FUKUI

RP Series

Contents

Features

The RP series is a pilot-operated Pressure relief valve. The pilot-operated Pressure relief valve offers more advantages than the spring-loaded type Pressure relief valve.

The RP series has API specified sizes from D to T, large-diameter sizes from V to B2 that exceed T, and a dual outlet type with two main valve outlets ranging from 1 to 7. As a feature of the pilot-operated Pressure relief valve, elastomers etc. are used in the main valve and the pilot valve, so it is necessary to consider temperature and corrosion resistance regarding these materials.

- Large size and wide pressure Fange

  Unlike the spring-loaded pressure relief valve, there are no spring manufacturing limitations, so large diameters and high pressures can be accommodated.

Comparison of pressure–temperature rating between pilot-operated and spring-loaded pressure relief valves						
Body material SCPH2, A216-WCB			Maximum pressure limit MPa			
Size	Class		Pilot-operated		Spring-loaded	
	Inlet	Outlet	38°C	260°C	38°C	260°C
3*K*4	1500	300	25.54	20.78	—	—
3*K*6			—	—	15.3	15.14
3*L*4	1500	300	25.02	20.78	—	—
4*L*6		150	—	—	10.34	10.34
		300	25.54	20.78	—	—
4*M*6	900	150	—	—	7.58	7.58
	1500	300	25.54	20.78	—	—
4*N*6	900	150	—	—	6.89	6.89
	1500	300	25.54	20.78	—	—
4*P*6	900	150	—	—	6.89	6.89
	1500	300	25.02	20.78		
		600	25.54	20.78		
6*Q*8	600	150	9.99	8.3	4.13	4.13
		300	10.2	8.3		
6*R*8	600	150	7.03	7.03		
6*R*10			—	—	2.06	2.06
8*T*10	300	150	5.10	4.17	2.06	2.06
	600		6.79	6.79	—	—

- High seat airtightness performance

  Capable of accommodating a high operating pressure exceeding 90% of the set pressure.

- Accommodating a high cumulative backpressure

  Capable of accommodating severe operating conditions because unstable operation due to cumulative backpressure generated during Pressure relief valve actuation is hardly caused.

Certification

RPS, RPSL (outlet 1-direction)

Certification	Range				
	Service	Size	Pressure range		Discharge coefficient
			MPa	psi	
ASME BPVC SECTION VIII Division 1	Gas	D, E, F, G, H, J, K	0.103–68.9	15–10000	0.877
		L	0.103–34.4	15–5000	
		M, N, P	0.103–27.5	15–4000	
	Steam	Q, R	0.103–13.7	15–2000	0.743
		T, V	0.103–10.3	15–1500	
		W, Y, Z, Z1, A, B, B2	0.103–3.44	15–500	

RPS (outlet 2-direction)

Certification	Range				
	Service	Size	Pressure range		Discharge coefficient
			MPa	psi	
ASME BPVC SECTION VIII Division 1	Gas	1	0.103–41.3	15–6000	0.877
		2, 3	0.103–27.5	15–4000	
	Steam	4, 5	0.103–13.7	15–2000	0.743
		6, 7	0.103–10.3	15–1500	

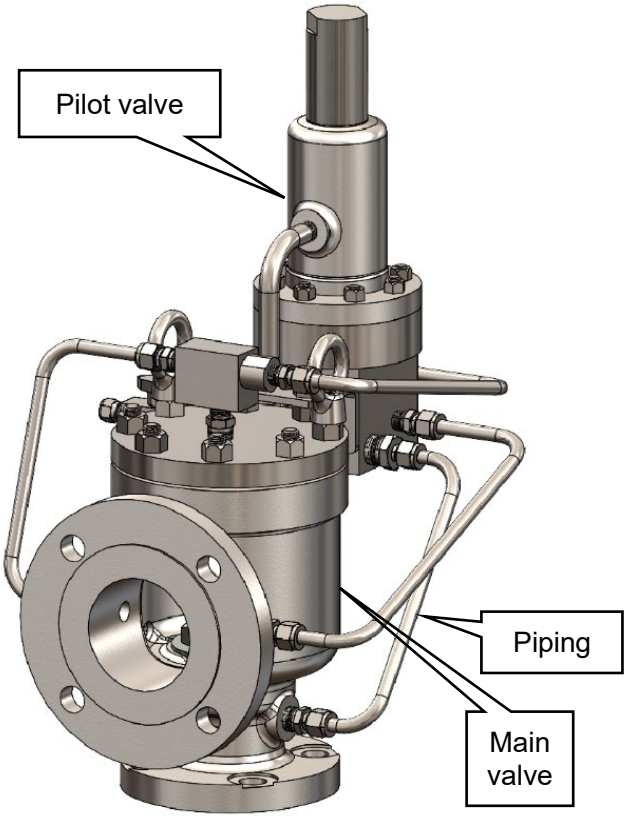
* In addition to the above-mentioned pressure and size, the ASME UV STAMP also specifies minimum requirements for temperature, structure, materials, etc. If all of these requirements are satisfied, the product can be certified as ASME UV STAMP. Therefore, the products may not be certified as ASME UV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

* We have also obtained certifications from CE Mark etc. For more information, contact us.

* For the actual manufacturing range, refer to the pressure–temperature rating. Products exceeding this pressure–temperature rating can also be manufactured.

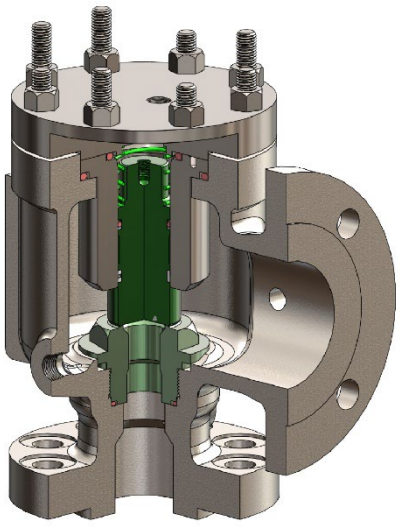
Configuration of Pilot-Operated Pressure relief valve

The pilot-operated Pressure relief valve consists of the main valve, pilot valve, 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.

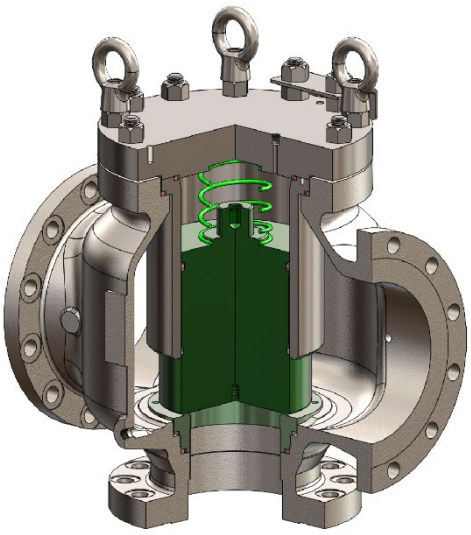


Structure of Main Valve

The main valve outlet is available in two types: the 1-direction type and 2-direction type. The 2-direction type outlet offers the advantages of securing a larger discharge area for the same inlet size and offsetting the reaction force during discharge.



Outlet 1-direction



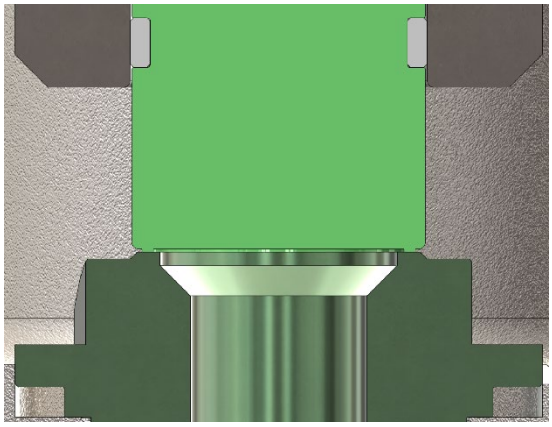
Outlet 2-direction

The main valve structure is of the piston type, adopting seven types of structures depending on the operating pressure, temperature, etc.

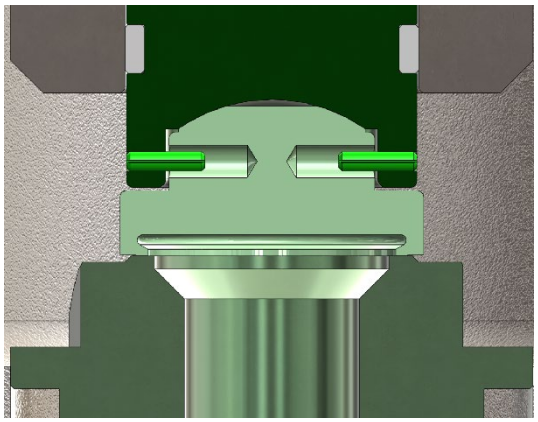
No.	Seat structure		Seal structure	Description
1	Metal	Solid	O-ring	Most standard specification
2			Teflon seal	Mainly used for low temperatures where the O-rings are not suitable.
3		Separate	O-ring	Standard specification for high temperatures. This structure may be selected when highly corrosion-resistant materials are used.
4			Teflon seal	Mainly used for low temperatures where the O-rings are not suitable.
5	O-ring		O-ring	General soft seat specification. Compared to the metal seat, the nozzle airtightness is higher, but the seat durability is lower. The maximum set pressure is limited depending on the type of O-ring.
6	Resin		O-ring	Soft seat mainly used for temperatures and pressures where the O-rings are not suitable.
7			Teflon seal	Mainly used for low temperatures where the O-rings are not suitable.

◆ Seat structure

The metal seat is available in two types: the standard solid type and the feather type for high temperatures. The feather type uses SUS630 or B637-N07750 as the standard material to ensure the strength and toughness of the feather lip section and is of the two-piece type.

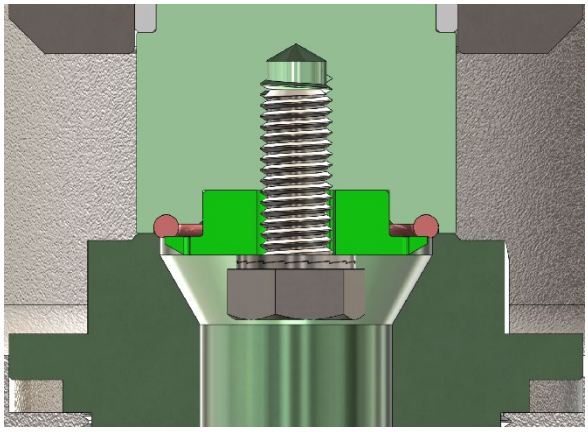


Metal solid seat



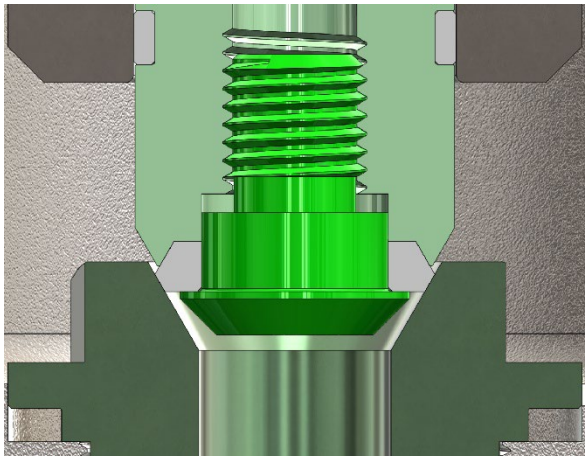
Metal feather seat

The O-ring seat is a seat used when a higher seat airtightness performance is required as compared with the metal seat. Materials suitable for the pressure, temperature and process should be selected for the O-ring. In addition, the O-rings need to be replaced at appropriate maintenance intervals, and its maintenance period may be generally shorter than that of the metal seat.

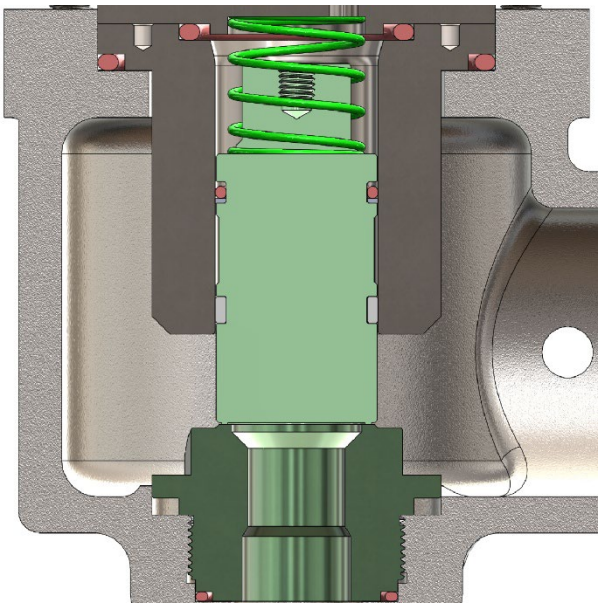


O-ring seat

The resin seat uses a conical seat made of engineering plastics such as PEEK and PTCFE. It is a soft seat used for temperatures and services where O-ring seat is unsuitable.



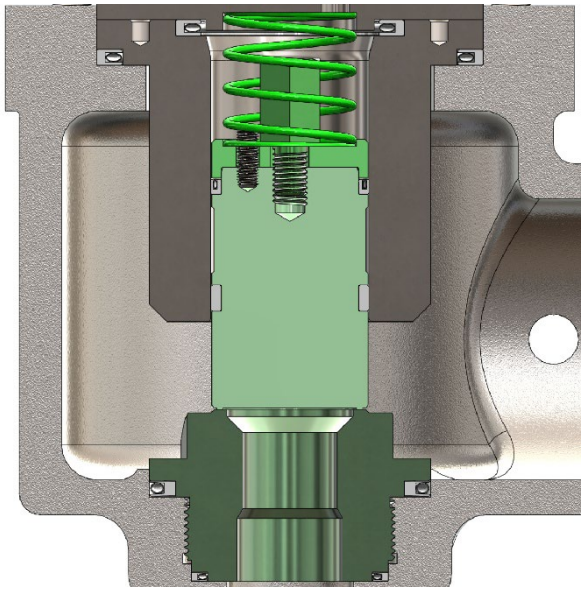
◆ Seal structure



O-ring seal

This type uses O-rings for the sealing sections other than the seat. The O-ring seal is the standard specification.

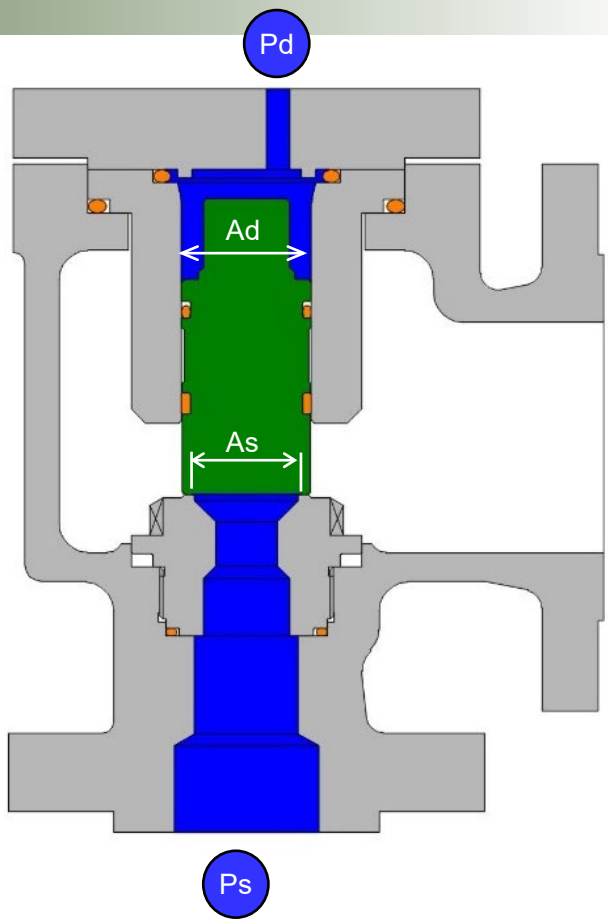
The Teflon seal is used for temperature ranges where the O-ring seal is unsuitable. Unlike the O-ring, Teflon alone does not have elasticity, so this seal material incorporates a spring with a U-shaped Teflon to ensure elasticity. In addition, unlike the O-ring, it cannot accommodate both internal and external pressure, so a seal for internal pressure and one for external pressure are provided in the nozzle seal section.



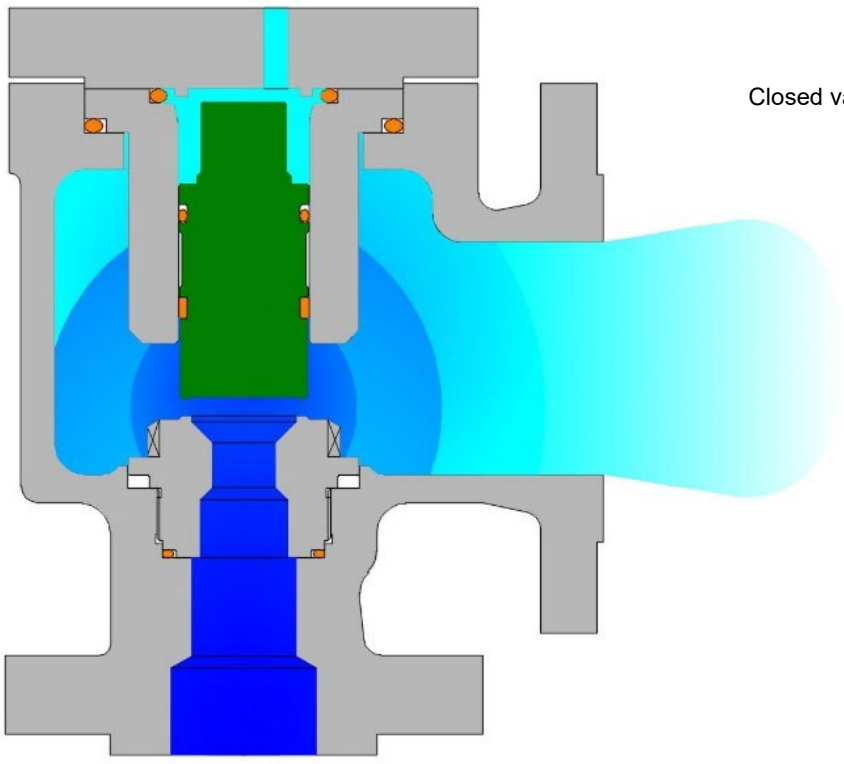
Teflon seal

Operating Principle of Main Valve

For the main valve, the dome area (Ad) is designed to be larger than the seat area (As). The dome pressure (Pd) and the system pressure (Ps) are equal until the valve operates. Since the downward load applied on the disc (Ad × Pd) is greater than the upward load applied on the disc (As × Ps), the disc is firmly seated on the seat to close the valve.



Closed valve condition



Open valve condition

When the system pressure rises and reaches the set pressure, the fluid in the dome is discharged through the pilot valve, causing the dome pressure (Pd) to drop. As a result of this pressure drop, the upward load applied on the disc (As×Ps) becomes greater than the downward load applied on the disc (Ad×Pd), causing the disc to move away from the seat to operate the main valve.

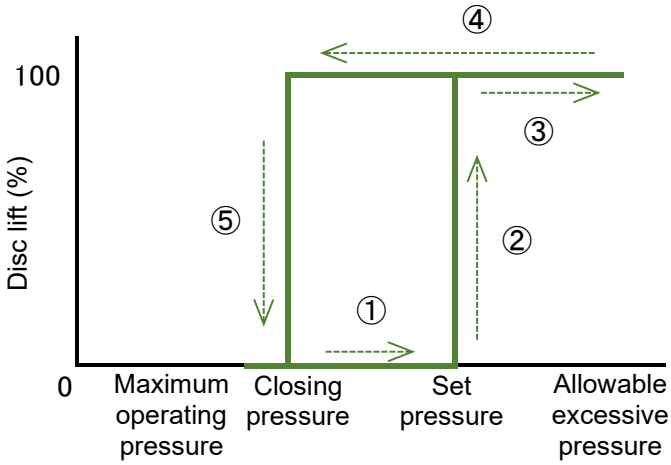
Types of Pilot Valves

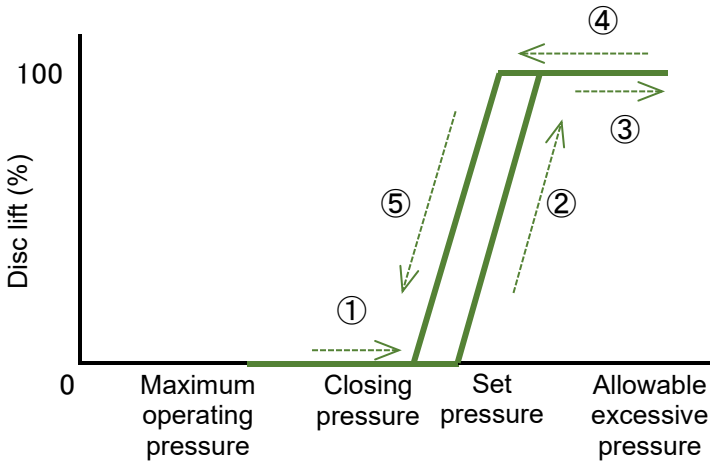
◆ Type of pilot valve

The pilot valve is available in two types: the pop action type and modulating action type. Both types are of the non-flowing type.

◆ Pop action

The pop action Pressure relief valve performs full lift without excessive pressure. The pop action is not suitable for liquid. The pilot valve that performs pop action is rarely used due to piping design issues such as blow-off reaction and issues of process fluid loss.





◆ Modulating action

In the case of the modulating action, the disc of the main valve lifts according to the necessary amount. This makes it possible to reduce the fluid to be discharged and noise. It has operating characteristics suitable for gas, liquid, and two-phase flow. This type allows the outlet piping of the Pressure relief valve to be designed economically, because the outlet piping can be designed based on the accumulated backpressure corresponding to the required discharge rate.

◆ Non-flowing type

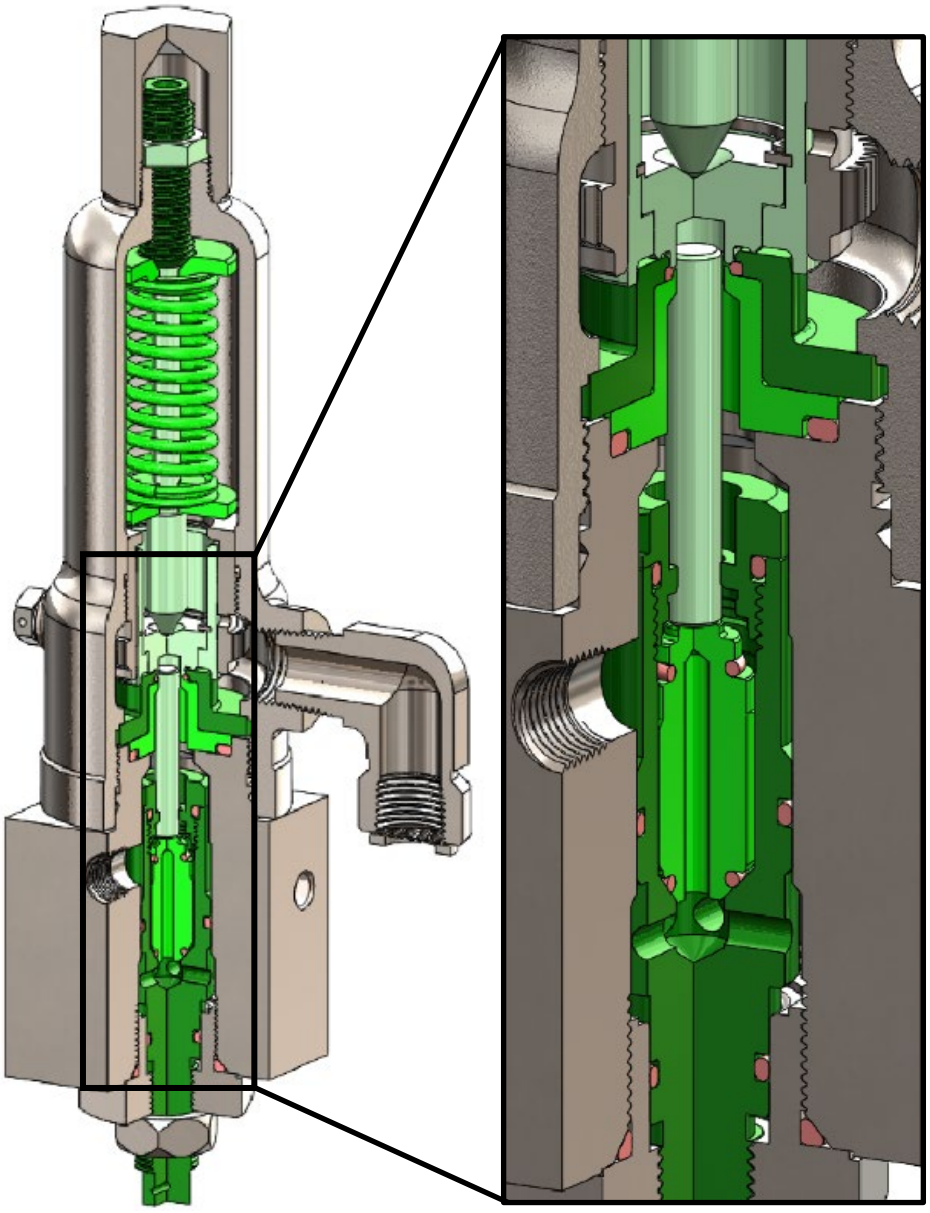
This type discharges the minimum necessary amount of fluid from the main valve dome to operate the main valve. It can reduce the possibility of icing associated with pilot valve operation and clogging of the pilot valve due to solids in the fluid. For this reason, the non-flowing type is generally adopted. However, it is rarely used for low-pressure tank Pressure relief valves etc. because it has difficulty in performing closing after operation.

◆ Types of pilot valves

The RP series offers the following four types of non-flowing type pilot valves in the lineup.

Pilot valve	Operating characteristics	Applicable service	Pressure classification
P30	Pop action	Gas	No classification
P70L	Modulating action	Gas, liquid, two-phase flow	Low pressure
P70M			Medium pressure
P70H			High pressure

Structure of P30 Pilot Valve

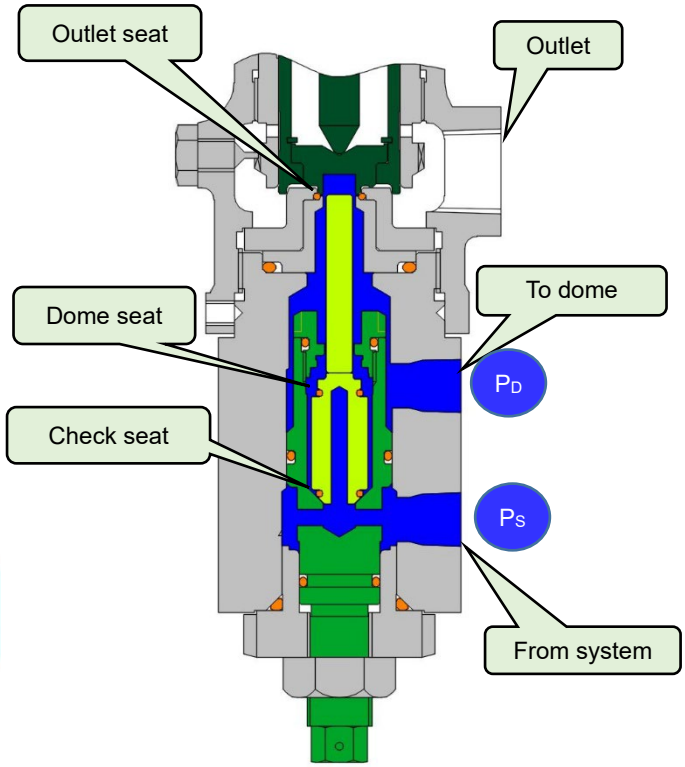


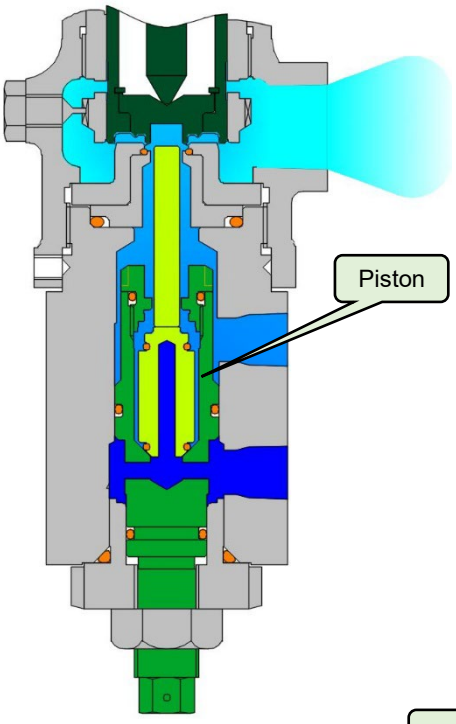
Structural drawing of P30 pilot

Operating Principle of P30 Pilot Valve

Up to the discharge pressure, fluid flows from the system through the check seat, making Pd (dome pressure) equal to Ps (system pressure).

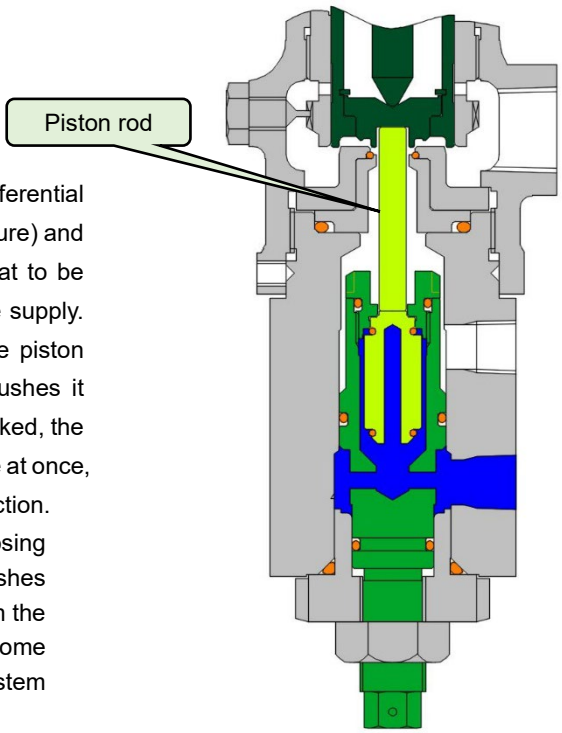
Ps = Pd





When the load (valve opening load) generated by the outlet seat area and Pd (dome pressure) becomes nearly equal to the spring load (valve closing load) at the outlet seat, fluid starts to discharge from the outlet seat to the outlet. This discharge makes Pd (dome pressure) smaller than Ps (system pressure).

Ps > Pd



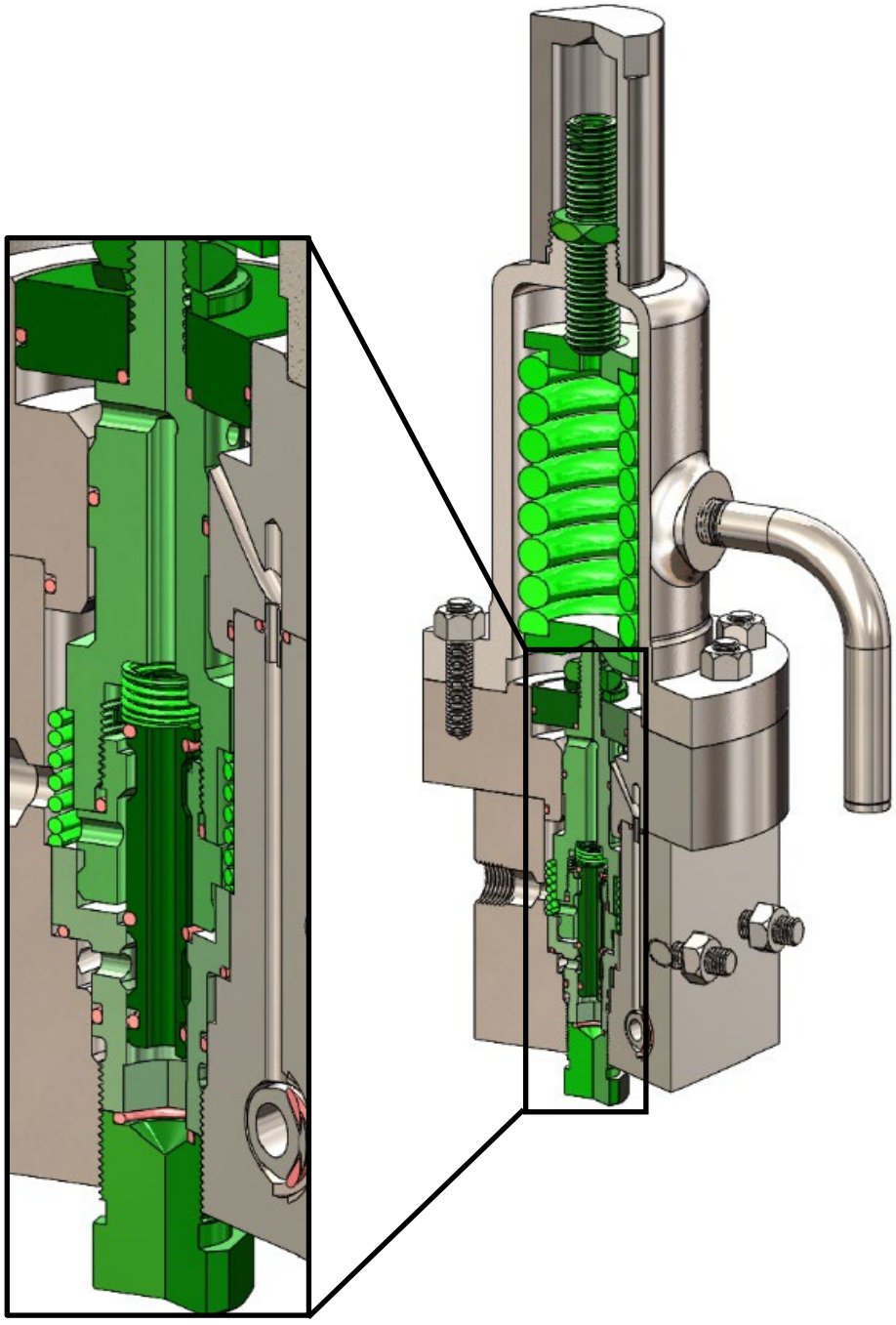
The piston moves upward due to the differential pressure generated between Pd (dome pressure) and Ps (system pressure), causing the dome seat to be seated. This seating blocks the flow from the supply. Almost simultaneously with this blocking, the piston rod comes into contact with the disc and pushes it upward. As the supply from the system is blocked, the dome pressure drops to atmospheric pressure at once, causing the main valve disc to perform pop action.

When the system pressure Ps drops to the closing pressure, the valve disc moves down and pushes the piston downward, supplying pressure from the dome seat to the dome. As a result, the dome pressure Pd becomes equal to the system pressure Ps, causing the main valve to close.

P70 Pilot Valve

- Structure of P70L and P70M pilot valves

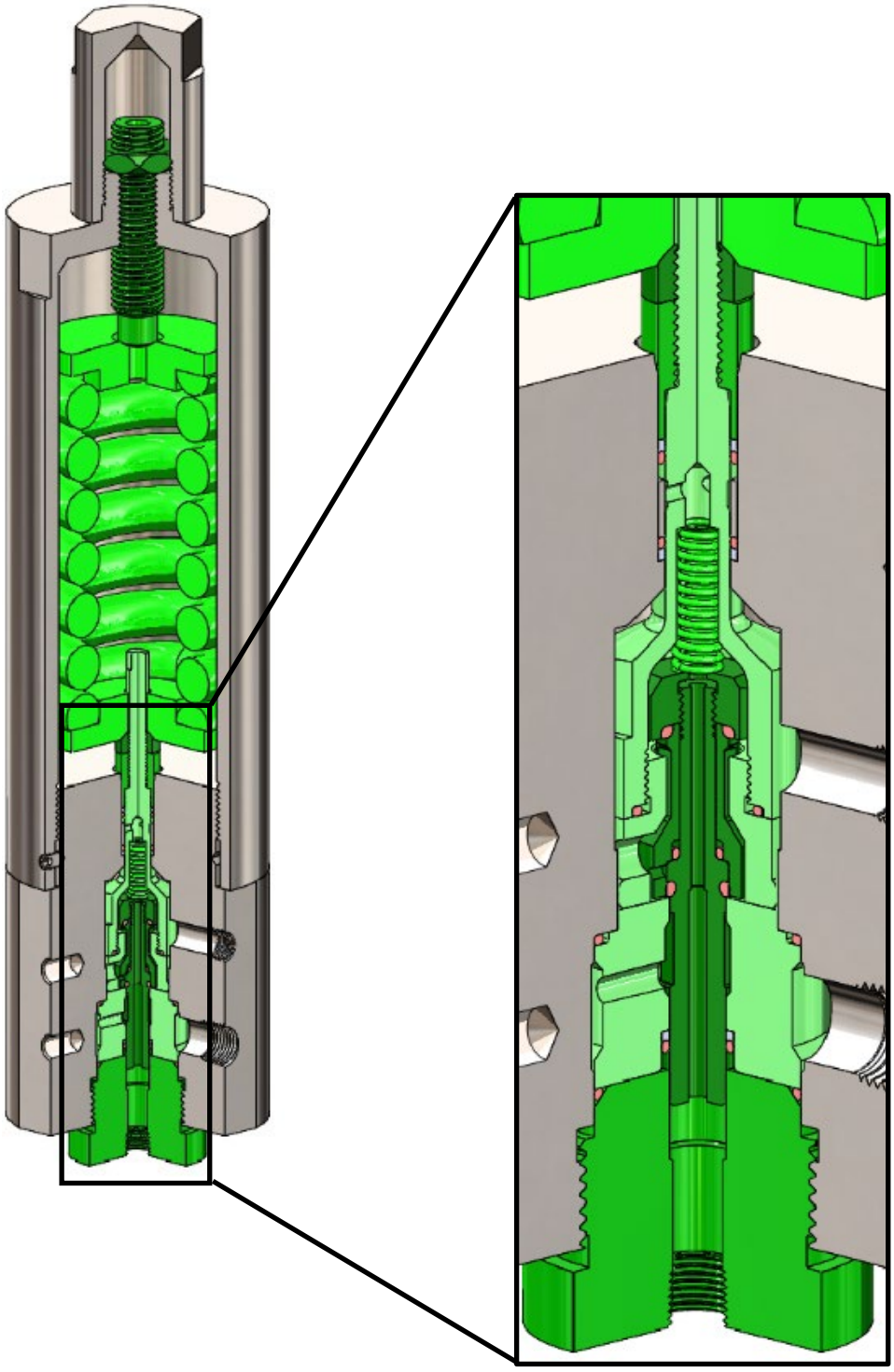
  The structures of the P70L and P70M are the same. However, they differ in the pressure-receiving area of the pilot valve seat.



Structural drawing of P70L, P70M pilot

◆ Structure of P70H Pilot Valve

To accommodate high pressure, the indicator and check valve which are integrated in the P70L and P70M are separated into distinct structures.



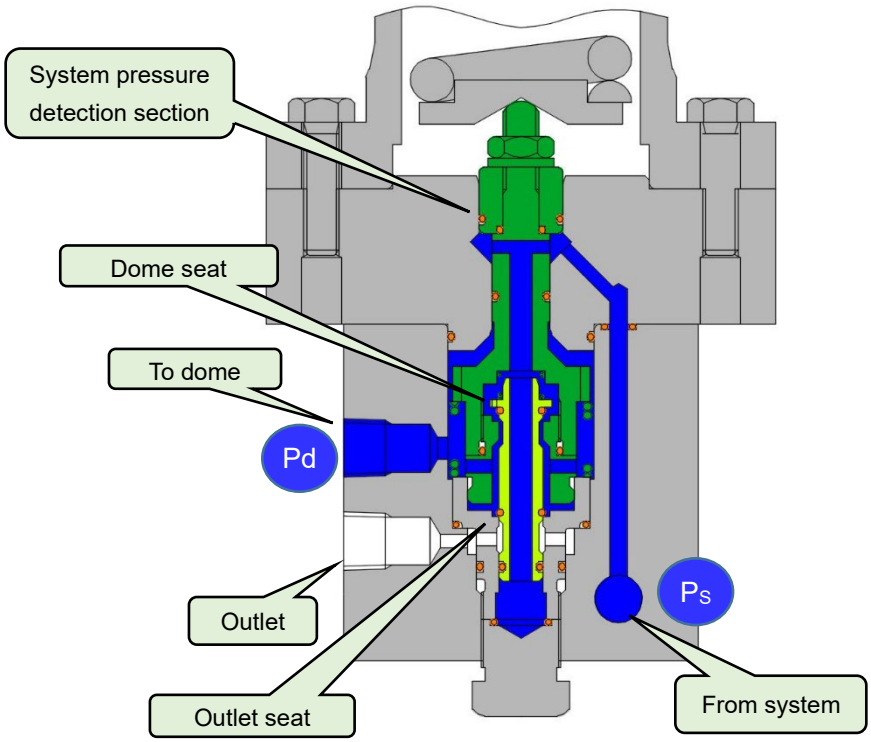
Structural drawing of P70H pilot

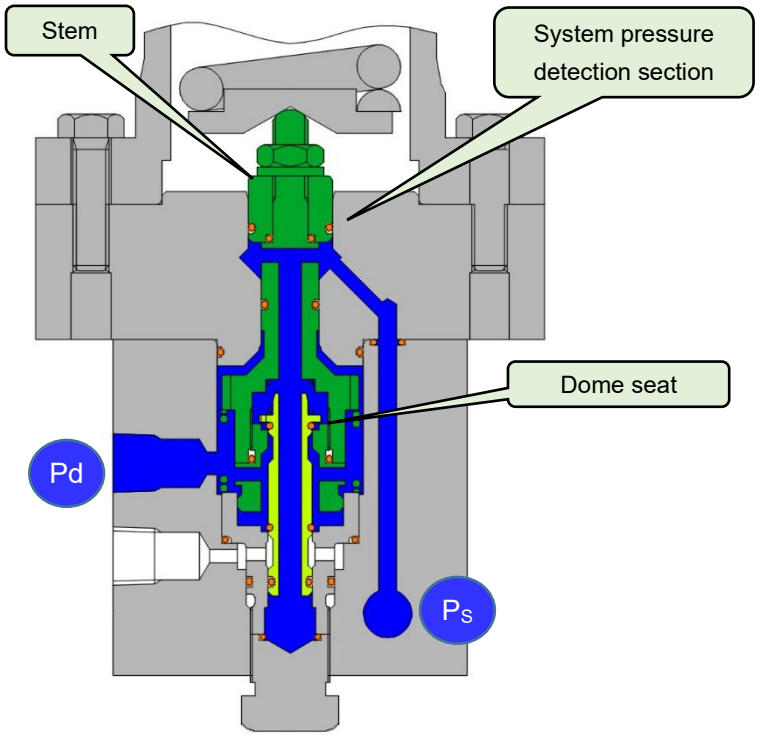
Operating Principle of P70 Pilot Valve

The structure of the P70H pilot valve differs from that of the P70L and P70M pilot valves, but the operating principle is the same.

Up to the discharge pressure, fluid flows from the system through the dome seat to the dome, making the dome pressure Pd equal to the system pressure Ps.

$$Ps = Pd$$



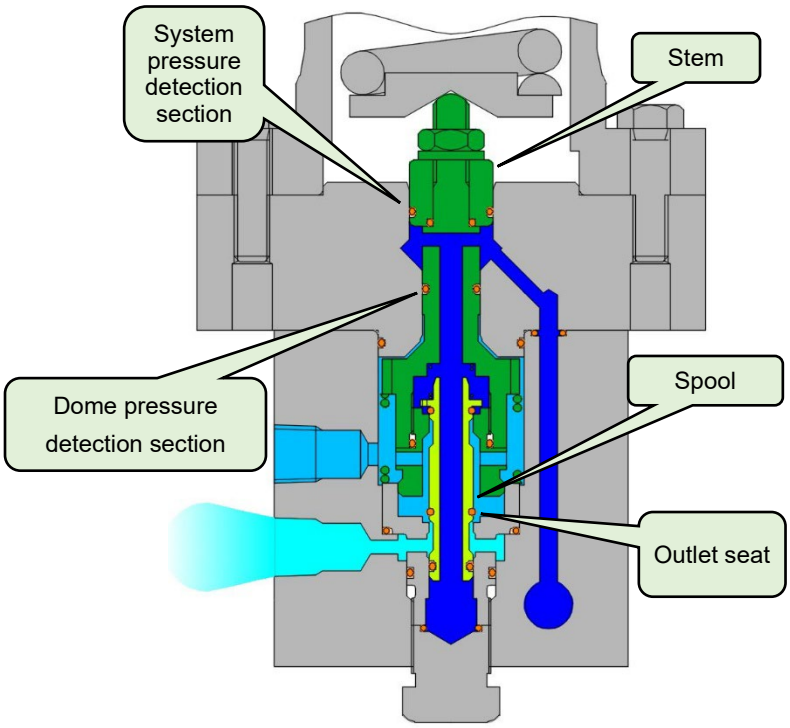


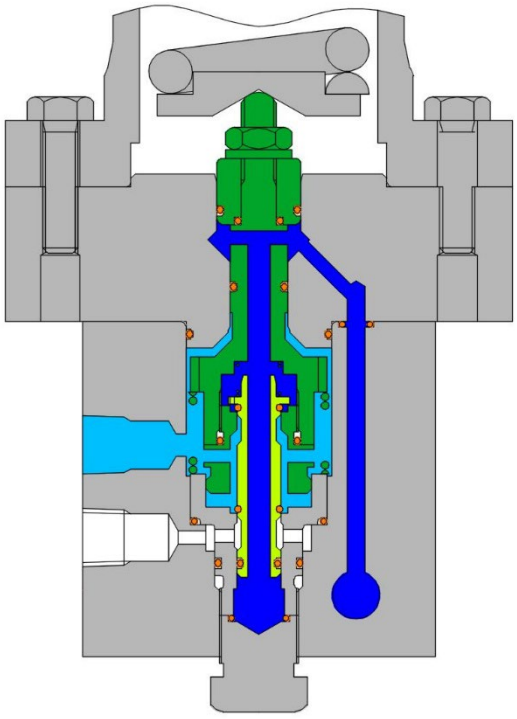
When the load generated by the system pressure detection section area and system pressure Ps (valve opening load) becomes nearly equal to the spring load (valve closing load), the stem moves upward. This movement causes the dome seat to close. (The inflow from the system pressure is stopped, resulting in a non-flowing state.)

When the system pressure Ps rises further, the stem slightly moves up together with the spool. As a result of this upward movement, the dome pressure is released from the outlet seat through the outlet, causing the dome pressure Pd to drop. This drop in the dome pressure Pd generates a pressure difference with the system pressure Ps, generating a load that pushes down the stem at the dome pressure detection section. This causes the stem to move down together with the spool, seating the outlet seat to stop the dome pressure from dropping.

The above-mentioned operation is repeated as the system pressure Ps rises, causing the dome pressure Pd to drop in inverse proportion to the rise in the system pressure Ps.

This makes the main valve perform a modulating action.

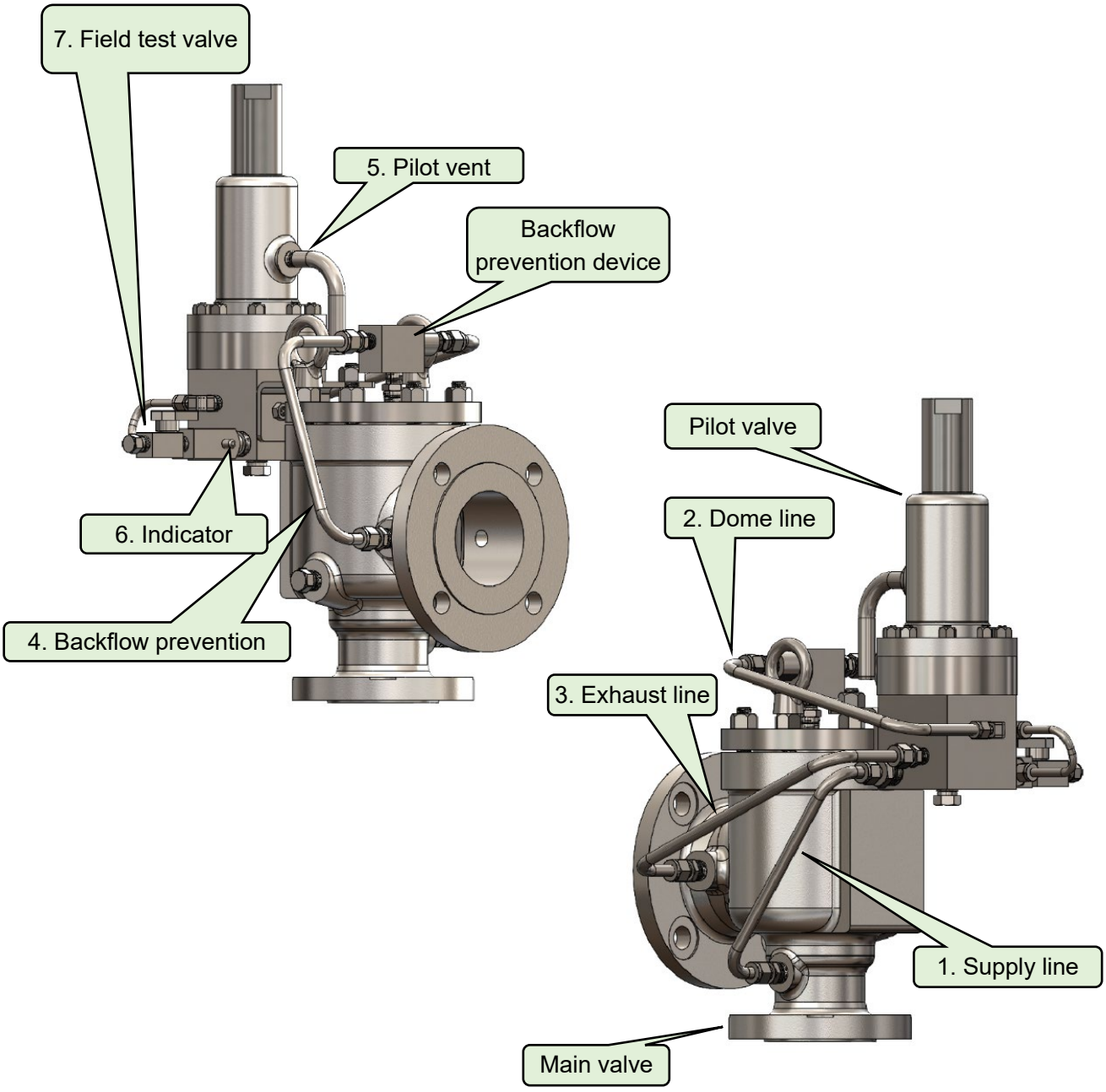




Piping System Diagram

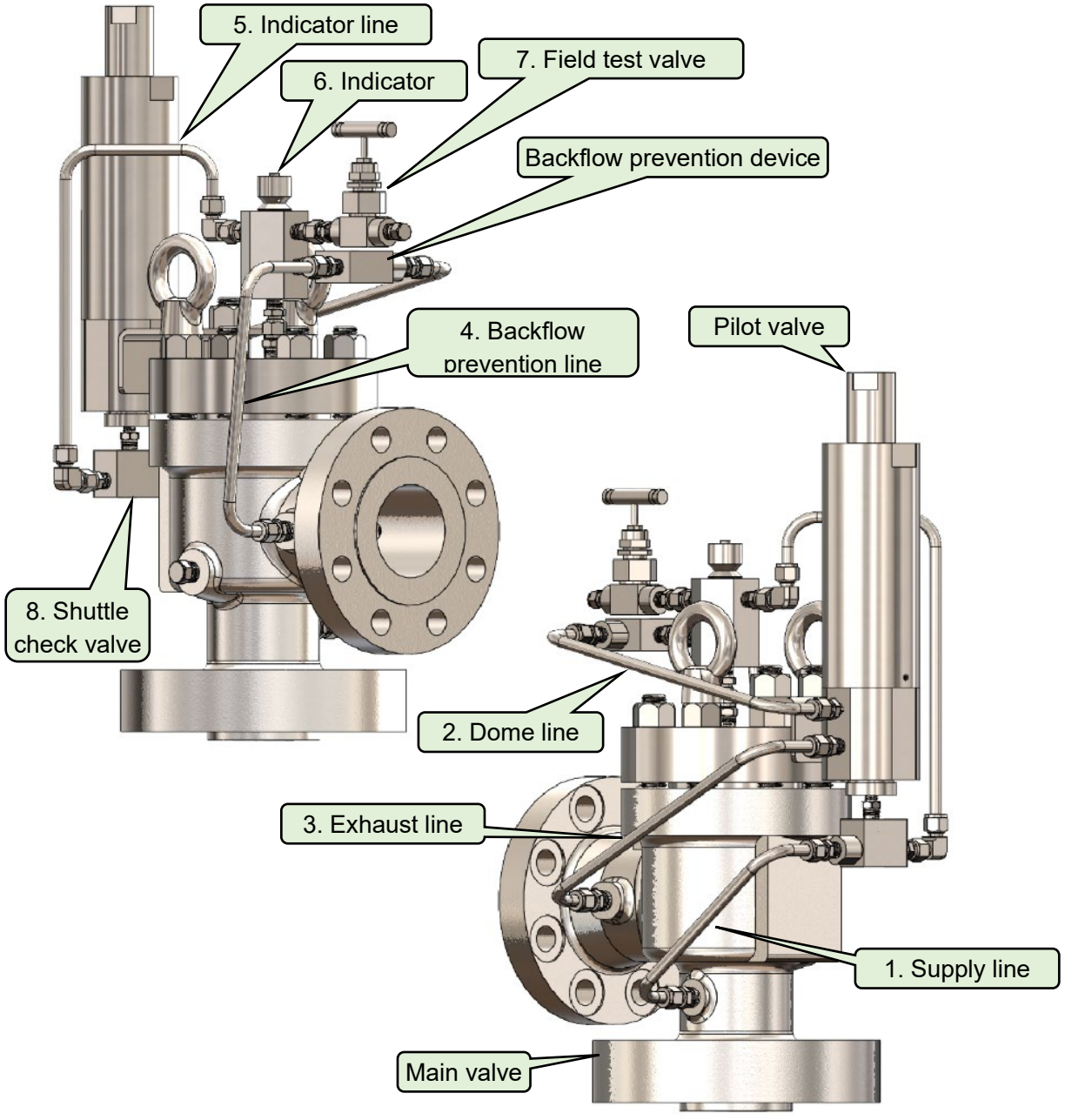
A piping diagram of the P70L, P70M pilot valves is shown below. This piping varies depending on the accessories.

No.	Name	Description
1	Supply line	This is the pressure detection (supply) piping of the pilot valve (standard).
2	Dome line	This is the line connecting the pilot valve to the main valve dome (standard).
3	Exhaust line	This is the exhaust line of the pilot valve. It is normally connected to the main valve outlet (standard).
4	Backflow prevention line	This is the line connecting the backflow prevention device to the main valve outlet (option).
5	Pilot vent	This is the line for the pilot valve to detect atmospheric pressure. No fluid is discharged from this line (standard).
6	Indicator	This is used to check the operational status of the pilot valve during a field test (standard).
7	Field test valve	Pressure is applied through this valve during a field test (option).



A typical piping diagram of the P70H pilot valve is shown below. This piping varies depending on the accessories. Unlike the P70L and P70M pilot valves, the P70H pilot valve uses the indicator and shuttle check valve as external units.

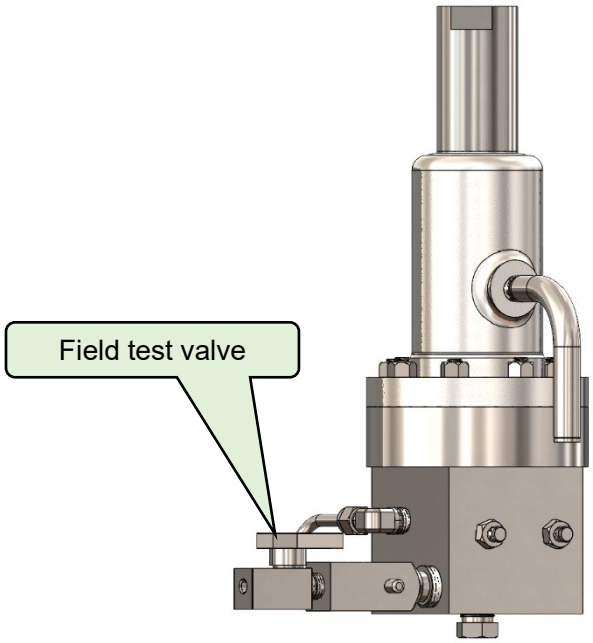
No.	Name	Description
1	Supply line	This is the pressure detection (supply) piping of the pilot valve (standard).
2	Dome line	This is the line connecting the pilot valve to the main valve dome (standard).
3	Exhaust line	This is the exhaust line of the pilot valve. It is normally connected to the main valve outlet (standard).
4	Backflow prevention line	This is the line connecting the backflow prevention device to the main valve outlet (option).
5	Indicator line	This is the line connecting the indicator and the shuttle check valve (standard).
6	Indicator	This is used to check the operational status of the pilot valve during a field test (standard).
7	Field test valve	Pressure is applied through this valve during a field test (option).
8	Shuttle check valve	This is the check valve that switches to the higher of the two lines (standard).

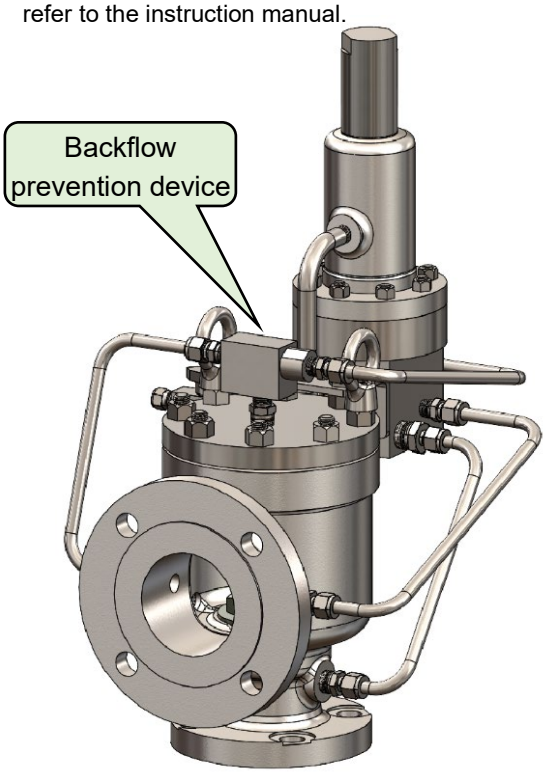


Accessories

- Field test valve

  This valve is intended to check the set pressure with the Pressure relief valve installed. In this field test, a nitrogen cylinder is usually used as the pressure supply source, an appropriate regulator etc. is used to reduce the pressure, and then pressure is gradually increased. Normally, this test is conducted with no pressure applied to the main valve. For the operation confirmation method etc., refer to the instruction manual.



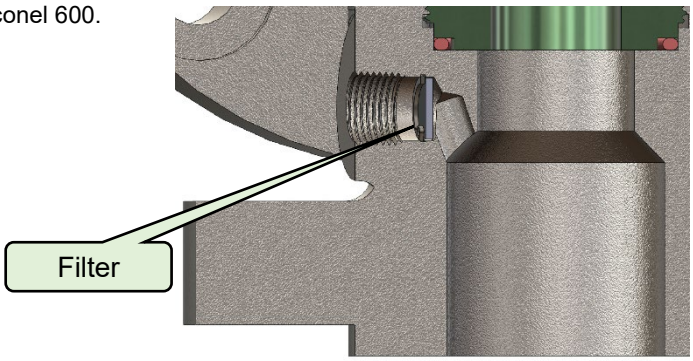


- Backflow prevention device

  The backflow prevention device is required when pressure exceeding the inlet pressure is generated on the outlet side of the Pressure relief valve. This is because when the outlet pressure becomes higher, a valve opening force acts on the main valve piston to cause backflow. When a backflow prevention device is selected, a filter is provided as standard on the outlet side of the device. This filter is installed to prevent dust or foreign matters from entering the main valve dome through the backflow prevention device.

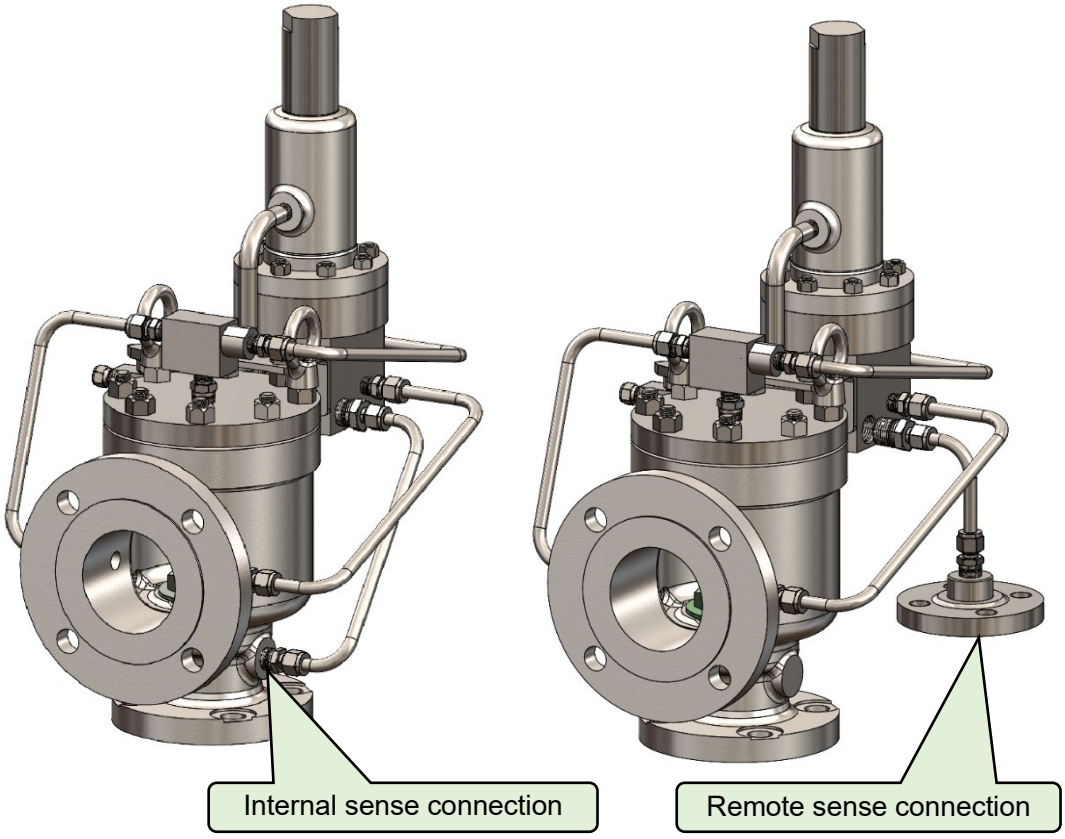
- Pilot supply line filter

  This filter is provided to protect the pilot valve from particles such as dust. In services prone to filter clogging, regular maintenance is required. The filter is made of sintered metal equivalent to Inconel 600.



- Remote pressure sense connection

  When the Pressure relief valve operates, a pressure loss occurs in the inlet piping. In the case of an internal pressure sense connection where a pressure loss of more than 3% occurs, the detected pressure in the pilot valve apparently becomes lower after operation. Therefore, there is a risk of unstable actuation after operation. By connecting to a location where the pressure in the pilot valve can be detected more accurately even after the Pressure relief valve is operated, it becomes possible to reduce the risk of unstable actuation.



- Manual blow valve

  The Pressure relief valve is actuated by opening this valve to reduce the pressure in the main valve dome.

- Pilot valve isolation

  If there are lots of solids causing blockage, adhesion, etc. or if there are high-viscosity fluids etc. that may polymerize, a design that isolates the pilot valve using an inert gas can be used.

Type code

RP	4	6	1-	R	S1	-1LE8	(A)

Cap code

(A)	Screwed	(B)	(A) + Test gag
(J)	Screwed + MBV[*1]	(P)	(A) + Test gag + MBV[*1]
(G)	Bolted	(H)	(G) + Test gag
(K)	Bolted + MBV[*1]	(Q)	(G) + Test gag + MBV[*1]

Option code [1] + [2] + [3] + [4] (See the table below.)

Material code (See the table below.)

Detection method

I	Internal sense connection	R	Remote sense connection

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-	Screwed	—	—

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

3	-196 (-320) ≤ T< -29 (-20)	6	-29 (-20) ≤ T< 232 (450)
7	232 (450) ≤ T< 260 (500)	8	260 (500) ≤ T ≤ 325 (617)

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]

[1]	[2]		[3]	
RP	S	Outlet 1-direction	Blank	For gas
	D	Outlet 2-direction	L	For liquid

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

[1] Body material code

Blank	A216-WCB (SCPH2)	E	A105	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
C5	A352-LCB (SCPL1)	E5	LF2	S3	A351-CF3M (SCS16A)	G3	SUSF316L
M	Monel® casting	MF	Monel® forging	S4	A351-CF8C	G4	SUSF321
H	Hastelloy® casting	HF	Hastelloy® forging	A	Aluminum	T	Titanium series
B	Copper alloy series	SS	Special	—	—	—	—

[2] NACE code[*2]

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

*1 MBV: Manual blow valve

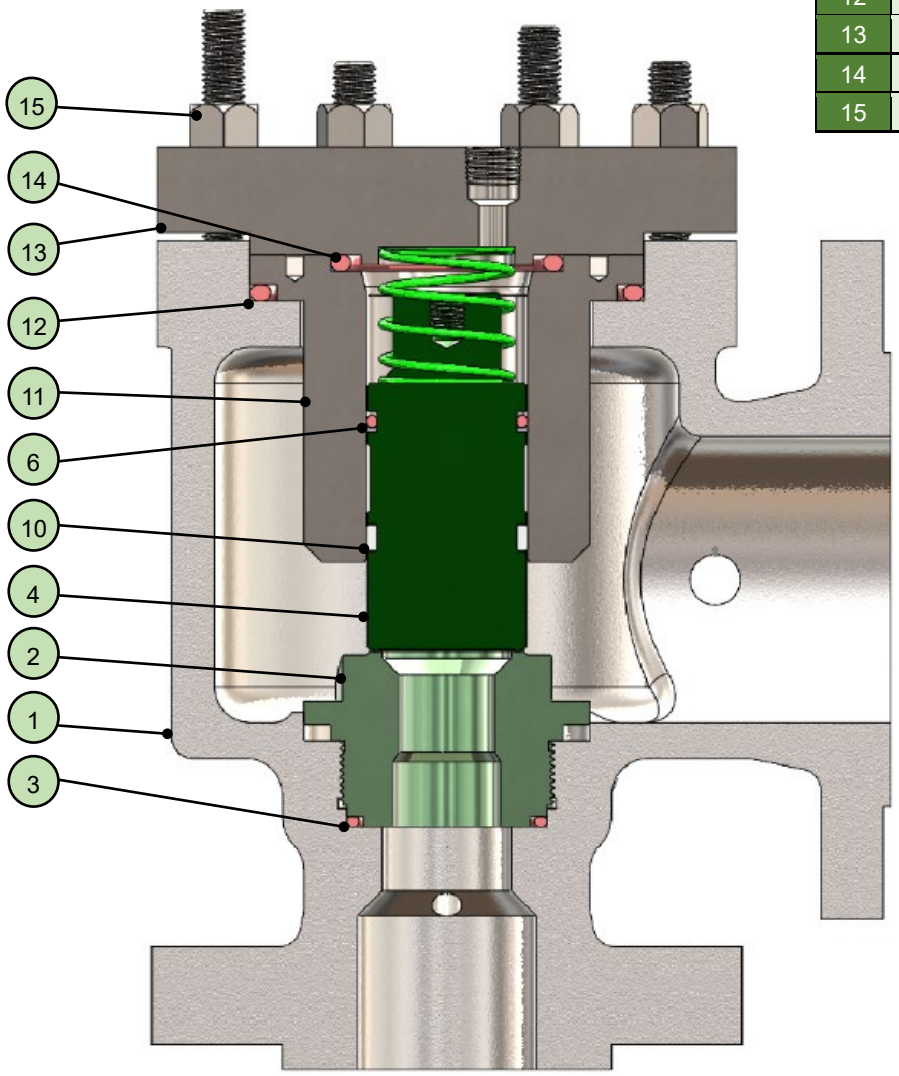
*2 The NACE applicable grade varies depending on conditions such as the applicable standard, year, pressure, and sour gas partial pressure.

Option code [1] + [2] + [3] + [4]								
[1] Main valve structure								
	Seat	Seal		Seat	Seal		Seat	Seal
1	Metal (solid)	Elastomer*1	4	PTFE	Teflon seal	F	FKM	FKM
2		Teflon seal	5	RTFE (6P0)*3		H	HNBR	HNBR
3		Elastomer*2	6	PCTFE (Kel-F®)		K	Kalrez® (FFKM)	Kalrez®
A	Metal (feather)	Elastomer*1	7	PEEK	Teflon seal	N	NBR	NBR
B		Teflon seal	8	VESPEL		P	FFKM	FFKM
C		Elastomer*2	E	EPDM	EPDM	V	VMQ	VMQ
Q	Combinations other than above		—	—	—	—	—	—
Remarks	*1 The seal material (elastomer) of the main valve is the same as that of the pilot valve. *2 The seal material (elastomer) of the main valve is different from that of the pilot valve.							
[2] Pilot valve structure								
L	P70L pilot 0.25 ≤ P ≤ 2.5 (2.7)*3 MPa			M	P70M pilot (2.3)*3 2.5 < P ≤ 12.5 (13)*3 MPa			
H	P70H pilot (12) *3 12.5 < P ≤ 68MPa			3	P30 pilot 0.35 ≤ P ≤ 18 MPa			
Q	Other than above			—	—			
Remarks	L, M and H are non-flowing modulating pilots; 3 is a non-flowing pop pilot. *3 The values in parentheses can be applied when multiple units are installed and the same pilot valves are selected (API 520 Part 1, 2020, Para. 5.4.2.2).							
[3] Pilot valve seal material								
E	EPDM	H	HNBR	N	NBR	V	VMQ	
F	FKM	K	Kalrez® (FFKM)	P	FFKM	Q	Others	
[4] Accessories								
	BFP*5	Field test valve	Filter		BFP*5	Field test valve	Filter	
1	—	—	—	5	Yes	—	—	
2	—	—	Yes	6	Yes	—	Yes	
3	—	Yes	—	7	Yes	Yes	—	
4	—	Yes	Yes	8	Yes	Yes	Yes	
Remarks	*5 BFP: Backflow prevention device. When a BFP is provided, a filter is installed as standard on the outlet side.							

Cross-sectional View of Main Valve

Metal seat, O-ring seal type

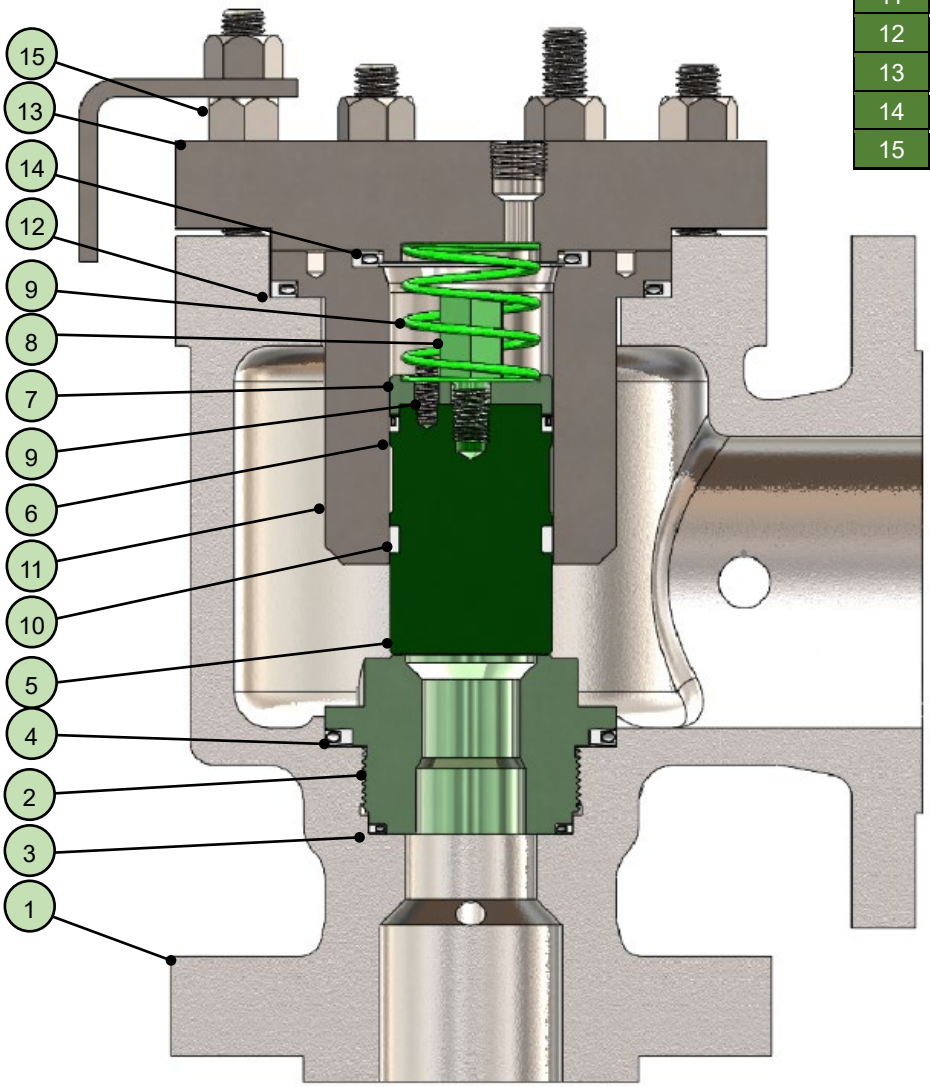
No.	Part name
1	Body
2	Nozzle
3	Nozzle seal
5	Disc
6	Disc seal
10	Wear ring
11	Guide
12	Guide seal
13	Cover
14	Cover seal
15	Bolt, nut



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

Metal seat, Teflon seal type

No.	Part name
1	Body
2	Nozzle
3	Nozzle seal 1
4	Nozzle seal 2
5	Disc
6	Disc seal
7	Disc seal holder
8	Lift stopper
9	Lift stopper lock
10	Wear ring
11	Guide
12	Guide seal
13	Cover
14	Cover seal
15	Bolt, nut



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

Standard Material of Main Valve

Standard material by temperature (main valve)

No.	Application temperature range °C	-196–-46	-46–-29	-29–260	260–325
	Material code	S	C5	Blank	Blank
1	Body	A351-CF8	A352-LCB	A216-WCB	
2	Nozzle	SUS304 or SCS13A			
3	Nozzle seal 1	PTFE	Elastomer		
4	Nozzle seal 2	PTFE	Elastomer		
5	Disc	SUS304			
6	Disc seal	PTFE	Elastomer		
7	Disc seal holder	SUS304		—	
8	Lift stopper	SUS304		—	
9	Lift stopper lock	SUS304		—	
10	Wear ring	PTFE			
11	Guide	SUS304 or SCS13A			
12	Guide seal	PTFE	Elastomer		
13	Cover	SUS304	A350-LF2	SA105M	
14	Cover seal	PTFE	Elastomer		
15	Bolt, nut	SUS304		A193-B7, A194-4	

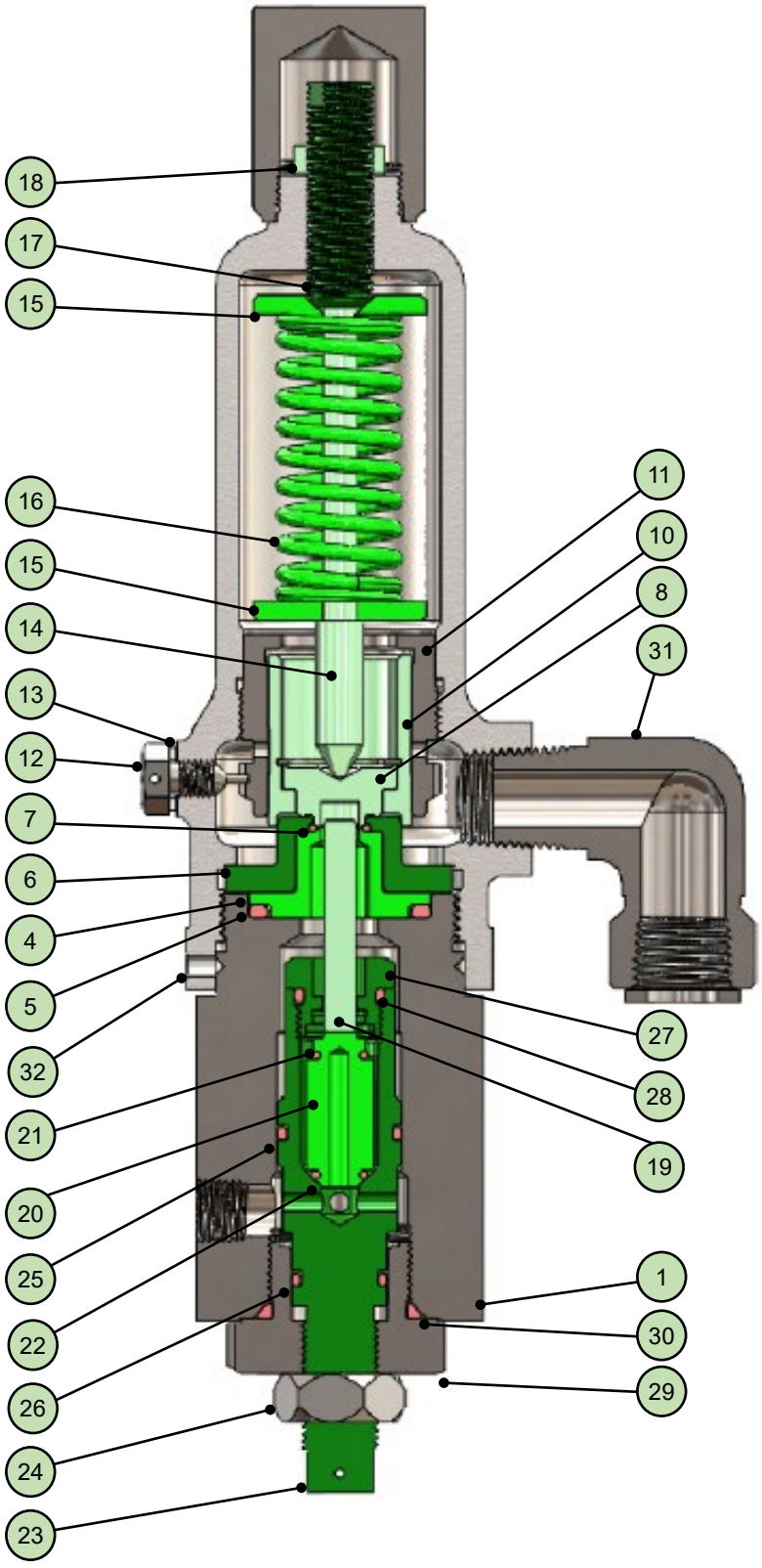
* The minimum operating temperature of SCPH2 varies depending on the applicable regulations.

Standard material by material code (main valve)

No.	Material code	S1	S2	S3
1	Body	A351-CF8M	A351-CF3	A351-CF3M
2	Nozzle	SUS316 or SCS14A	SUS304L or SCS19A	SUS316L or SCS16A
3	Nozzle seal 1	Elastomer		
4	Nozzle seal 2	Elastomer		
5	Disc	SUS316	SUS304L	SUS316L
6	Disc seal	Elastomer		
10	Wear ring	PTFE		
11	Guide	SUS316 or SCS14A	SUS304L or SCS19A	SUS316L or SCS16A
12	Guide seal	Elastomer		
13	Cover	SUS 316	SUS304L	SUS316L
14	Cover seal	Elastomer		
15	Bolt, nut	SUS316	SUS304	SUS316

Cross-sectional View of Pilot Valve

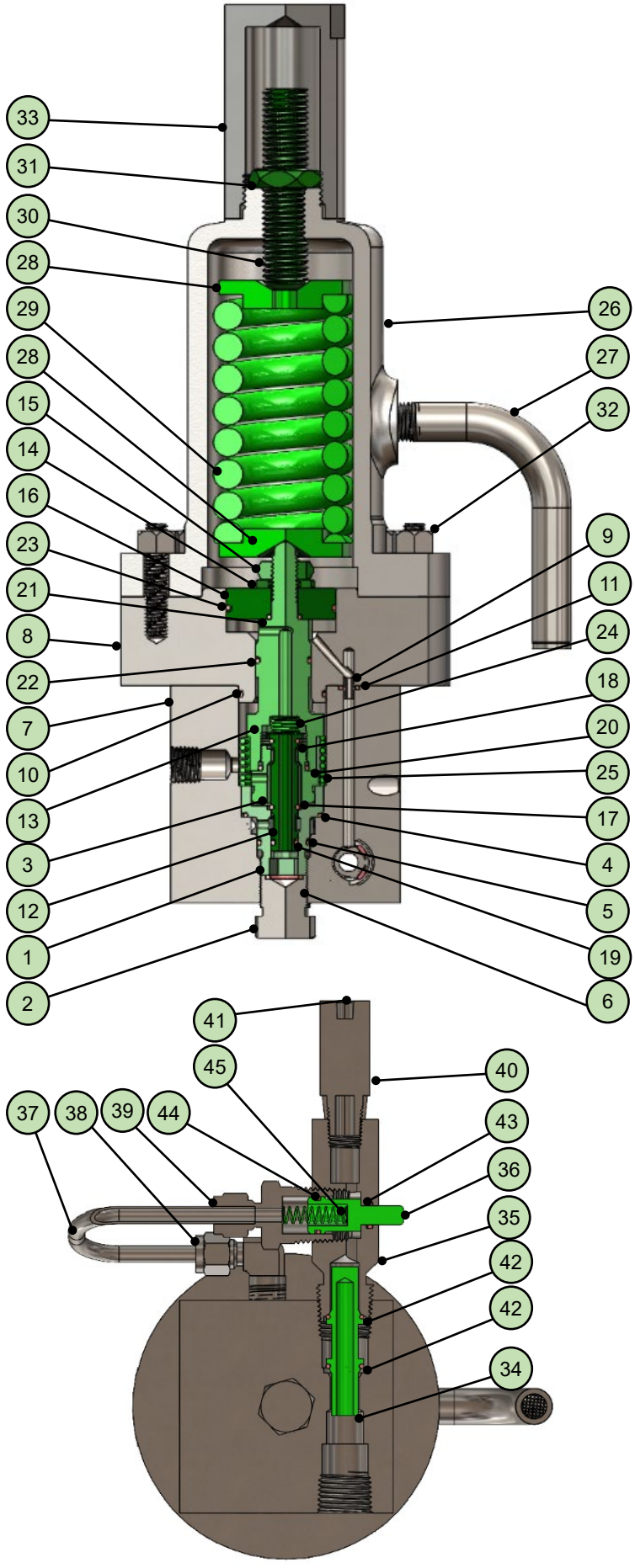
30 pilot



No.	Part name
1	Body
2	Bonnet
3	Cap
4	Nozzle
5	Nozzle seal
6	Seat retainer
7	Outlet seat
8	Disc
9	Disc snap ring
10	Holder
11	Guide
12	Guide lock bolt
13	Guide lock bolt gasket
14	Spindle
15	Spring retainer
16	Spring
17	Adjusting screw
18	Adjusting screw lock nut
19	Piston rod
20	Piston
21	Dome seat
22	Check seat
23	Lift adjusting screw
24	Lift adjusting screw lock nut
25	Lift adjusting screw seal (upper)
26	Lift adjusting screw seal (lower)
27	Piston stopper
28	Piston stopper seal
29	Bush
30	Bush seal
31	Exhaust elbow
32	Whirl stop

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

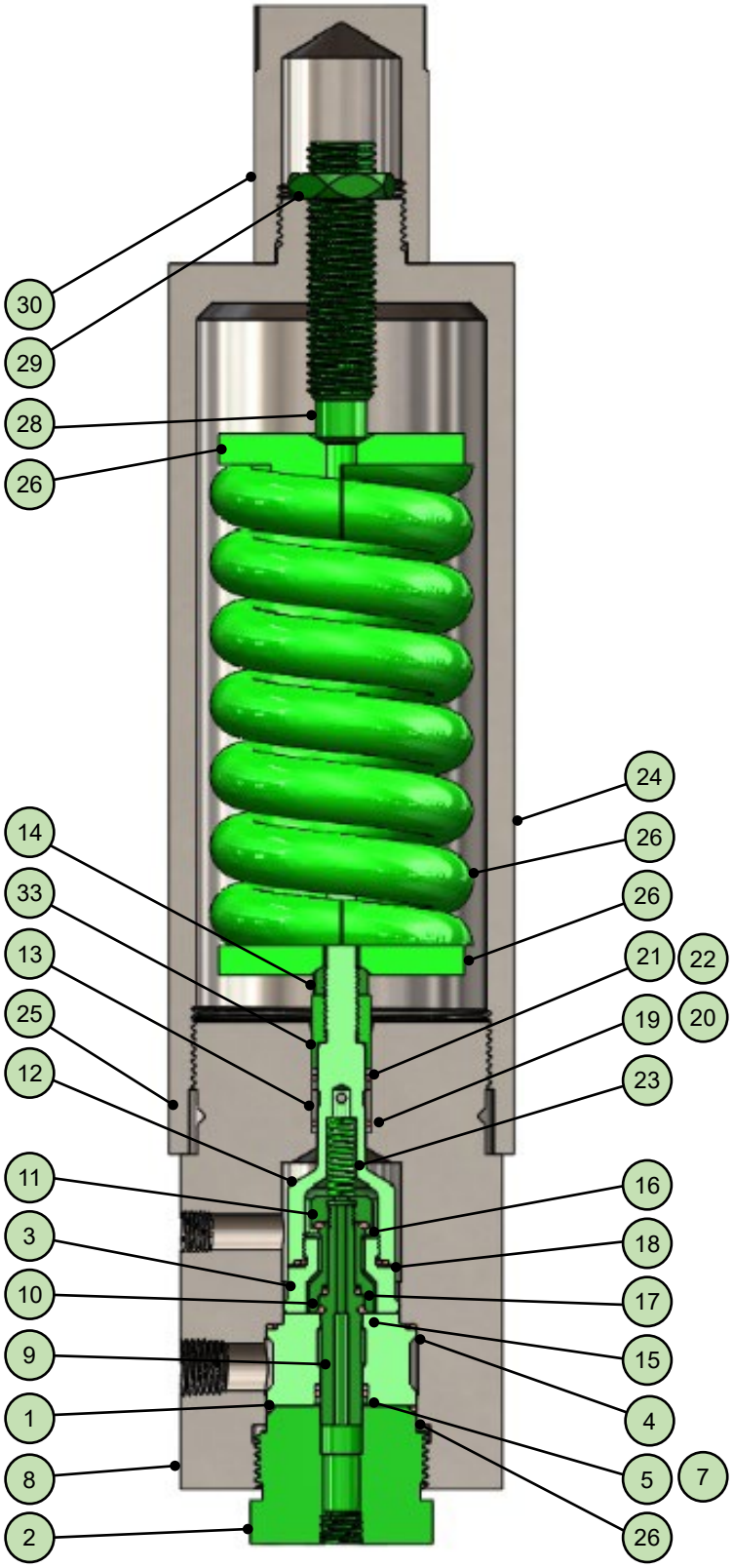
70L pilot, 70M pilot



No.	Part name
1	Nozzle
2	Nozzle bush
3	Dome nozzle
4	Nozzle seal (upper)
5	Nozzle seal (lower)
6	Nozzle bush seal
7	Body
8	Piston case
9	Positioning pin
10	Piston case seal
11	Positioning pin seal
12	Spool
13	Stem
14	Stem washer
15	Stem nut
16	Sensing piston
17	Outlet seat
18	Dome seat
19	Spool seal
20	Dome nozzle seal
21	Stem seal (upper)
22	Stem seal (lower)
23	Piston seal
24	Inner spring
25	Outer spring
26	Bonnet
27	Vent elbow
28	Spring retainer
29	Spring
30	Adjusting screw
31	Adjusting screw lock nut
32	Stud bolt
33	Cap
34	Shuttle check piston
35	Indicator body
36	Indicator
37	Indicator tube
38	Indicator fitting 1
39	Indicator fitting 2
40	Field test valve
41	Plug
42	Shuttle check seat
43	Indicator seal 1
44	Indicator seal 2
45	Indicator spring

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

70H pilot



No.	Part name
1	Nozzle
2	Nozzle bush
3	Dome nozzle
4	Nozzle seal (upper)
5	Nozzle seal (lower)
6	Nozzle bush seal
7	Nozzle bush backup ring
8	Body
9	Inner spool
10	Outer spool
11	Spool nut
12	Stem
13	Piston spacer
14	Step ring
15	Outlet seat
16	Dome seat
17	Spool seal
18	Dome nozzle seal
19	Stem seal
20	Stem backup ring
21	Piston seal
22	Piston backup ring
23	Inner spring
24	Bonnet
25	Bonnet lock bolt
26	Spring retainer
27	Spring
28	Adjusting screw
29	Adjusting screw lock nut
30	Cap

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

Standard Material of Pilot Valve

Standard material of P30 pilot

No.	Part name	Standard	Special
1	Body	SUSF316	SUSF316L
2	Bonnet	SCS14A	SUS316L
3	Cap	SUS316	SUS316L
4	Nozzle	SUS316	SUS316L
5	Nozzle seal	Elastomer	
6	Seat retainer	SUS316	SUS316L
7	Outlet seat	Elastomer	
8	Disc	SUS316	SUS316L
9	Disc snap ring	SUS304	
10	Holder	SUS316	SUS316L
11	Guide	SUS316	SUS316L
12	Guide lock bolt	SUS316	SUS316L
13	Guide lock bolt gasket	V7020	
14	Spindle	SUS316	SUS316L
15	Spring retainer	SUS316	SUS316L
16	Spring	SUS316	
17	Adjusting screw	SUS316	SUS316L
18	Adjusting screw lock nut	SUS316	SUS316L
19	Piston rod	SUS316	SUS316L
20	Piston	SUS316	SUS316L
21	Dome seat	Elastomer	
22	Check seat	Elastomer	
23	Lift adjusting screw	SUS316	SUS316L
24	Lift adjusting screw lock nut	SUS316	SUS316L
25	Lift adjusting screw seal (upper)	Elastomer	
26	Lift adjusting screw seal (lower)	Elastomer	
27	Piston stopper	SUS316	SUS316L
28	Piston stopper seal	Elastomer	
29	Bush	SUS316	SUS316L
30	Bush seal	Elastomer	
31	Exhaust elbow	SUS316	SUS316
32	Whirl stop	SUS304	

No.	Part name	Standard	Special
1	Nozzle	SUS316	SUS316L
2	Nozzle bush	SUS316	SUS316L
3	Dome nozzle	SUS316	SUS316L
4	Nozzle seal (upper)	Elastomer	
5	Nozzle seal (lower)	Elastomer	
6	Nozzle bush seal	Elastomer	
7	Body	SUSF316	SUSF316L
8	Piston case	SUS316	SUS316L
9	Positioning pin	SUS316	SUS316L
10	Piston case seal	Elastomer	
11	Positioning pin seal	Elastomer	
12	Spool	SUS316	SUS316L
13	Stem	SUS316	SUS316L
14	Stem washer	SUS316	SUS316L
15	Stem nut	SUS316	SUS316L
16	Sensing piston	SUS316	SUS316L
17	Outlet seat	Elastomer	
18	Dome seat	Elastomer	
19	Spool seal	Elastomer	
20	Dome nozzle seal	Elastomer	
21	Stem seal (upper)	Elastomer	
22	Stem seal (lower)	Elastomer	
23	Piston seal	Elastomer	
24	Inner spring	SUS316	
25	Outer spring	SUS316	
26	Bonnet	SCS14A	
27	Vent elbow	SUS316-TP	SUS316L-TP
28	Spring retainer	SUS316	SUS316L
29	Spring	SUS316	SUS316L
30	Adjusting screw	SUS316	SUS316L
31	Adjusting screw lock nut	SUS316	SUS316L
32	Stud bolt	SUS316	SUS316L
33	Cap	SUS316	SUS316L
34	Shuttle check piston	SUS316	SUS316L
35	Indicator body	SUS316	SUS316L
36	Indicator	SUS316	SUS316L
37	Indicator tube	SUS316-TP	SUS316L-TP
38	Indicator fitting 1	SA182-F316	
39	Indicator fitting 2	SA182-F316	
40	Field test valve	SA479-316	
41	Plug	SUS316	SUS316L
42	Shuttle check seat	Elastomer	
43	Indicator seal 1	Elastomer	
44	Indicator seal 2	Elastomer	
45	Indicator spring	SUS316	

No.	Part name	Standard	Special
1	Nozzle	SUS316	SUS316L
2	Nozzle bush	SUS316	SUS316L
3	Dome nozzle	SUS316	SUS316L
4	Nozzle seal (upper)	Elastomer	
5	Nozzle seal (lower)	Elastomer	
6	Nozzle bush seal	Elastomer	
7	Nozzle bush backup ring	PTFE	
8	Body	SUS316	SUS316L
9	Inner spool	SUS316	SUS316L
10	Outer spool	SUS316	SUS316L
11	Spool nut	SUS316	SUS316L
12	Stem	SUS316	SUS316L
13	Piston spacer	SUS316	SUS316L
14	Step ring	SUS316	SUS316L
15	Outlet seat	Elastomer	
16	Dome seat	Elastomer	
17	Spool seal	Elastomer	
18	Dome nozzle seal	Elastomer	
19	Stem seal	Elastomer	
20	Stem backup ring	PTFE	
21	Piston seal	Elastomer	
22	Piston backup ring	PTFE	
23	Inner spring	SUS316	SUS316L
24	Bonnet	SUS316	SUS316L
25	Bonnet lock bolt	SUS316	SUS316L
26	Spring retainer	SUS316	SUS316L
27	Spring	SUS316	
28	Adjusting screw	SUS316	SUS316L
29	Adjusting screw lock nut	SUS316	SUS316L
30	Cap	SUS316	SUS316L

Actual Area

The orifice represents the minimum passing area of the Pressure relief valve, using letters and numbers from D to B2 and from 1 to 7. 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 shall use 90% of the actual measured value, the “Throat area” shown in the “FUKUI column” is designed and manufactured 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	10.1	0.397	2.6	0.1	80.1	0.124	71.0	0.11
E	13.4	0.528	3.4	0.134	141.0	0.219	126.5	0.196
F	16.8	0.661	4.2	0.166	221.6	0.343	198.1	0.307
G	21.5	0.846	5.4	0.212	363.0	0.562	324.5	0.503
H	26.8	1.055	6.7	0.264	564.1	0.874	506.5	0.785
1*1	33.3	1.311	8.4	0.328	870.9	1.35	-	-
J	34.3	1.35	8.6	0.338	924.0	1.431	830.3	1.287
K	41	1.614	10.3	0.404	1320.2	2.046	1185.8	1.838
2*1	45.6	1.795	11.4	0.449	1633.1	2.53	-	-
L	51.1	2.012	12.8	0.503	2050.8	3.179	1840.6	2.853
M	57.4	2.26	14.4	0.565	2587.6	4.011	2322.6	3.6
N	63	2.48	15.8	0.62	3117.2	4.83	2800.0	4.34
3*1	68	2.677	17	0.67	3631.6	5.628	-	-
P	76.5	3.01	19.2	0.753	4596.3	7.116	4116.1	6.38
4*1	88.9	3.5	22.3	0.875	6207.1	9.621	-	-
Q	100.5	3.957	25.2	0.99	7932.7	12.3	7129.0	11.05
R	120.9	4.76	30.3	1.19	11480	17.8	10322.6	16
5*1	133	5.236	33.3	1.309	13892	21.53	-	-
T	154.1	6.067	38.6	1.517	18650	28.91	16774.2	26
6*1	155.5	6.122	38.9	1.531	18991	29.43	-	-
V, 7*1	190.5	7.5	47.7	1.875	28502	44.18	-	-
W	228.6	9	57.2	2.25	41043	63.62	-	-
Y	266.7	10.5	66.7	2.625	55864	86.59	-	-
Z	279.9	11.02	70	2.753	61531	95.38	-	-
Z1	304.8	12	76.2	3	72965	113.1	-	-
A	342.9	13.5	85.8	3.375	92347	143.1	-	-
B	381	15	95.3	3.75	114000	176.7	-	-
B2	431.8	17	108	4.25	146430	227	-	-

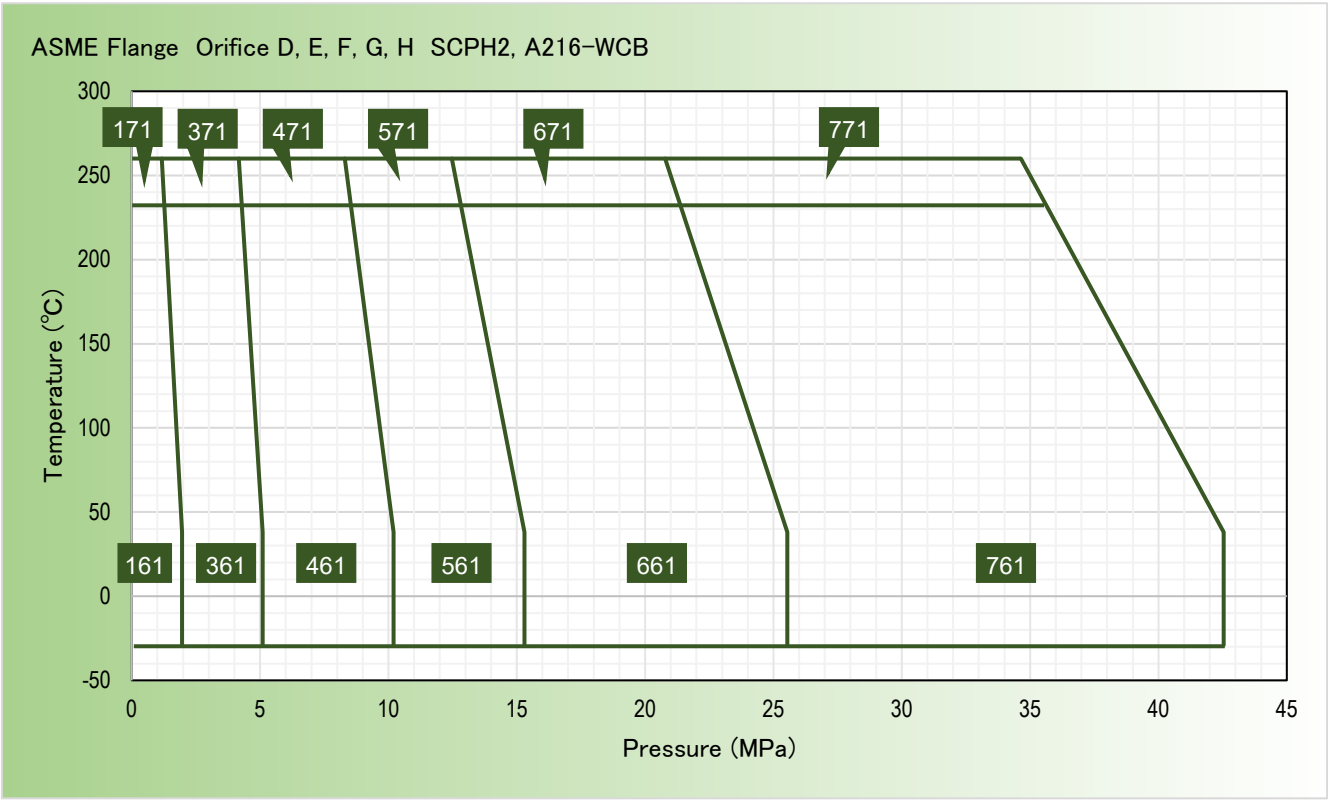
*1 The orifice with a number indicates that it has a two-way outlet.

Pressure–temperature Rating

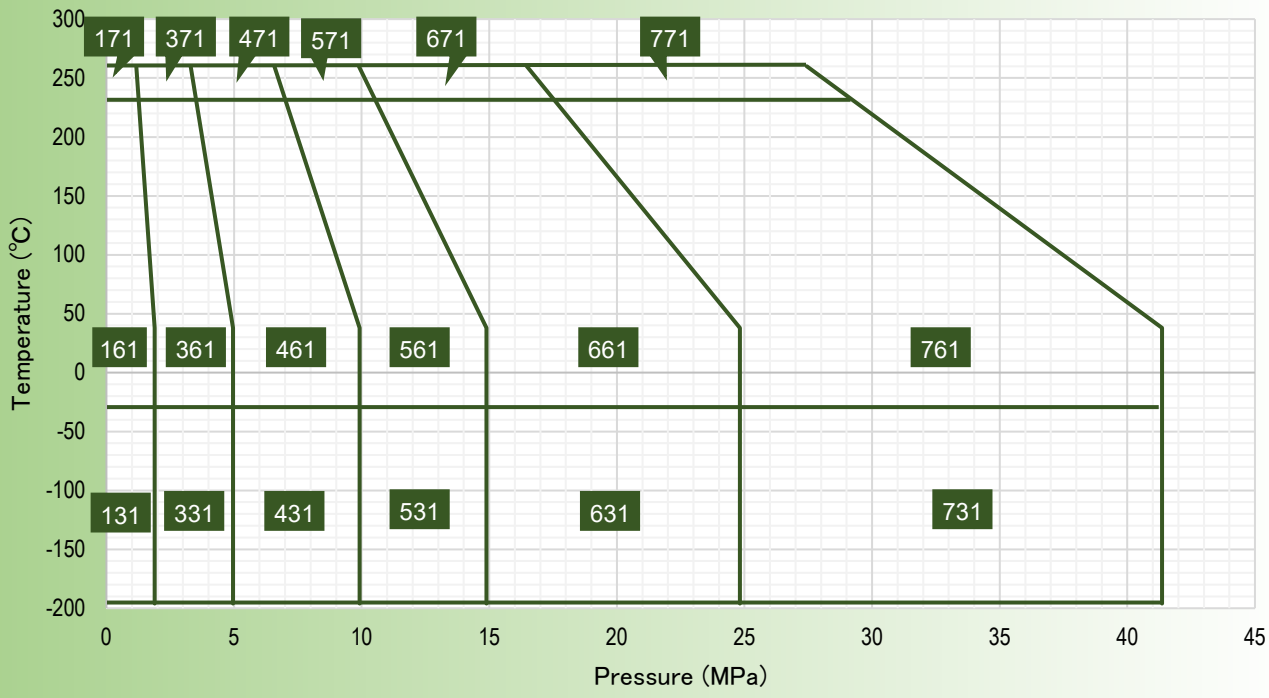
The pressure–temperature rating for the metal seat is shown.

Pressure–temperature Rating ASME B16.5 Flange Orifice D, E, F, G, H								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	6, 7	
SCPH2 A216-WCB	1*D*2 1 1/2*D*2 1*E*2 1 1/2*E*2 1*F*2 1 1/2*F*2 1 1/2*G*3 2*G*3 1 1/2*H*3 2*H3	150	150	1	—	1.96	1.17	1.96
		300		3		5.10	4.17	
		600		4		10.2	8.3	
		900	300	5		15.3	12.47	5.1
		1500		6		25.54	20.78	
		2500		7		42.54	34.64	
SCS14A A351- CF8M		150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.92	9.92	6.58	
		900	300	5	14.89	14.89	9.89	4.96
		1500		6	24.82	24.82	16.47	
		2500		7	41.36	41.36	27.44	

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

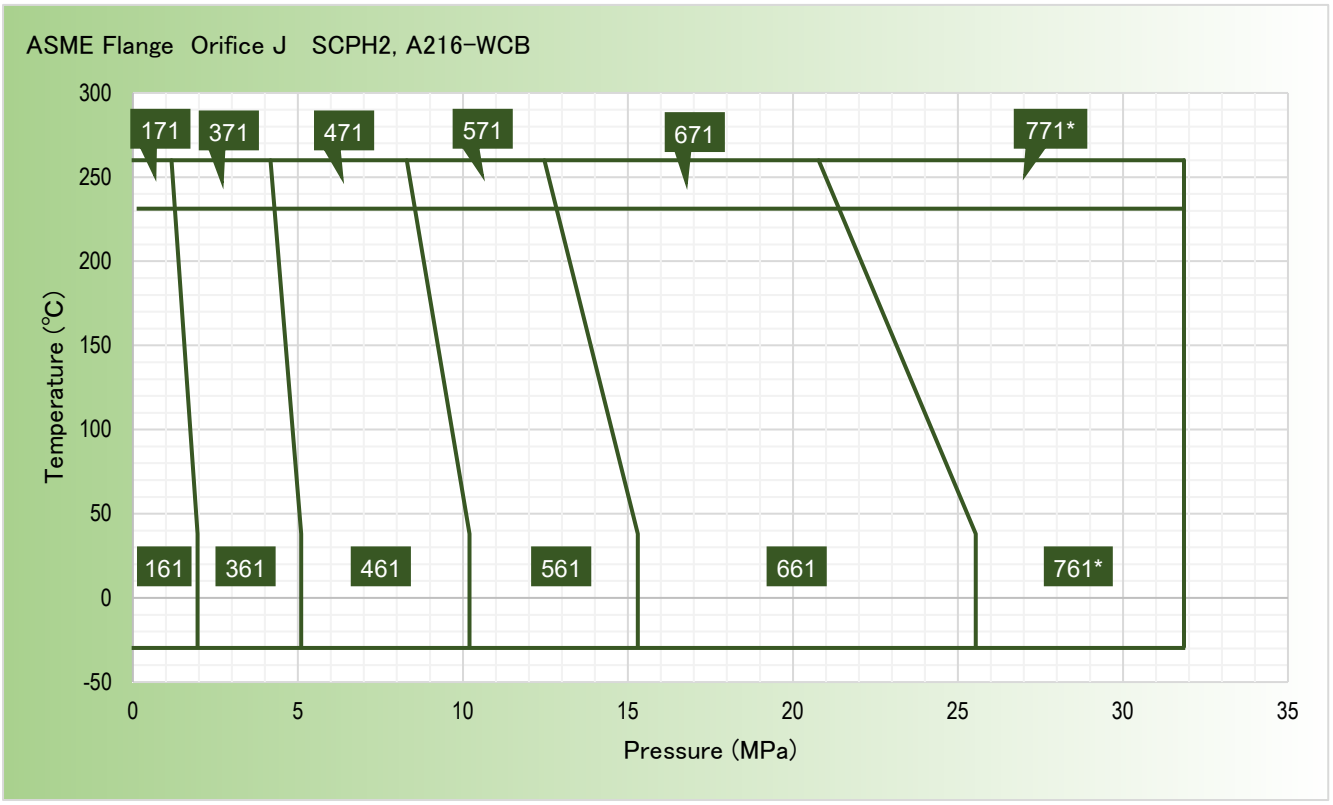


ASME Flange Orifice D, E, F, G, H SCS14A, A351-CF8M

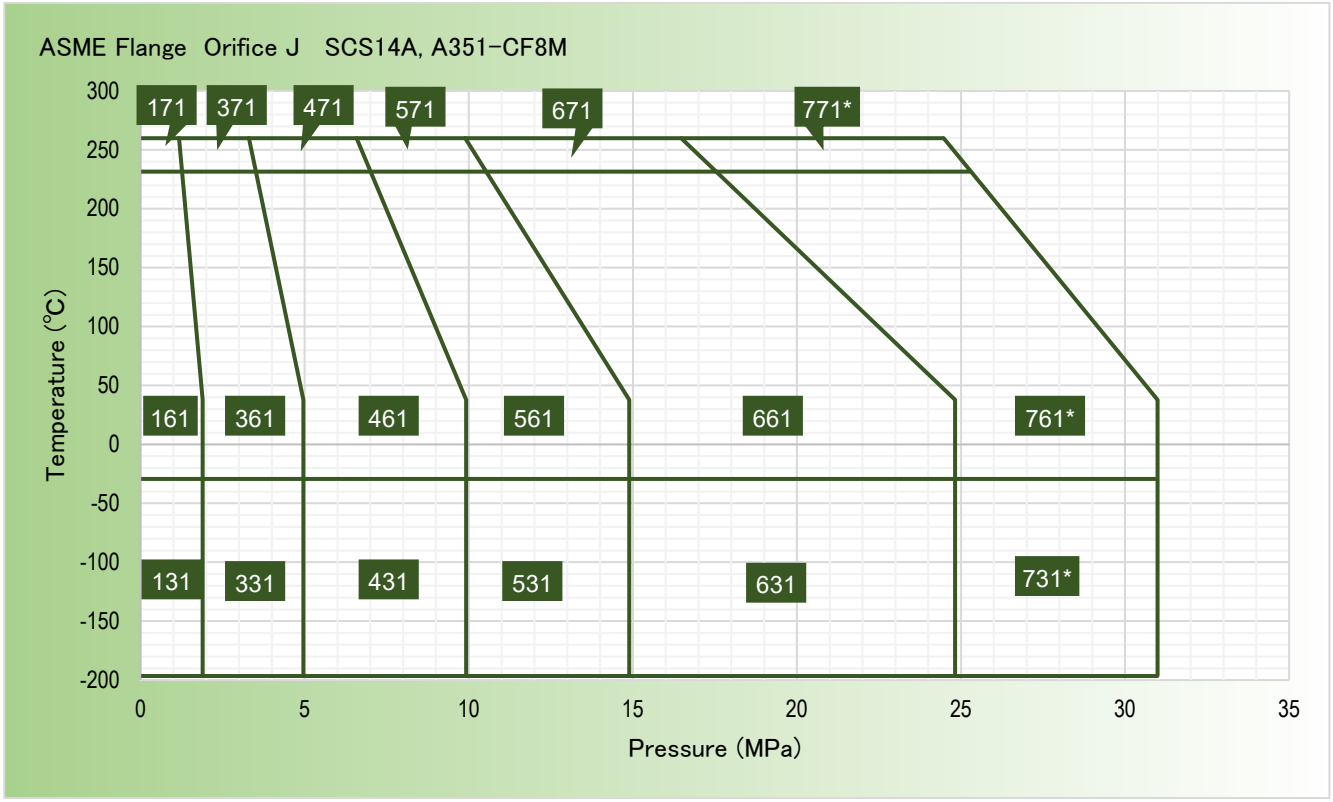


Pressure–temperature Rating ASME B16.5 Flange Orifice J								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	2*J*3	150	150	1		1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		10.2	8.3	
		900	300	5		15.3	12.47	5.1
		1500		6		25.54	20.78	
		2500		7	—	31.85	31.85	
	3*J*4	150	150	1		1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		10.2	8.3	
		900	300	5		15.3	12.47	5.1
		1500		6		25.54	20.78	
SCS14A A351- CF8M	2*J*3	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.92	9.92	6.58	
		900	300	5	14.89	14.89	9.89	4.96
		1500		6	24.82	24.82	16.47	
		2500		7	30.99	30.99	24.47	
	3*J*4	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.92	9.92	6.58	
		900	300	5	14.89	14.89	9.89	4.96
		1500		6	24.82	24.82	16.47	

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



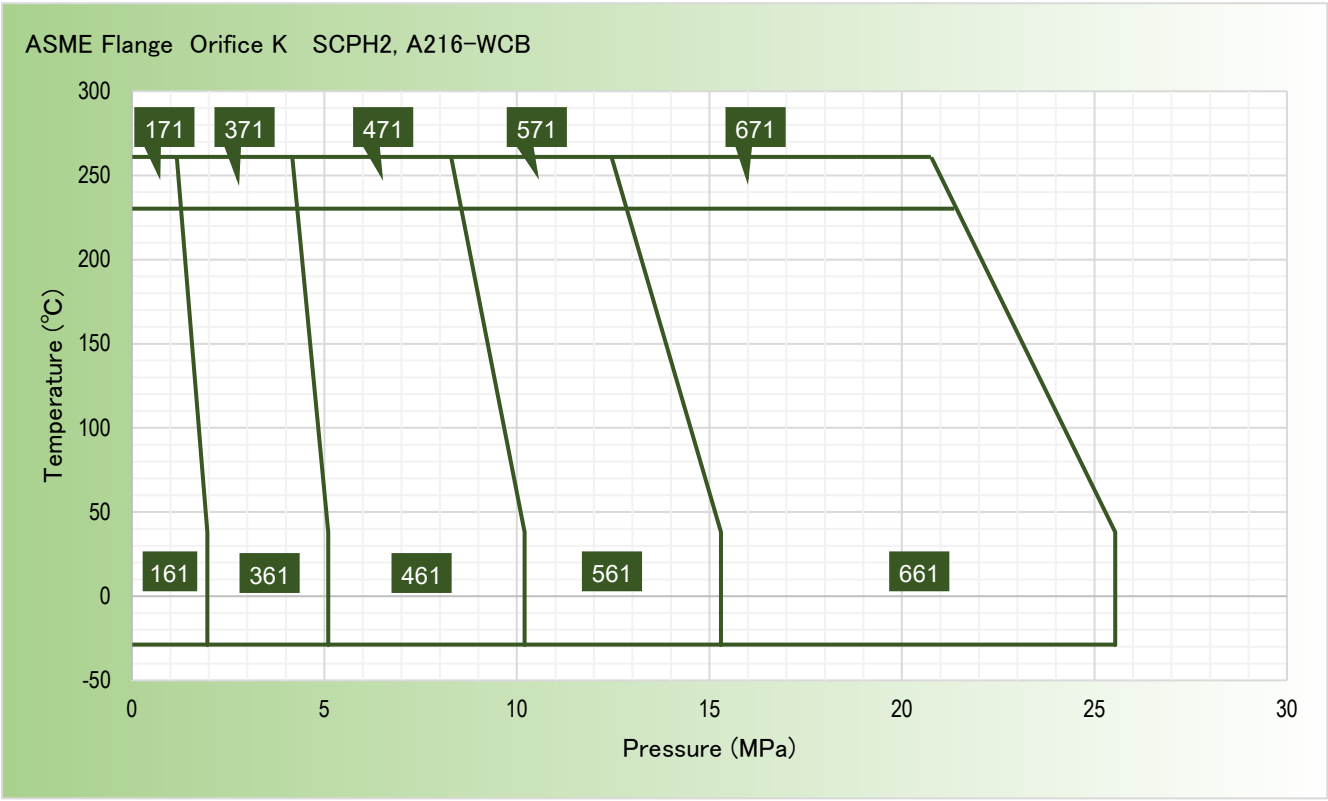
* Excluding size 3*J*4

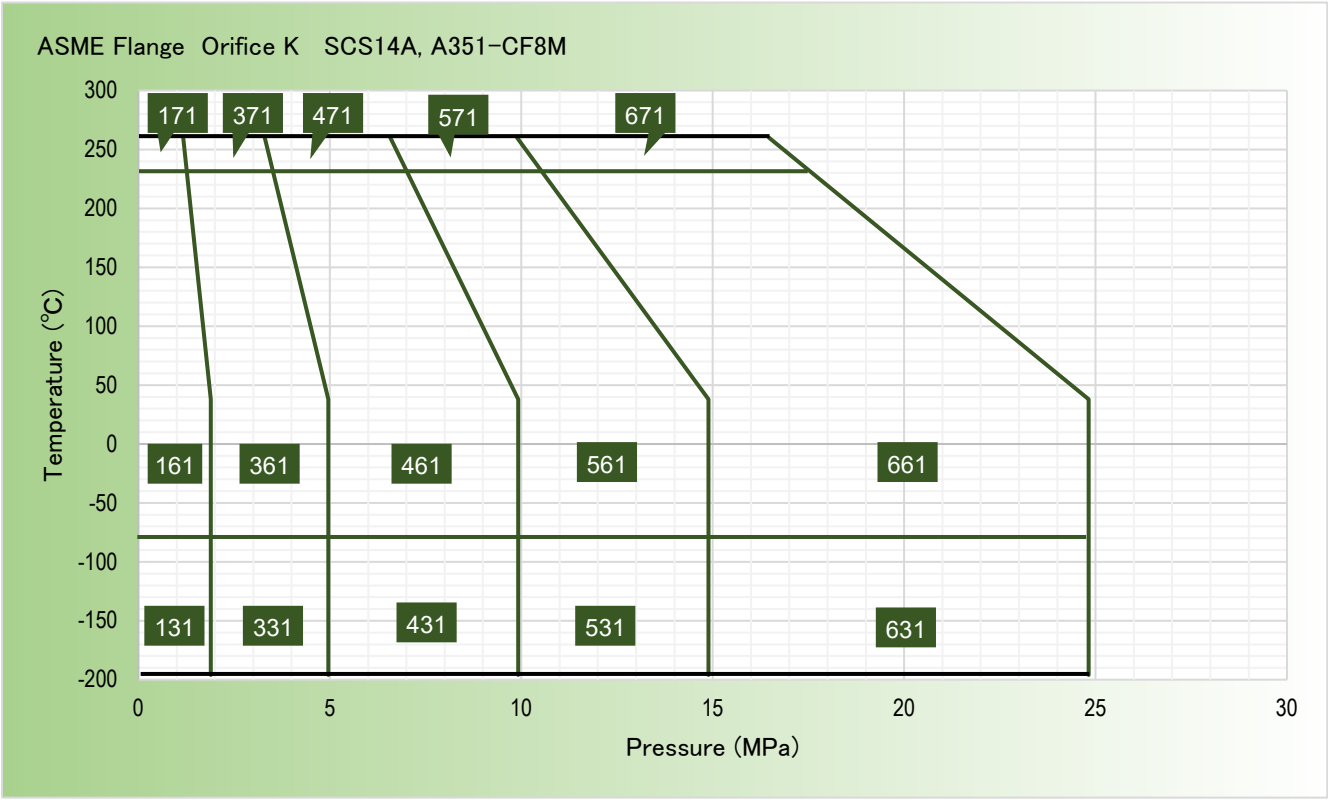


* Excluding size 3*J*4

Pressure–temperature Rating ASME B16.5 Flange Orifice K								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	3*K*4	150	150	1	—	1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		10.2	8.3	
		900	300	5		15.3	12.47	5.1
		1500		6		25.54	20.78	
SCS14A A351- CF8M	3*K*4	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.92	9.92	6.58	
		900	300	5	14.89	14.89	9.89	4.96
		1500		6	24.82	24.82	16.47	

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

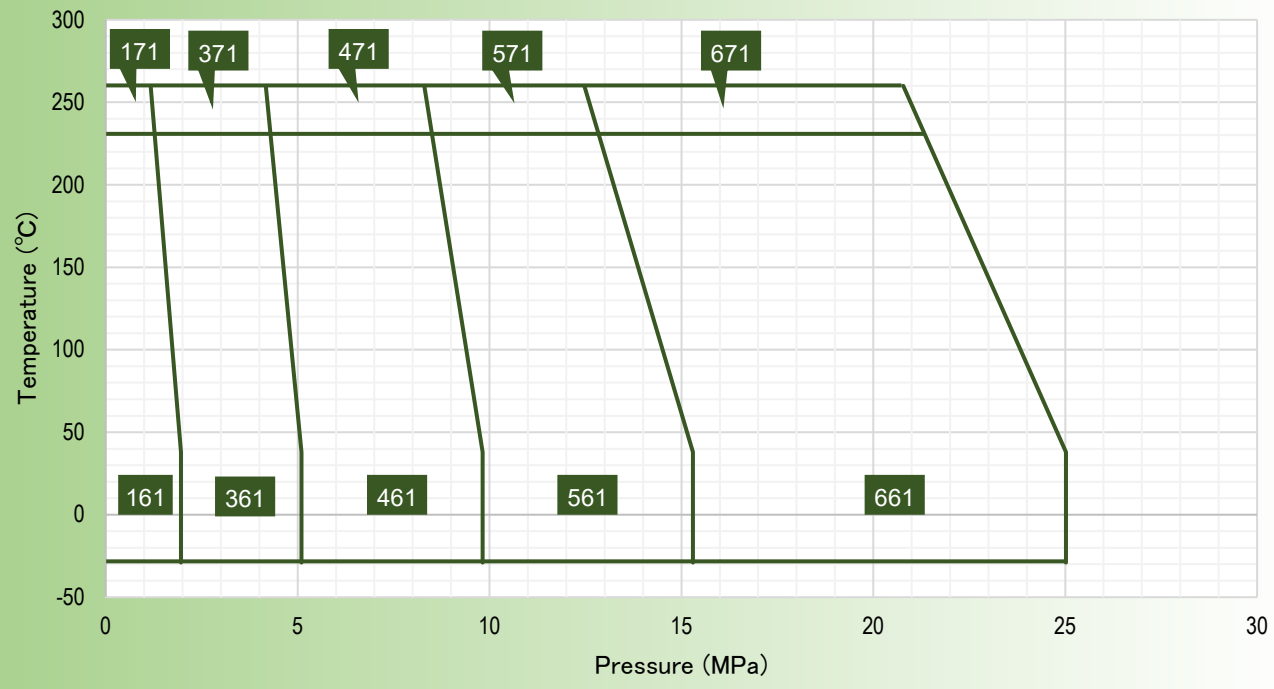




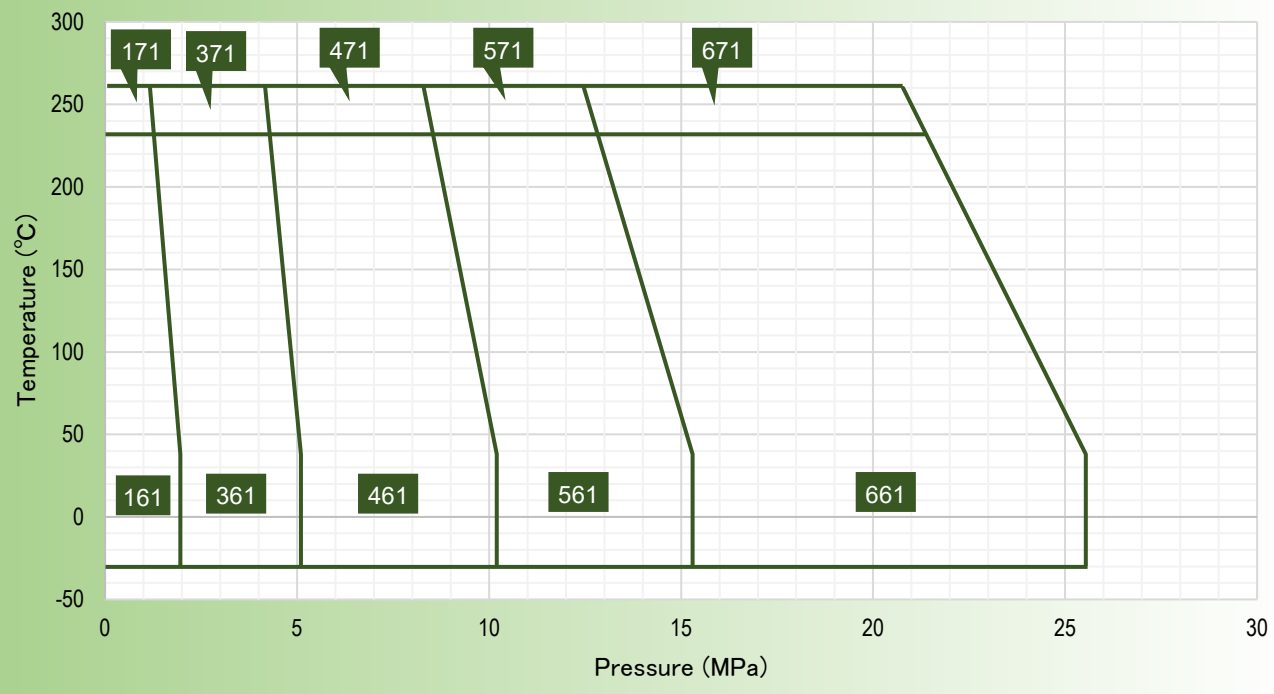
Pressure–temperature Rating ASME B16.5 Flange Orifice L								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	3*L*4	150	150	1	—	1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		9.82	8.3	
		900	300	5		15.3	12.47	5.1
		1500		6		25.02	20.78	
	4*L*6	150	150	1		1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		10.2	8.3	
		900	300	5		15.3	12.47	5.1
		1500		6		25.54	20.78	
SCS14A A351- CF8M	3*L*4	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.48	9.48	6.58	
		900	300	5	14.89	14.89	9.89	4.96
		1500		6	24.33	24.33	16.47	
	4*L*6	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.92	9.92	6.58	
		900	300	5	14.89	14.89	9.89	4.96
		1500		6	24.82	24.82	16.47	

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

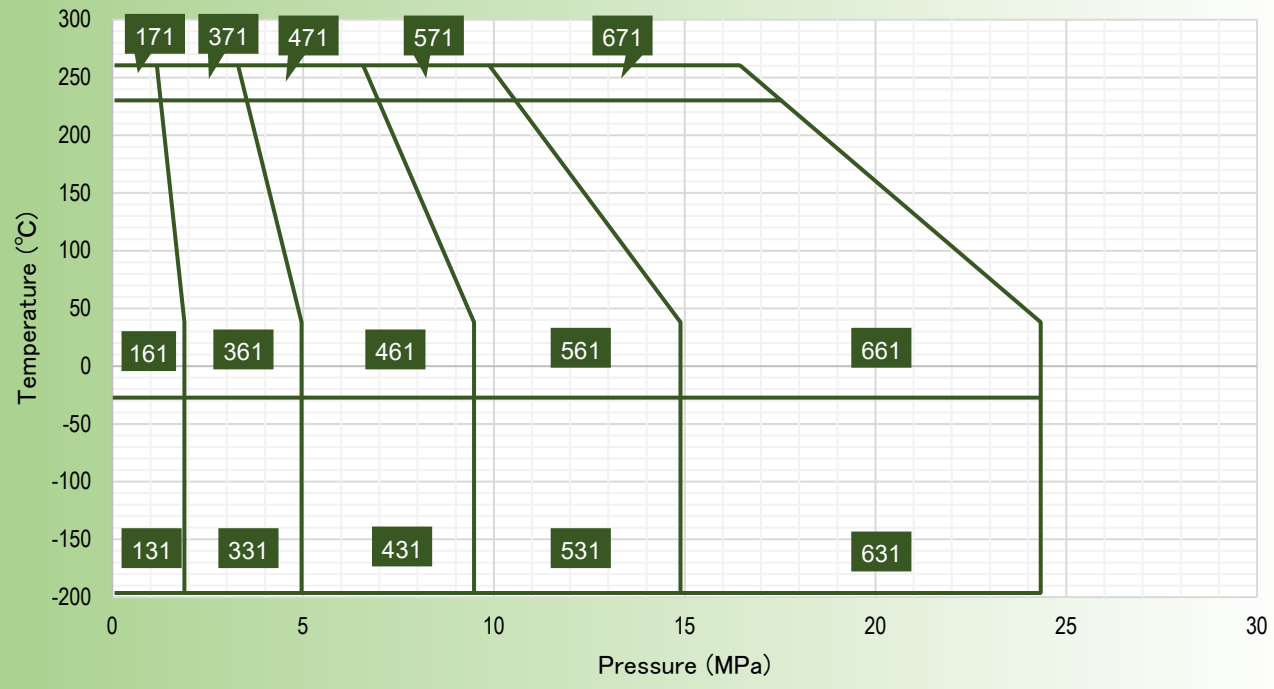
ASME Flange Size 3*L*4 SCPH2, A216-WCB



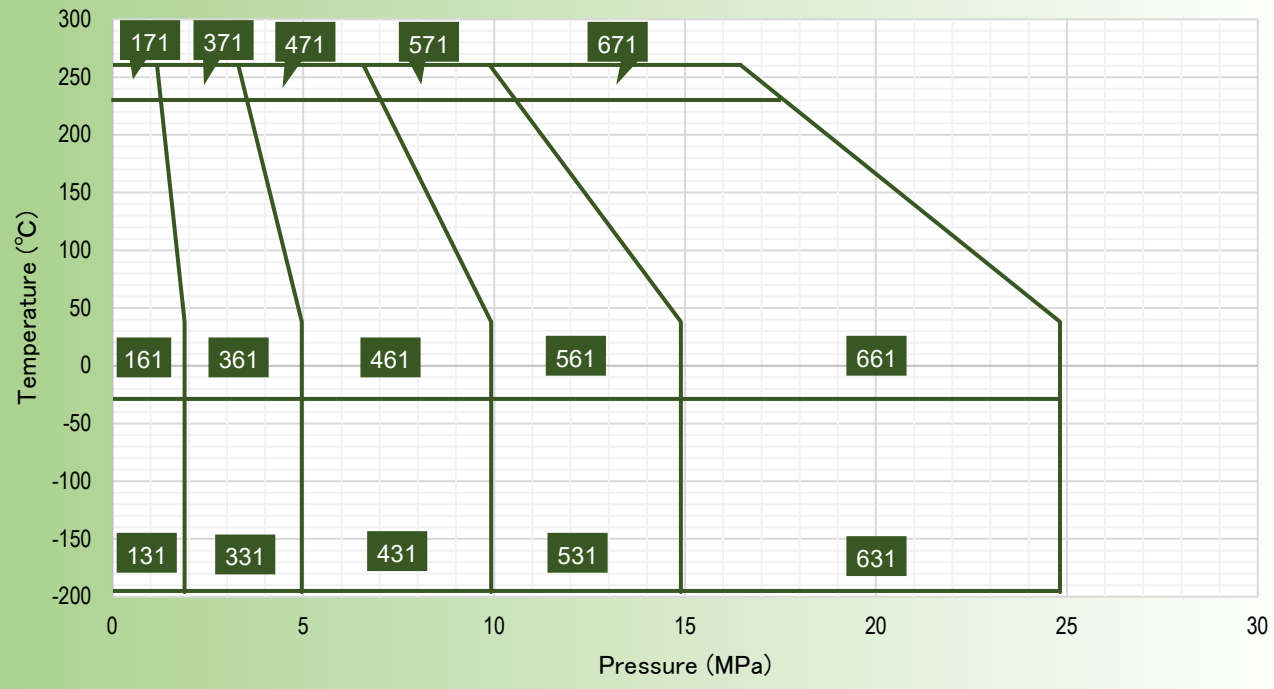
ASME Flange Size 3*L*4 SCPH2, A216-WCB



ASME Flange Size3*L*4 SCS14A, A351-CF8M

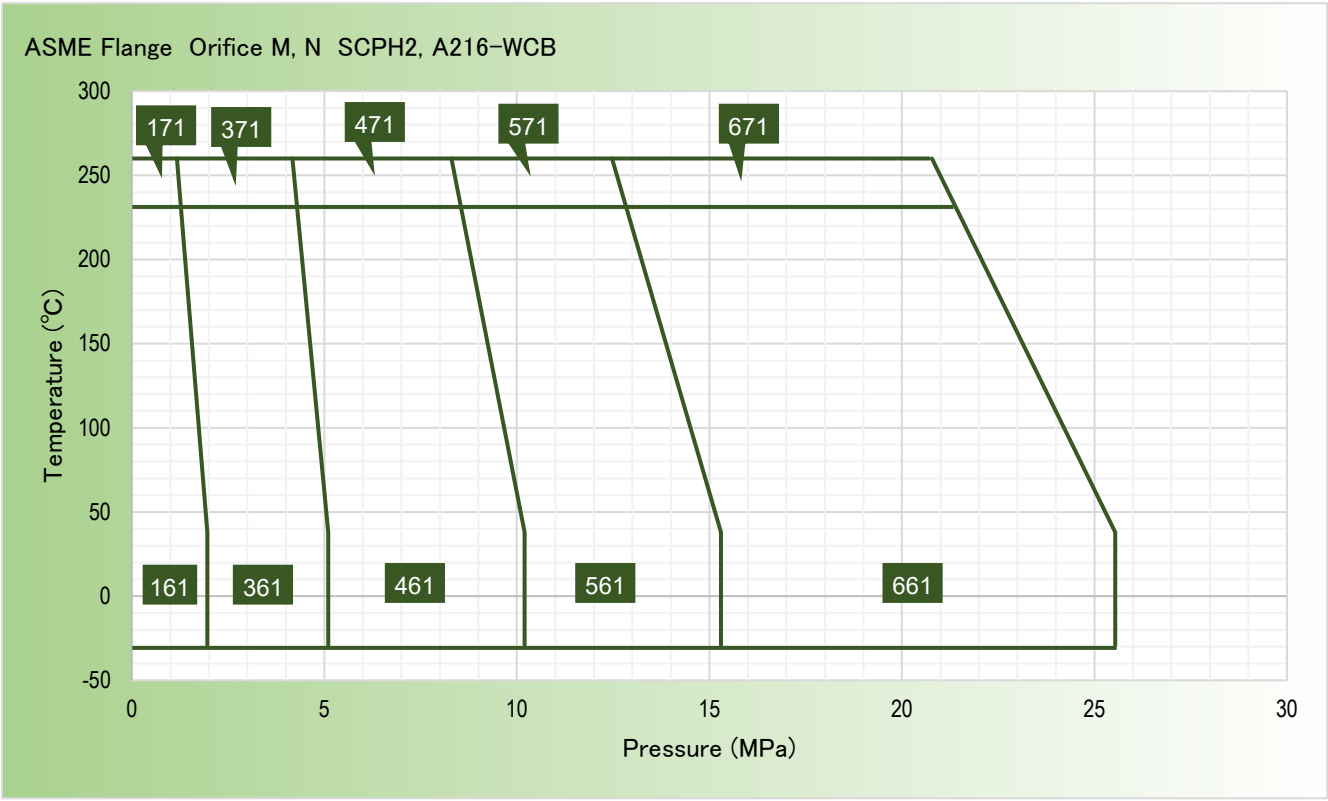


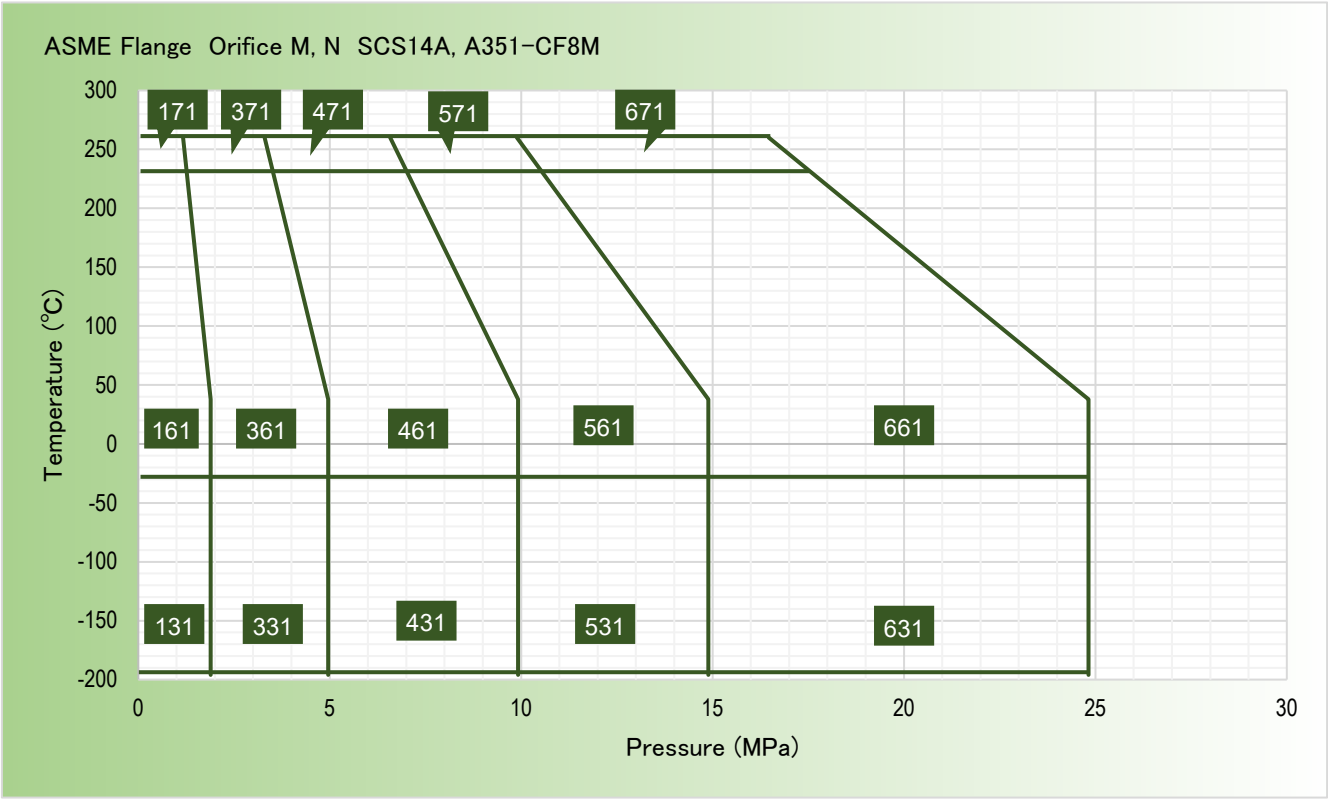
ASME Flange Size4*L*6 SCS14A, A351-CF8M



Pressure–temperature Rating ASME B16.5 Flange Orifice M, N								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	4*M*6	150	150	1	—	1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		10.2	8.3	
		900	300	5		15.3	12.47	5.1
		1500		6		25.54	20.78	
SCS14A A351- CF8M	4*M*6	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.92	9.92	6.58	
		900	300	5	14.89	14.89	9.89	4.96
		1500		6	24.82	24.82	16.47	

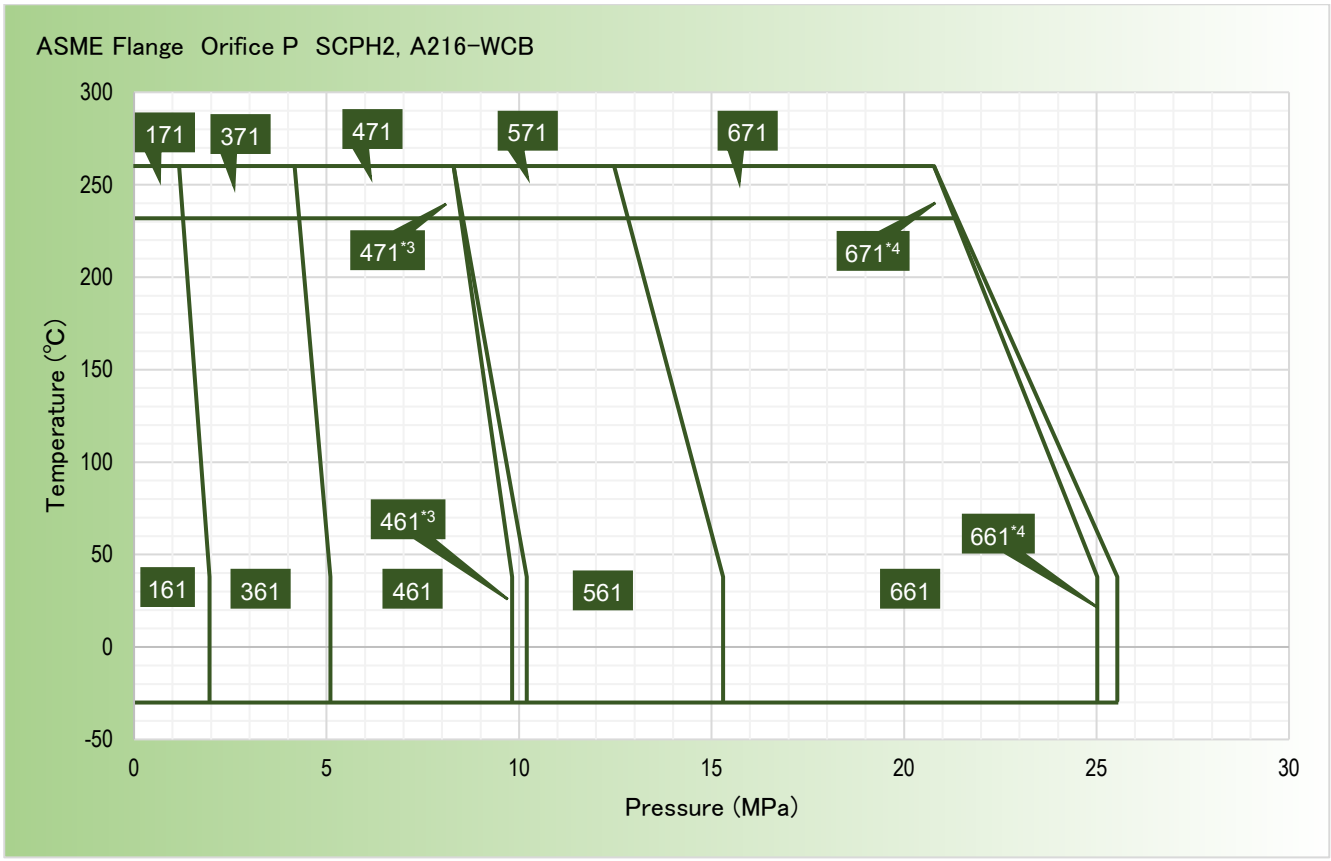
*1 Indicates the pressure class code. *2 Indicates the temperature code.



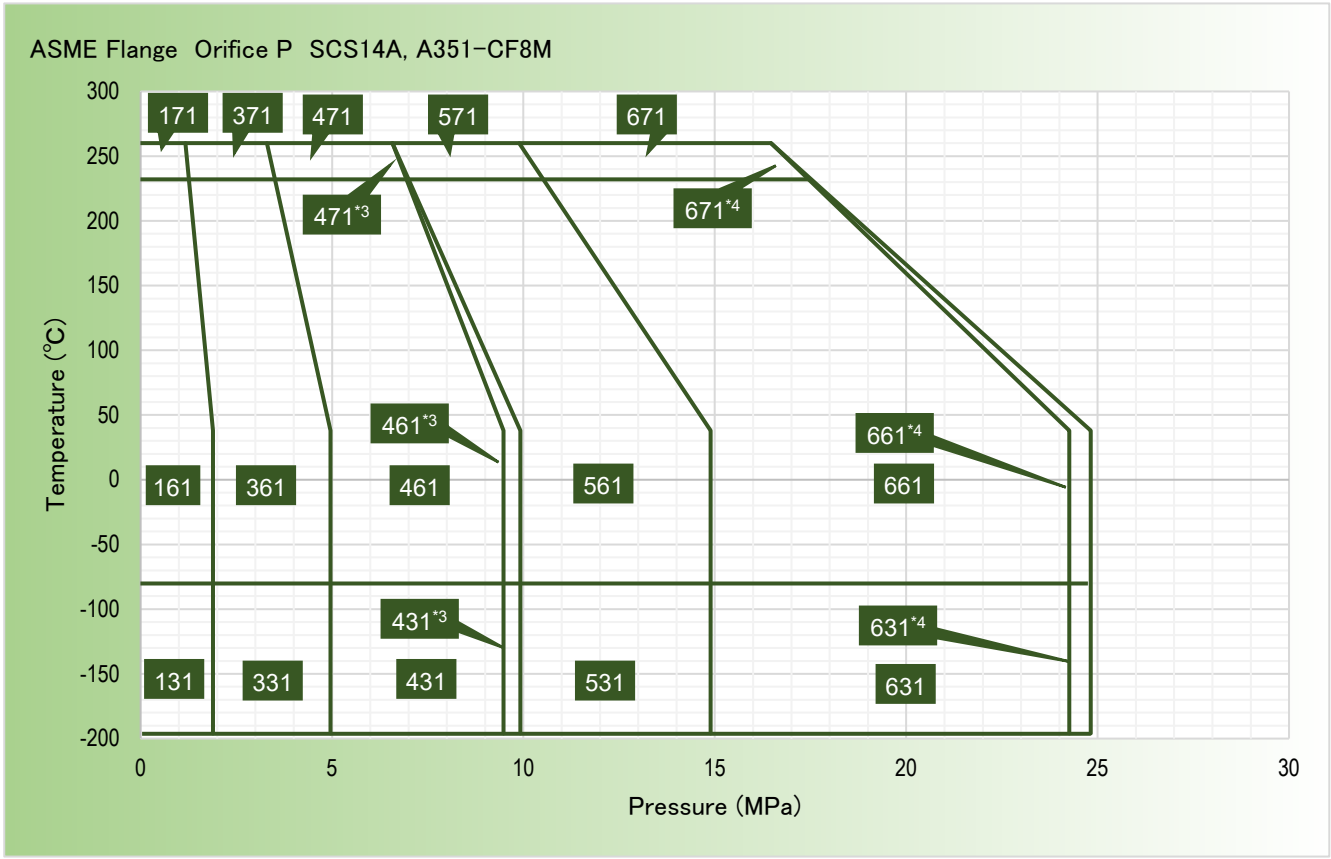


Pressure–temperature Rating ASME B16.5 Flange Orifice P								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	4*P*6	150	150	1	—	1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		9.82	8.3	
			300	4		10.2	8.3	5.1
		900		5		15.3	12.47	
		1500		6		25.02	20.78	
			600	6		25.54	20.78	10.2
SCS14A A351- CF8M	4*P*6	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.48	9.48	6.58	
		600	300	4	9.92	9.92	6.58	4.96
		900		5	14.89	14.89	9.89	
		1500	300	6	24.26	24.26	16.47	
		1500	600	6	24.82	24.82	16.47	9.92

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



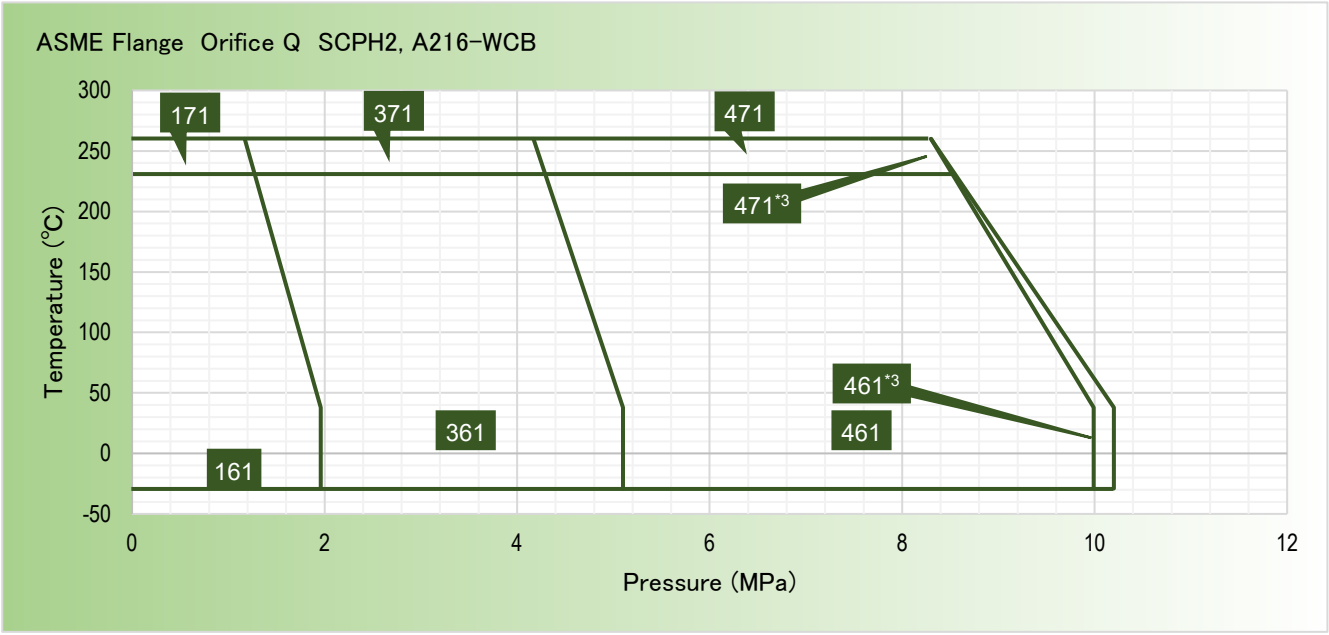
*3 Indicates a case where the outlet flange is Class 300. *4 Indicates a case where the outlet flange is Class 600.



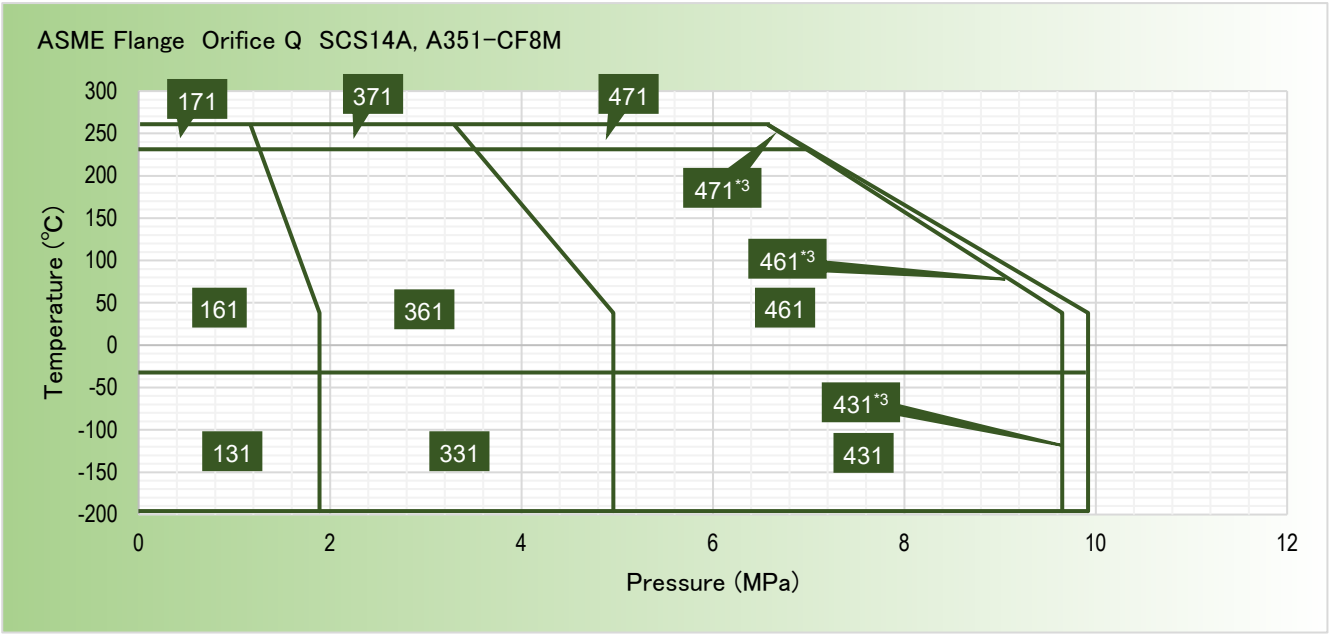
*3 Indicates a case where the outlet flange is Class 300. *4 Indicates a case where the outlet flange is Class 600.

Pressure–temperature Rating ASME B16.5 Flange Orifice Q								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	6*Q*8	150	150	1	—	1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		9.99	8.3	
			300	4		10.2	8.3	5.1
SCS14A A351- CF8M	6*Q*8	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	9.65	9.65	6.58	
			300	4	9.92	9.92	6.58	4.96

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

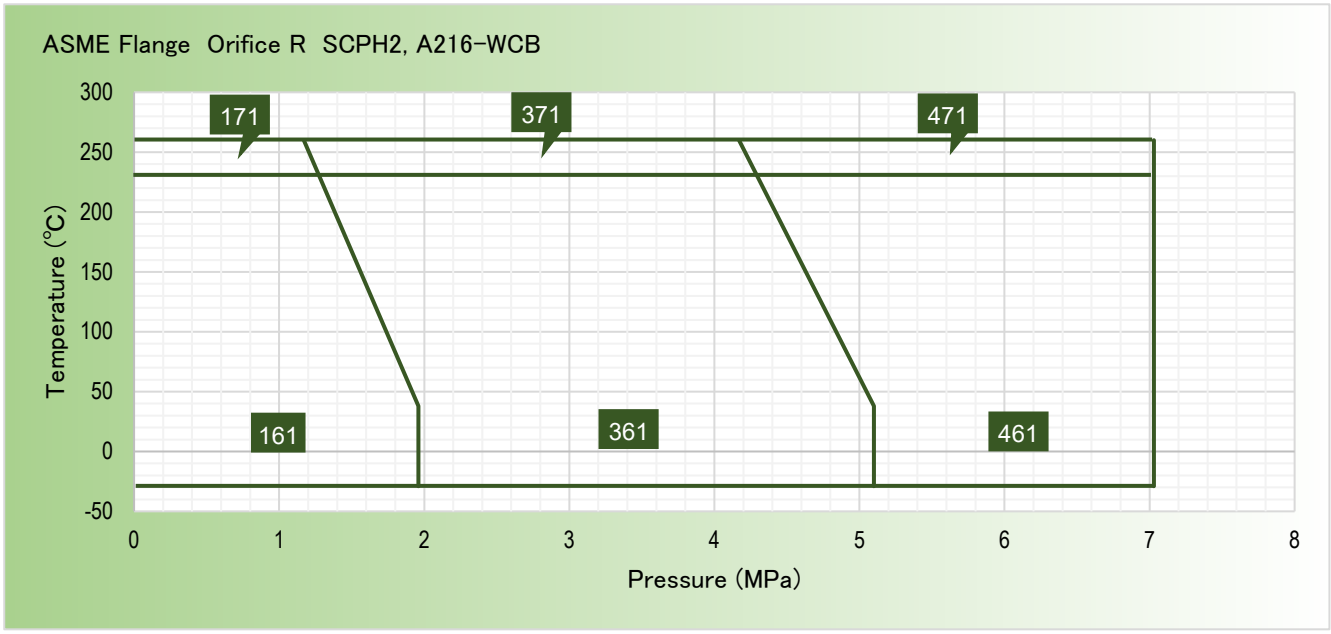


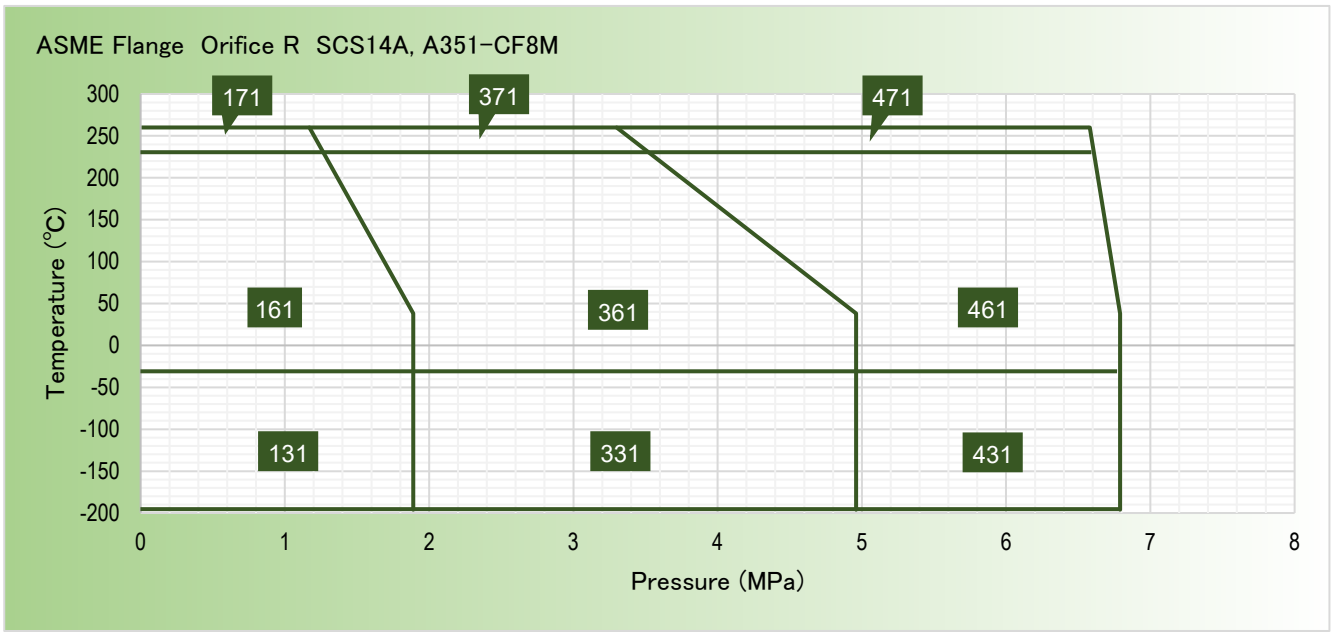
*3 Indicates a case where the outlet flange is Class 300.



Pressure–temperature Rating ASME B16.5 Flange Orifice R								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	6*R*8	150	150	1	—	1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		7.03	7.03	
SCS14A A351- CF8M	6*R*8	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	6.79	6.79	6.58	

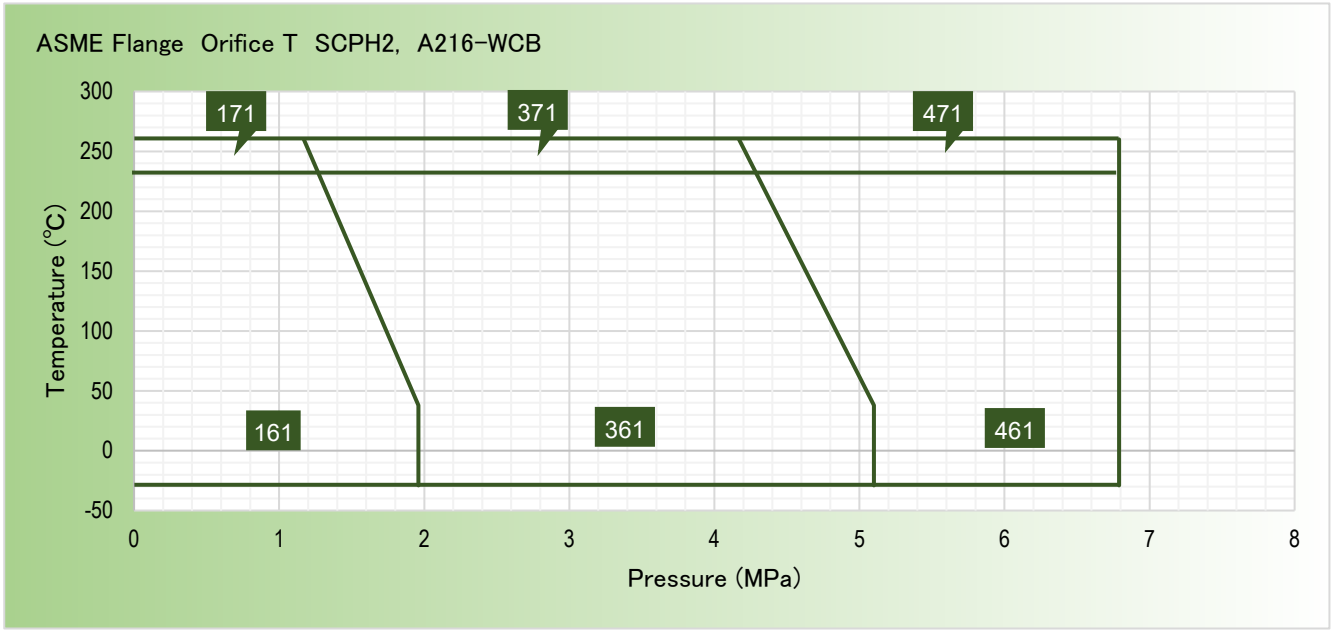
*1 Indicates the pressure class code. *2 Indicates the temperature code.

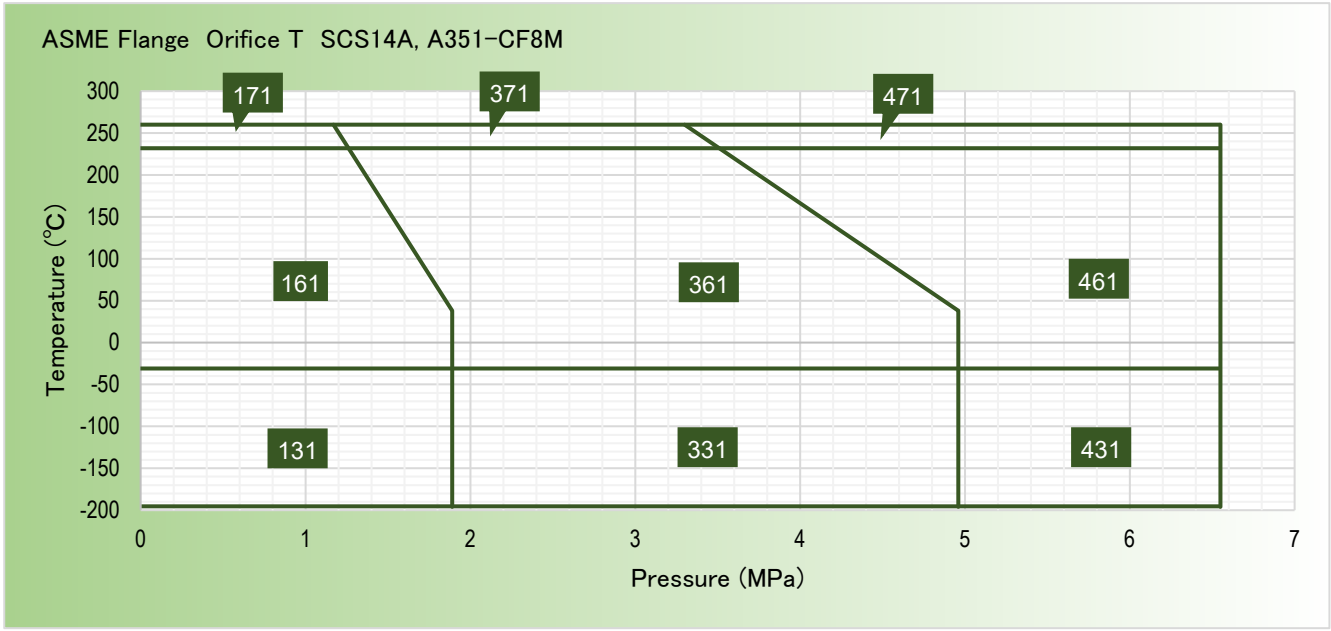




Pressure–temperature Rating ASME B16.5 Flange Orifice T								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	8*T*10	150	150	1	—	1.96	1.17	1.96
		300		3		5.1	4.17	
		600		4		6.79	6.79	
SCS14A A351- CF8M	8*T*10	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	6.55	6.55	6.55	

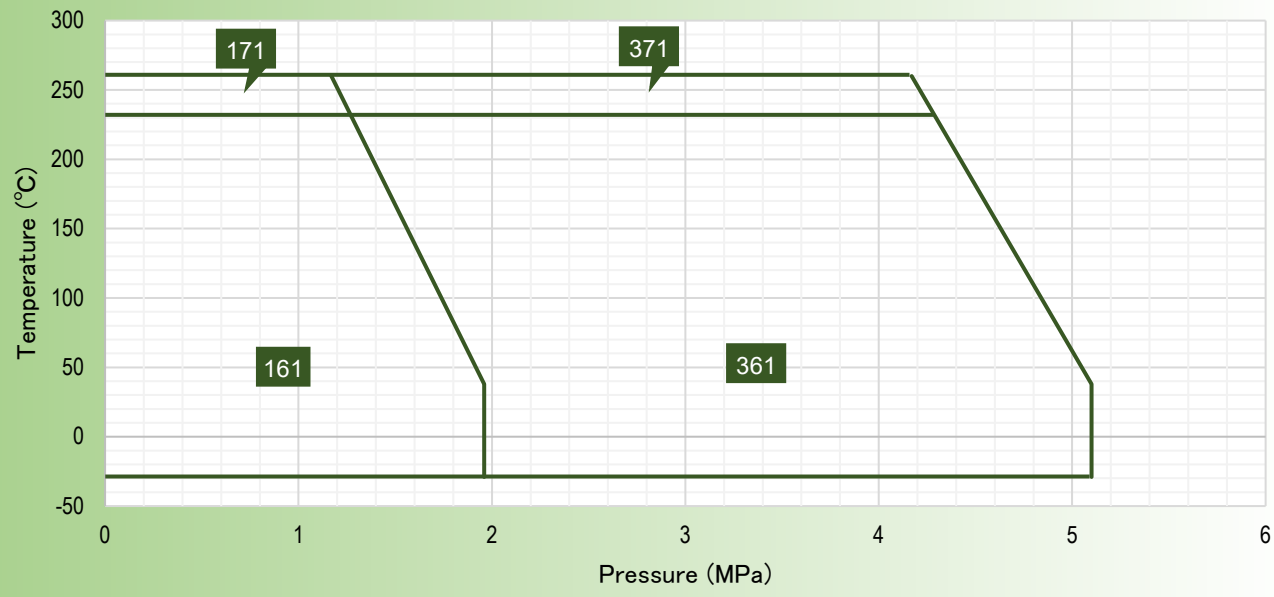
*1 Indicates the pressure class code. *2 Indicates the temperature code.



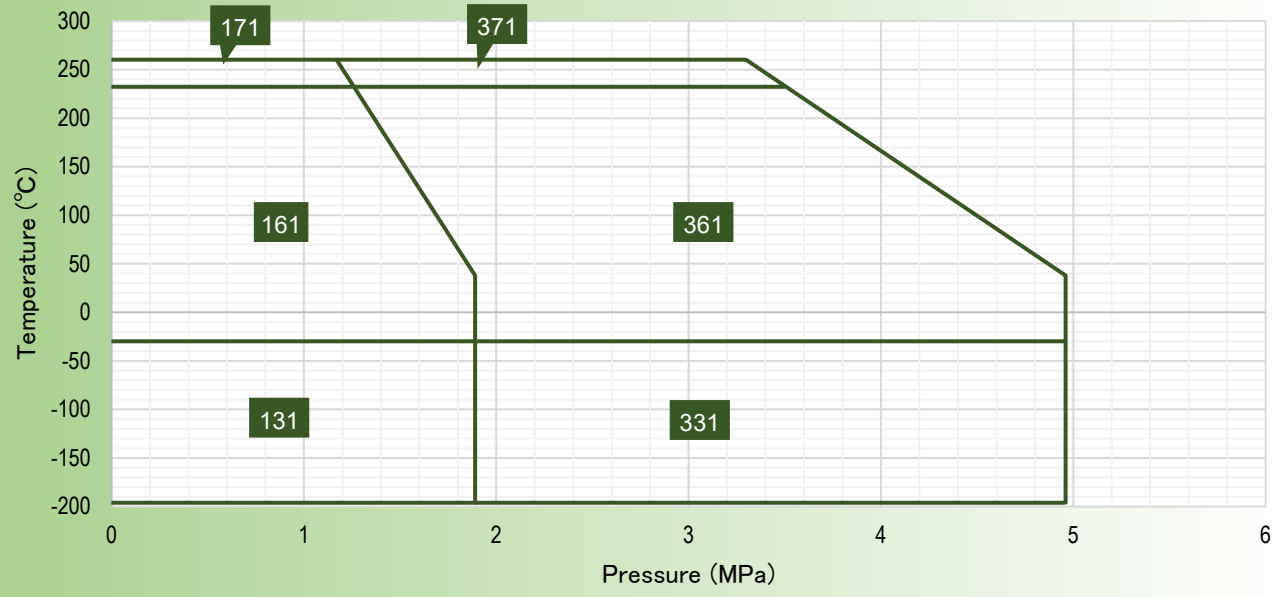


Pressure–temperature Rating ASME B16.5 Flange Orifice V								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	10*V*14	150	150	1	—	1.96	1.17	1.96
		300		3		5.10	4.17	
SCS14A A351- CF8M	10*V14	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.30	

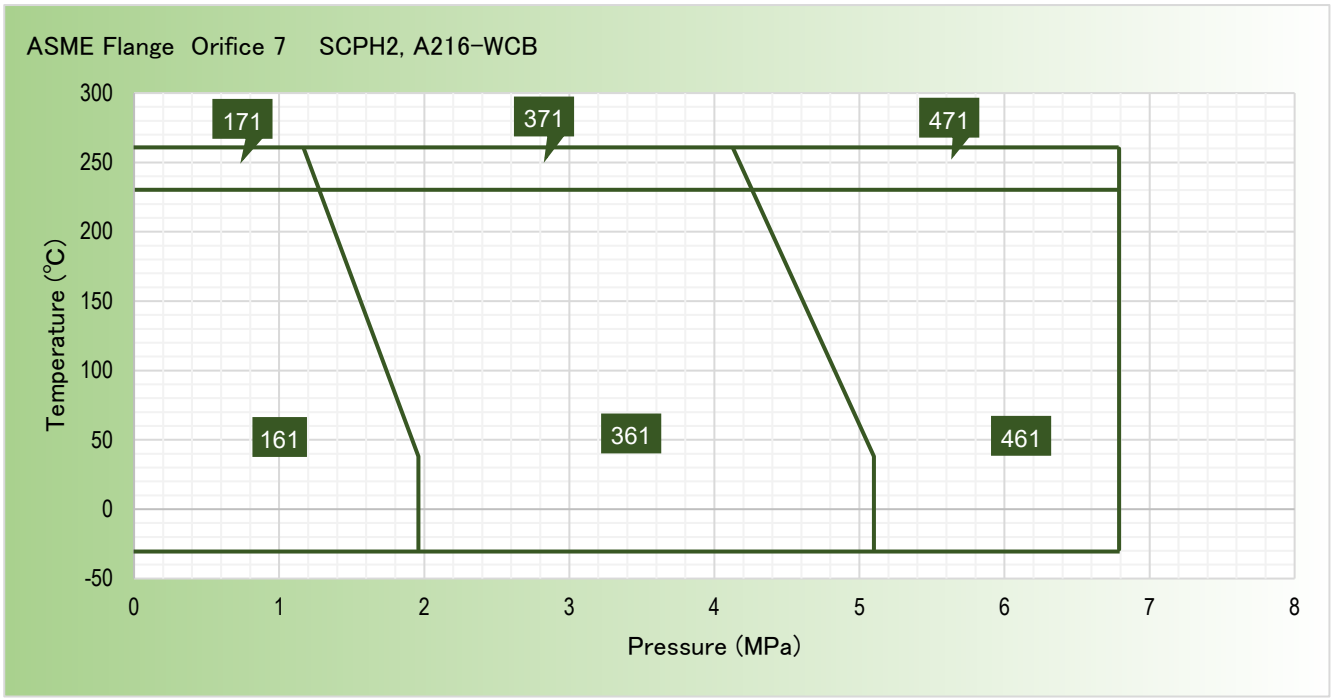
ASME Flange Orifice V SCPH2, A216-WCB

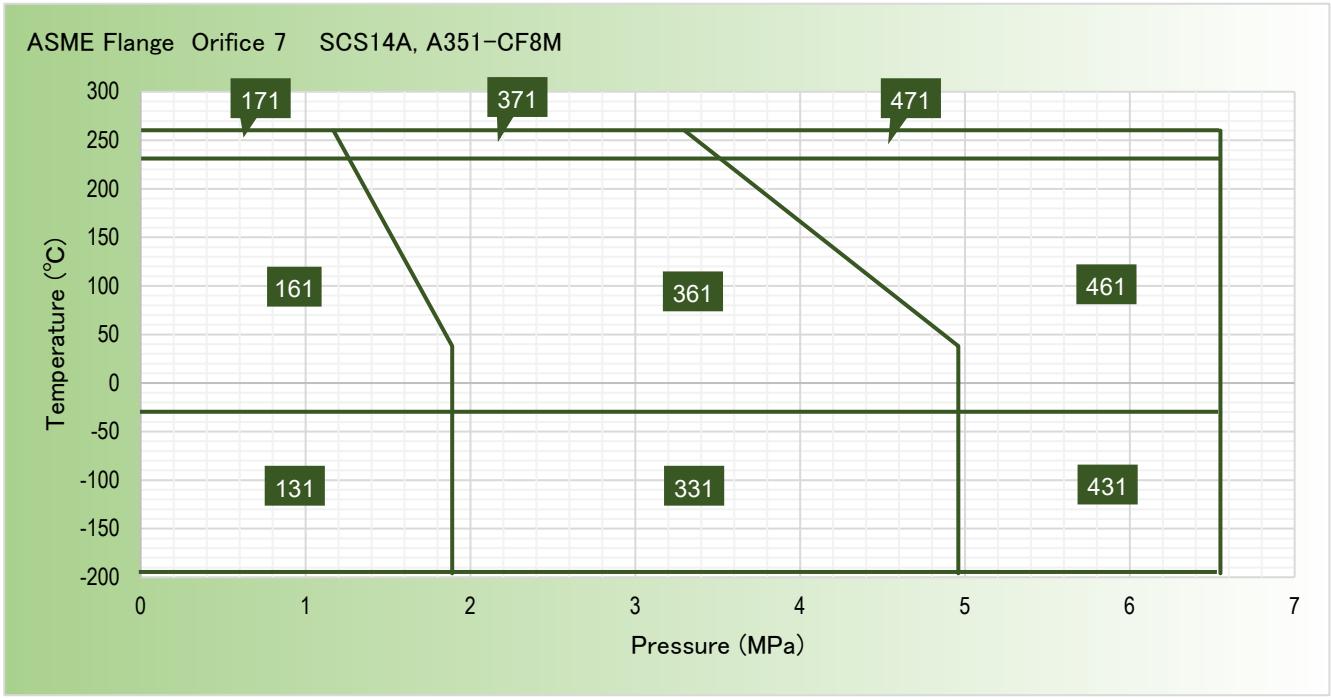


ASME Flange Orifice V SCS14A, A351-CF8M



Pressure–temperature Rating ASME B16.5 Flange Orifice 7								
Material Body	Size	Flange class		Maximum pressure limit (MPa)				Maximum outlet pressure (MPa)
				Temperature T (°C)	-196 ≤ T T < -29	-29 ≤ T T ≤ 38	38 < T T ≤ 260	
		Inlet	Outlet	*1 *2	3	6	7	
SCPH2 A216-WCB	8*7*10	150	150	1	—	1.96	1.17	1.96
		300		3		5.10	4.17	
		600		4		6.79	6.79	
SCS14A A351- CF8M	8*7*10	150	150	1	1.89	1.89	1.17	1.89
		300		3	4.96	4.96	3.3	
		600		4	6.55	6.55	6.55	





O-ring seat pressure–temperature rating											
Temperature (°C)	Maximum pressure limit MPa										
	NBR		FKM		VMQ	EPDM		Kalrez		Echo Perfluor	HNBR
	Hs<90	Hs≥90	Hs<90	Hs≥90	Hs<90	Hs<90	Hs≥90	Hs<90	Hs≥90		
-50	—	—	—	—	4	—	—	—	—	—	—
-45						4	7				
-30	4										7*2
-25										4	7
-20		7									
-15			4	7							
0								4	7		
40											
60											
80											
100											
120	—	—						3.9	6.83		
140						—	—	3.8	6.66		2.22
160								3.71	6.16	2.8	1.53
180					0.66			3.61	6.32	1.2	—
200			3.16*1	5.54*1	0.34			3.52	6.16	0.8	
220			—	—	—			3.25	5.69	0.4	
240								3.02	5.29	—	
260								2.58	4.51		
280								2.09	3.66		
300								1.76	3.08		

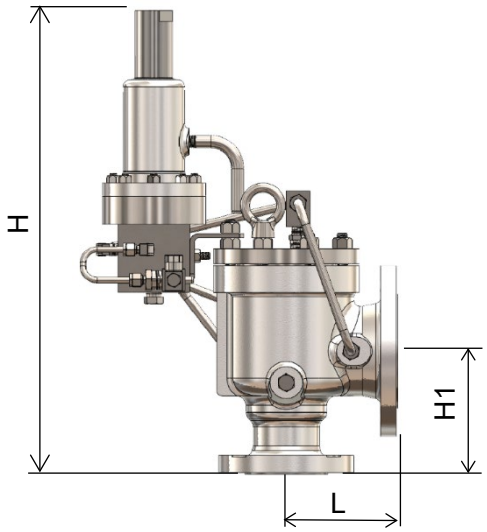
*1 The temperature should be read as 204°C.

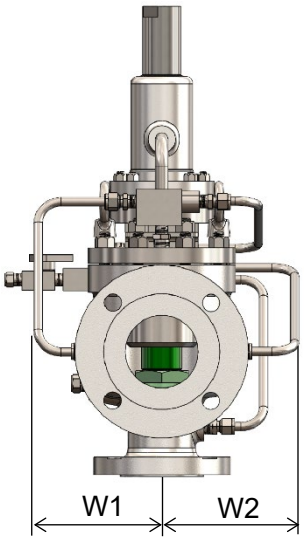
*2 The temperature should be read as −29°C.

Resin seat pressure–temperature rating			
Material	PEEK	VESPEL	PCTFE
Pressure range class	Class 600 (900)*1–2500		Class 300–900
Temperature range (°C)	-50–250	-273–288	-196–120

*1 Indicates a case where the seat diameter is 19 mm.

Dimensions and Weight





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

Size	Flange class		Dimensions								Approximate weight
	Inlet	Outlet	H1	L	P70L, P70M			P70H			
					W1	W2	H	W1	W2	H	
1*D*2 1*E*2 1*F*2	150	150	105	114	130	135	445	—	—	—	25
	300	150	111	114	130	135	450	—	—	—	27
	600	150	111	114	130	135	455	—	—	—	27
	900	300	125	121	130	135	475	125	170	555	35
	1500	300	125	121	—	—	—	125	170	555	35
	2500	300	125	121	—	—	—	125	170	560	37
1 1/2*D*2 1 1/2*E*2 1 1/2*F*2	150	150	124	121	130	135	465	—	—	—	26
	300	150	124	121	130	135	465	—	—	—	29
	600	150	124	121	130	135	465	—	—	—	29
	900	300	149	140	130	135	495	125	170	570	39
	1500	300	149	140	—	—	—	125	170	570	39
	2500	300	149	140	—	—	—	125	170	585	45
1 1/2*G*3 1 1/2*H*3 1 1/2*J*3	150	150	130	124	140	140	500	—	—	—	38
	300	150	130	124	140	140	510	—	—	—	42
	600	150	130	124	140	140	510	—	—	—	42
	900	300	162	171	140	140	555	140	170	635	60
	1500	300	162	171	—	—	—	140	170	635	60
	2500	300	162	171	—	—	—	140	170	645	68
2*G*3 2*H*3 2*J*3	150	150	137	124	140	140	510	—	—	—	39
	300	150	137	124	140	140	515	—	—	—	43
	600	150	137	124	140	140	515	—	—	—	43
	900	300	167	171	140	140	560	140	170	585	66
	1500	300	167	171	—	—	—	140	170	585	66
	2500	300	178	171	—	—	—	140	170	605	74

* For set pressure ≤ 12.5 MPa, refer to P70L and P70M; for set pressure >12.5 MPa, refer to P70H.

ASME, JPI Flange Dimensions and Weight											Units: mm, kg
Size	Flange class		Dimensions								Approximate weight
	Inlet	Outlet	H1	L	P70L, P70M			P70H			
					W1	W2	H	W1	W2	H	
3*J*4 3*K*4 3*L*4	150	150	156	162	150	150	550	—	—	—	55
	300	150	156	162	150	150	565	—	—	—	63
	600	150	162	162	150	150	575	—	—	—	64
	900	300	191	181	150	150	610	150	170	635	92
	1500	300	191	181	—	—	—	150	170	645	106
4*L*6 4*M*6 4*N*6 4*P*6	150	150	197	210	175	175	620	—	—	—	80
	300	150	197	210	175	175	630	—	—	—	93
	600	150	197	210	175	175	645	—	—	—	102
	600	300	249	233	175	175	695	—	—	—	131
	900	300	249	233	175	175	705	175	175	720	141
	1500	300	249	233	—	—	—	175	175	740	161
	1500	600	249	264	—	—	—	175	175	740	189
6*Q*8 6*R*8	150	150	240	241	200	200	710	—	—	—	147
	300	150	240	241	200	200	715	—	—	—	175
	600	150	246	241	200	200	745	—	—	—	210
	600	300	246	265	200	200	745	—	—	—	235
8*T*10	150	150	276	279	235	245	770	—	—	—	218
	300	150	276	279	235	245	790	—	—	—	256
	600	150	297	279	235	245	815	—	—	—	293
10*V*14	150	150	325	345	280	280	845	—	—	—	369
	300	150	342	345	280	280	880	—	—	—	418
8*7*10(Dual)	150	150	278	291	235	350	850	—	—	—	374
	300	150	278	291	235	350	865	—	—	—	406
	600	150	299	291	235	350	905	—	—	—	476

* For set pressure ≤ 12.5 MPa, refer to P70L and P70M; for set pressure >12.5 MPa, refer to P70H.

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