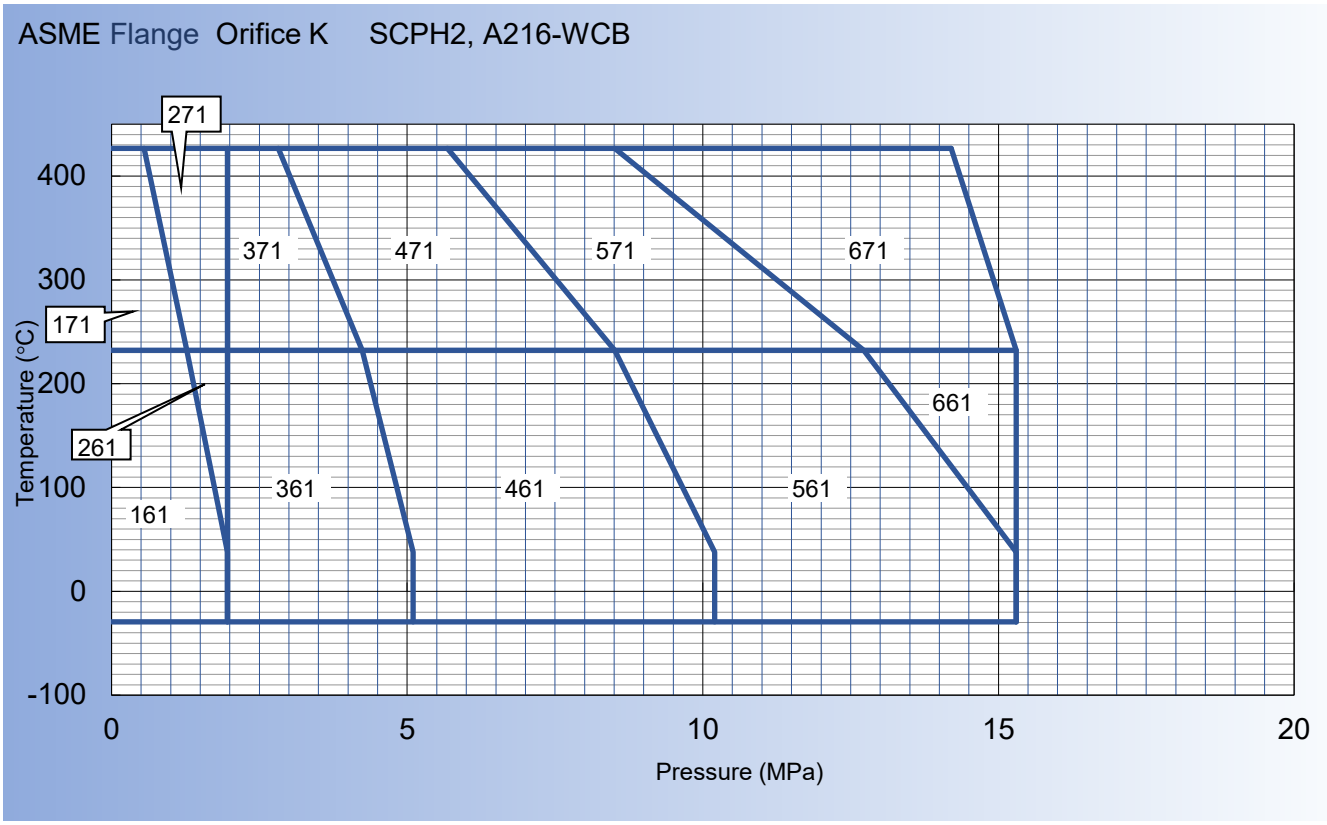
ASME Flange Orifice J SCS14A, A351-CF8M



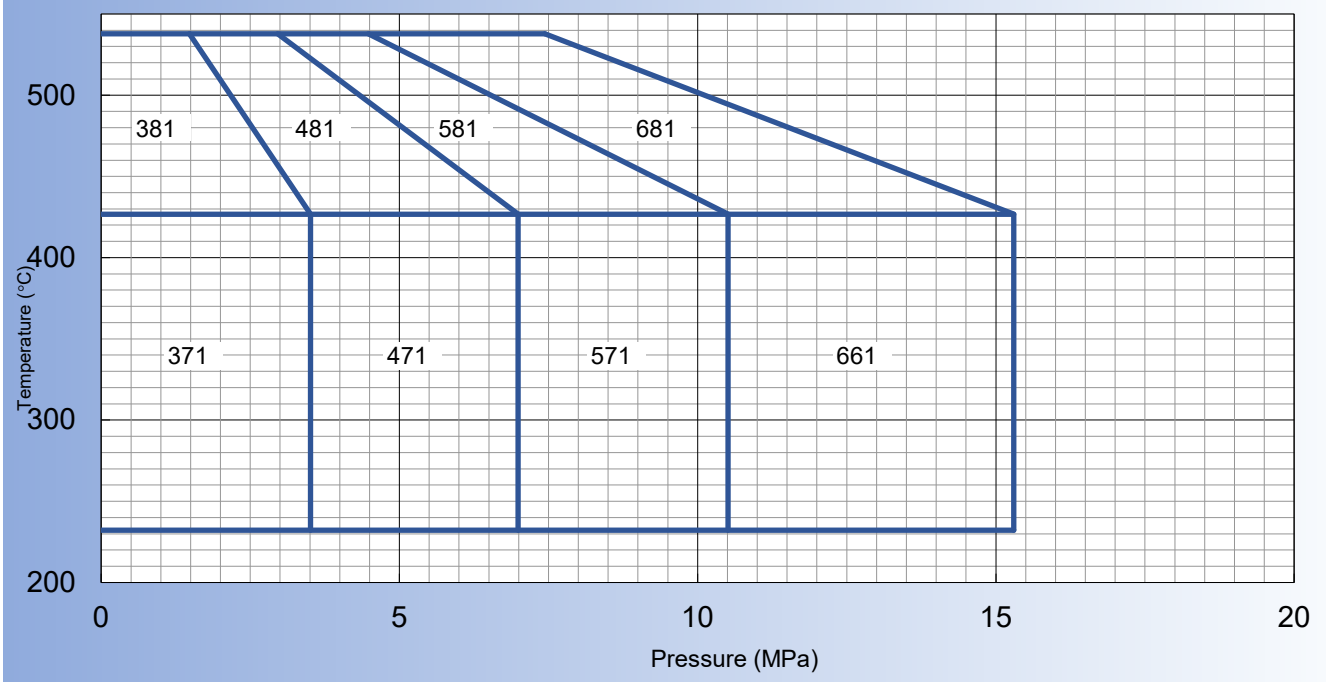
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

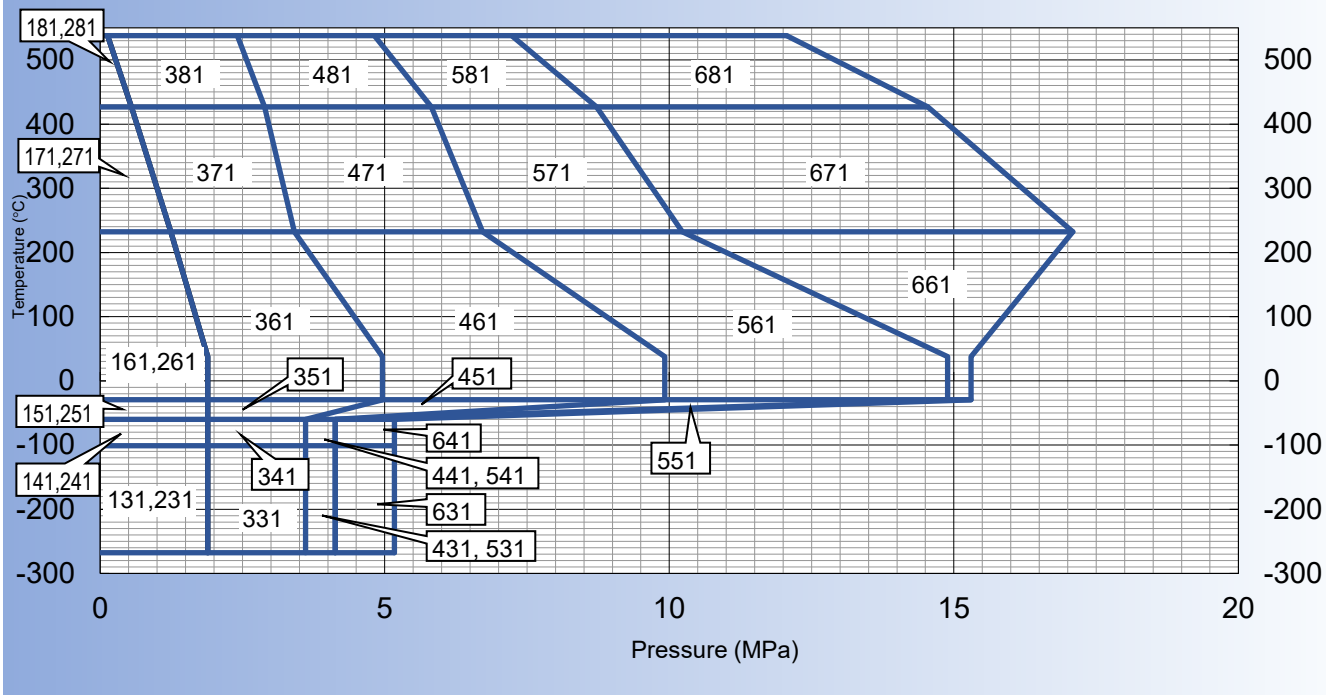
Pressure-temperature Rating ASME B16.5 Flange Orifice K												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C / *1 *2	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	3*K*4	150	150	1	-	-	1.96	1.27	0.55	-	1.96	1.03
		300		2	-	-	1.96	1.96	1.96	-		
				3	-	-	5.1	4.24	2.82	-		
		600		4	-	-	10.2	8.51	5.68	-		1.37
	3*K*6	900		5	-	-	15.3	12.72	8.51	-		
		1500	300	6	-	-	15.3	15.3	14.2	-	4.13	
SCPH21 A217-WC6	3*K*4	300	150	3	-	-	-	-	3.51	1.48	1.96	1.58
		600		4	-	-	-	-	6.99	2.96		
	3*K*6	900		5	-	-	-	-	10.51	4.48		
		1500	300	6	-	-	-	-	15.3	7.44	4.13	
SCS14A A351-CF8M	3*K*4	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	1.58
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
				3	3.61	4.96	4.96	3.41	2.89	2.41		
		600		4	4.13	9.92	9.92	6.72	5.82	4.82		
	3*K*6	900		5	4.13	14.89	14.89	10.23	8.72	7.23		
		1500	300	6	5.17	15.3	15.3	15.3	14.54	12.06	4.13	



ASME Flange Orifice K SCPH21, A2167-WC6



ASME Flange Orifice K SCS14A, A2351-CF8M

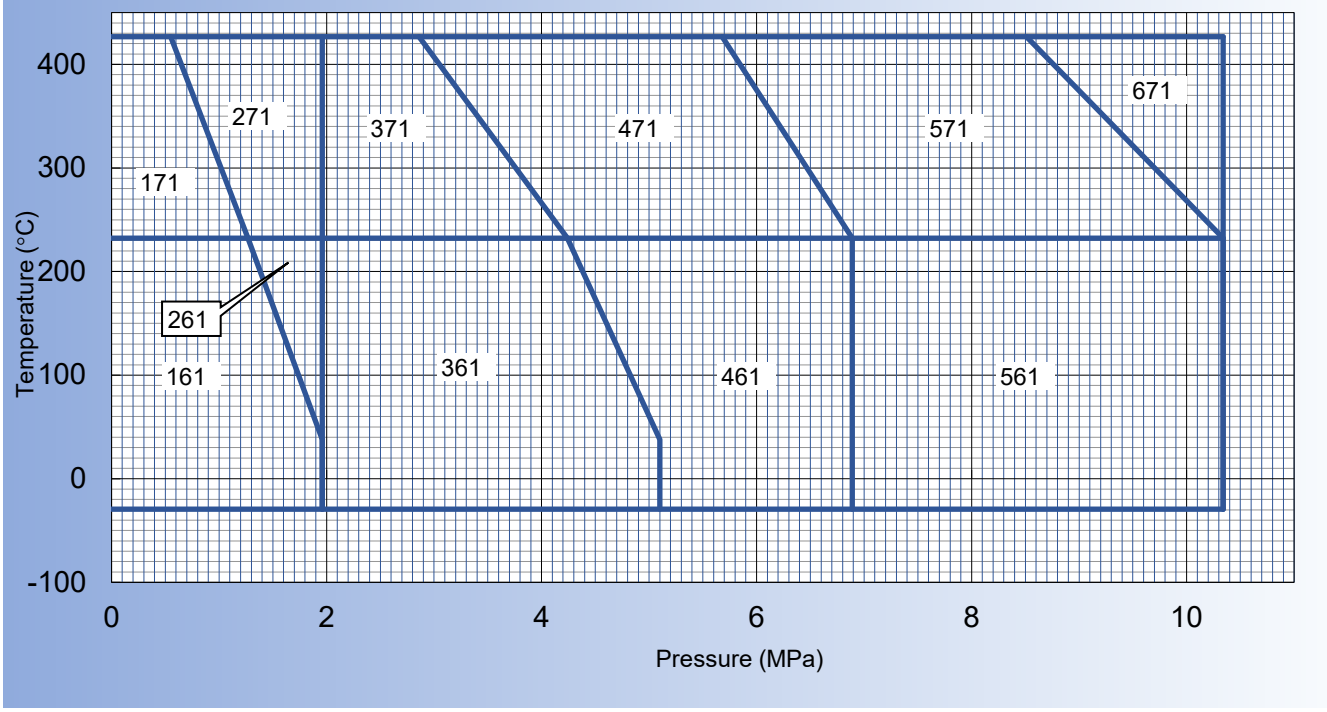


*1 Indicates the pressure class code. *2 Indicates the temperature code.

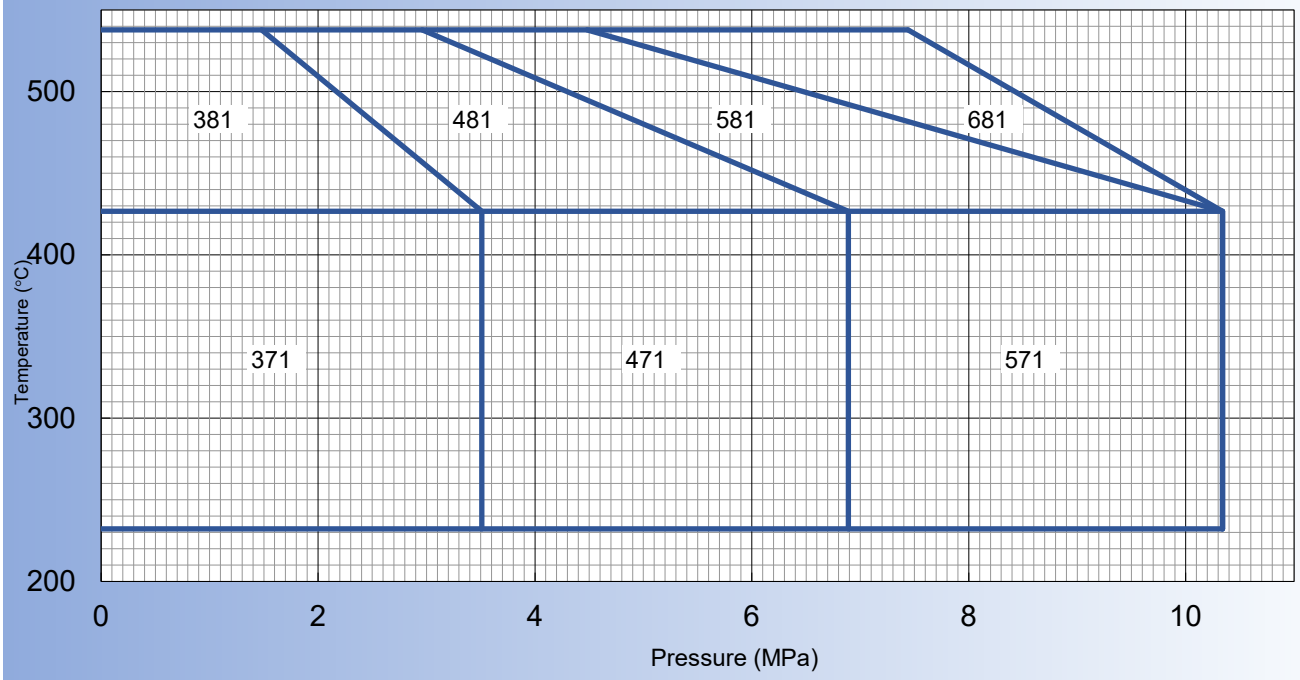
*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Pressure-temperature Rating ASME B16.5 Flange Orifice L												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C / *1 *2	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
					2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	3*L*4	150	150	1	-	-	1.96	1.27	0.55	-	1.96	0.68
		300		2	-	-	1.96	1.96	1.96	-		
	4*L*6			3	-	-	5.1	4.24	2.82	-		1.17
		600		4	-	-	6.89	6.89	5.68	-		
		900		5	-	-	10.34	10.34	8.51	-		
		1500		6	-	-	10.34	10.34	10.34	-		
SCPH21 A217-WC6	4*L*6	300	150	3	-	-	-	-	3.51	1.48	1.96	1.17
		600		4	-	-	-	-	6.89	2.96		
		900		5	-	-	-	-	10.34	4.48		
		1500		6	-	-	-	-	10.34	7.44		
SCS14A A351-CF8M	3*L*4	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	0.68
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
	4*L*6			3	3.68	4.96	4.96	3.41	2.89	2.41		1.17
		600		4	3.68	6.89	6.89	6.72	-	4.82		
		900		5	4.82	10.34	10.34	10.23	8.72	7.23		

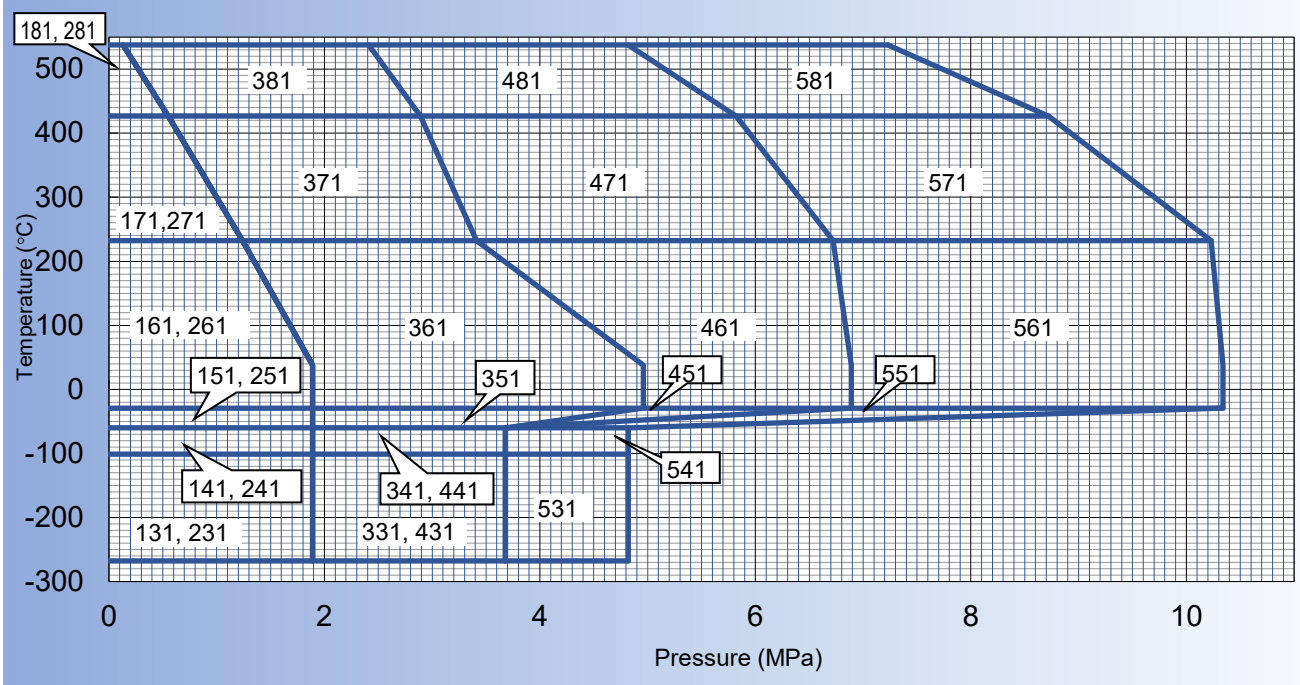
ASME Flange Orifice L SCPH2, A216-WCB



ASME Flange Orifice L SCPH21, A217-WC6



ASME Flange Orifice L SCS14A, A351-CF8M

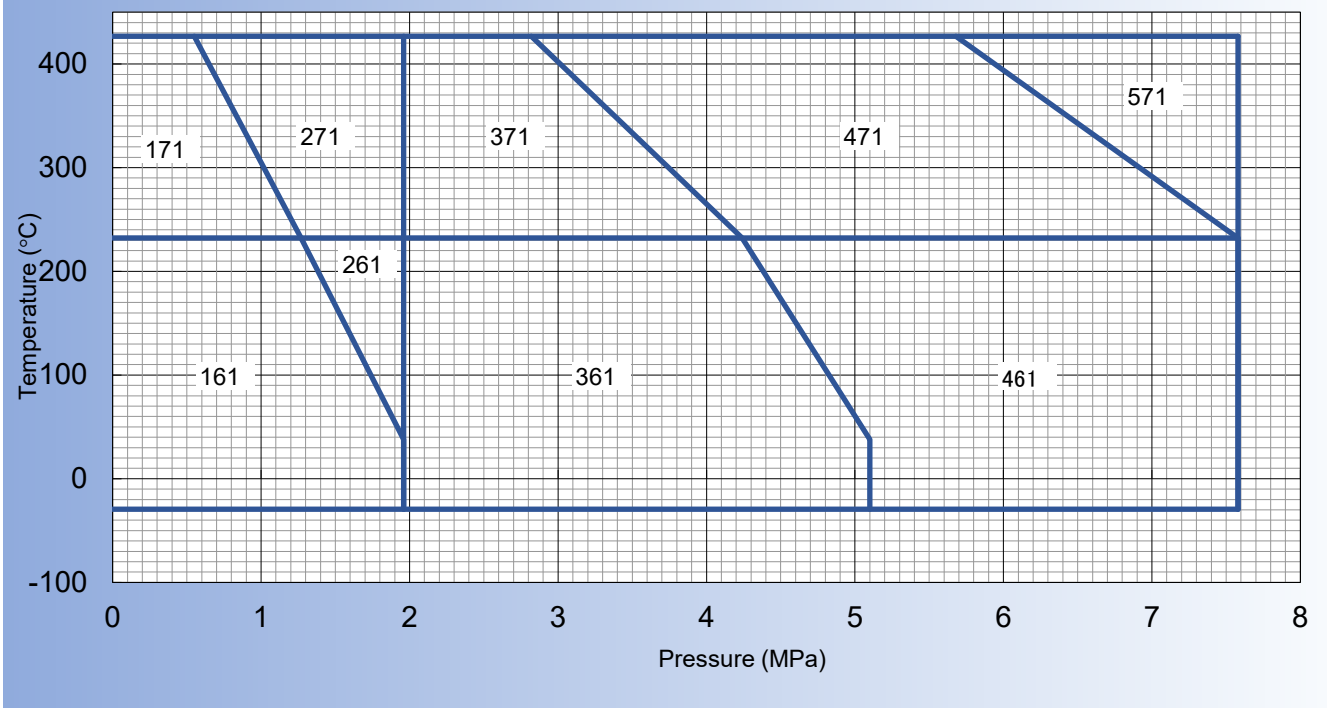


*1 Indicates the pressure class code. *2 Indicates the temperature code.

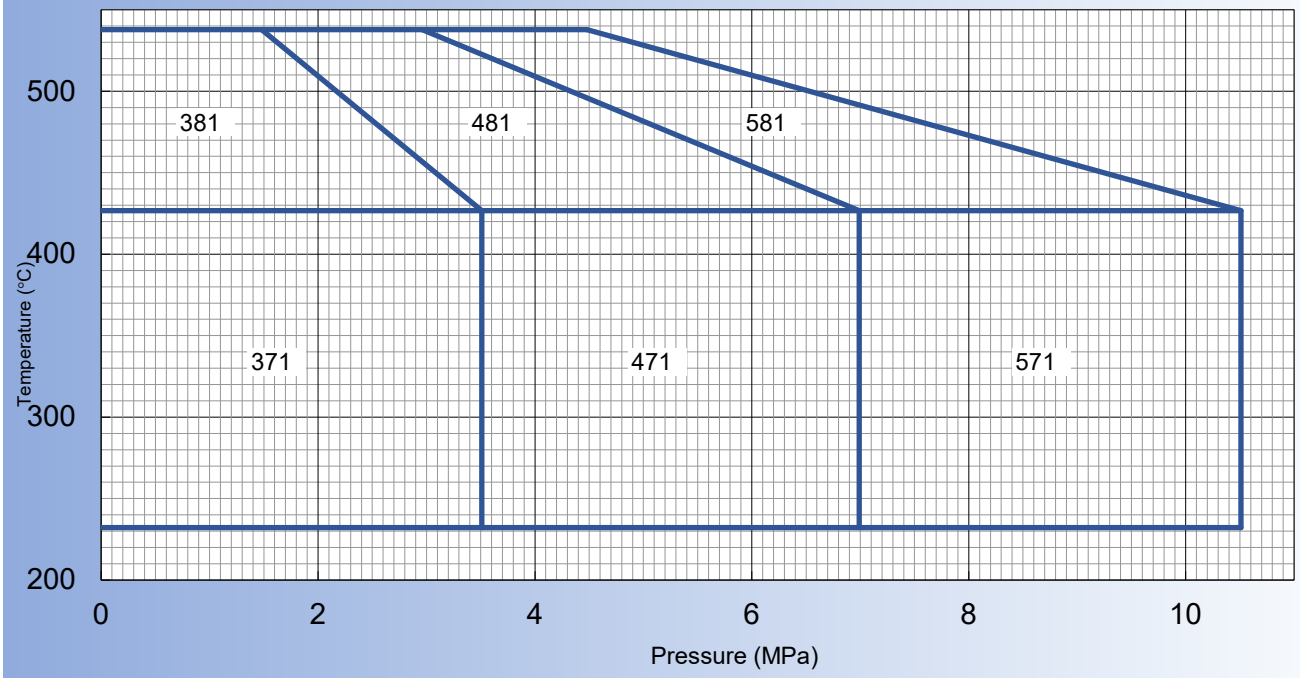
*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Pressure-temperature Rating ASME B16.5 Flange Orifice M												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C / *1 *2	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	4*M*6	150	150	1	-	-	1.96	1.27	0.55	-	1.96	0.55
		300		2	-	-	1.96	1.96	1.96	-		
				3	-	-	5.1	4.24	2.82	-		1.1
		600		4	-	-	7.58	7.58	5.68	-		
		900		5	-	-	7.58	7.58	7.58	-		
SCPH21 A217-WC6	4*M*6	300	150	3	-	-	-	-	3.51	1.48	1.96	1.1
		600		4	-	-	-	-	6.89	2.96		
		900		5	-	-	-	-	7.58	4.48		
SCS14A A351-CF8M	4*M*6	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	0.55
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
				3	3.61	4.96	4.96	3.41	2.89	2.41		1.1
		600		4	4.13	7.58	7.58	6.72	5.82	4.82		

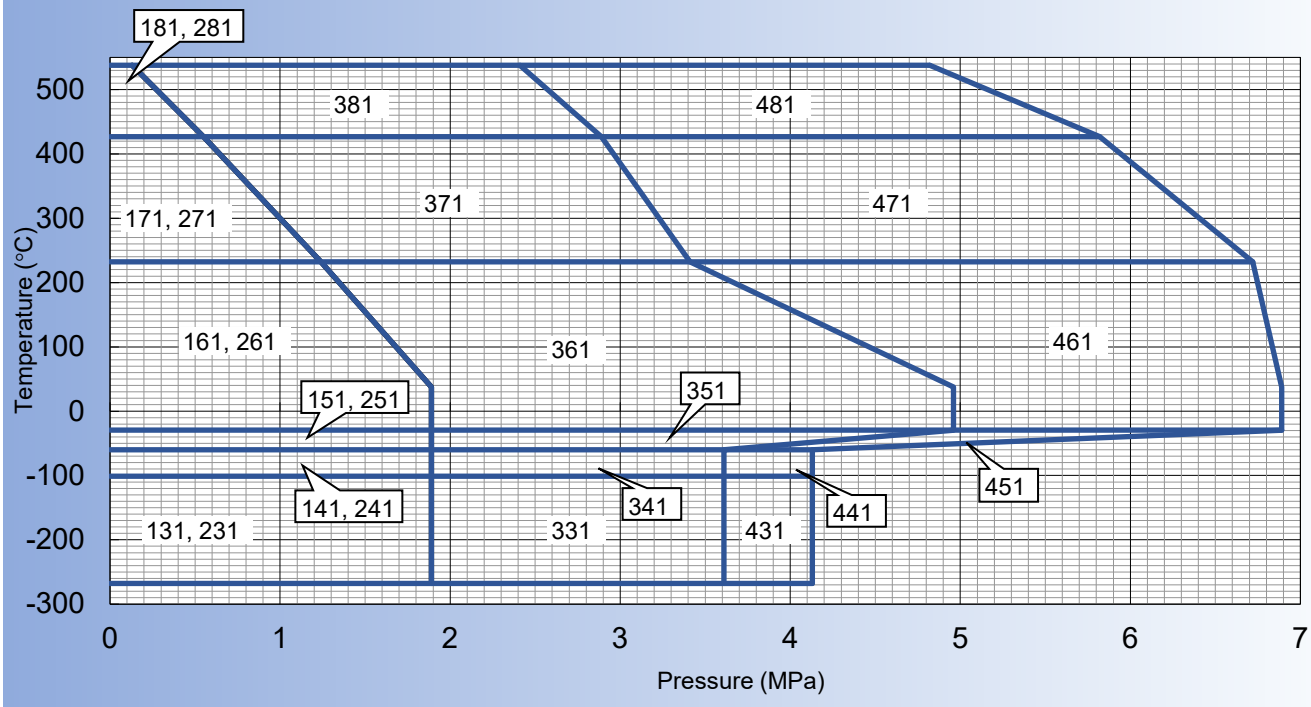
ASME Flange Orifice M SCPH2, A216-WCB



ASME Flange Orifice M SCPH21, A217-WC6



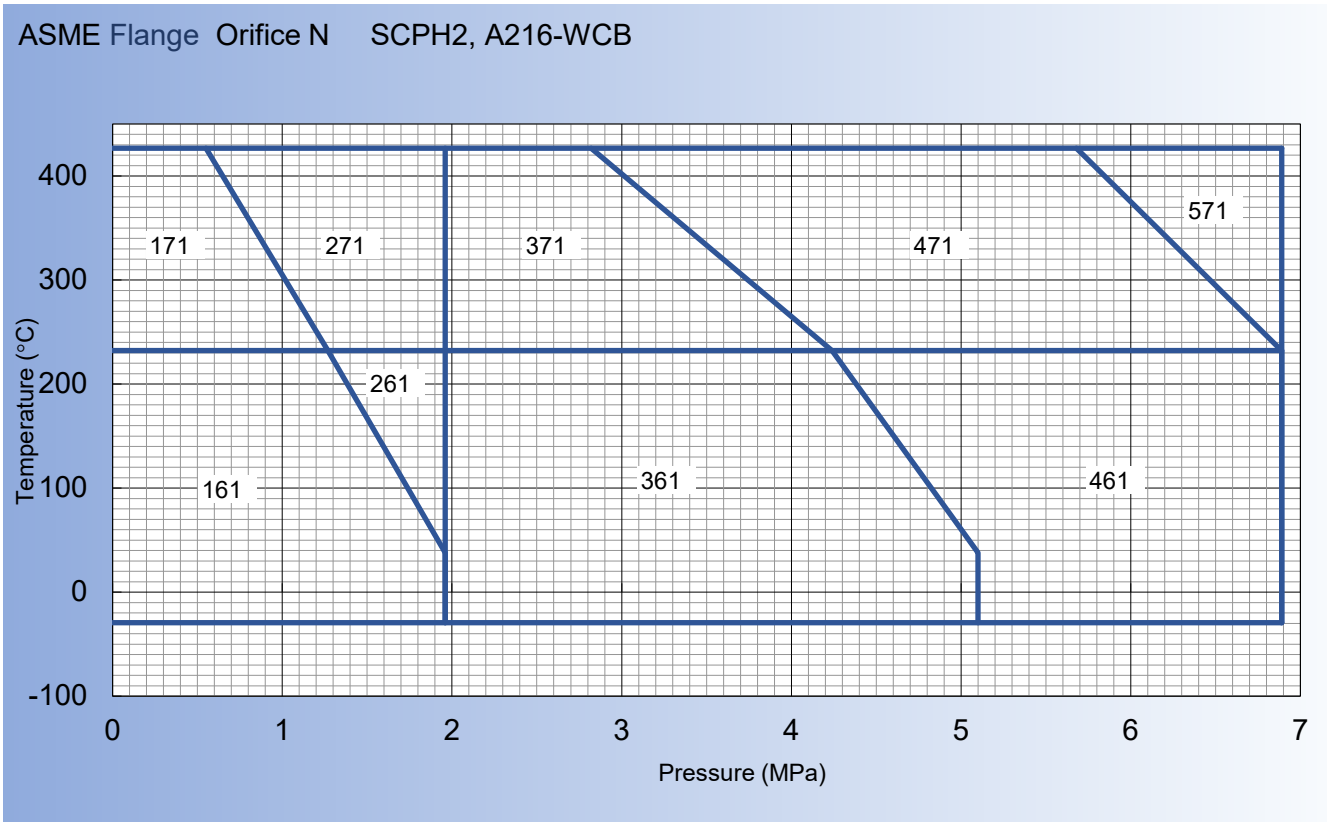
ASME Flange Orifice M SCS14A, A351-CF8M



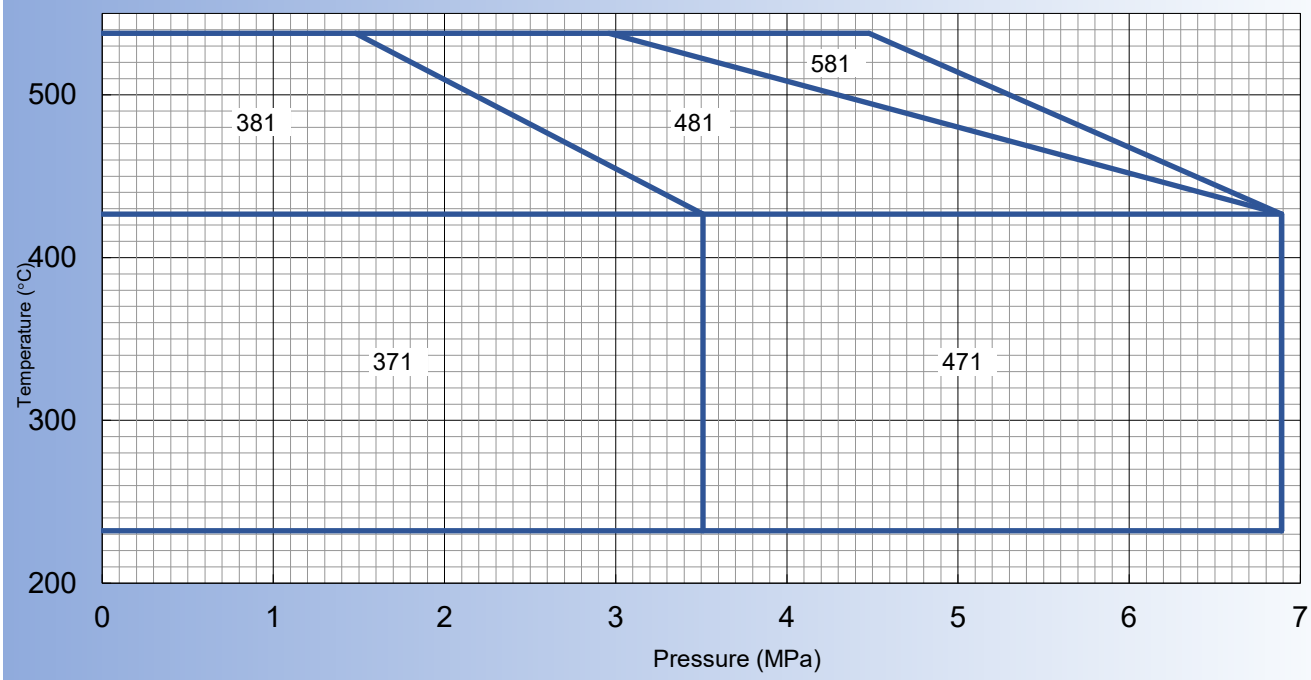
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

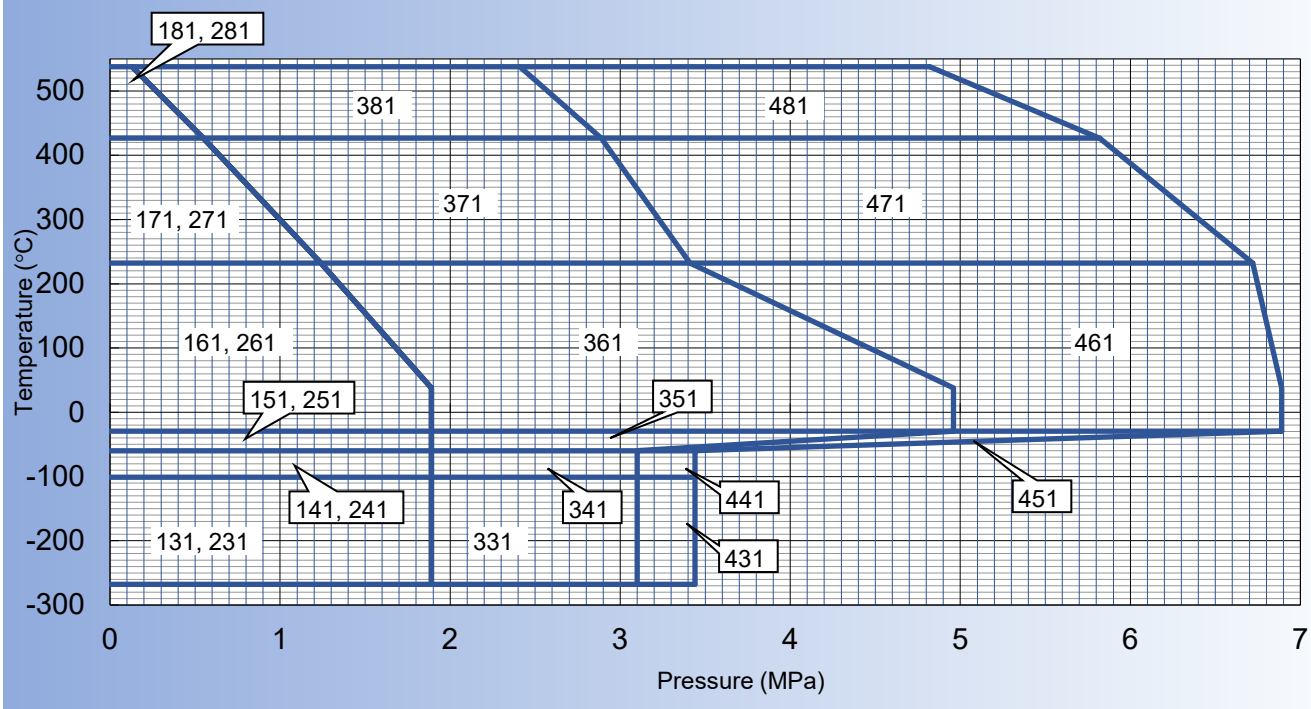
Pressure-temperature Rating ASME B16.5 Flange Orifice N												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C / *1 *2	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	4*N*6	150	150	1	-	-	1.96	1.27	0.55	-	1.96	0.55
		300		2	-	-	1.96	1.96	1.96	-		
				3	-	-	5.1	4.24	2.82	-		1.1
		600		4	-	-	6.89	6.89	5.68	-		
		900		5	-	-	6.89	6.89	6.89	-		
SCPH21 A217-WC6	4*N*6	300	150	3	-	-	-	-	3.51	1.48	1.96	1.1
		600		4	-	-	-	-	6.89	2.96		
		900		5	-	-	-	-	6.89	4.48		
SCS14A A351-CF8M	4*N*6	150	150	1	1.89	1.89	1.89	1.24	0.55	0.13	1.89	0.55
		300		2	1.89	1.89	1.89	1.89	1.89	1.89		
				3	3.1	4.96	4.96	3.41	2.89	2.41		1.1
		600		4	3.44	6.89	6.89	6.72	5.82	4.82		



ASME Flange Orifice N SCPH21, A217-WC6



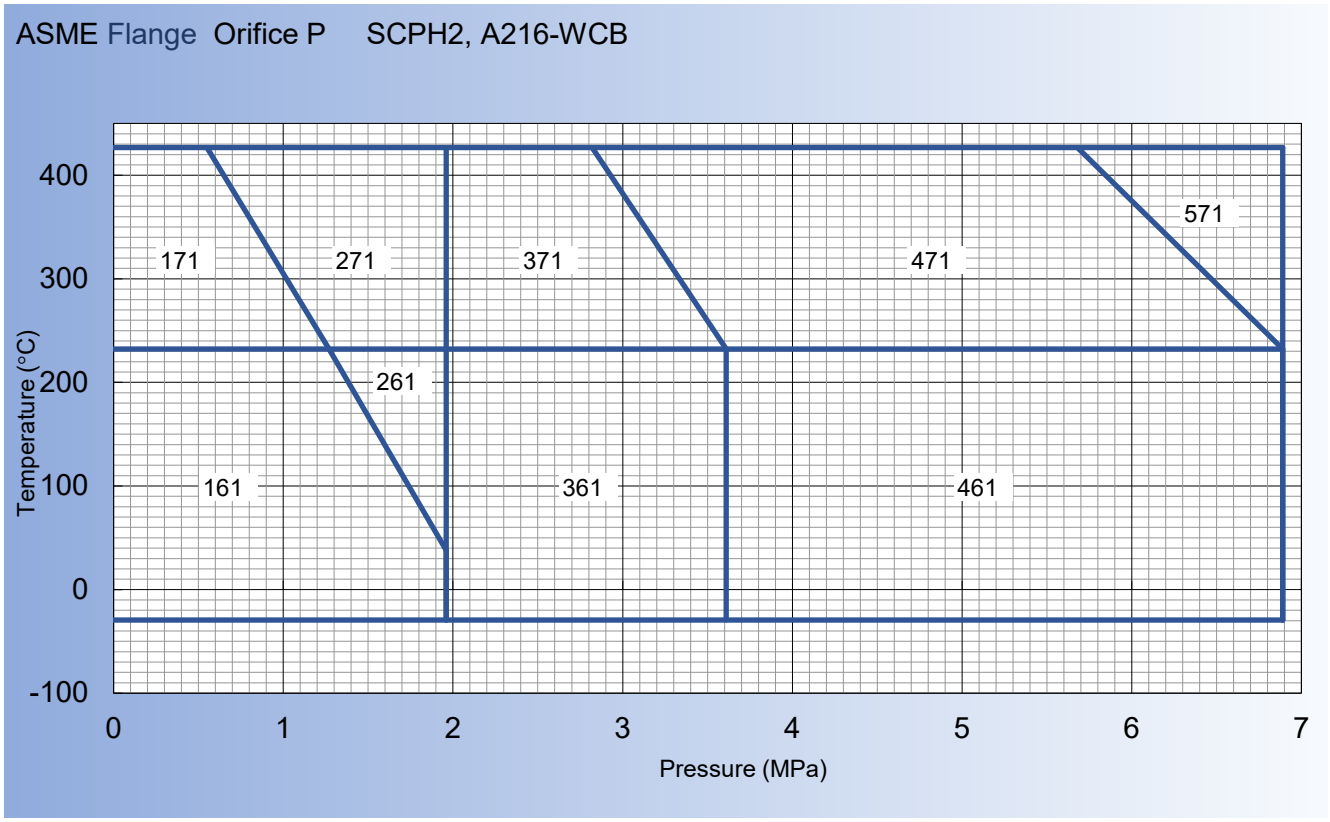
ASME Flange Orifice N SCS14A, A351-CF8M

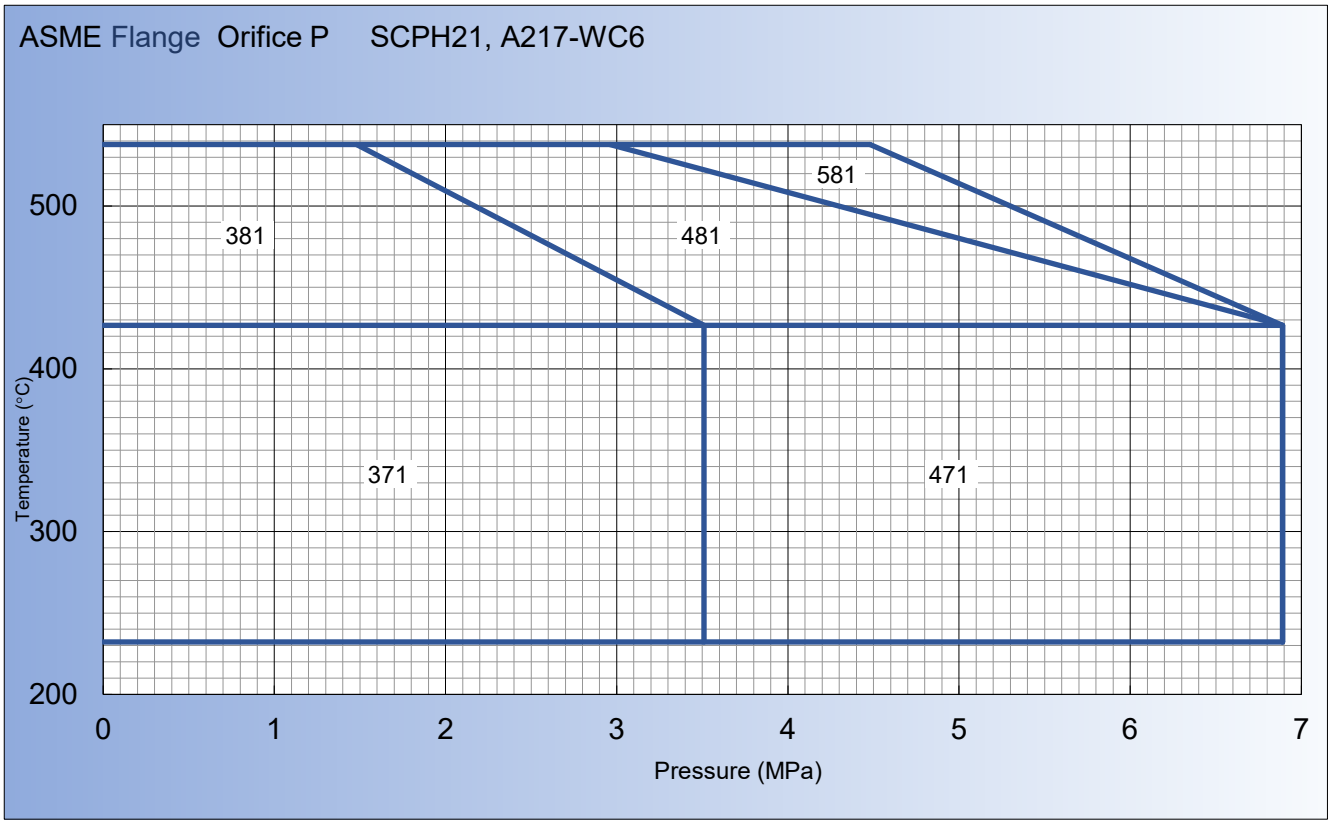


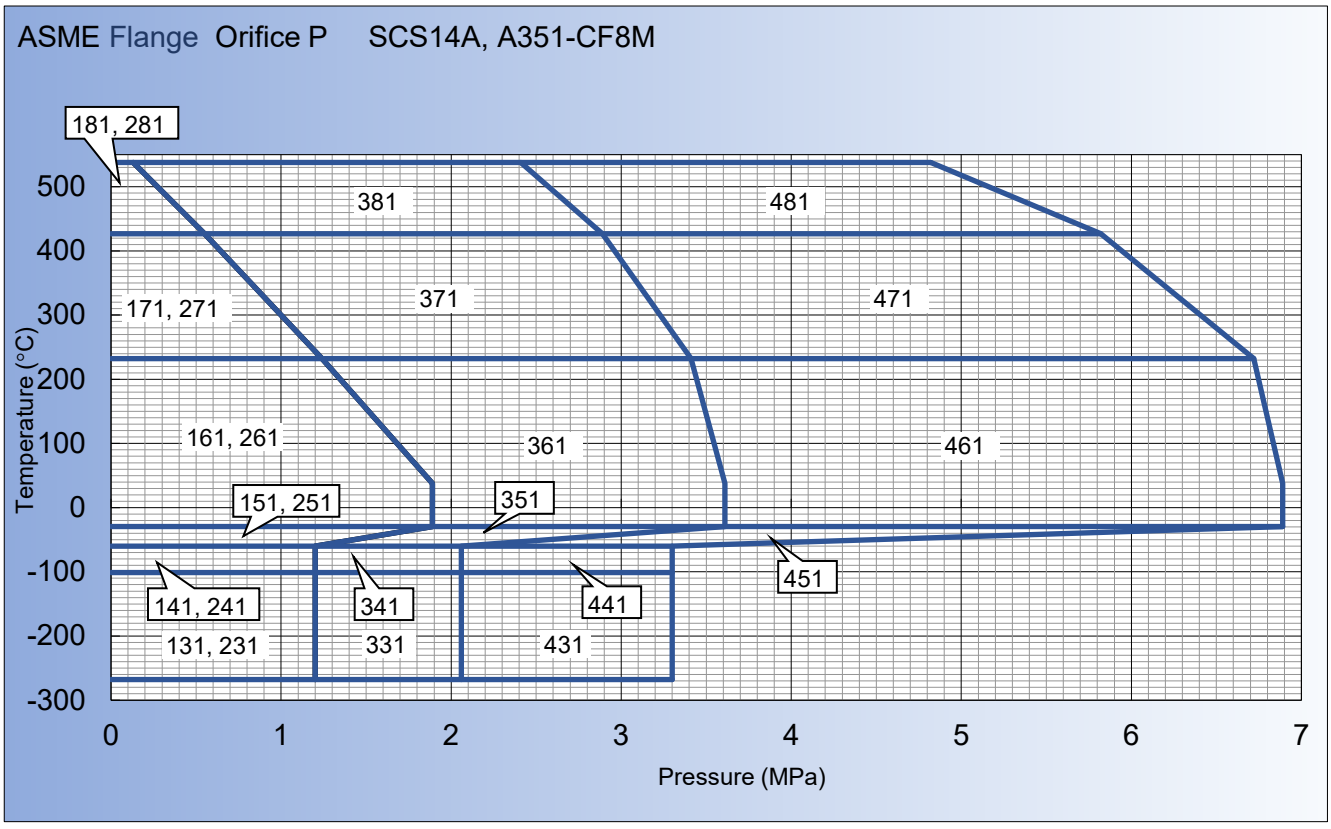
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Pressure-temperature Rating ASME B16.5 Flange Orifice P												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C / *1 *2	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	4*P*6	150	150	1	-	-	1.96	1.27	0.55	-	1.96	0.55
		300		2	-	-	1.96	1.96	1.96	-		
				3	-	-	3.61	3.61	2.82	-		1.03
		600		4	-	-	6.89	6.89	5.68	-		
		900		5	-	-	6.89	6.89	6.89	-		
SCPH21 A217-WC6	4*P*6	300	150	3	-	-	-	-	3.51	1.48	1.96	1.1
		600		4	-	-	-	-	6.89	2.96		
		900		5	-	-	-	-	6.89	4.48		
SCS14A A351-CF8M	4*P*6	150	150	1	1.2	1.89	1.89	1.24	0.55	0.13	1.89	0.55
		300		2	1.2	1.89	1.89	1.89	1.89	1.89		
				3	2.06	3.61	3.61	3.41	2.89	2.41		1.1
		600		4	3.3	6.89	6.89	6.72	5.82	4.82		



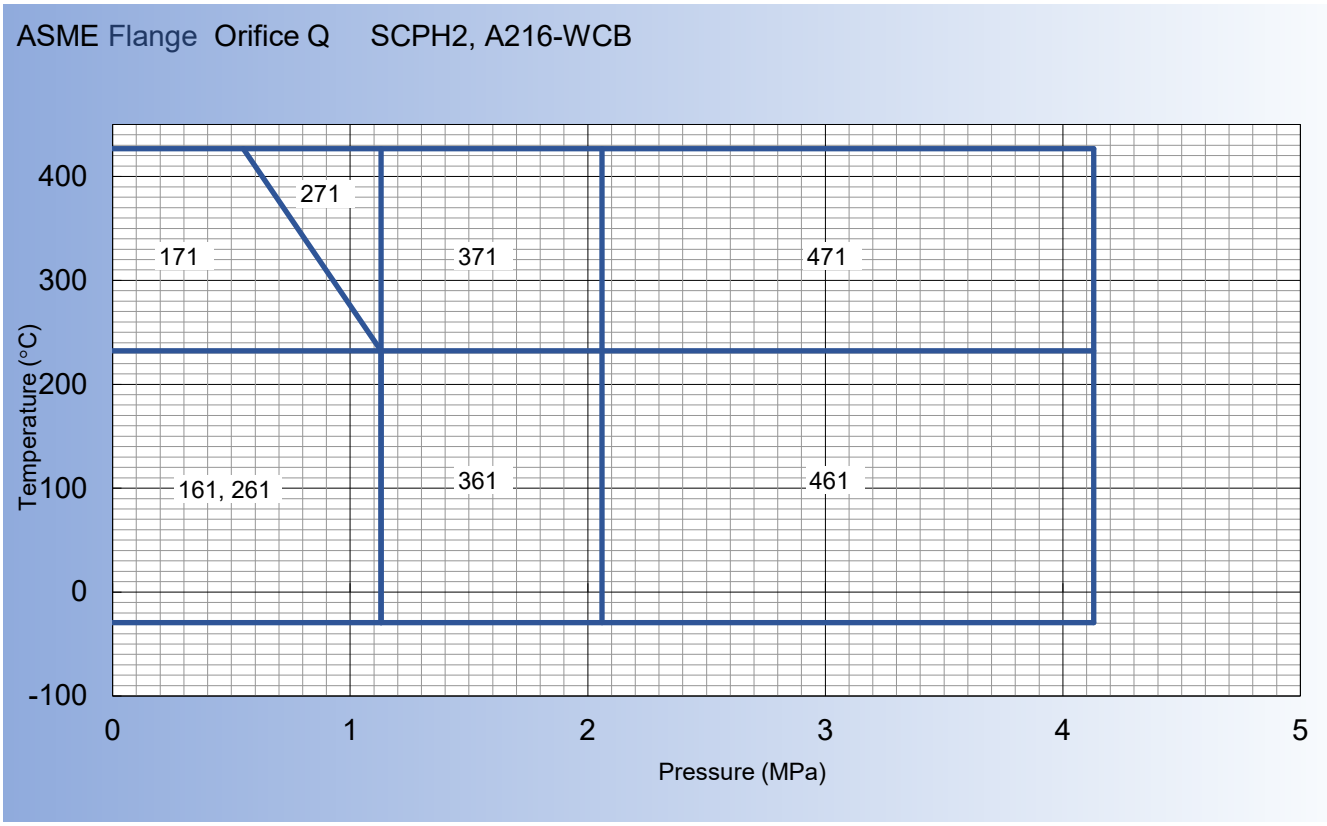




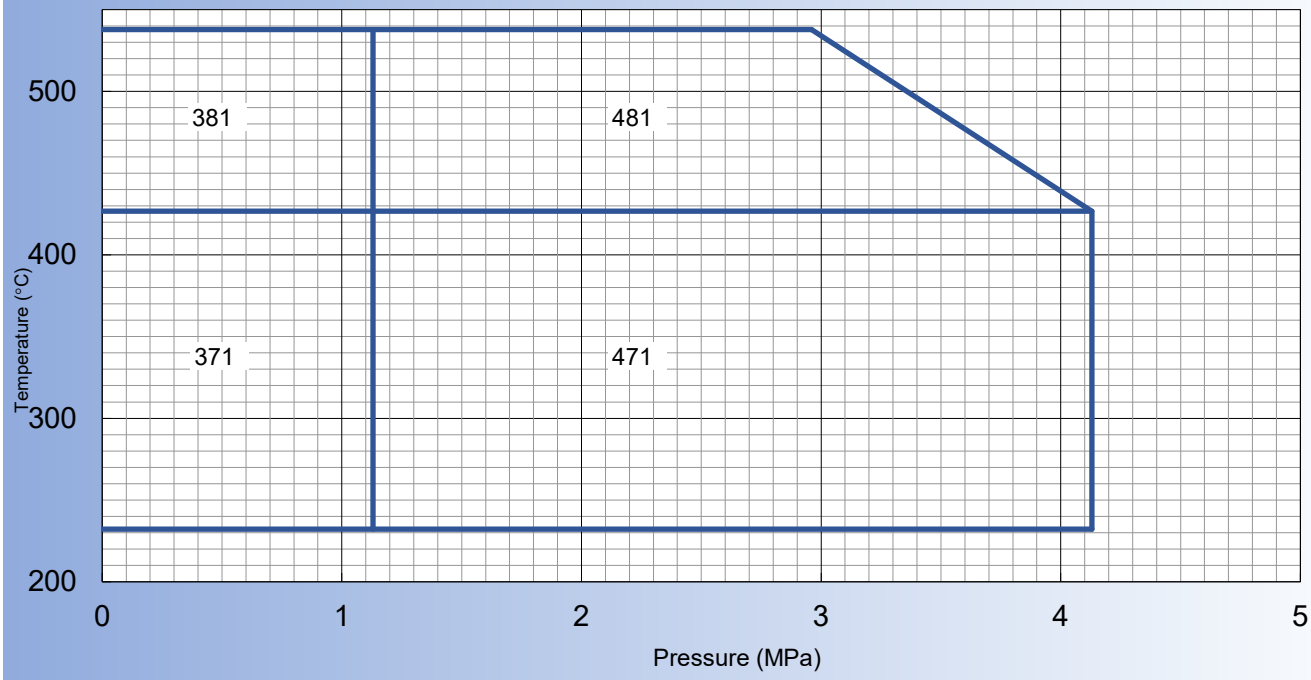
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

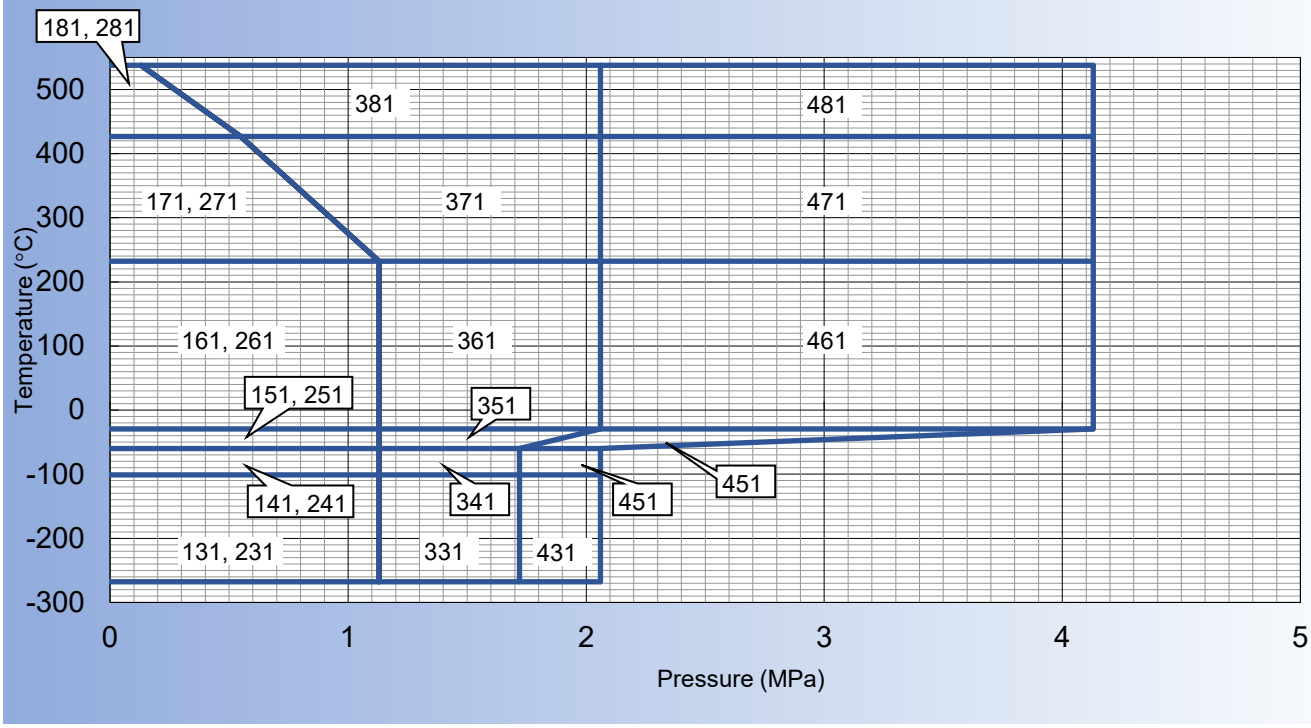
Pressure-temperature Rating ASME B16.5 Flange Orifice Q												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C / *1 *2	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
					2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	6*Q*8	150	150	1	-	-	1.13	1.13	0.55	-	0.79	0.48
		300		2	-	-	1.13	1.13	1.13	-		
				3	-	-	2.06	2.06	2.06	-		0.79
		600		4	-	-	4.13	4.13	4.13	-		
SCPH21 A217-WC6	6*Q*8	300	150	3	-	-	-	-	1.13	1.13	0.79	0.79
		600		4	-	-	-	-	4.13	2.96		
SCS14A A351-CF8M	6*Q*8	150	150	1	1.13	1.13	1.13	1.13	0.55	0.13	0.79	0.48
		300		2	1.13	1.13	1.13	1.13	1.13	1.13		
				3	1.72	2.06	2.06	2.06	2.06	2.06		0.79
		600		4	2.06	4.13	4.13	4.13	4.13	4.13		



ASME Flange Orifice Q SCPH21, A217-WC6



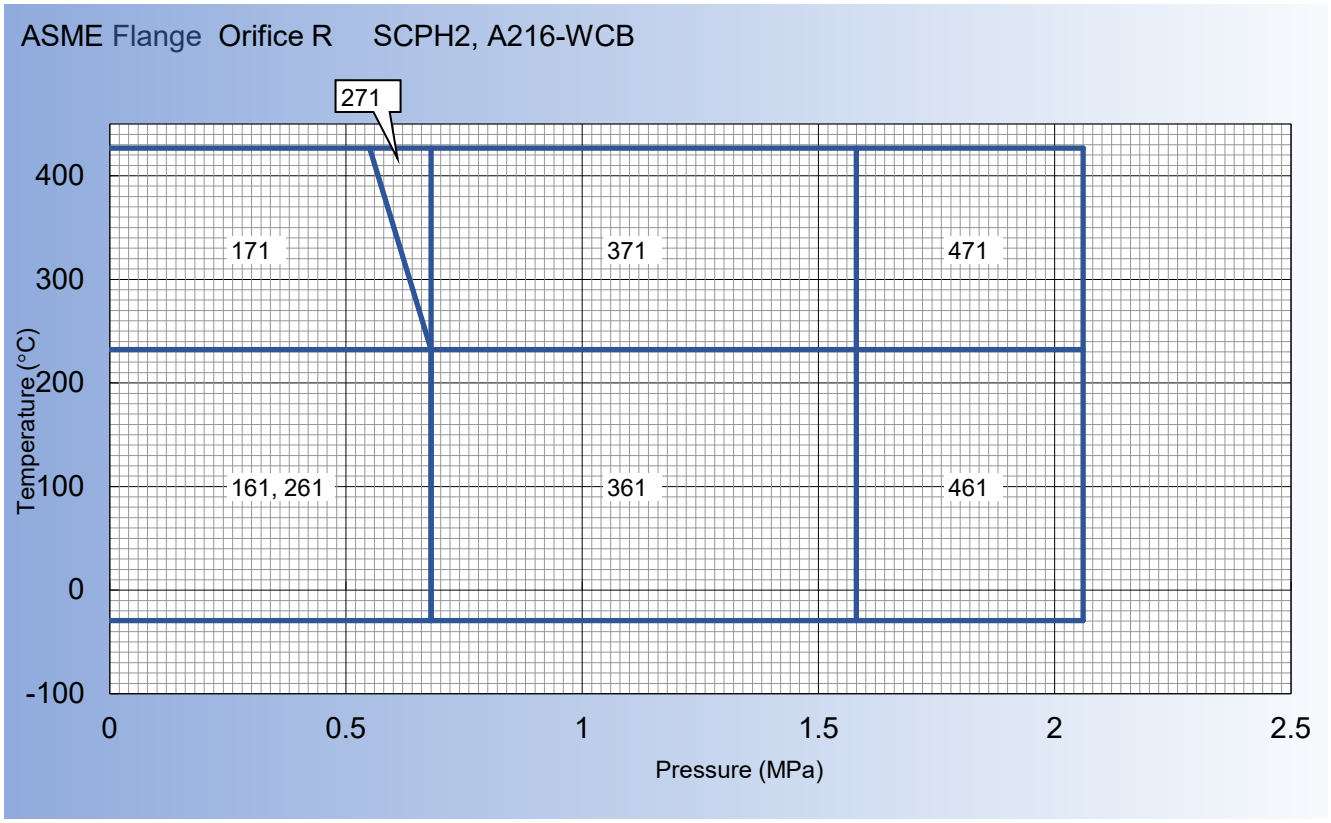
ASME Flange Orifice Q SCS14A, A351-CF8M



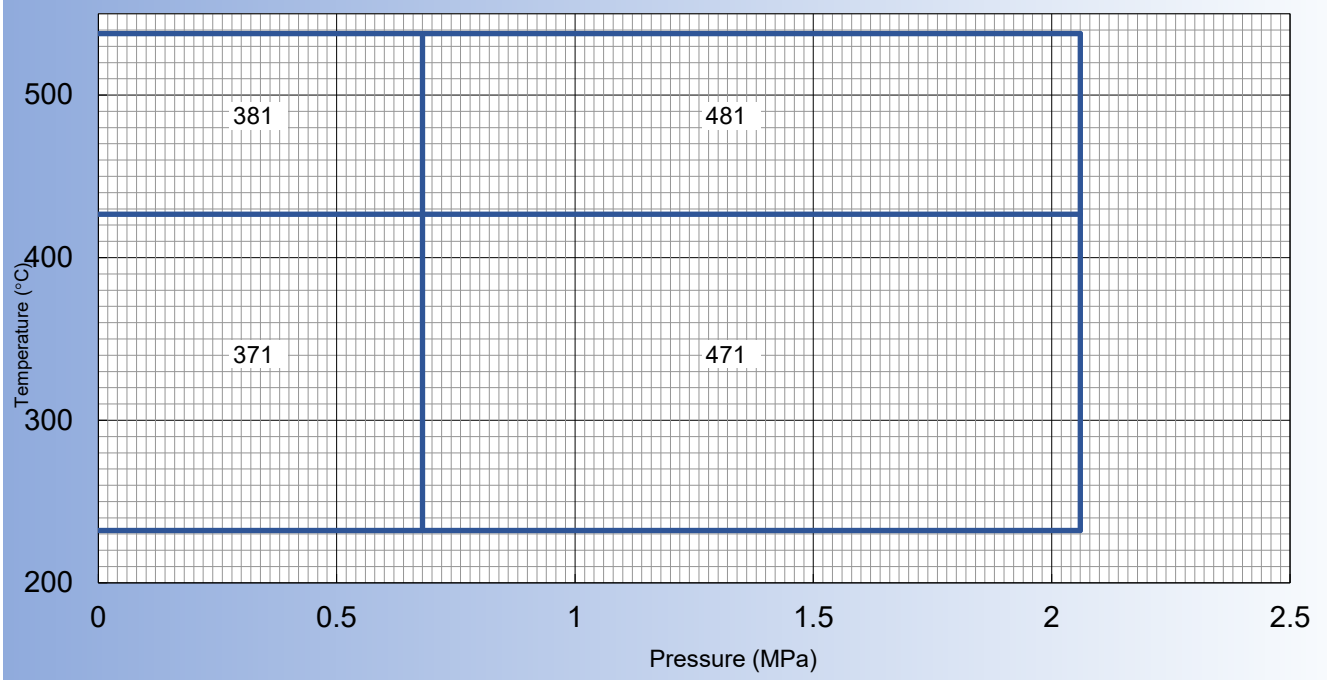
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

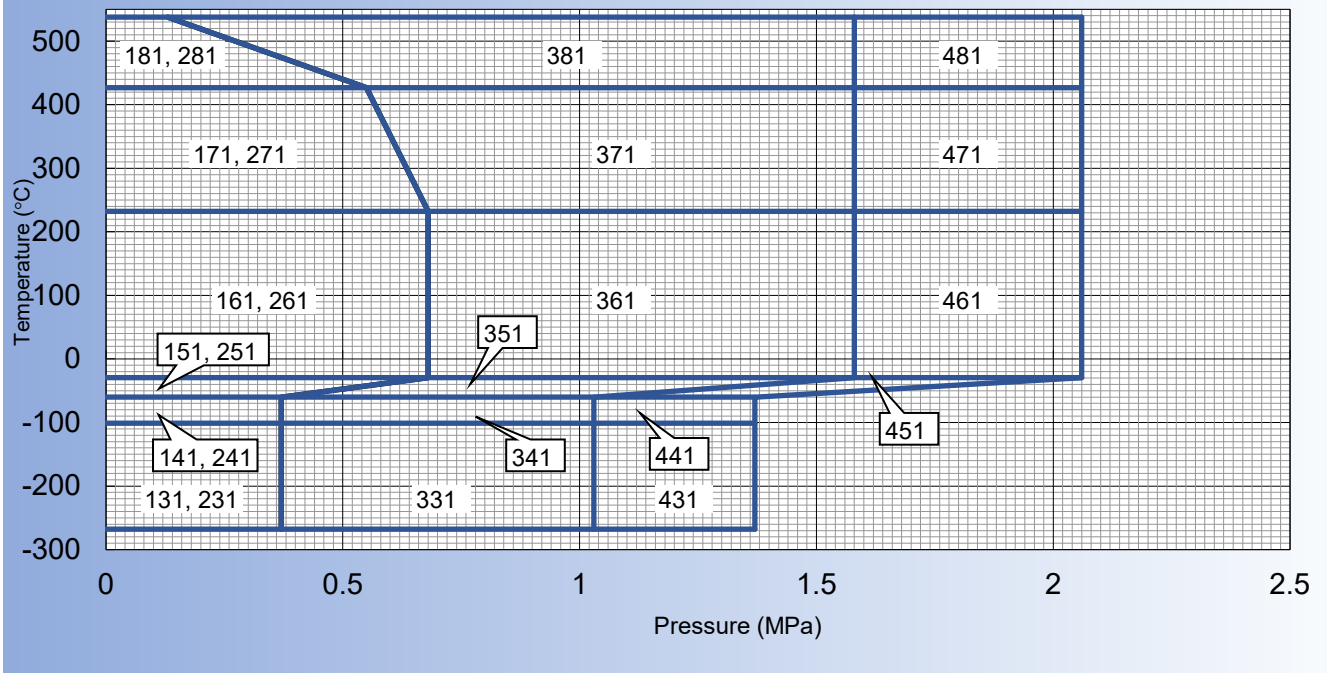
Pressure-temperature Rating ASME B16.5 Flange Orifice R												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	6*R*8	150	150	1	-	-	0.68	0.68	0.55	-	0.41	0.41
		300		2	-	-	0.68	0.68	0.68	-		
	6*R*10			3	-	-	1.58	1.58	1.58	-	0.68	0.68
		600		4	-	-	2.06	2.06	2.06	-		
SCPH21 A217-WC6	6*R*8	300	150	3	-	-	-	-	0.68	0.68	0.68	0.68
	6*R*10	600		4	-	-	-	-	2.06	2.06		
SCS14A A351-CF8M	6*R*8	150	150	1	0.37	0.68	0.68	0.68	0.55	0.13	0.41	0.41
		300		2	0.37	0.68	0.68	0.68	0.68	0.68		
	6*R*10			3	1.03	1.58	1.58	1.58	1.58	1.58	0.68	0.68
		600		4	1.37	2.06	2.06	2.06	2.06	2.06		



ASME Flange Orifice R SCPH21, A217-WC6



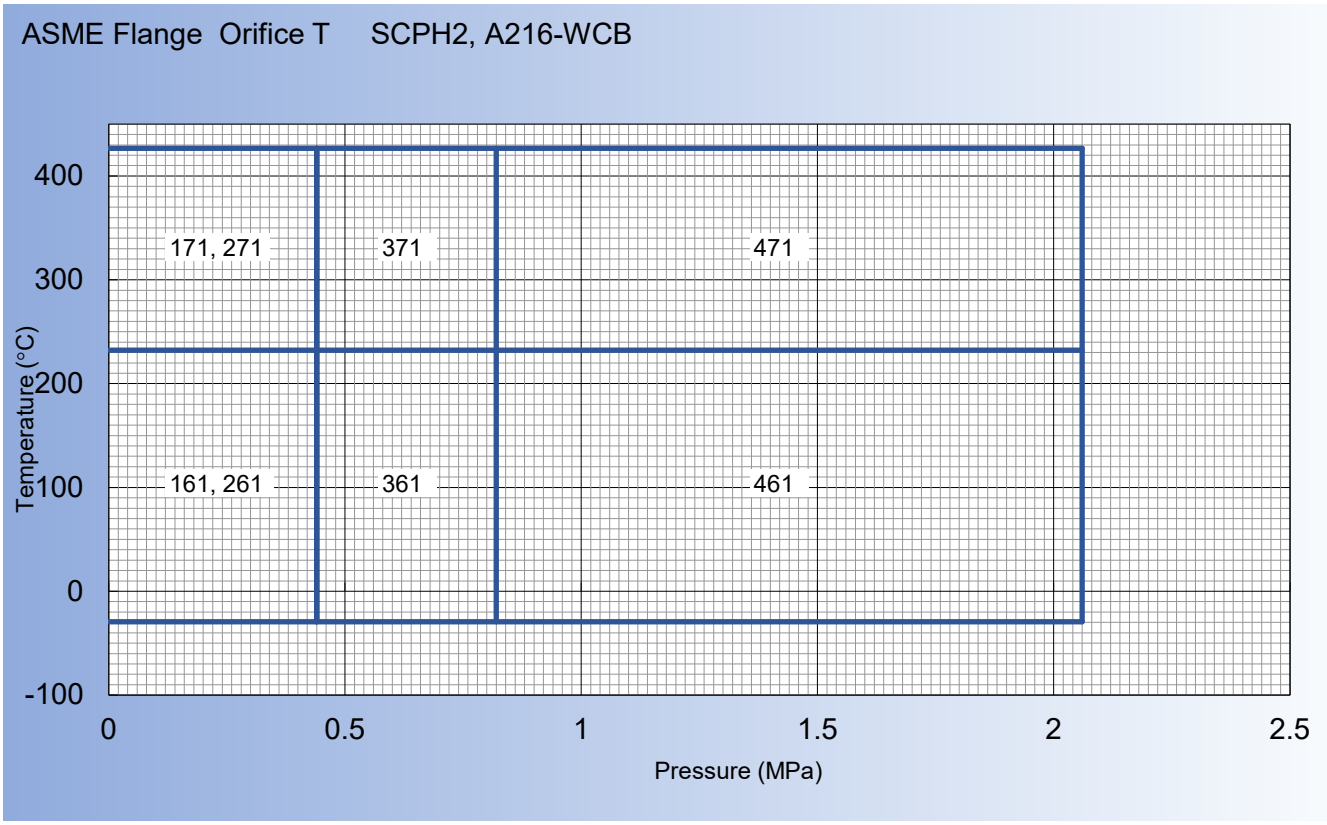
ASME Flange Orifice R SCA14A, A351-CF8M



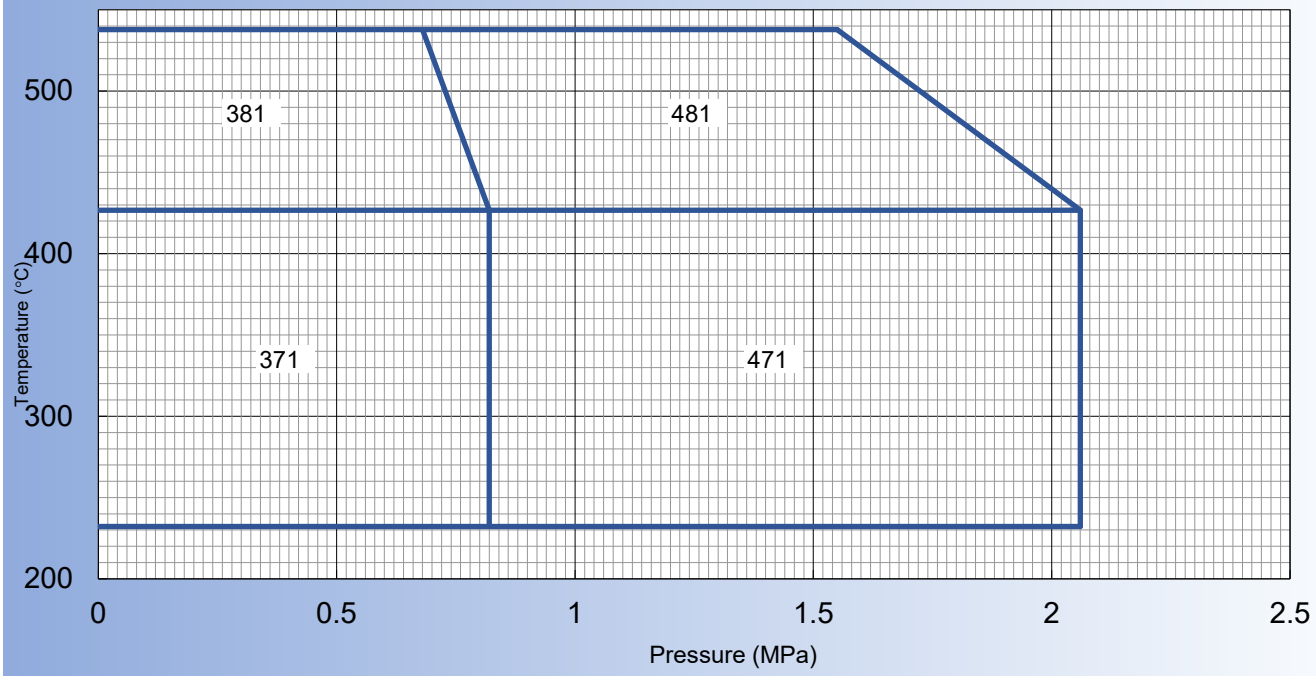
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

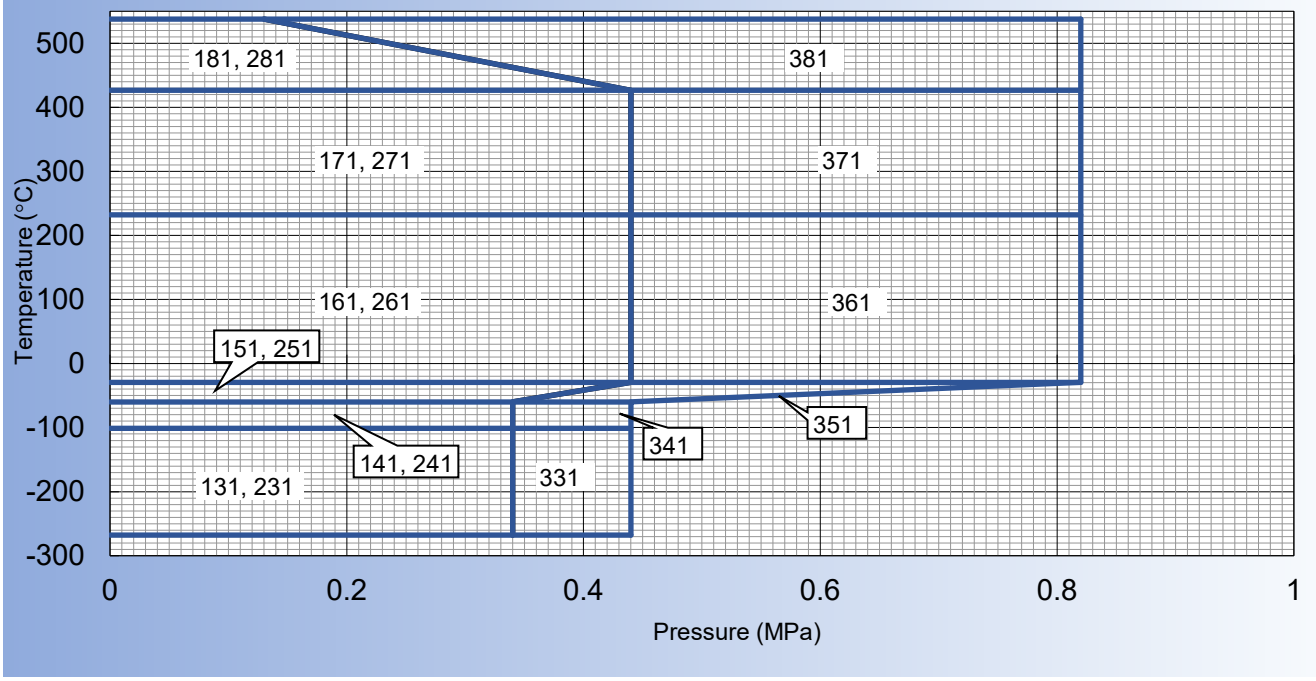
Pressure-temperature Rating ASME B16.5 Flange Orifice T												
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa							Maximum outlet pressure MPa	
		Inlet	Outlet	Temperature T °C / *1 *2	-268 ≤ T T < -60	-60 ≤ T T < -29	-29 ≤ T T < 38	232	427	538	REC	REB
				*1 *2	2, 3, 4	5	6		7	8		
SCPH2 A216-WCB	8*T*10	150	150	1	-	-	0.44	0.44	0.44	-	0.2	0.2
		300		2	-	-	0.44	0.44	0.44	-		
				3	-	-	0.82	0.82	0.82	-	0.41	0.41
				4	-	-	2.06	2.06	2.06	-	0.68	0.68
SCPH21 A217-WC6	8*T*10	300	150	3	-	-	-	-	0.82	0.68	0.41	0.41
				4	-	-	-	-	2.06	1.48	0.68	0.68
SCS14A A351-CF8M	8*T*10	150	150	1	0.34	0.44	0.44	0.44	0.44	0.13	0.2	0.2
		300		2	0.34	0.44	0.44	0.44	0.44	0.44		
				3	0.44	0.82	0.82	0.82	0.82	0.82	0.41	0.41



ASME Flange Orifice T SCPH21, A217-WC6



ASME Flange Orifice T SCS14A, A351-CF8M

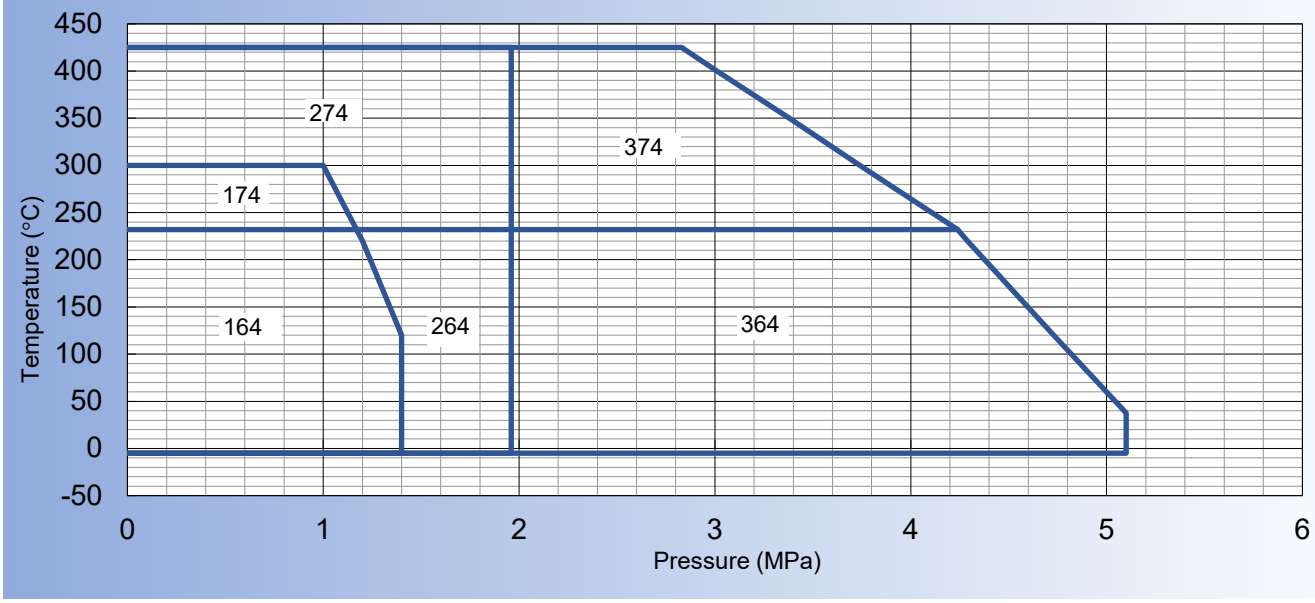


*1 Indicates the pressure class code. *2 Indicates the temperature code.

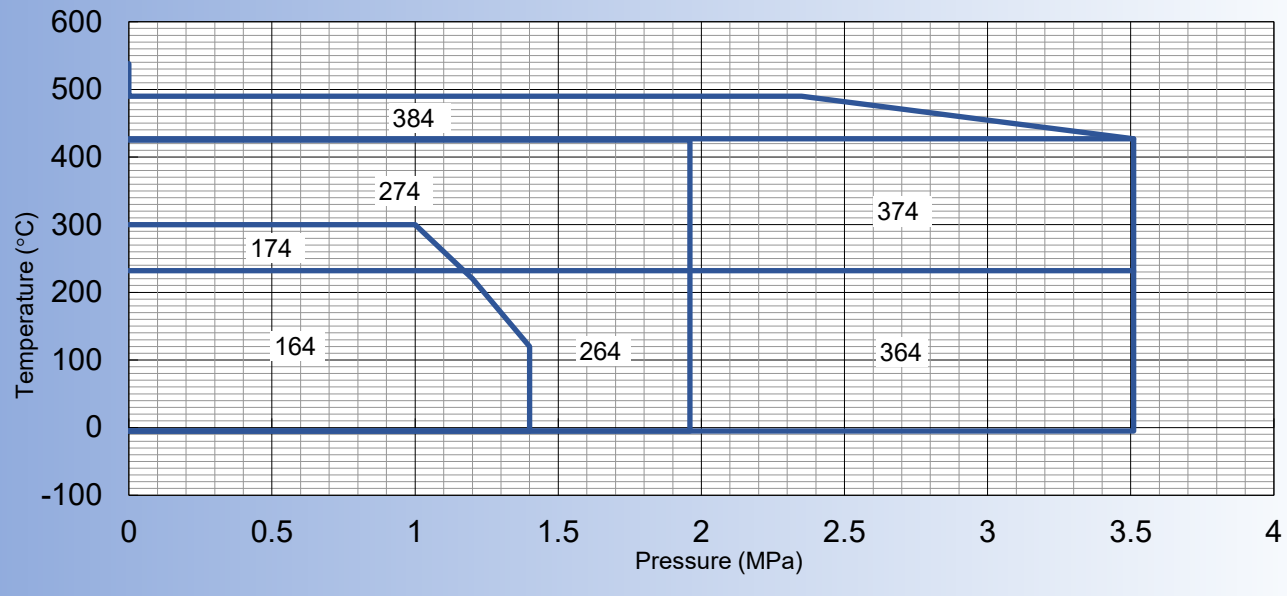
*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Pressure-temperature Rating JIS B 2220 Flange Orifice D, E, F, G, K, M, N																
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa												
				Temperature °C	-196	-60	-29	-5	38	232	300	425	427	450	490
		Inlet	Outlet	*1 \ *2	2, 3, 4	5		6		7				8	
SCPH2 A216-WCB	1*D*2 1*E*2 1.1/2*F*2 1.1/2*G*3 3*K*4 4*M*6 4*N*6	10K	10K	1	-	-	-	1.4	1.4	1.17	1	-	-	-	-
		20K		2	-	-	-	1.96	1.96	1.96	1.96	1.96	-	-	-
		30K		3	-	-	-	5.1	5.1	4.24	3.74	2.83	-	-	-
SCPH21 A217-WC6		10K		1	-	-	-	1.4	1.4	1.17	1	-	-	-	-
		20K		2	-	-	-	1.96	1.96	1.96	1.96	1.96	-	-	-
		30K		3	-	-	-	3.51	3.51	3.51	3.51	3.51	3.51	3.08	2.35
SCS14A A351-CF8M		10K		1	1.4	1.4	1.4	1.4	1.4	1.17	1	-	-	-	-
		20K		2	1.89	1.89	1.89	1.89	1.89	1.24	1	0.55	-	-	-
		30K		3	4.96	4.96	4.96	4.96	4.96	3.41	3.22	2.89	2.89	2.79	-

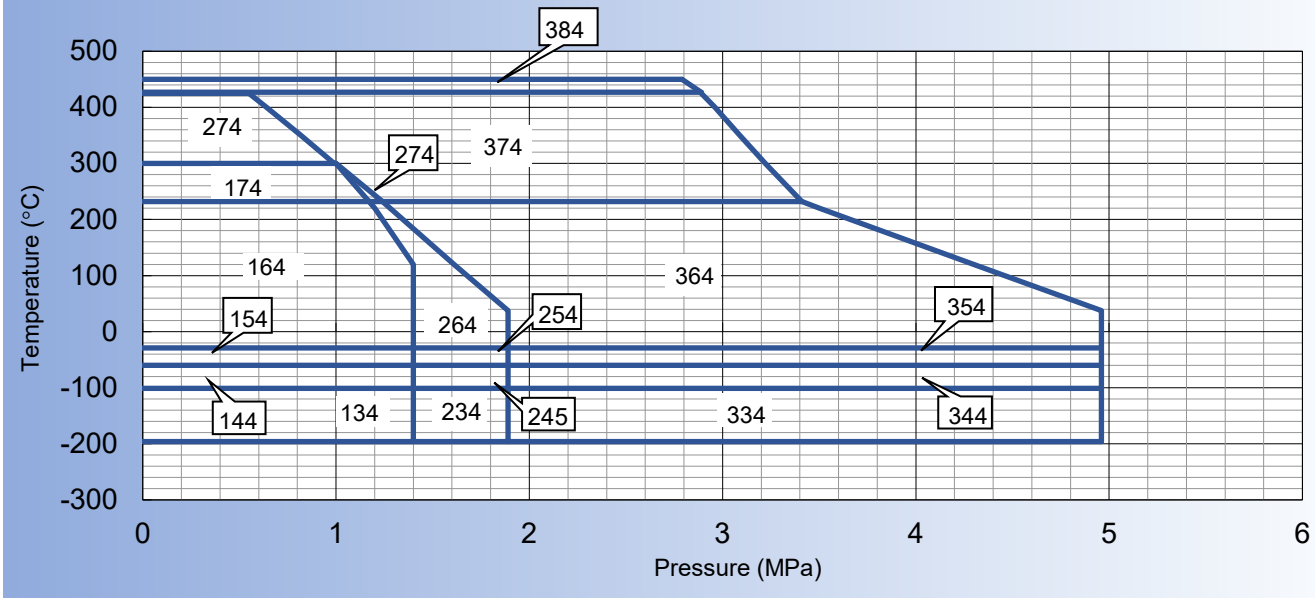
JIS Flange Orifice D, E, F, G, H, J, K, L, M, N SCPH2, A216-WCB



JIS Flange Orifice D, E, F, G, H, J, K, L, M, N SCPH21, A217-WC6



JIS Flange Orifice D, E, F, G, H, J, K, L, M, N SCS14A, A351-CF8M



*1 Indicates the pressure class code. *2 Indicates the temperature code.

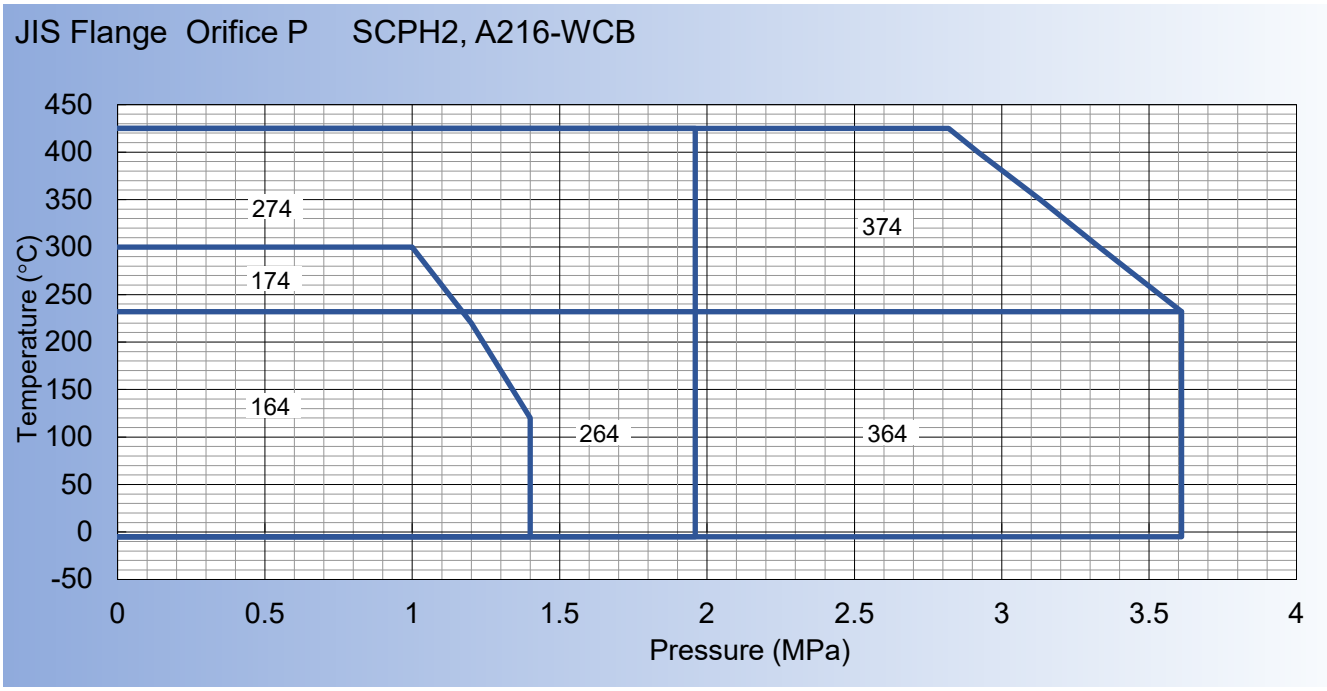
*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

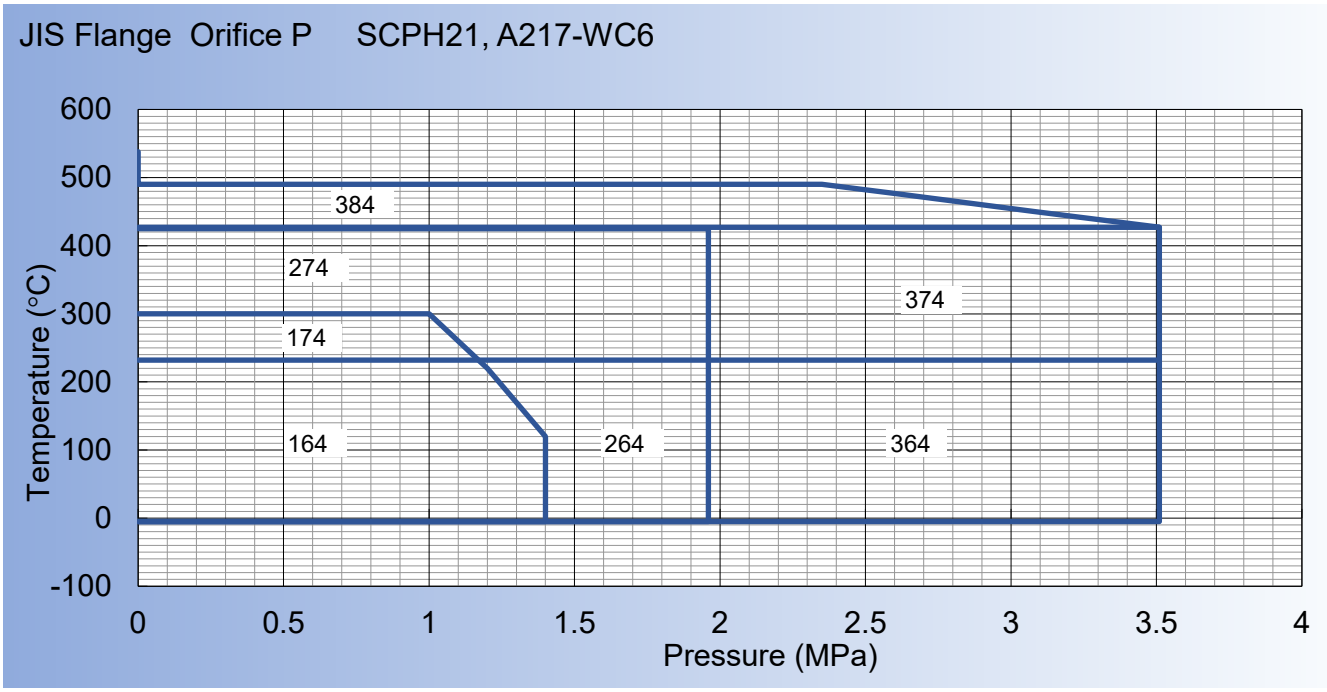
Pressure-temperature Rating JIS B 2220 Flange Orifice H																
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa												
				Temperature °C	-196	-60	-29	-5	38	232	300	425	427	450	490	
		Inlet	Outlet	*1 *2	2, 3, 4	5		6		7				8		
SCPH2 A216-WCB	1.1/2*H*3	10K	10K	1	Same as orifice D											
		20K		2												
	2*H*3	30K		3												
SCPH21 A217-WC6	1.1/2*H*3	10K		1												
		20K		2												
	2*H*3	30K		3												
SCS14A A351-CF8M	1.1/2*H*3	10K		1												
		20K		2												
	2*H*3	30K		3												

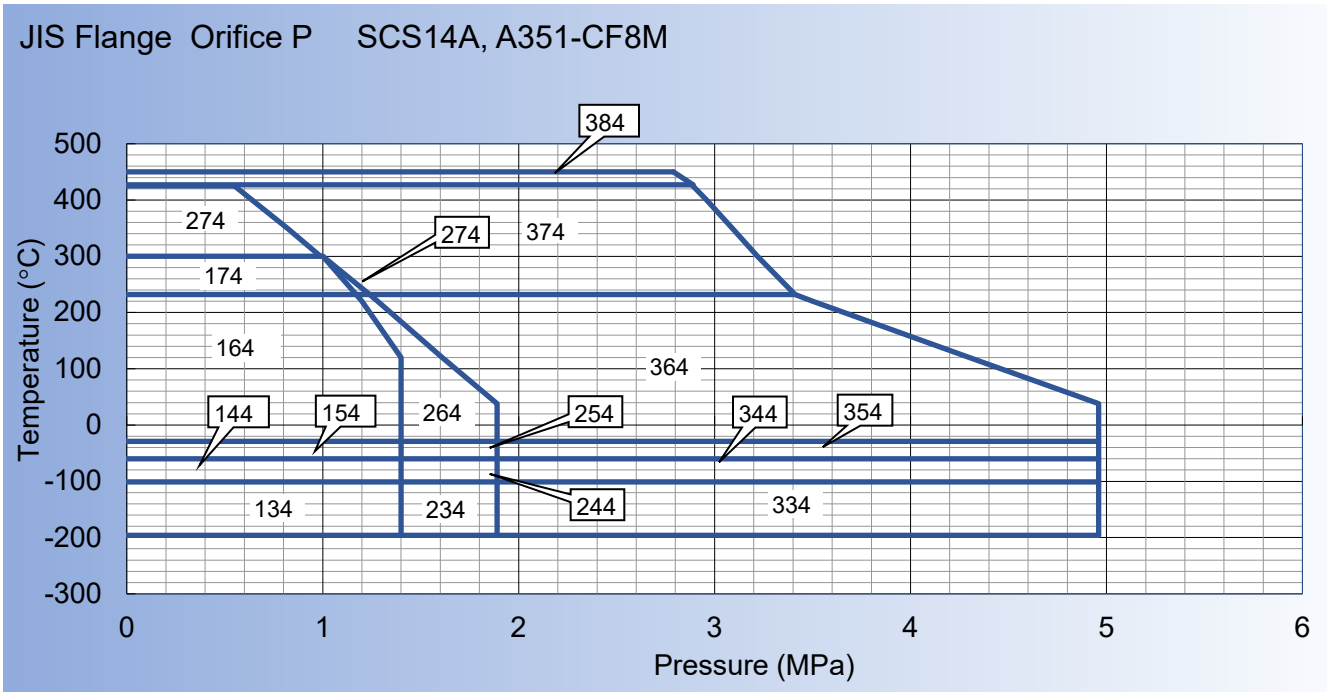
Pressure-temperature Rating JIS B 2220 Flange Orifice J																
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa												
				Temperature °C	-196	-60	-29	-5	38	232	300	425	427	450	490	
		Inlet	Outlet	*1 *2	2, 3, 4	5		6		7				8		
SCPH2 A216-WCB	2*J*3	10K	10K	1	Same as orifice D											
		20K		2												
	3*J*4	30K		3												
SCPH21 A217-WC6	2*J*3	10K		1												
		20K		2												
	3*J*4	30K		3												
SCS14A A351-CF8M	2*J*3	10K		1												
		20K		2												
	3*J*4	30K		3												

Pressure-temperature Rating JIS B 2220 Flange Orifice L																
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa												
				Temperature °C	-196	-60	-29	-5	38	232	300	425	427	450	490	
		Inlet	Outlet	*1 *2	2, 3, 4	5		6		7				8		
SCPH2 A216-WCB	3*L*4	10K	10K	1	Same as orifice D											
		20K		2												
	4*L*6	30K		3												
SCPH21 A217-WC6	3*L*4	10K		1												
		20K		2												
	4*L*6	30K		3												
SCS14A A351-CF8M	3*L*4	10K		1												
		20K		2												
	4*L*6	30K		3												

Pressure-temperature Rating JIS B 2220 Flange Orifice P																
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa												
				Temperature °C	-196	-60	-29	-5	38	232	300	425	427	450	490
		Inlet	Outlet	*1 \ *2	2, 3, 4	5		6		7				8	
SCPH2 A216-WCB	4*P*6	10K	10K	1	-	-	-	1.4	1.4	1.17	1	-	-	-	-
		20K		2	-	-	-	1.96	1.96	1.96	1.96	1.96	-	-	-
		30K		3	-	-	-	3.61	3.61	3.61	3.33	2.82	-	-	-
SCPH21 A217-WC6		10K		1	-	-	-	1.4	1.4	1.17	1	-	-	-	-
		20K		2	-	-	-	1.96	1.96	1.96	1.96	1.96	-	-	-
		30K		3	-	-	-	3.51	3.51	3.51	3.51	3.51	3.51	3.08	2.35
SCS14A A351-CF8M		10K		1	1.4	1.4	1.4	1.4	1.4	1.17	1	-	-	-	-
		20K		2	1.89	1.89	1.89	1.89	1.89	1.24	1	0.55	-	-	-
		30K		3	4.96	4.96	4.96	4.96	4.96	3.41	3.22	2.89	2.89	2.79	-



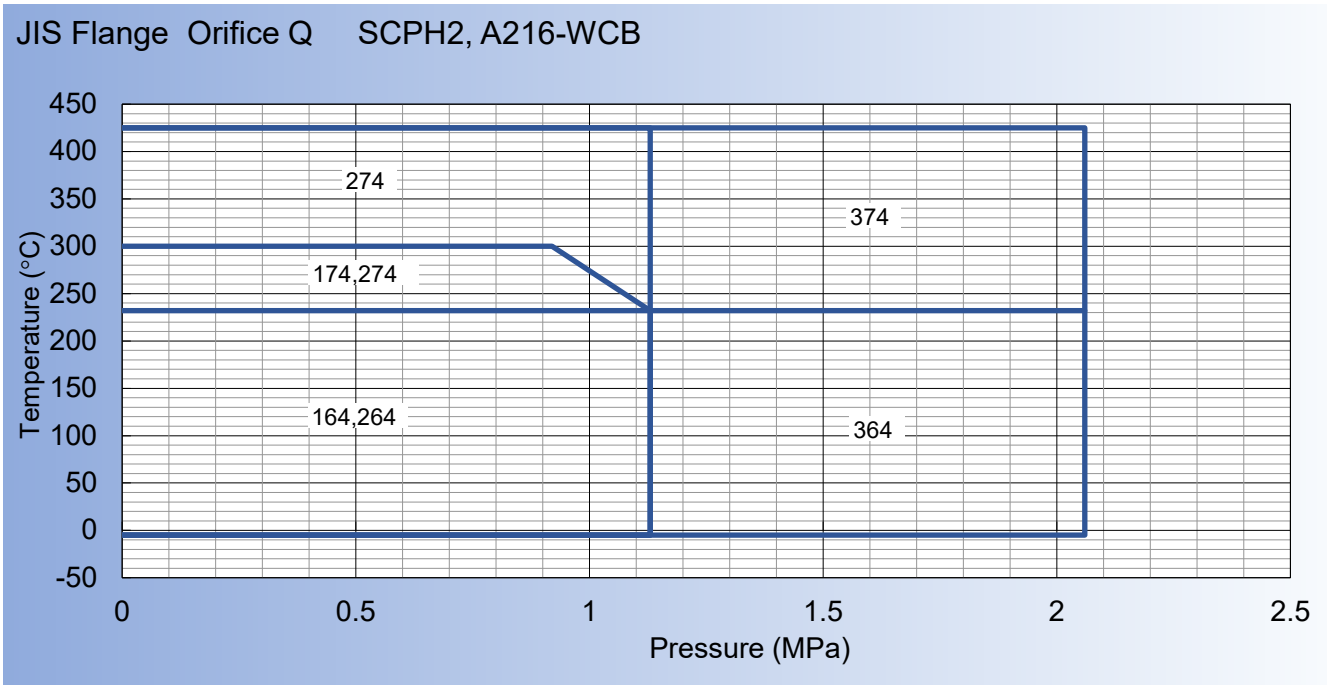


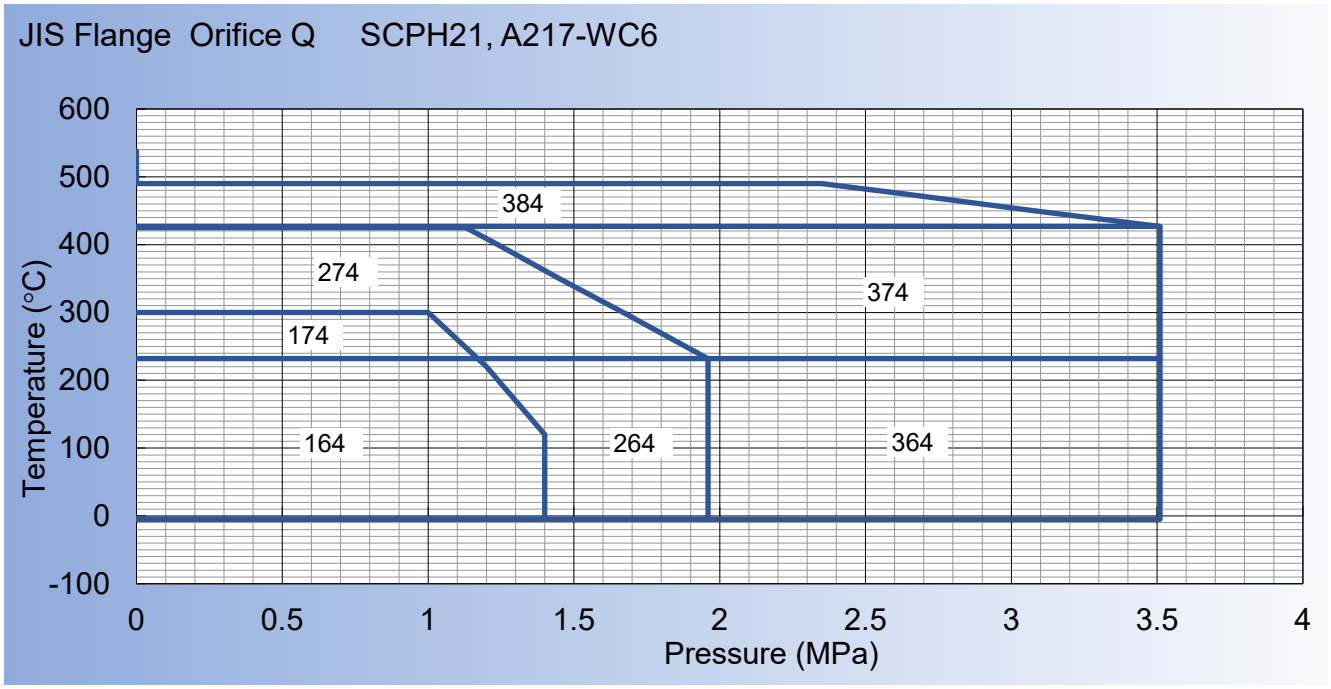


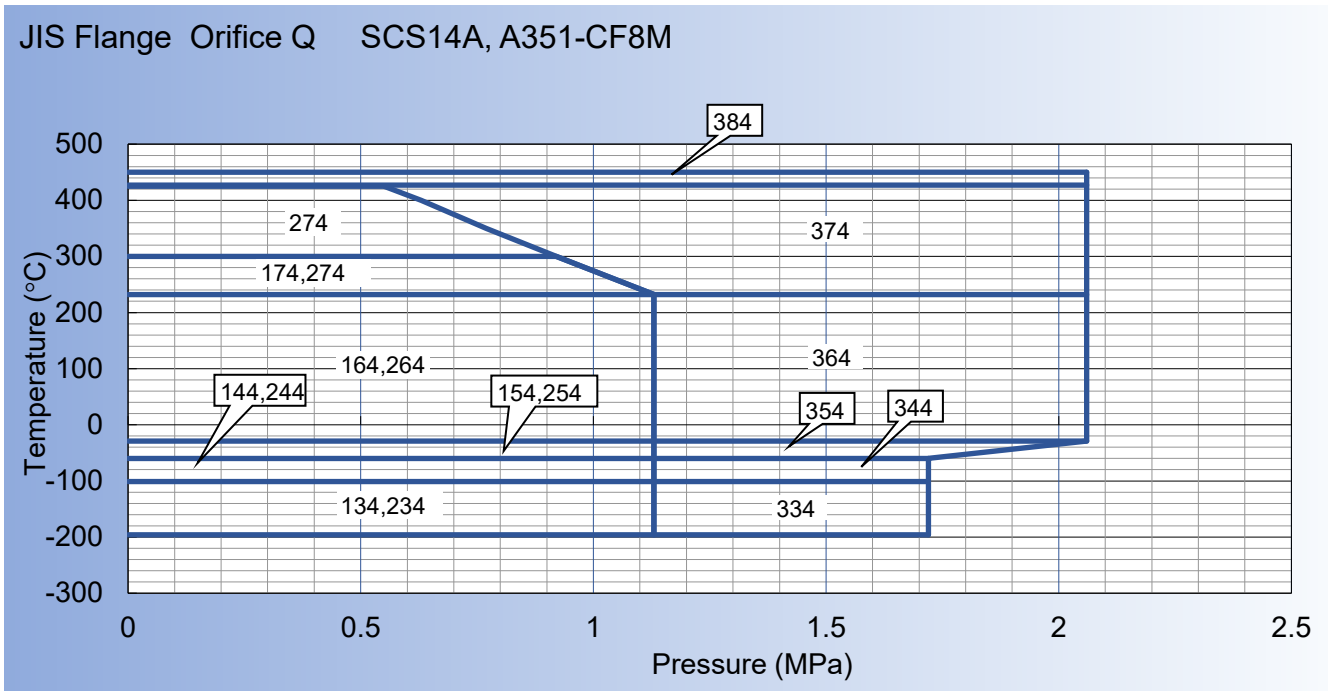
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Pressure-temperature Rating JIS B 2220 Flange Orifice Q																
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa												
				Temperature °C	-196	-60	-29	-5	38	232	300	425	427	450	490
		Inlet	Outlet	*1 \ *2	2, 3, 4	5		6		7				8	
SCPH2 A216-WCB	6*Q*8	10K	10K	1	-	-	-	1.13	1.13	1.13	0.92	-	-	-	-
		20K		2	-	-	-	1.13	1.13	1.13	1.13	1.13	-	-	-
		30K		3	-	-	-	2.06	2.06	2.06	2.06	2.06	-	-	-
SCPH21 A217-WC6		10K		1	-	-	-	1.4	1.4	1.17	1	-	-	-	-
		20K		2	-	-	-	1.96	1.96	1.96	1.67	1.13	-	-	-
		30K		3	-	-	-	3.51	3.51	3.51	3.51	3.51	3.51	3.08	2.35
SCS14A A351-CF8M		10K		1	1.13	1.13	1.13	1.13	1.13	1.13	0.92	-	-	-	-
		20K		2	1.13	1.13	1.13	1.13	1.13	1.13	0.92	0.55	-	-	-
		30K		3	1.72	1.72	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	-



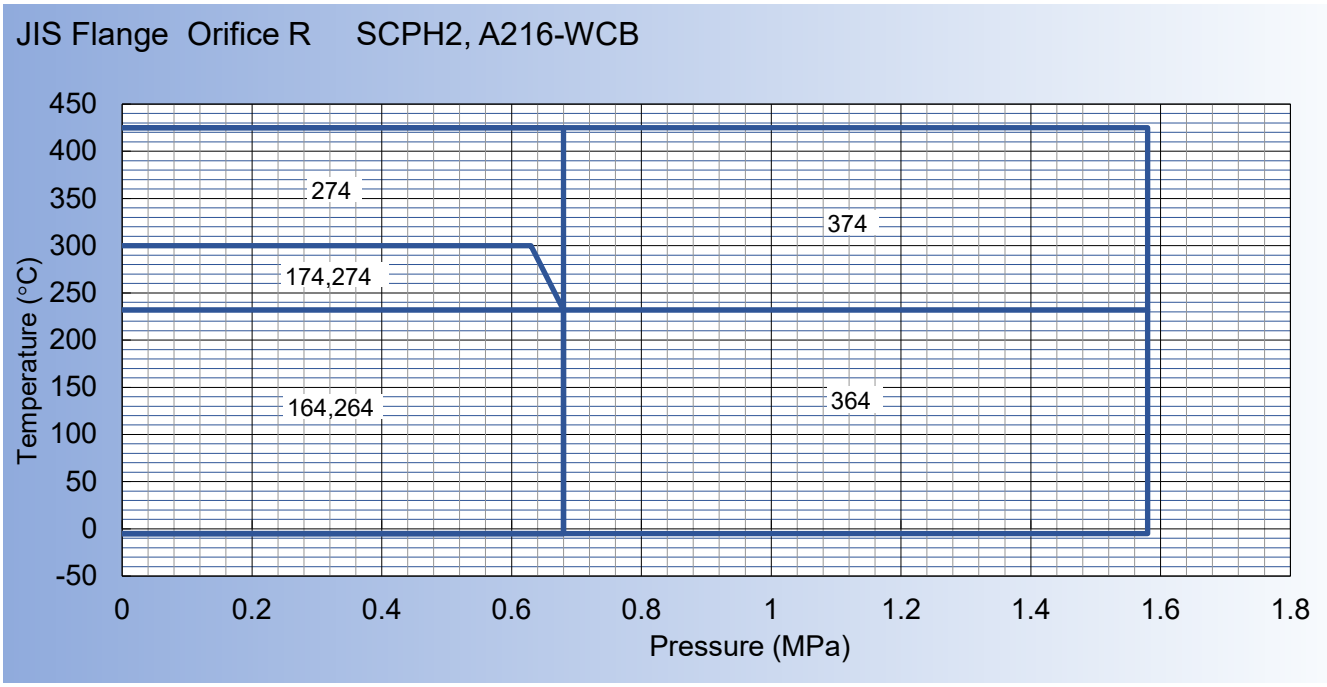


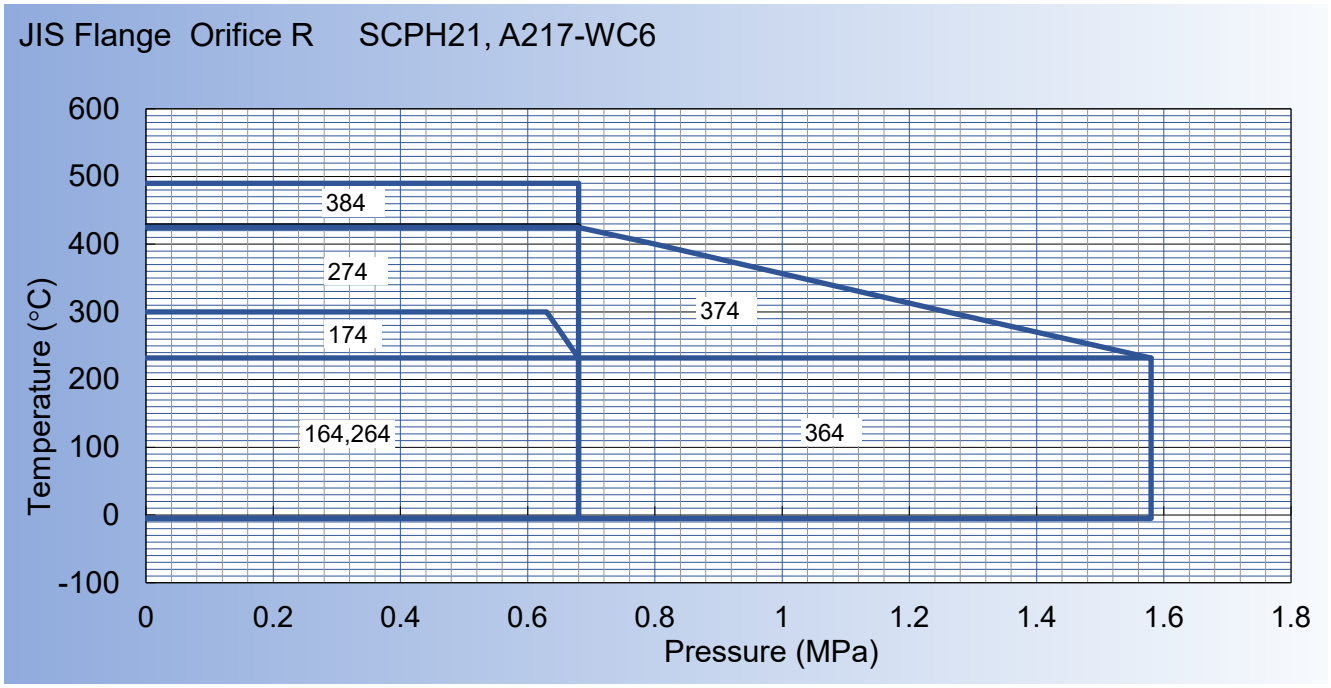


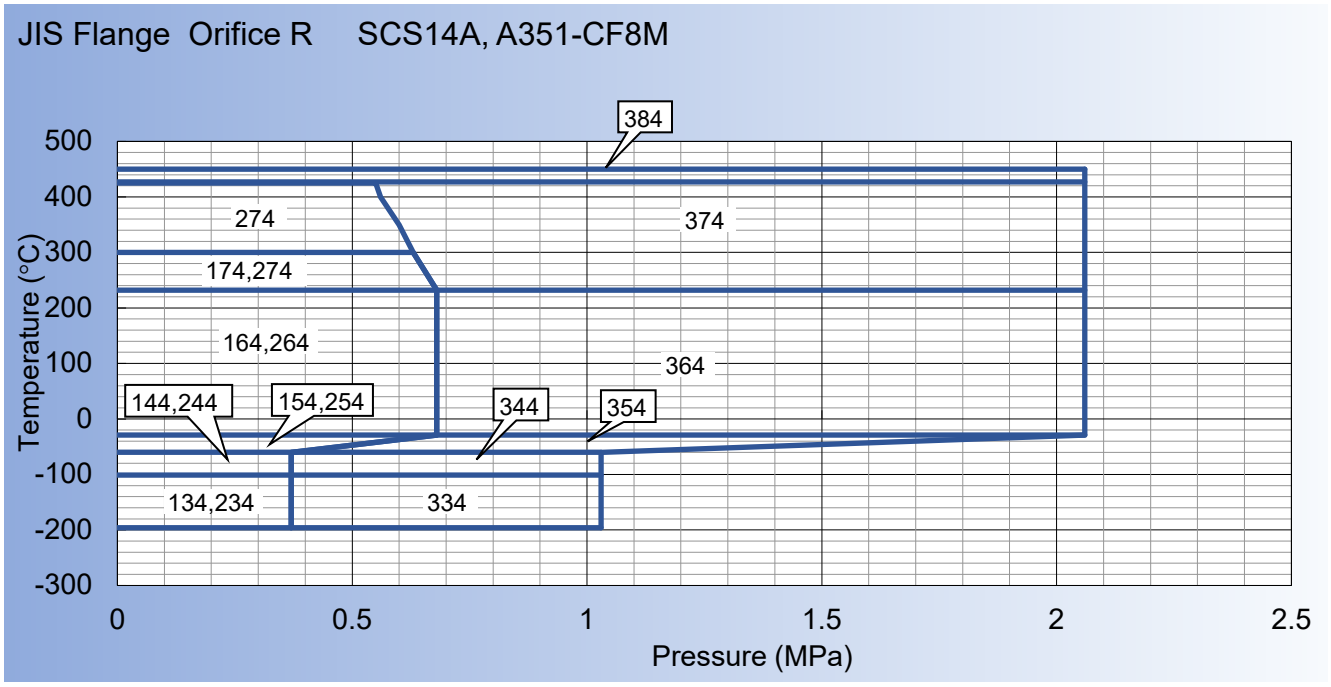
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Pressure-temperature Rating JIS B 2220 Flange Orifice R																
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa												
				Temperature °C	-196	-60	-29	-5	38	232	300	425	427	450	490
		Inlet	Outlet	*1 \ *2	2, 3, 4	5		6		7				8	
SCPH2 A216-WCB	6*R*8	10K	10K	1	-	-	-	0.68	0.68	0.68	0.63	-	-	-	-
		20K		2	-	-	-	0.68	0.68	0.68	0.68	0.68	-	-	-
	6*R*10	30K		3	-	-	-	1.58	1.58	1.58	1.58	1.58	-	-	-
SCPH21 A217-WC6	6*R*8	10K		1	-	-	-	0.68	0.68	0.68	0.63	-	-	-	-
		20K		2	-	-	-	0.68	0.68	0.68	0.68	0.68	-	-	-
	6*R*10	30K		3	-	-	-	1.58	1.58	1.58	1.26	0.68	0.68	0.68	0.68
SCS14A A351-CF8M	6*R*8	10K		1	0.37	0.37	0.68	0.68	0.68	0.68	0.63	-	-	-	-
		20K		2	0.37	0.37	0.68	0.68	0.68	0.68	0.63	0.55	-	-	-
	6*R*10	30K		3	1.03	1.03	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	



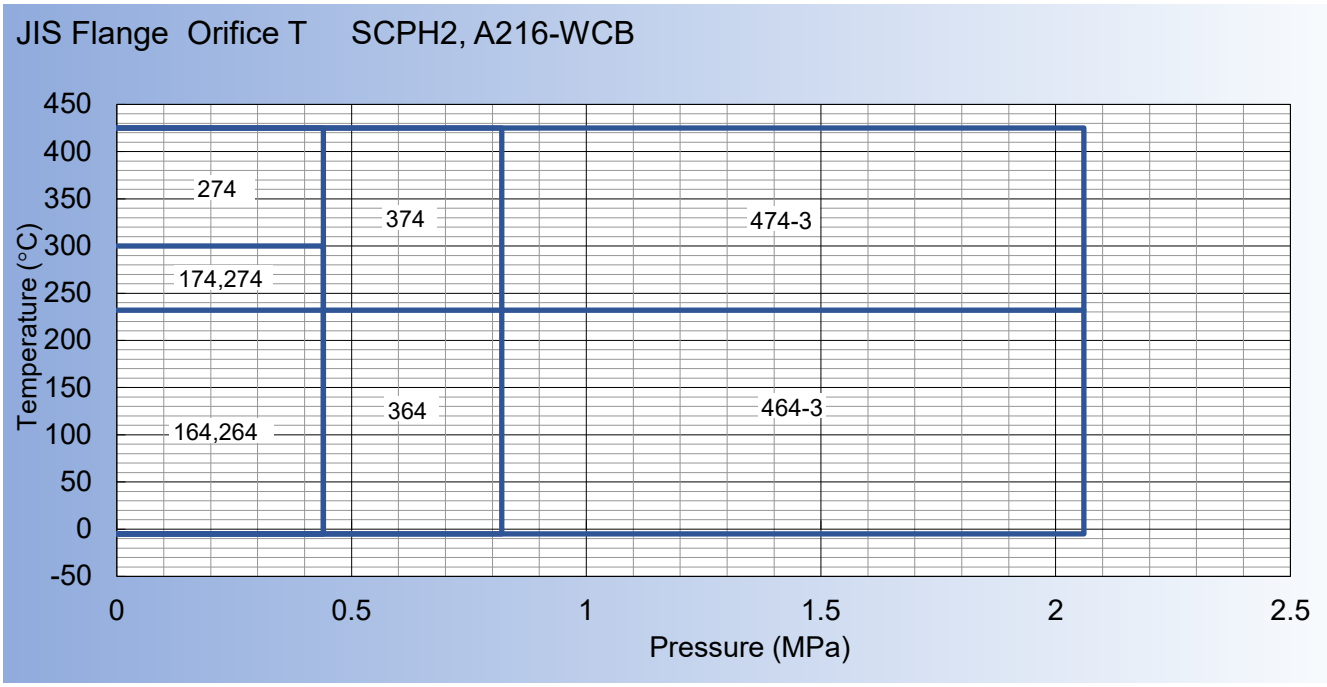




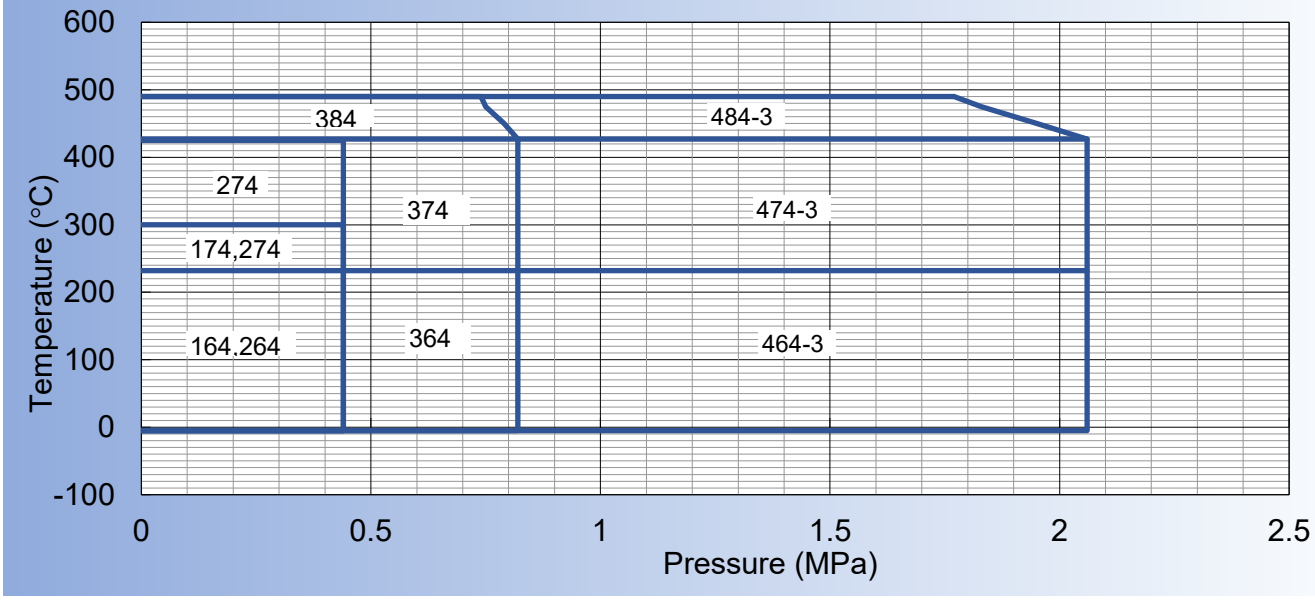
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

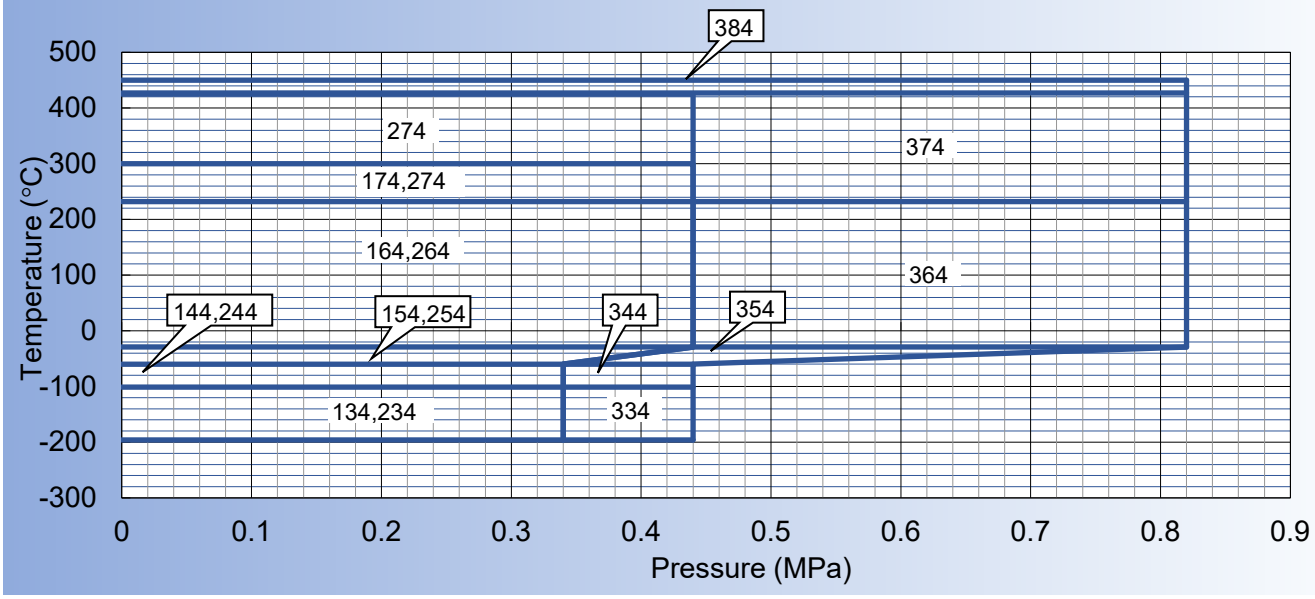
Pressure-temperature Rating JIS B 2220 Flange Orifice T																
Material Body Bonnet	Size	Flange pressure class		Maximum pressure limit MPa												
				Temperature °C	-196	-60	-29	-5	38	232	300	425	427	450	490
		Inlet	Outlet	*1 \ *2	2, 3, 4	5		6		7				8	
SCPH2 A216-WCB	8*T*10	10K	10K	1	-	-	-	0.44	0.44	0.44	0.44	-	-	-	-
		20K		2	-	-	-	0.44	0.44	0.44	0.44	0.44	-	-	-
		30K		3	-	-	-	0.82	0.82	0.82	0.82	0.82	-	-	-
				4	-	-	-	2.06	2.06	2.06	2.06	2.06	-	-	-
SCPH21 A217-WC6		10K		1	-	-	-	0.44	0.44	0.44	0.44	-	-	-	-
		20K		2	-	-	-	0.44	0.44	0.44	0.44	0.44	-	-	-
		30K		3	-	-	-	0.82	0.82	0.82	0.82	0.82	0.82	0.79	0.74
				4	-	-	-	2.06	2.06	2.06	2.06	2.06	2.06	1.95	1.77
SCS14A A351-CF8M		10K		1	0.34	0.34	0.44	0.44	0.44	0.44	0.44	-	-	-	-
		20K		2	0.34	0.34	0.44	0.44	0.44	0.44	0.44	0.44	-	-	-
		30K		3	0.44	0.44	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	-



JIS Flange Orifice T SCPH21, A217-WC6



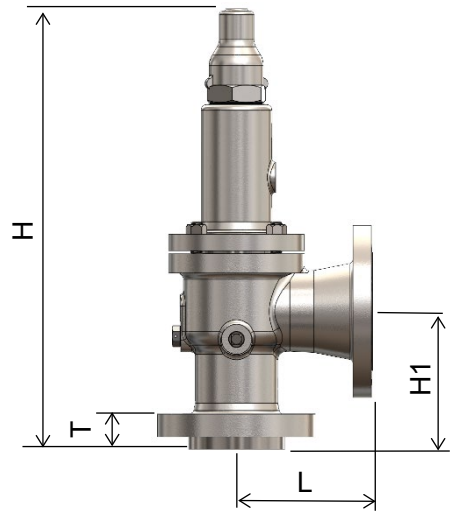
JIS Flange Orifice T SCS14A, A351-CF8M



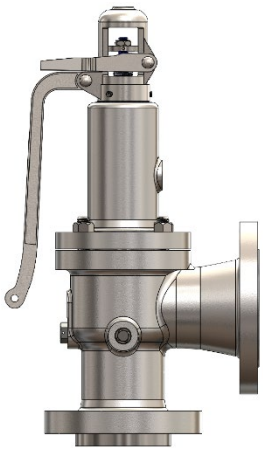
*1 Indicates the pressure class code. *2 Indicates the temperature code.

*3 The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Dimensions and Weight



Cap code (A)



Cap code (C)

Cap code (D)

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

Size	Pressure class code	Flange class		Center-to-face dimension		Inlet flange dimension T	Overall length H			Approximate weight		
		Inlet	Outlet	H1	L		Cap code			Cap code		
							(A)	(C)	(D)	(A)	(C)	(D)
3/4*D*1	1	150	150	92	96	30	320	315	365	9	10	10
	2	300										
	3	300										
1*D*2	1	150	150	105	114	32	335	330	375	11	12	13
	2	300										
	3	300										
	4	600					345	345	390	13	14	15
1 1/2*D*2	5	900	300		140	50	425	430	475	20	21	22
	6	1500										
1 1/2*D*3	7	2500		140	178	63	530	525	575	23	25	26
1*E*2	1	150	150	105	114	32	335	330	375	11	12	13
	2	300								12	13	14
	3	300										
	4	600					345	345	390	14	15	16
1 1/2*E*2	5	900	300		140	50	425	430	475	20	21	22
	6	1500										
1 1/2*E*3	7	2500		140	178	63	530	525	575	23	25	26
1 1/2*F*2	1	150	150	124	121	39	350	350	395	15	16	17
	2	300										
	3	300			152	40						
	4	600				41	365	360	410	17	18	19
1 1/2*F*3	5	900	300		165	50	445	450	495	27	29	30
	6	1500										
	7	2500		140	178	63	530	525	575	35	37	39

ASME, JPI flange Dimensions and Weight												Units: mm, kg
Size	Pressure class code	Flange class		Center-to-face dimension		Inlet flange dimension T	Overall length H			Approximate weight		
							Cap code			Cap code		
		Inlet	Outlet	H1	L		(A)	(C)	(D)	(A)	(C)	(D)
1 1/2*G*3	1	150	150	124	121	39	375	375	420	17	18	19
	2	300										
	3	300			152	40	405	400	450	19	20	21
	4	600				41				21	23	24
	5	900	300		165	50	455	455	500	29	31	32
2*G*3	6	1500		156	171	57	555	550	600	37	37	41
	7	2500				69				42	45	47
1 1/2*H*3	1	150	150	130	124	39	425	420	465	17	18	19
	2	300								20	21	22
2*H*3	3 *1	300				41	460	460	505	22	24	25
	4 *1	600		154	162	44	485	485	530	25	27	28
	5	900				57	550	545	595	42	45	47
	6	1500	300							45	48	50
2*H*3	3 *2	300	150	130	124	44	460	460	505	22	24	25
	4 *2	600										
2*J*3	1	150	150	137	124	41	475	475	520	23	25	26
	2	300								24	26	27
3*J*4	3 *1	300		184	181	47	590	585	635	44	47	49
	4 *1	600				50				50	53	55
	5 *1	900				57	630	625	670	59	62	65
	6	1500	300			66				77	81	85
3*J*4	3 *2	300	150	184	181	50	590	585	635	45	48	50
	4 *2	600										
	5 *2	900				60	630	625	670	60	63	66
3*K*4	1	150	150	156	162	47	570	565	615	41	44	46
	2	300								43	46	48
	3	300					605	600	650	47	50	52
	4	600		184	181	50	635	630	680	57	60	63
3*K*6	5	900		198	216	57	690	685	735	80	84	88
	6	1500	300	197		66	690	685	735	95	100	105
3*K*4	3	300	150	156	162	50	605	600	650	47	50	52
	4	600										
3*K*6	5	900		184	181	57	635	630	680	70	74	77
3*L*4	1	150	150	156	165	47	620	615	665	52	55	58
	2	300								54	57	60
4*L*6	3	300		179	181	50	685	680	730	72	76	80
	4 *1	600			203	56.5				77	81	85
	5	900		197	222	63	820	815	885	108	114	119
	6	1500				72				117	123	129
4*L*6	4 *2	600	150	181	203	57	685	680	730	77	81	85

*1 Indicates dimensions for temperature classes 2 to 7.

*2 Indicates dimensions for temperature classes 8 and 9.

ASME, JPI flange Dimensions and Weight													Units: mm, kg
Size	Pressure class code	Flange class		Center-to-face dimension		Inlet flange dimension T	Overall length H			Approximate weight			
							Cap code			Cap code			
		Inlet	Outlet	H1	L		(A)	(C)	(D)	(A)	(C)	(D)	
4*M*6	1	150	150	178	184	50	645	640	685	58	61	64	
	2	300								72	76	80	
	3	300					760	755	820	90	95	99	
	4	600			203	56.5	820	815	880	111	117	123	
	5	900		197	222	63	835	830	900	121	128	134	
4*N*6	1	150	150	197	210	50	710	705	755	76	80	84	
	2	300								81	86	90	
	3	300					840	835	905	105	111	116	
	4	600			222	56.5				113	119	125	
	5	900				63				125	132	138	
4*P*6	1	150	150	181	229	50	850	845	915	83	88	92	
	2	300								105	111	116	
	3	300		225	254		945	940	1010	140	147	154	
	4	600				56.5				142	150	157	
	5	900				63				162	171	179	
6*Q*8	1	150	150	240	241	44	990	985	1050	160	168	176	
	2	300				55				170	179	187	
	3	300				56	1075	1070	1155	196	206	216	
	4	600				66				253	266	279	
6*R*8	1	150	150	240	241	44	990	985	1055	220	231	242	
	2	300				56				230	242	253	
6*R*10	3	300			267		1080	1075	1155	250	263	275	
	4	600				66	1095	1090	1175	260	273	286	
8*T*10	1	150	150	276	279	48	1085	1080	1165	245	258	270	
	2	300				60				300	315	330	
	3	300					1140	1135	1220				
	3 *3	300					1270	1265	1350	320	336	352	

*3 Indicates a case where the inlet flange class (different from the pressure class) is -4.

JIS flange Dimensions and Weight Units: mm, kg

Size	Pressure class code	Flange class		Center-to-face dimension		Inlet flange dimension T	Overall length H			Approximate weight		
		Inlet	Outlet	H1	L		Cap code			Cap code		
							(A)	(C)	(D)	(A)	(C)	(D)
3/4*D*1	1	10K	10K	92	96	30	320	315	365	9	10	10
	2	20K										
	3	30K										
1*D*2	1	10K	10K	105	114	32	335	330	375	11	12	13
	2	20K										
	3	30K										
1*E*2	1	10K	10K	105	114	32	335	330	375	11	12	13
	2	20K								12	13	14
	3	30K										
1 1/2*F*2	1	10K	10K	124	121	39	350	345	395	15	16	17
	2	20K										
	3	30K			152	40						
1 1/2*G*3	1	10K	10K	124	121	39	375	375	420	17	18	19
	2	20K										
	3	30K			152	40	405	400	450	19	20	21
1 1/2*H*3	1	10K	10K	130	124	39	425	420	465	17	18	19
	2	20K								20	21	22
2*H*3	3 *1	30K				41	460	460	505	22	24	25
2*H*3	3 *2	30K				44						
2*J*3	1	10K	10K	137	124	41	475	475	520	23	25	26
	2	20K								24	26	27
3*J*4	3 *1	30K		184	181	47	590	585	635	44	47	49
3*J*4	3 *2	30K				50				45	48	50

*1 Indicates dimensions for temperature classes 2 to 7.

*2 Indicates dimensions for temperature classes 8 and 9.

JIS flange Dimensions and Weight Units: mm, kg

Size	Pressure class code	Flange class		Center-to-face dimension		Inlet flange dimension T	Overall length H			Approximate weight		
							Cap code			Cap code		
		Inlet	Outlet	H1	L		(A)	(C)	(D)	(A)	(C)	(D)
3*K*4	1	10K	10K	156	162	47	570	565	615	41	44	46
	2	20K								43	46	48
	3 *1	30K					605	600	650	47	50	52
3*K*4	3 *2	30K				50						
3*L*4	1	10K	10K	156	165	47	620	615	665	52	55	58
	2	20K								54	57	60
4*L*6	3	30K		179	181	50	685	680	730	72	76	80
4*M*6	1	10K	10K	178	184	50	645	640	685	58	61	64
	2	20K								72	76	80
	3	30K					760	755	820	90	95	99
4*N*6	1	10K	10K	197	210	50	710	705	755	76	80	84
	2	20K								81	86	90
	3	30K					840	835	905	105	111	116
4*P*6	1	10K	10K	181	229	50	850	845	915	83	88	92
	2	20K								105	111	116
	3	30K		225	254		945	940	1010	140	147	154
6*Q*8	1	10K	10K	240	241	44	990	985	1050	160	168	176
	2	20K				55				170	179	187
	3	30K				56	1075	1070	1155	196	206	216
6*R*8	1	10K	10K	240	241	44	990	985	1055	220	231	242
	2	20K				56				230	242	253
6*R*10	3	30K			267		1080	1075	1155	250	263	275
8*T*10	1	10K	10K	276	279	48	1085	1080	1165	245	267	280
	2	20K								300	315	330
	3	30K				60	1140	1135	1220			
	3 *3						1270	1265	1350	320	336	352

*1 Indicates dimensions for temperature classes 2 to 7.

*2 Indicates dimensions for temperature classes 8 and 9.

*3 Indicates a case where the inlet flange class (different from the pressure class) is -4.

Large-diameter Structure

As a manufacturer's standard, we manufacture pressure relief valves with inlet sizes of NPS 10 (DN 250) or larger, exceeding the API 526 Flanged Steel Pressure-relief Valves. These pressure relief valves were developed for low-pressure, large-capacity water production plants.

- Semi-nozzle
- Bolted bonnet
- Cast integral body
- Lower adjusting ring

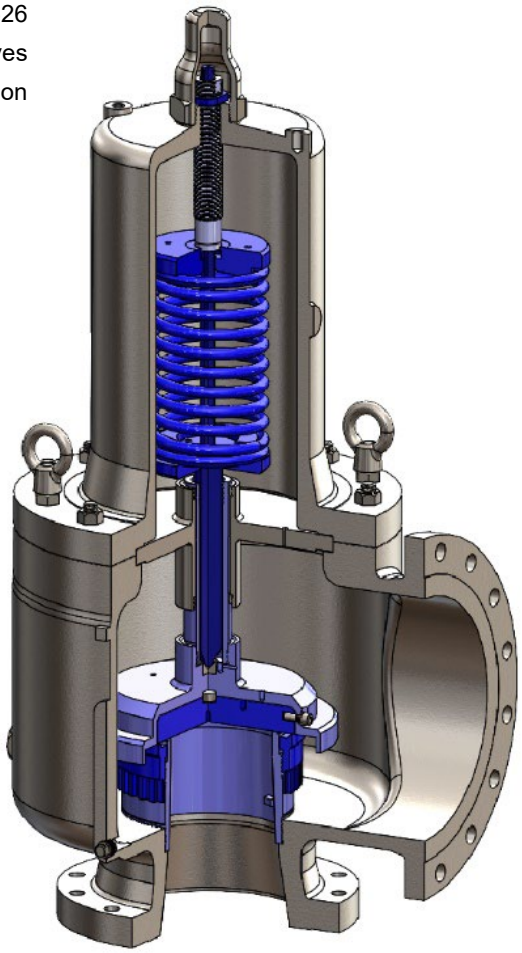


Figure 13. REC (NPS 10 or larger)
Conventional type

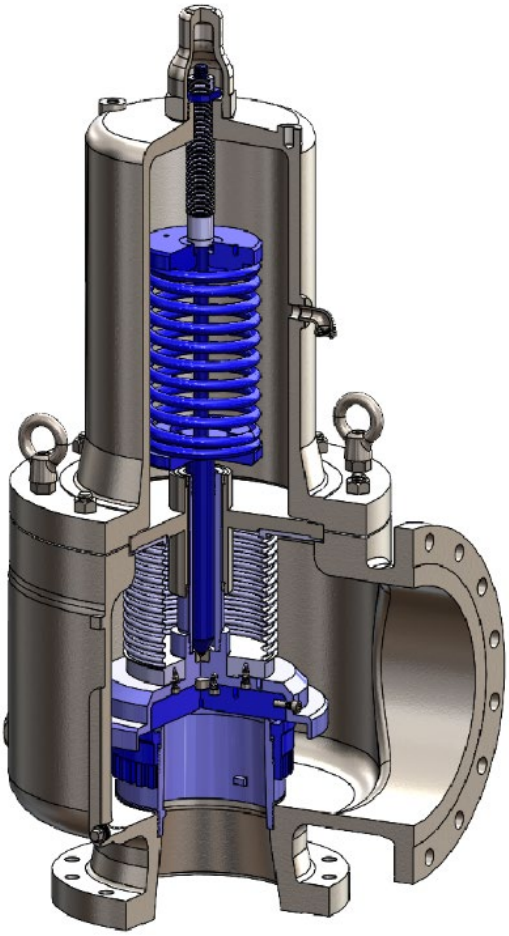
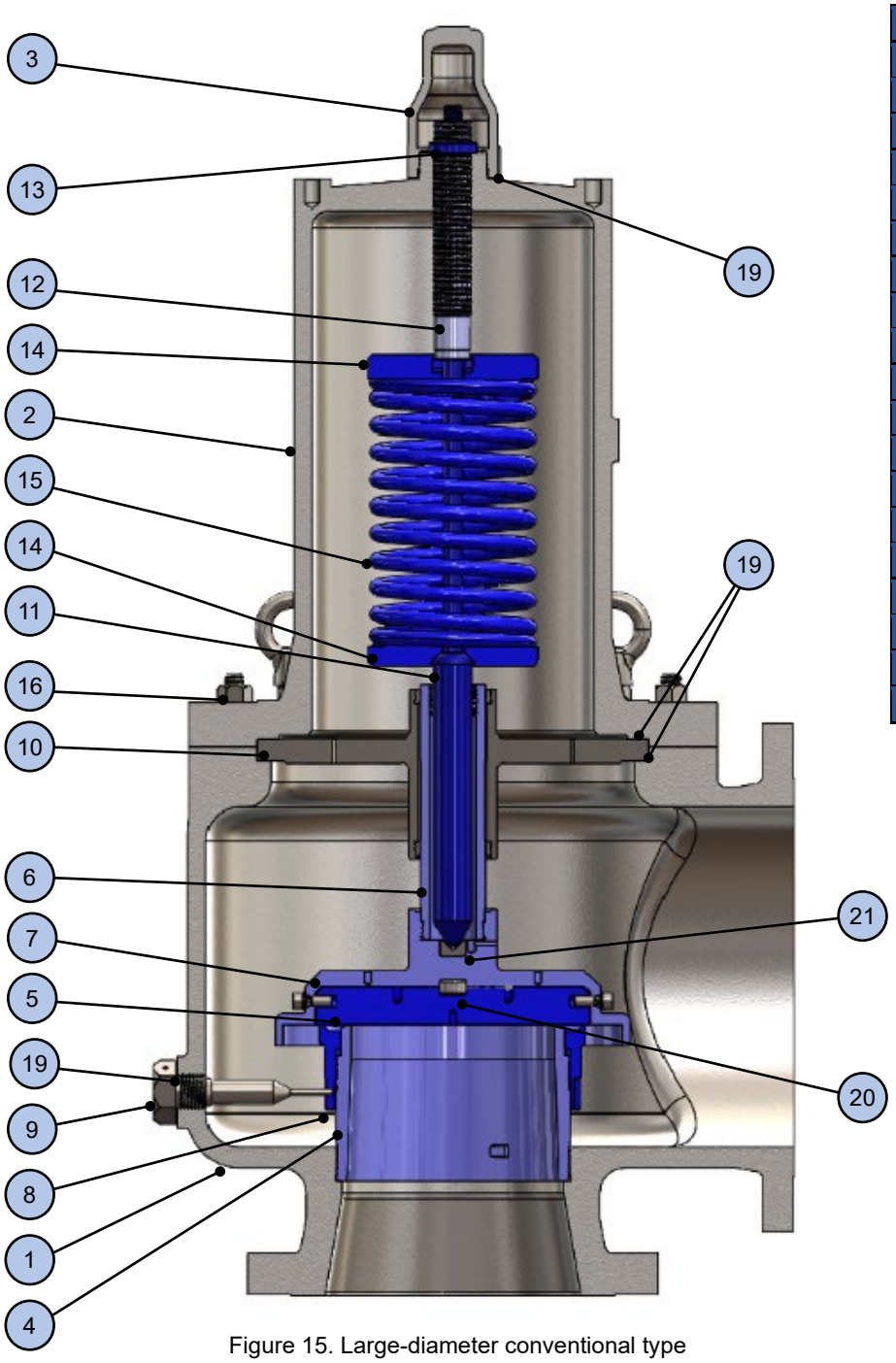


Figure 14. REB (NPS 10 or larger)
Bellows type

Large-diameter Cross-sectional View

Conventional type cross-sectional view



No.	Part name
1	Body
2	Bonnet
3	Cap
4	Nozzle
5	Disc
6	Disc holder
7	Holder ring
8	Adjusting ring
9	Adjusting ring lock bolt
10	Guide
11	Spindle
12	Adjusting screw
13	Adjusting screw lock nut
14	Spring retainer
15	Spring
16	Stud bolt and nut
19	Gasket
20	Disc bush
21	Spindle bush

Figure 15. Large-diameter conventional type

Bellows type cross-sectional view

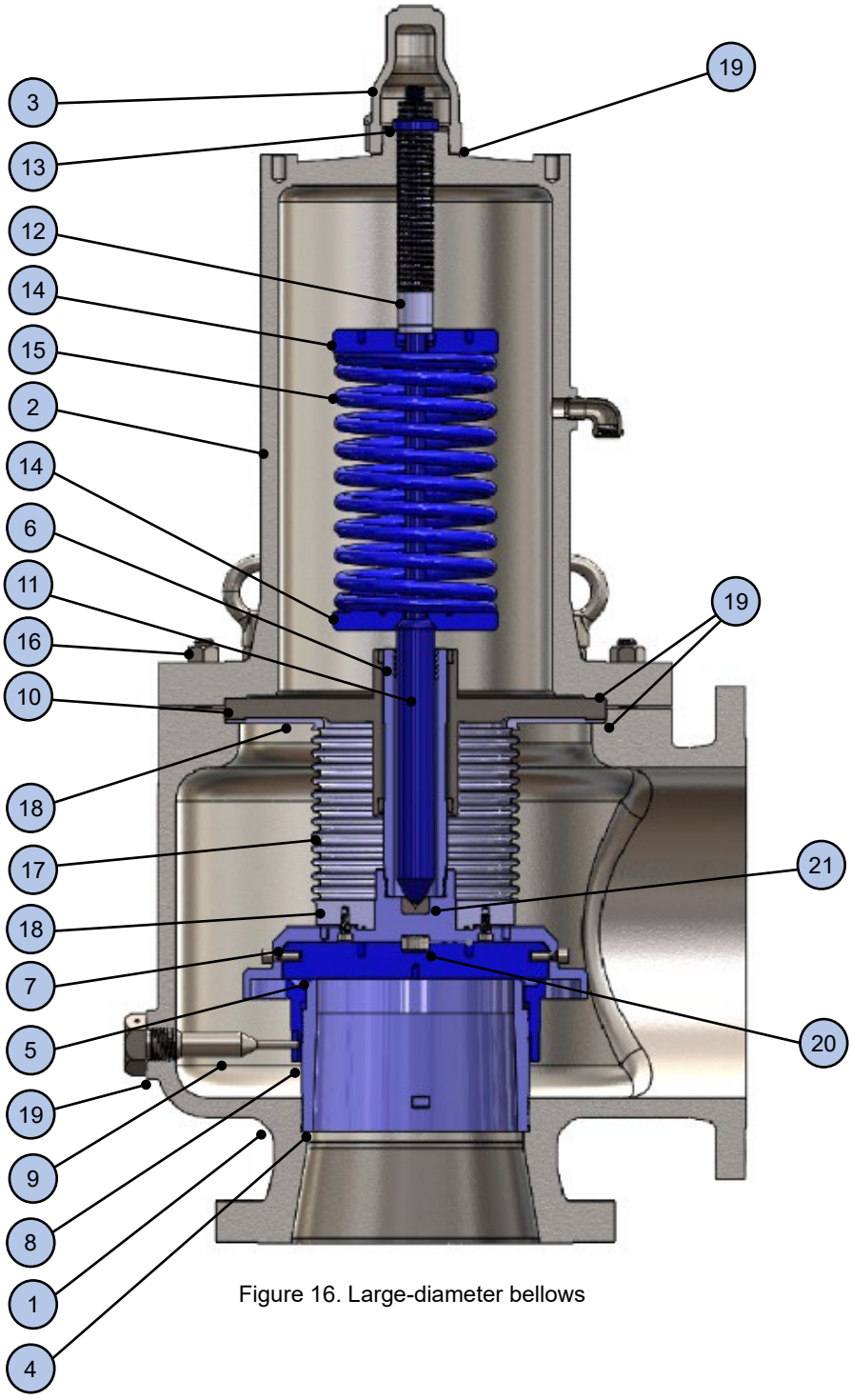


Figure 16. Large-diameter bellows

No.	Part name
1	Body
2	Bonnet
3	Cap
4	Nozzle
5	Disc
6	Disc holder
7	Holder ring
8	Adjusting ring
9	Adjusting ring lock bolt
10	Guide
11	Spindle
12	Adjusting screw
13	Adjusting screw lock nut
14	Spring retainer
15	Spring
16	Stud bolt and nut
17	Bellows
18	Bellows fitting
19	Gasket
20	Disc bush
21	Spindle bush

Pressure-temperature Rating for Large Diameters

Standard material by temperature

No.	Application temperature range °C	-196 – -29	-29 – 427
	Material code	S	Blank
1	Body	A351-CF8 or SCS13A	A216-WCB or SCPH2
2	Bonnet	A351-CF8 or SCS13A	A216-WCB or SCPH2
3	Cap	SCS13A	SCPH2 or SA105M
4	Nozzle	SCS13A	
5	Disc	SUS304 / SUS630(T ≤ 320°C), B637-N07750(T > 320°C)	
6	Disc holder	SUS304	SUS403
7	Holder ring	SCS13A	SCS1
8	Adjusting ring	SCS13A	
9	Adjusting ring lock bolt	SUS304	SUS304
10	Guide	SUS304	SUS304, SA105M
11	Spindle	SUS304	SUS403
12	Adjusting screw	SUS304	SUS403
13	Adjusting screw lock nut	SUS304	SS400
14	Spring retainer	SUS304	S25C
15	Spring	SUS304	Spring Steel
16	Stud bolt and nut	SUS304 / SUS304	SNB7 / S45C
17	Bellows*	SUS316L	
18	Bellows fitting*	SUS316L	
19	Gasket	V7010(-50 ≤ T ≤ 100°C) V7020-(196 ≤ T < -50°C, 100 < T ≤ 200°C)	V6502(T ≤ 300°C) / V560(T > 300°C)

* These parts are not included in REC (conventional type).

* The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

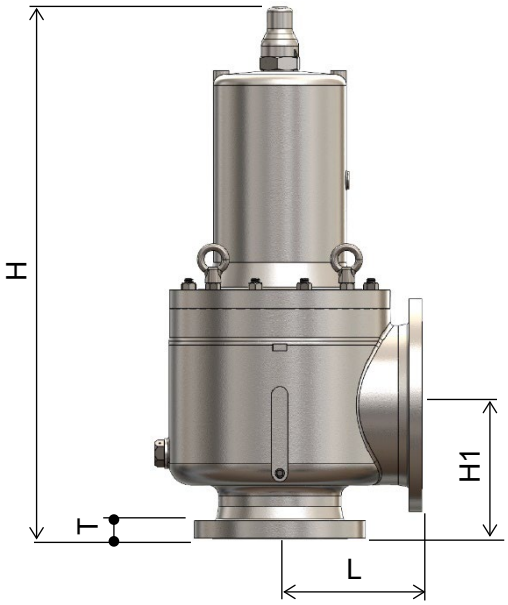
Standard material by material code

No.	Material code		S1	S2	S3	S4
1	Body		A351-CF8M or SCS14A	A351-CF3 or SCS19A	A351-CF3M or SCS16A	A351-CF8C or SCS21
2	Bonnet		A351-CF8M or SCS14A	A351-CF3 or SCS19A	A351-CF3M or SCS16A	A351-CF8C or SCS21
3	Cap		SCS14A	SCS19A	SCS16A	SCS14A
4	Nozzle		SUS(F)316 or SCS14A	SUS(F)304L or SCS19A	SUS(F)316L or SCS16A	SUS(F)321
5	Disc		SUS316	SUS304L	SUS316L	SUS(F)321
6	Disc holder		SUS316	SUS304L	SUS316L	SUS316
7	Adjusting ring		SUS316 or SCS14A	SUS304L or SCS19A	SUS316L or SCS16A	SUS316
8	Adjusting ring lock bolt		SUS316	SUS304L	SUS316L	SUS316
9	Guide	Sleeve	SUS316	SUS304L	SUS316L	SUS316
		Flange	SUS316	SUS304L	SUS316L	SUS316
10	Spindle		SUS316	SUS304L	SUS316L	SUS316
11	Adjusting screw		SUS316	SUS304L	SUS316L	SUS316
12	Adjusting screw lock nut		SUS316	SUS304L	SUS316L	SUS316
13	Spring retainer		SUS316	SUS304L	SUS316L	SUS316
14	Spring		SUS316	SUS304	SUS316	SUS316
15	Stud bolt and nut		SUS316	SUS304	SUS316	SUS316
16	Bellows		SUS316L			
17	Bellows fitting		SUS316L			
18	Gasket		V7010(-50 ≤ T ≤ 100°C) V7020(-196 ≤ T < -50°C, 100 < T ≤ 200°C)			

Pressure-temperature Rating, Dimensions and Weight for Large Diameters

Pressure-temperature rating, dimensions and weight – Large diameters									Units: mm, kg
Size	Throat area mm^2	Flange class		Maximum pressure limit MPa	Center-to-face dimension		Inlet flange dimension	Overall length*	Approximate weight*
		Inlet	Outlet	-196°C ≤ T ≤ 232°C	H1	L	T	H	
10*V*14	30946	150	150	0.703	325	400	48	1700	950
12*W*16	44488			0.703	375	400	51	1750	1250
14*Y*18	60698			0.703	400	500	54	1900	1350
16*Z*18	66966			0.703	425	500	58	1900	1450
16*Z2*18	79672			0.703	425	530	58	2000	1650
16*Z2*20				0.703	450	530	58	2100	1800
18*A*24	100090			0.703	500	630	61	2280	2100
20*B*24	123780			0.6	500	630	64	2450	2400

* Indicates the dimensions and weight of cap code (A).



For Feedwater Heaters (Option Code: –EC)

The type for feedwater heaters was developed for high-temperature, high-pressure saturated water. Particularly in the case of pressure relief valves for feedwater heaters, water hammering exceeding the set pressure often occurs when the boiler is started, which frequently leads to seat leakage after the boiler is started. To reduce the occurrence of this problem, a structure providing a higher nozzle airtightness performance than the standard type is adopted. The disc is of the feather disc type and has a structure in which the disc is directly pushed by the spindle.

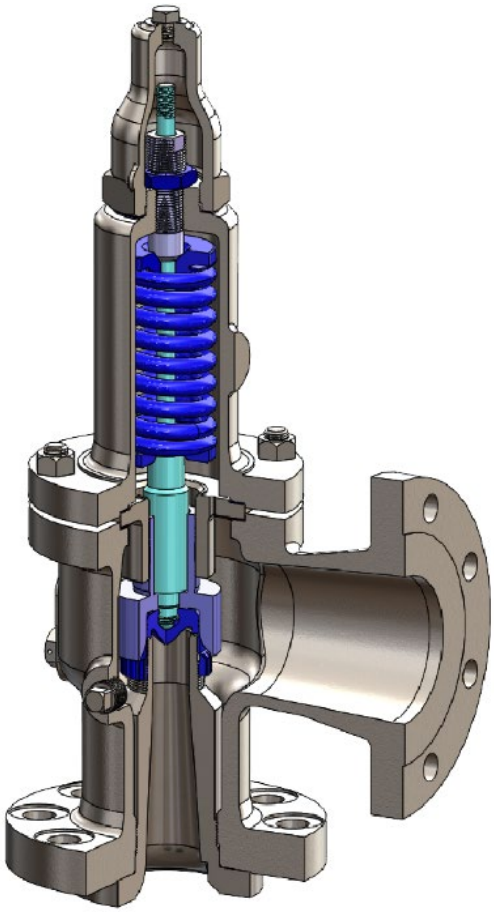


Figure 17. Structure for feedwater heater

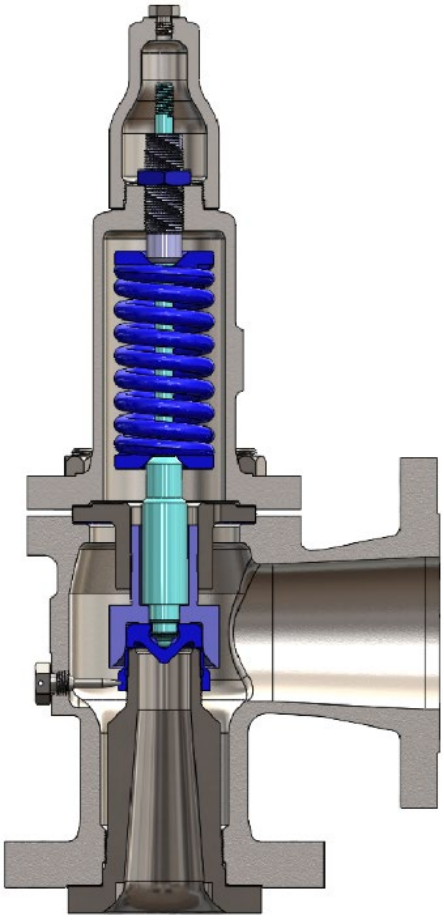


Figure 18. Cross-sectional view for feedwater heater

For Pump Relief (Type Code: RE( )LP)

The pump relief type mainly adopts a structure that prevents chattering and enables full lift at the specified pressure. By pressing, against the guide, the O-ring installed on the disc and guide using the pressure on the valve primary side, an appropriate sliding resistance is generated, preventing chattering as well as enabling full lift at the specified pressure.
It complies with the accumulation test specified in API 614 / ISO 10438-3 Lubrication, Shaft-sealing and Oil-control Systems and Auxiliaries.
The Pressure-temperature rating, dimensions, and weight are the same as the standard type.
The structure is the same as the standard type except for the main section.

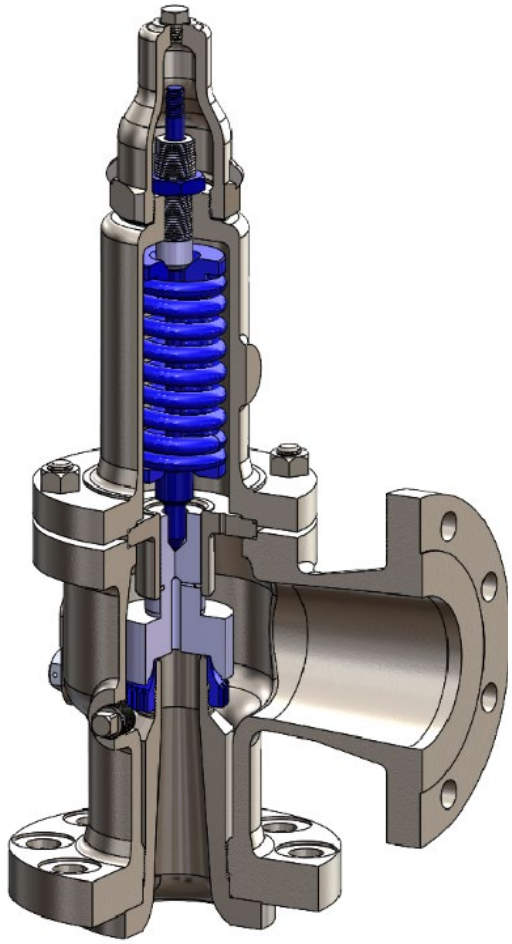


Figure 19. Structure for pump relief

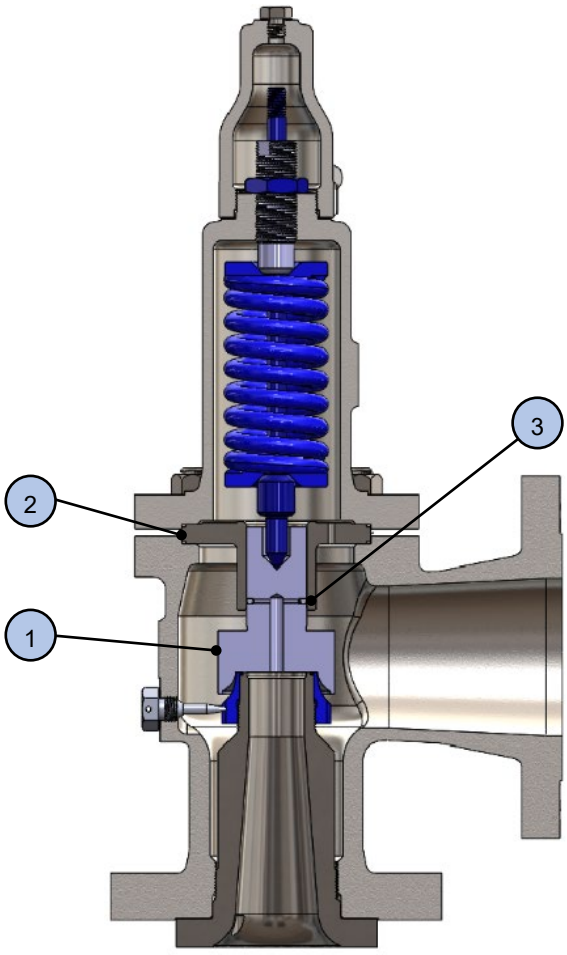


Figure 20. Cross-sectional view for pump relief

No.	Part name	Material
1	Disc	SUS304
2	Guide	SUS304
3	O-ring	ELASTOMER

Jacket Type (Type Code: RE()J)

The jacket type is equipped with a steam jacket for heating on the pressure relief valve body. Since the fluid inside the pressure relief valve nozzle does not flow during operation, the fluid temperature becomes lower than the process operating temperature. The steam jacket is provided in order to prevent the fluid from becoming more viscous or solidifying due to this temperature drop.

The standard connection for steam supply and exhaust is an ASME Class 150 flange. As an option, it is also possible to accommodate an injector that sprays steam directly onto the seat section.

Except for the jacket section, the main section structure, cap structure, and Pressure-temperature rating are the same as those of the RE (standard). Two jacket types are available: the semi-jacket and full jacket.

In the case of the semi-jacket design, no jacket is provided on the inlet/outlet flange neck section and the inlet/outlet size is the same as the standard type. However, the Center-to-face dimension is larger than that of the standard type.

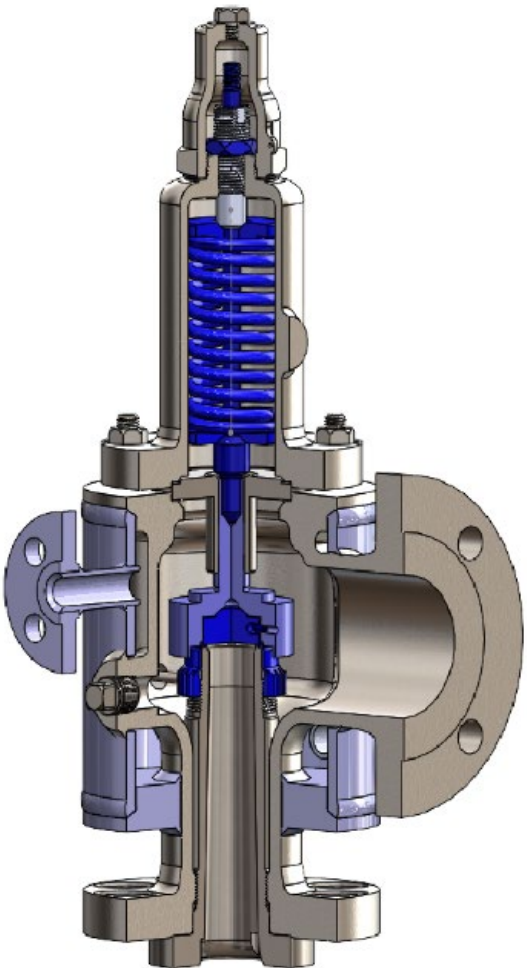


Figure 21. Semi-jacket type

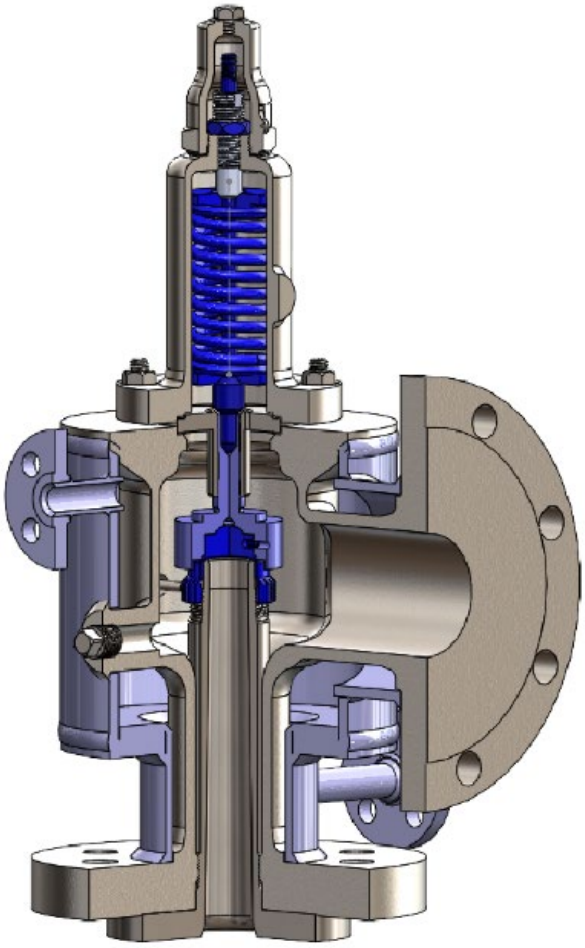


Figure 22. Full jacket type

In the case of the full jacket design, the jacket is provided up to the inlet/outlet flange neck section, and the inlet/outlet size and the Center-to-face dimension are larger than those of the standard type. The inlet and outlet diameters of the pressure relief valve inlet/outlet flange are smaller.

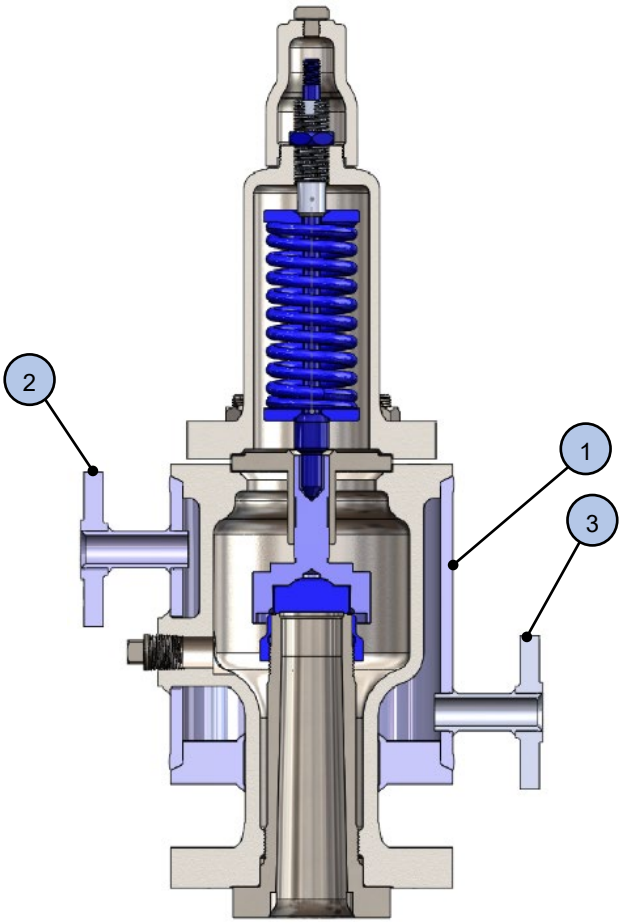


Figure 23. Semi-jacket type

No.	Part name	Material
1	Jacket	STPG370
2	Steam inlet flange	A105, STPG370
3	Steam outlet flange	

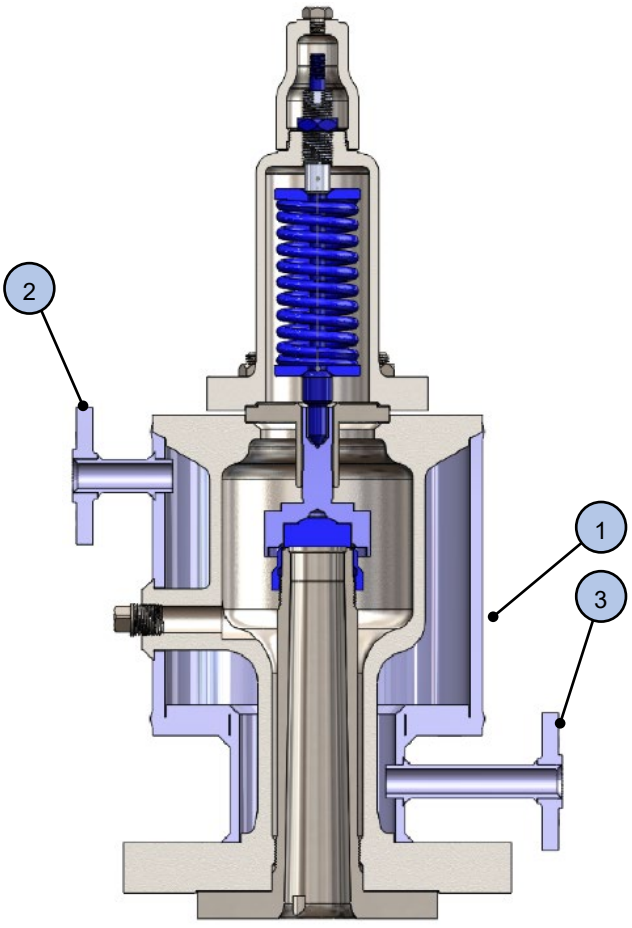


Figure 24. Full jacket type

Except for the jacket section, the parts and materials are the same as those of the standard type. Contact us for details on the Center-to-face dimension, weight, etc.

Water Seal Type (Option Code: –G)

The water seal type is used in steam services at turbine outlets etc. when negative pressure may be caused and it is required to prevent the atmosphere on the pressure relief valve outlet side from flowing back to the pressure relief valve inlet side. The structure allows a water seal in the outlet seat section. Two water seal types are available: the type with an elbow installed on the pressure relief valve outlet side, and the type with a weir provided at the pressure relief valve outlet. The elbow type is mainly used for small diameters; the weir type for large diameters. Except for the installation of an elbow or a weir, the structure, materials, and Pressure-temperature rating are the same as those of the RE (standard) or RE large-diameter type. Water supply and drainage connections are provided as standard specifications.

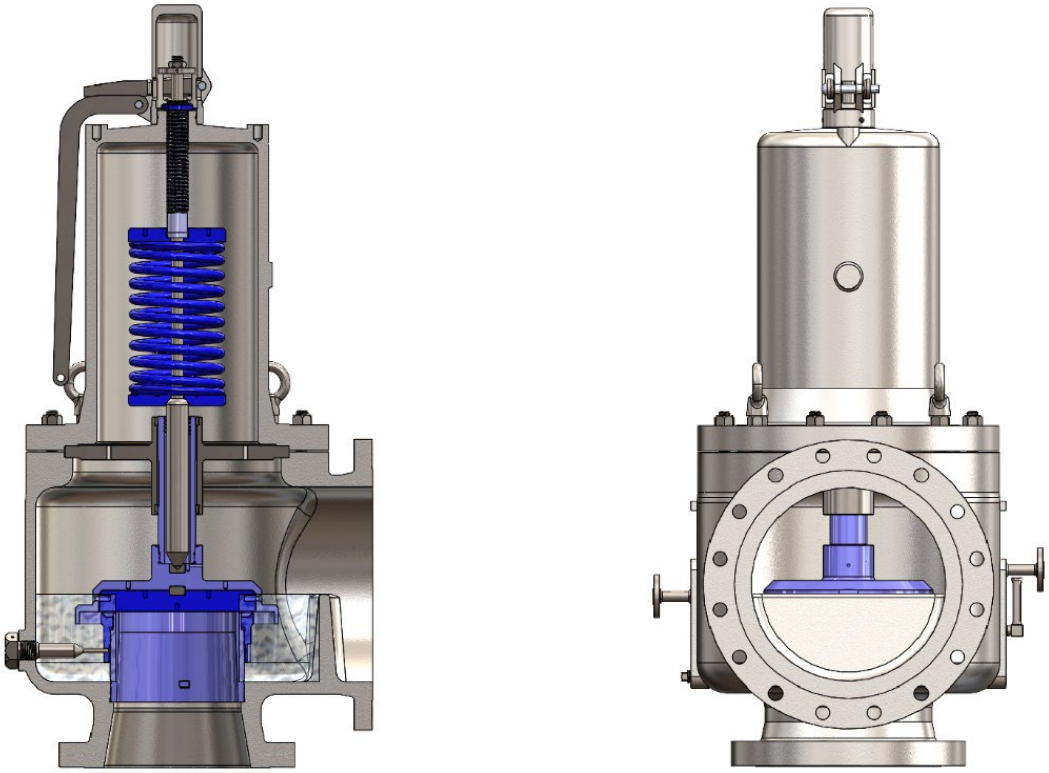


Figure 25. Weir type

Figure 26. Small-diameter elbow water seal type

Weight-loaded Type (Type Code: REDW)

The weight-loaded type is used for low pressures which cannot be accommodated by spring loading. It is adopted when the set pressure is lower than approx. 0.03 MPa (30 kPa). The set pressure is determined by the self-weight of the disc and the seat diameter. The seat surface is not buildup-hardened.

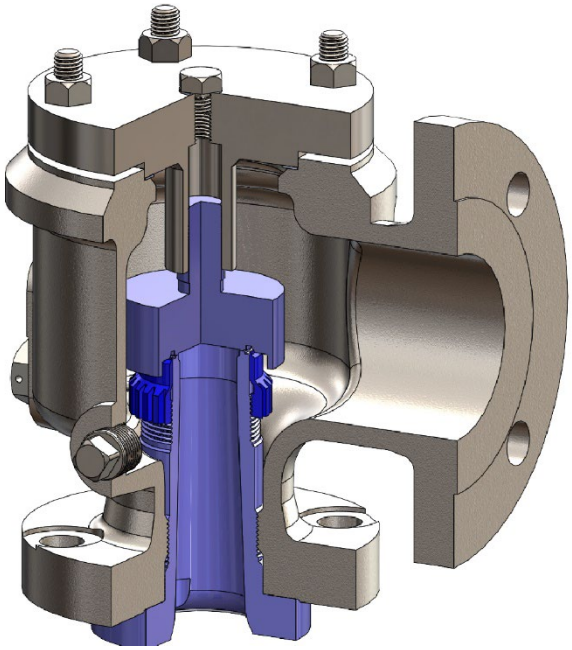


Figure 27. Structural drawing of the weight type

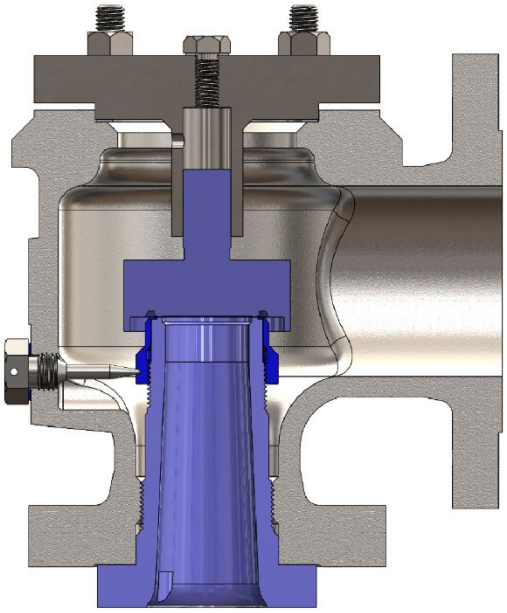


Figure 28. Cross-sectional view of the weight type

High-Backpressure Type (Option Code: –HP)

This pressure relief valve for high backpressure is used when the API 526 outlet backpressure standard is significantly exceeded. The body, bonnet, and cap are carved out of forged material or bar material. To accommodate high backpressure, a self-sealing-type seal, which is an O-ring or metallic hollow O-ring, is adopted. It is generally of the conventional type, which is based on the differential pressure between the inlet and outlet sides.

Figure 29. External view of high-backpressure type

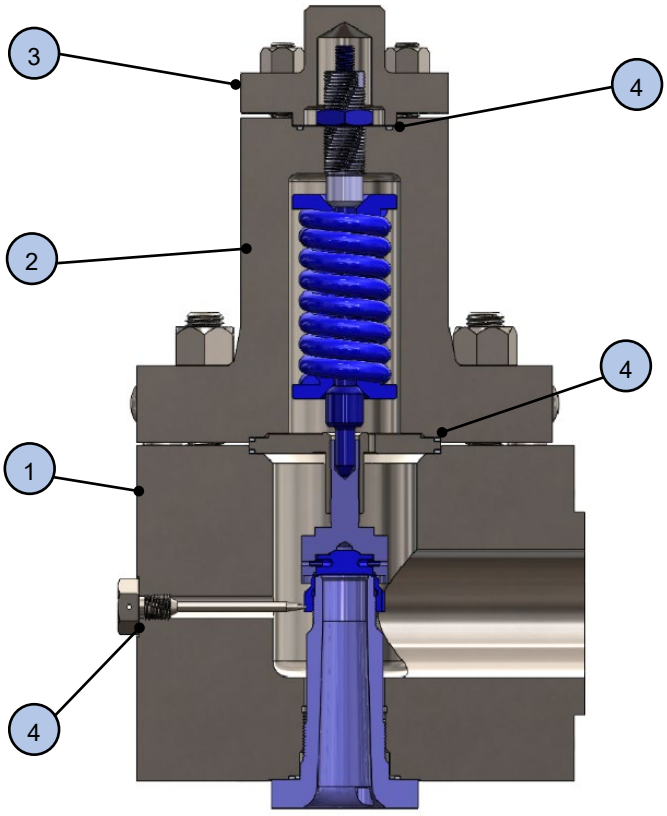


Figure 30. Structural drawing of high-backpressure type

No.	Part name	Material
1	Body	A105
2	Bonnet	A105
3	Cap	A105
4	O-ring	ELASTOMER

High-Temperature Type (Option Code: –HT)

This high-temperature pressure relief valve is suitable for high-temperature services exceeding the API 526 temperature limit (538°C). To cope with high-temperature services, a yoke is used instead of a bonnet and tungsten alloy steel is adopted as the spring material, curbing the reduction in spring loading due to high temperatures and preventing the discharge pressure from dropping. In addition, it is common to adopt the bellows type in order to prevent the high-temperature gas from discharging to the yoke section during operation and to perform primary heat shielding during operation. The parts that differ from the standard type are shown in the cross-sectional view.

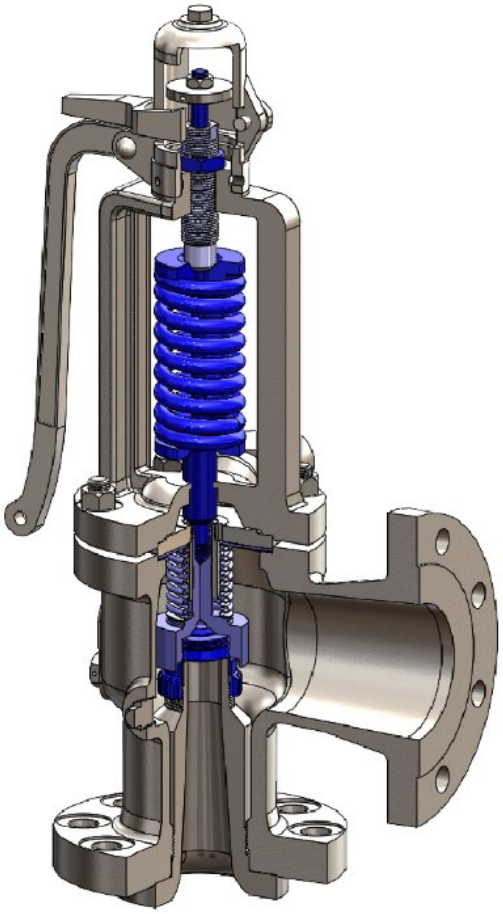


Figure 31. Structural drawing of high-temperature type

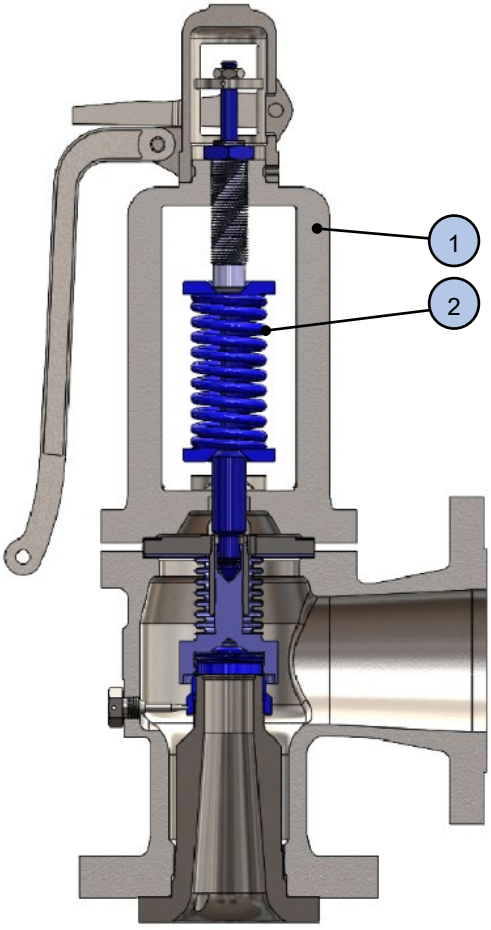


Figure 32. Cross-sectional view of high-temperature type

No.	Part name	Material
1	Yoke	SCS13A
2	Spring	TUNGSTEN ALLOY

Balance Piston Type (Option Code: –BP)

The bellows is made of highly corrosion-resistant material such as SUS316L and Inconel 625. However, if the bellows is damaged in strongly corrosive services or during long-term operation, the fluid on the secondary side of the pressure relief valve will discharge from the vent elbow of the bonnet section. The balance piston type is designed to minimize this discharge. The balance piston is equipped with seals made of polytetrafluoroethylene resin, graphite, etc. The components of the balance piston section are shown in the structural drawing.

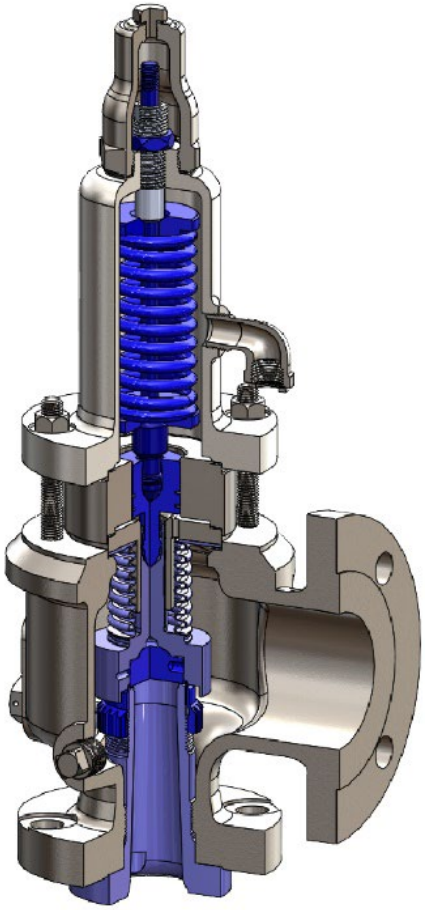


Figure 33. Balance piston type

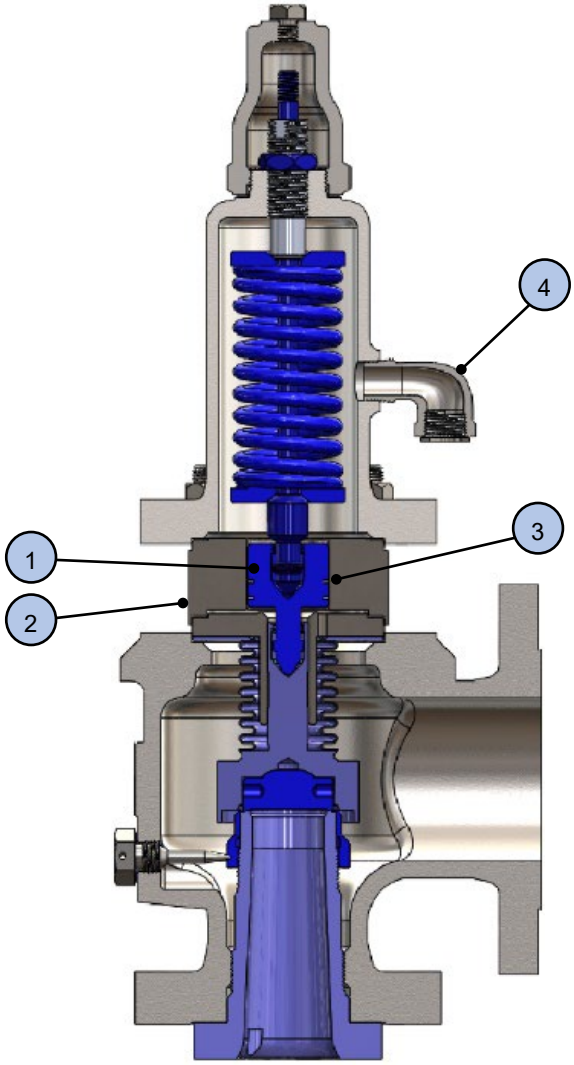


Figure 34. Cross-sectional view of balance piston type

No.	Part name	Material
1	Piston	SUS304
2	Piston guide	SUS34
3	Piston ring	PTFE or GRAPHITE
4	Vent elbow	SCS13

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