FUKUI PRODUCT LINEUP FOR MARINE SERVICE

WH2

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1. Safety valves for cargo tanks

These safety valves are used for installation on cargo tanks for LNG vessels, LPG vessels, FPSO (Floating Production, Storage and Offloading system), FSO (Floating Storage and Offloading system) and other types of systems and vessels.

As safety valves for marine use, the pilot-operated safety valve structure is adopted because the set pressure is not affected by vibration. The following two types are available:

- PSL-MD Series: Low pressure/ diaphragm type mainly used onboard LNG vessels
- PSL-MP Series: Low pressure/piston type mainly used onboard pressure type LPG vessels
- 2. Safety valves for boiler service

As safety valves for marine boiler use, the following series are available from our lineup.

- SL and SJ series of cast steel make
- SP series of bronze casing make for small package boilers

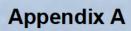
These series valves have been designed and developed for steam service only, featuring firm seat tightness during operation and secure operating performance in case of an emergency.

3. Safety valves for piping

RE series provides high flexibility in service as safety valves for cargo piping and utilities.

4. Classification society

Theses series of safety valves have been type approved from each classification society.



PSL-MD SERIES FUKUI SEISAKUSHO CO., LTD.

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CES

Achievements in the rocket fuel, helium gas, and liquefied gas fields have realized our ideal as a product.



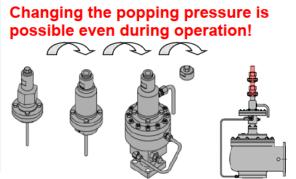
Global warming in recent years, seriously affecting our environment!

Green action on a global level now brings about attention focused on "natural gas" as a clean energy that can replace oil and coal.

The PSL series we offer here is based on FUKUI's hands-on experience and know-how about liquefied gas covering transportation and storage of this "natural gas", thus realizing the use in a harsh environment involving extremely low temperatures and very low pressures.



Features of valves for cargo tanks of liquefied gas vessels



Ordinary safety valves were not easy to change the popping pressure during system operation. However, PSL series allows simple and reliable change of the popping pressure appropriate to the cargo by using aux. setter.

Also meets the IGC code in design.

Accurate operation!

Adopts PTFE diaphragm excellent in durability and corrosion resistance.

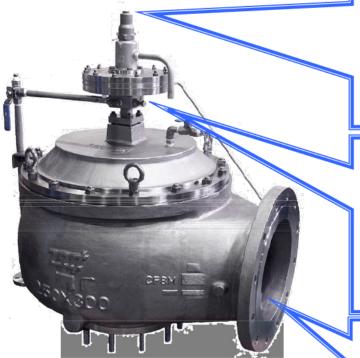
Accommodates all types of cargo, and realizes accurate operation and reduced maintenance costs at the same time.

Employs a flange structure to attain easy installation of a pilot valve, and also as a means for preventing a malfunction from occurring due to loose connection caused by vibration, for example.

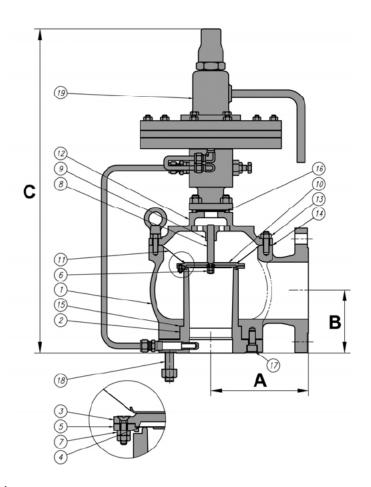
Excellent gastightness

Adopts a membrane seat structure that allows no leaks of cargo from the main valve.

Uses PTFE sealing to prevent deterioration of sealing performance that may occur over years, thus ensuring 100% protection of cargo loaded onboard.



	ſ	PSL-MD	1	3 -	1 6	5 1	- N	S1	<mark>(B)</mark>		
Series	code		Т	Γ.				Т	<u> </u>		
									Cap code		
Pilot valv	ve code								Designation	Des	cription
Designation	Descr	intion							Α	Closed type	
1	Single pilot as single		1						В	Closed type with	test gag
2	Single pilot as multi-s		1								
3									Valve bo	dy material	code
4	Dual pilot as single so Dual pilot as multi-se		1						Designation	Ma	aterial
4	Dual pilot as multi-se	l	i						Designation	JIS	ASTM
Main yeb	ve structure o	ode		1					(Blank)	SCPH2	A216 Gr.WCB
				_					C5	SCPL1	A352 Gr.LCB
Designation	Descr	•	1						S	SCS13A	A351 Gr.CF8
2	Flangeless type wit	h no diaphragm							S1	SCS14A	A351 Gr.CF8M
2	support.								S2	SCS19A	A351 Gr.CF3
									S3	SCS16A	A351 Gr.CF3M
3	Flangeless type wit	h diaphragm	1							30310A	AUT OLUT JW
Ŭ	support						L		Added co	ode	
	•								Designation		cription
Pressure	class code				, 1				Designation		er made of casting
Designation	Pressu	e class							(Blank)	material or none.	ler made of casung
Designation	JIS	ANSI, JPI									ner made of plate
1	10K	150#	1						N	material	her made of plate
2	20K	300#	1								an mode of plate
3	30K	300#							D	material for seale	ner made of plate
			4								ner made of plate
									т		nd other parts are
									· · ·	made of titanium.	nu otner parts are
									Х	With limit switch (
									Ŵ		AIEA)
									vv	Double pilot	
									Inlet con	nection cod	-
									Designation		onnection
									1		ige standard
									2		ge standard
									4		B 2220
											by customer
									5		al connection)
									Tempera	ture class c	ode
									Designation		nperature range
									3		to -101.1°C
									5		to -28.8°C
									6	-28.8	to 125°C

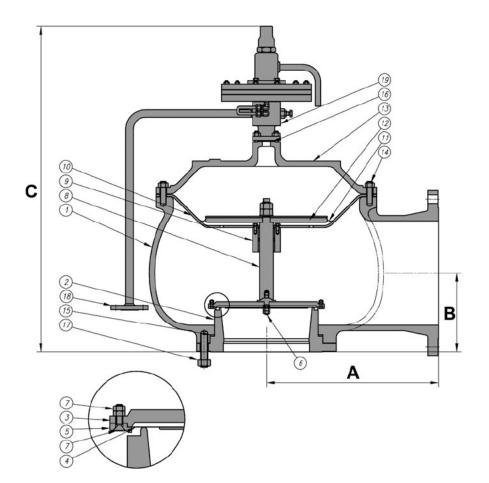


Standard material

	Model code	PSL-MD ()2-()()()-S	PSL-MD ()2-()()()-C5	PSL-MD ()2-()()()-S1
	Temperature range	-196.0 - 125℃	-45 - 125℃	-196.0 - 125℃
1	Body *1	SCS13A	SCPL1	SCS14A
2	Nozzle seat	SUS304 c	or SCS13A	SUS316 or SCS14A
3	Disc	SUS	5304	SUS316
4	Seat	PT	FE	PTFE
5	Disc retainer	SUS	5304	SUS316
6	Disc center nut	SUS	5304	SUS316
7	Retainer bolt & nut	SUS	5304	SUS316
8	Spindle	SUS	SUS316	
9	Guide	SUS	5304	SUS316
10	Upper diaphragm set plate	SUS	SUS316	
11	Diaphragm	PT	FE	PTFE
12	Cover *1	SCS13A	SCS13A	SCS14A
13	Bolt & nut	SUS	5304	SUS316
14	Gasket	PT	FE	PTFE
15	Gasket	PT	FE	PTFE
16	Gasket	PT	FE	PTFE
17	Nozzle seat installation bolt	SUS	5304	SUS316
18	Inlet bolt & nut	SUS	SUS316	
19	Pilot valve	SUS304 o	or SCS13A	SUS316 or SCS14A

*1: Can comply with the material specified by a specific Classification Society. Note that the operating temperature range varies depending on the material standard of the valve body.

Operating temp. rang	1 - 10kPa (0.01 - 0.1bar)											
Dimensions	Dimensione		INLET × OUTLET									
Dimensions		2×2	3×3	4×4	6×6	8×8	10×10					
Orifice area	cm ²	21.647	47.783	82.194	186.265	334.587	479.163					
	Α	150	180	200	315	400	500					
Dimensions (mm)	В	105	115	140	175	200	230					
	С	580	620	700	820	900	975					
Weight (kg)		45	65	100	160	240	380					



Standard material

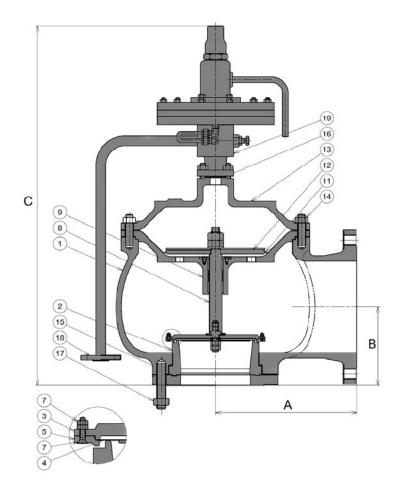
	Model code	PSL-MD()3-()()()-NS	PSL-MD()3-()()()-NC5	PSL-MD()3-()()()-NS1
	Operating temperature range	-196 - 125 °C	-45 - 125 °C	-196 - 125 °C
1	Body *1	SCS13A	SCPL1	SCS14A
2	Nozzle seat	SUS304	or SCS13A	SUS316 or SCS14A
3	Disc	SU	S304	SUS316
4	Seat	P.	TFE	PTFE
5	Disc retainer	SU	S304	SUS316
6	Disc center bolt	SU	S304	SUS316
7	Retainer bolt & nut	SU	S304	SUS316
8	Spindle	SU	S304	SUS316
9	Guide	SU	S304	SUS316
10	Diaphragm cover	SU	S304	SUS316
11	Diaphragm	P.	TFE	PTFE
12	Diaphragm retainer	SU	S304	SUS316
13	Cover *1	SCS13A	SCPL1	SCS14A
14	Bolt & nut	SU	S304	SUS316
15	Gasket	P.	TFE	PTFE
16	Gasket	P.	PTFE	
17	Inlet bolt & nut	SU	SUS316	
18	Remote pickup flange & pipe	SU	S304	SUS316
19	Pilot valve	SUS304	or SCS13A	SUS3016or SCS14A

*1: Can comply with the material specified by a specific Classification Society.

Note that the operating temperature range varies depending on the material standard of the valve body. *2 Inlet and outlet flanges can also be manufactured in accordance with JIS, in which case the nozzle may be a semi-nozzle type.

Operating temp. ran	ge	5 - 250kPa (0.05 - 2.5bar)									
Dimensions	Disconsistent		INLET (ANSI150LB) × OUTLET (ANSI150LB)								
Dimensions		4×6	6×8	8×10	10×12	12×16					
Orifice area	cm ²	82.194	186.265	334.587	479.163	759.644					
	Α	200	315	400	500	560					
Dimensions (mm)	В	140	175	200	230	250					
	С	665	780	860	935	1025					
Weight (kg)		120	200	280	400	600					

PSL-MD ()3-() () ()



Standard material

	Model codel	PSL-MD()3-()()()-S	PSL-MD()3-()()()-C5	PSL-MD()3-()()()-S1
	Operating temperature range	-196 - 125 °C	-45 - 125 ° C	-196 - 125 ° C
1	Body *1	SCS13A	SCPL1	SCS14A
2	Nozzle seat	SUS304 (or SCS13A	SUS316 or SCS14A
3	Disc	SU	S304	SUS316
4	Seat	P	IFE	PTFE
5	Disc retainer	SU	S304	SUS316
6	Disc center bolt		S304	SUS316
7	Retainer bolt & nut	SU	SUS316	
8	Spindle	SU	SUS316	
9	Guide	SC	SCS14A	
11	Diaphragm	P	PTFE	
12	Diaphragm retainer	SU	S304	SUS316
13	Cover *1	SCS13A	SCPL1	SUS316 or SCS14A
14	Bolt & nut	SU	S304	SUS316
15	Gasket	P	IFE	PTFE
16	Gasket	P	IFE	PTFE
17	Inlet bolt & nut	SU	S304	SUS316
18	Remote pickup flange & pipe	SU	S304	SUS316
19	Pilot valve	SUS304	SUS316 or SCS14A	

*1: Can comply with material specified by a specific Classification Society. Note that the operating temperature range varies depending on the material standard of the valve body.
*2 Inlet and outlet flanges can also be manufactured in accordance with JIS, in which case the nozzle may be a semi-nozzle type.

Operating temp. range		5 - 250 kPaG (0.05 - 2.5bar)					
Dimensions		INLET (AN	SI150LB) × OUTLET (ANSI150LB)				
Dimensions	Dimensions		3×4	14×18			
Orifice area	cm ²	21.647	47.783	905.251			
	А	150	180	630			
Dimensions (mm)	В	100	115	300			
	С	550	590	1150			
Weight (kg)		50	80	850			

Appendix B

PSL-MP SERIES

FUKUI SEISAKUSHO CO., LTD.



PSL-MP series is suited for air, gases, vapors and other services at low and medium pressures.

Adopts optimum design as a safety valve for use in cargo tanks of liquefied gas bulk carriers in particular.

Allows minimum installation costs with respect to the IGC code multi-pressure and large popping capacity (discharge coefficient: 0.843).

A good combination of "main valve of simple structure" and "pilot valve with excellent durability" ensures safety of the system.



Features of valves for cargo tanks of liquefied gas bulk carriers



Can change the popping pressure

For ordinary safety valves, the popping pressure could not be changed with ease during system operation. However, PSL-MP series allows simple and reliable change of the popping pressure setting to suit the cargo by using an aux. setter.

Also meets the IGC code design requirements.

Accurate operation!

Adopts metal diaphragm excellent in durability and corrosion resistance.

Accommodates all types of cargo, and also realizes accurate operation and reduced maintenance costs. Employs a flange structure for easy installation of a pilot valve, and also as a means for preventing a malfunction from occurring due to loose connection caused by vibration, for instance.

Excellent safety!

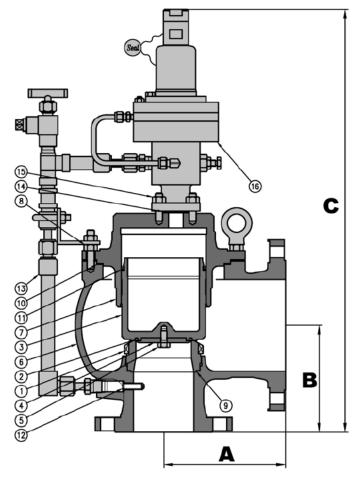
Can be optionally equipped with a protector to avoid possible damage to the valve and piping that may be caused by driftwood or floatage on a stormy day during navigation. Provided with measures against malfunction in any condition.

Superb gastightness!

Adopts the self-sealing structure that allows no leaks of cargo from the main valve. Uses highly corrosion-resistant O-ring for sealing purposes to attain better gastightness.

	Ρ	SL-MP	1	1 -	1	6	1 -	R	S	1 (B)		
Series co	ode											
										Cap code		
Pilot valv			L							Designation		cription
Designation		ription	Γ							Α	Closed type	
	Single pilot as single									B	Closed type with	test gag
2	Single pilot as multi-										des uns et entre la	
3	Dual pilot as single s									valve bo	dy material	aterial
4	Dual pilot as multi-se									Designation	JIS	ASTM
			1							(Blank)	SCPH2	A216 Gr.WCB
N/										C5	SCPL1	A352 Gr.LCB
	ve structure									S	SCS13A	A351 Gr.CF8
Designation	Desc	ription								<u>S1</u>	SCS14A	A351 Gr.CF8M
1	1 only for MP ser	ies								S2	SCS19A	A351 Gr.CF3
	-		1							S3	SCS16A	A351 Gr.CF3M
			_									•
Pressure	class code									Added co	ode	
Designation		re class								Designation		cription
Designation	JIS	ANSI, JPI	1							R	O-R	ing seat
1	10K	150#	1				I			Т	PTFE seat	
2	20K	300#										
3	30K	300#	1							Inlet con	nection cod	0
									Designation	Inlet c	onnection	
									1		nge standard	
									2		ge standard	
										4		B 2220
										5		stomer for special
										v	con	nection

Pressure class code								
Designation	Operating temperature range							
3	- 1 96.0101.1°C							
5	-101.128.8°C							
6	-28.8 - 125°C							



Standard material

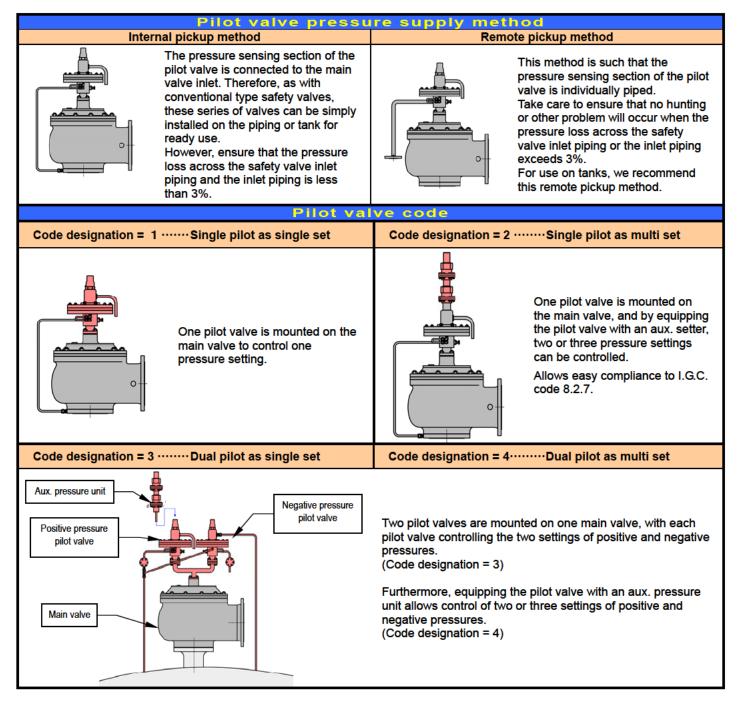
	Model code	PSL-MP()1-()()()-S	PSL-MP()1-()()()-C5	PSL-MP()1-()()()					
	Operating temperature range	-196.0 - 125°C	-45 - 125°C	-28.8 - 125°C					
1	Nozzle seat	SUS304							
2	Seat *2		Perfluoro-elastomer						
3	Disc		SUS304						
4	Seat retainer		SUS304						
5	Retainer bolt		SUS304						
6	Body *1	SCS13A	SCS13A SCPL1						
7	Cover *1		SCS13A						
8	Bolt & nut		SUS304						
9	Gasket		PTFE						
10	Gasket		PTFE						
11	Piston seal		PTFE						
12	Dipper tube	SUS304							
13	Supply pipe	SUS316/SUS304TP							
14	Gasket	PTFE							
15	Bolt & nut	SUS304							
16	Pilot valve		SUS304						

*1: Can comply with the material specified by a specific Classification Society. Note that the operating temperature range varies depending on the material standard of the valve body.

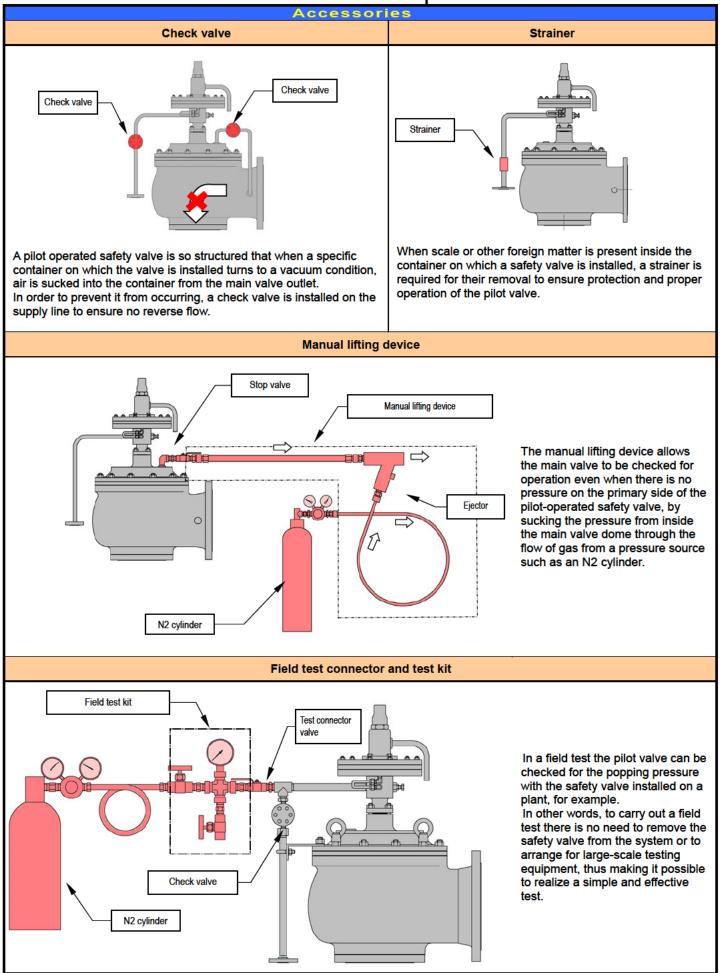
*2 Can also accommodate PTFE seats.

Operating temp. rang	Operating temp. range			0.1 - 2.0 MPaG						
Dimensions	Dimensions		ANSI150LB	X OUTLET (ANSI150LB)						
Dimensions		2×3	3×4	4×6	6×8	8×10				
Orifice area	cm ²	19.634	44.178	71.63	153.938	254.469				
	Α	135	175	200	280	310				
Dimensions (mm)	В	125	160	175	220	240				
	С	610	680	720	830	900				
Weight (kg)		50	70	110	170	250				

PSL-MD/MP Common Specifications



PSL-MD/MP Common Specifications



SL/SJ SERIES FOR STEAM SERVICE FUKUI SEISAKUSHO CO., LTD.

SJ/SL series safety valves have been developed for steam service to meet the Rules for the Survey and Construction of Steel Ships (NK) and the Rules and Regulations of those classifications societies such as LRS.

The SJ/SL series are designed to endure harsh operating conditions involving high temperatures and high pressures, in terms of structure and material.

In case of an emergency under a tough operating condition, safety valves must operate to quickly discharge an extra pressure to protect the pressure equipment from the risk of explosion. They also need gastightness good enough to permit no leaks of fluid from pressure equipment.

Thus, safety valves must play a role of meeting these two conflicting requirements at the same time. However, only the force of the spring built in the safety valve must cope with this tough problem.

In order to solve this problem, we adopt the disc structures called "feather lip disc" and "thermo lip disc" that are made by forming the seat tip to be lip shaped, followed by high-precision machining to provide excellent flexibility in property so that accurate operating and secure sealing characteristics will be drawn forth by utilizing the fluid temperature and pressure.

In addition, we dedicate efforts to create reliable springs, spindles and other products into the market by making full use of our longstanding experience/know-how and achievements so far made.

Yoke

SJ/SL100 to 300 series adopt a yoke structure. The structure with a spring installed in the yoke promotes efficient air cooling so that steam heat does not affect the spring at the time of valve operation.

Spring

A cylindrical coil spring of high dimensional accuracy in which the flexibility index is maintained at constant irrespective of pressure, and eccentric load is corrected.

For the spring material, alloy steel is used because of its excellent fatigue resistance, workability, and hardenability.

Operation adjustment mechanism

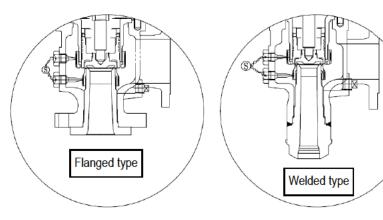
The lower adjusting ring equipped on the upper edge of the nozzle seat is a means for making fine adjustments of a popping action at its initial stage.

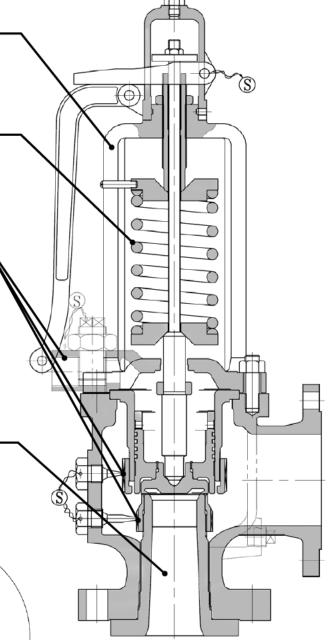
The upper adjusting ring is provided on the lower part of the guide as a blowdown adjusting mechanism.

In addition our back pressure adjusting mechanism is for blowdown adjustment and it is such that the back pressure adjusting needle or back pressure adjusting cock equipped on the yoke is used to control the back pressure that occurs at the back of the disc when the safety valve starts popping.

Nozzle seat

The nozzle seat adopted is so structured that an integral full nozzle is screwed in the valve body to fix in position, with the lower section seal-welded. The nozzle seat material used is carbon steel, forged steel or low alloy forged steel that are all high in safety, and the edge seat section coming in contact with the disc is clad with stellite for surface hardening.





Technology for enhancing product reliability (SL400)

Yoke

SL400 type series adopts a yoke structure. The structure with a spring installed in the yoke allows efficient air cooling so that steam heat does not affect the spring at the time of valve operation.

Spring

A cylindrical coil spring of high dimensional accuracy in which the flexibility index is maintained at constant irrespective of pressure, and eccentric load is corrected. For the spring material, alloy steel is used because of its excellent fatigue resistance, workability, and hardenability.

Operation adjustment mechanism

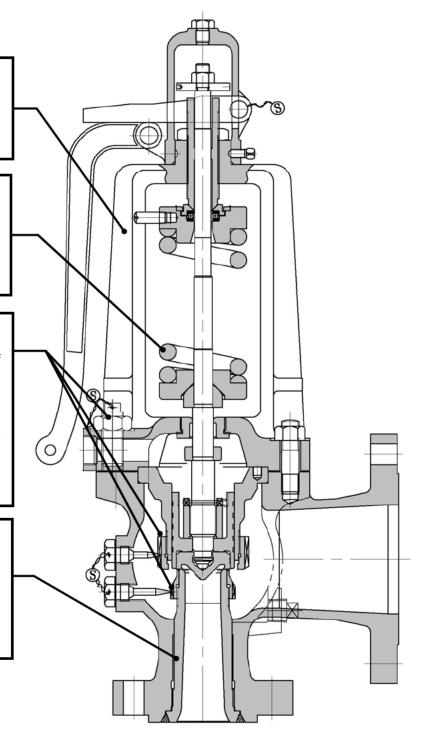
The lower adjusting ring equipped on the upper edge of the nozzle seat is a means for making fine adjustments of a popping action at its initial stage.

The upper adjusting ring is provided on the lower part of the guide and it is a blowdown adjusting mechanism. Our back pressure adjusting mechanism is for blowdown adjustment and it is such that the back pressure adjusting needle equipped on the yoke is used to control the back pressure that occurs at the back of the disc when the safety valve.

Nozzle seat

The nozzle seat adopted is so structured that an integral full nozzle is screwed in the valve body to fix in position, with the lower section seal-welded.

The nozzle seat material used is carbon steel, forged steel or low alloy forged steel that are all high in safety, and the edge seat section that comes in contact with the disc is clad with stellite for surface hardening.

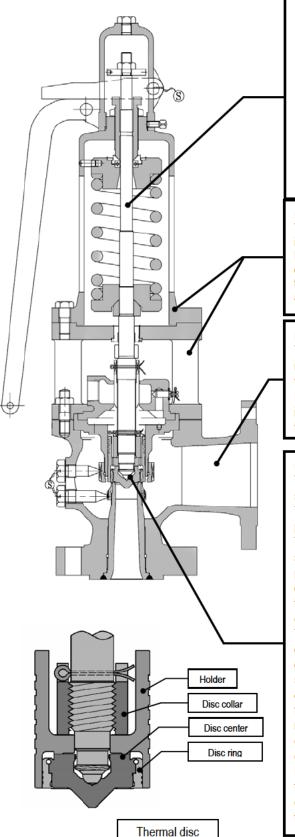


Technology for enhancing product reliability (SL500~900)

In addition to the popping characteristics and the seat tightness, safety valves need a mechanism that provides high reliability. One example is a back pressure adjusting mechanism unique in our safety valves.

Besides the clear popping mechanism and the valve lifting force adjustment mechanism, our safety valves are equipped with our original back pressure adjusting mechanism to allow safety valve blowdown adjustment.

This mechanism is based on the yoke type side needle method that features coil spring protection and easy adjustment work after installation, and also on the cooling type center throttle method in which the throttle automatically opens and closes in accordance with the disc action: these two methods have been put into practical use.



Spindle

At the edge of the spindle transmitting a spring thrust that ranges from hundreds of kilos to several tons, the spring thrust must be transmitted accurately to the disc center in the vertical direction, thus requiring load and wear resistances against the thrust.

For this, our spindle is so structured that the disc back section and the spindle edge at which the spindle thrust is to be received are finished to be perfectly spherical with each other to ensure centricity of the spring thrust and also reliable transmission of a load by maintaining an appropriate contact surface area. The spindle material is 13-chrome based stainless steel, and for high temperature & high pressure specifications, special chrome nickel silicon stainless steel is adopted for its higher wear resistance.

Cooling spool and bonnet

The bonnet of SL 700 type and above is of a cylindrical type for spring protection and increased strength against vibration.

In addition, a cooling spool is provided between the valve body and the bonnet to avoid direct exposure of the spring to high temperature steam at the time of valve operation. At the same time, this cooling section is structured to allow easy release of the center throttle adjusting back pressure.

■ Valve body

The valve body is spherical in shape to provide a structure that allows minimum influence of reaction force by popping steam or of distortion resulting from pipe vibration at the installation side or at the exhaust side.

Furthermore, this structure eliminates useless dead space in the body, and instead allows uniform pressure distribution inside the body, thus making the flow toward the valve outlet smooth.

Disc

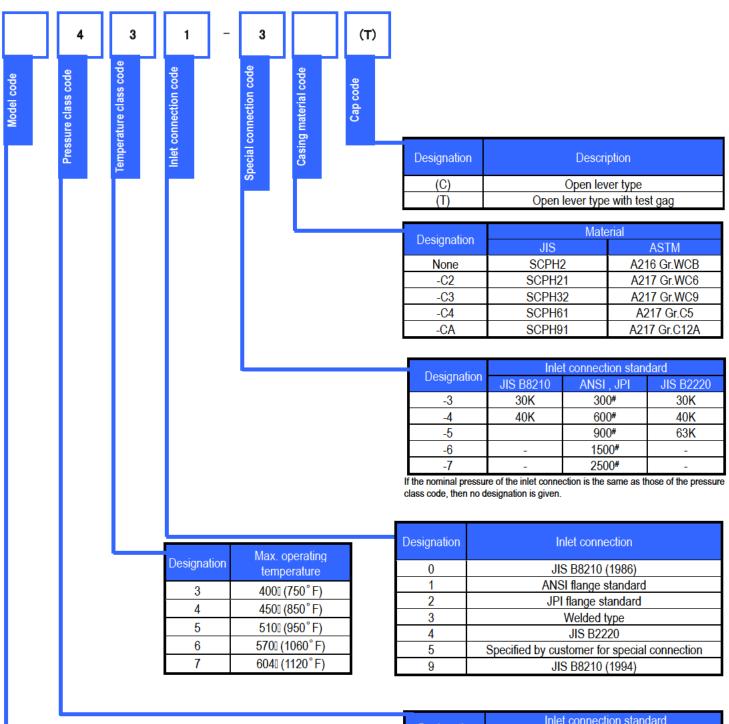
The disc structure comes in two types: feather lip disc in which the contact surface with the nozzle seat is formed to be a lip face, and a thermo lip disc. These are selectively used depending on the operating temperature and pressure.

The operating principle is that the disc seating section is machined to form a lip so that the lip edge is bent by the internal pressure until the safety valve starts popping, and with an increase in pressure the disc seat surface pressure decreases, in which case the raised section of the lip reduces the contact area of the disc with the nozzle seat, thus maintaining a high seat surface pressure to ensure good gas tightness.

The thermo lip disc is of a built-up structure consisting of a combination of the disc center and the disc ring, and is actually an improved version of a feather lip disc in terms of function, for use at high pressures. This method features that a lip support is provided at the disc center edge and the lip back-side, to prevent deformation of the lip section: to be more specific, the lip section is protected from deformation due to shocks that occur when the safety valve closes. This means that even in the high temperature/ high pressure area the feather lip's excellent function of maintaining tightness is not impaired, thus contributing to enhancing the durability of the disc.

In addition, a gap is provided between the disc and the holder, presenting a flexible type. Therefore, even if the spindle is subjected to inclination by an external force such as the reaction force of piping, the disc is not affected in its function.

Model code of safety valves for steam service



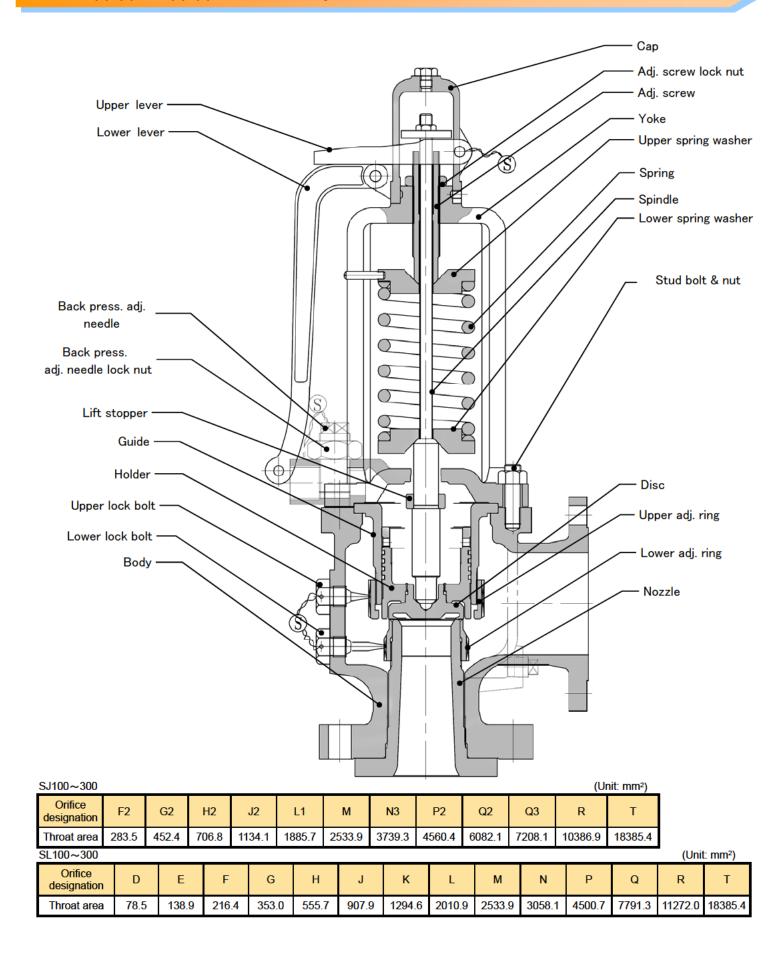
	Applicable standard and code	Inlet connection standard						
Designation	Classification society	ANSI , JPI	JIS B2220	Welded type				
SJ	Ø	0	Ø	Ø				
SL	Ø	Ø	0	Ø				

Designation	Inlet	connection stand	dard
Designation	JIS B8210	ANSI, JPI	JIS B2220
1	10K	150#	10K
2	20K	300#	20K
3	30K	300#	30K
4	40K	600#	40K
5		900#	63K
6	-	1500#	-
7	-	2500#	-
8	-	2500#	-
9	-	3000# *1	-
10	-	4500# *1	-
*1: Welded type onl	v		

Applicable standard	Equation	Symbol	
NK	$W = \frac{A \cdot Kd(1.03Ps+1)}{100} \sqrt{\frac{Vsat}{Vsh}}$	W : nominal relieving capacity A : throat area Kd : nominal discharge coefficient	kg/h mm²
LR	$W = \frac{A \cdot Kd(1.03Ps+1)}{98.1} \sqrt{\frac{Vsat}{Vsh}}$	<i>Ps</i> : set pressure <i>Vsat</i> : specific volume of saturated steam <i>Vsh</i> : specific volume of superheated steam (<i>Vsh</i> = <i>Vsat</i> for saturated steam)	barG m ³ /kg m ³ /kg
DNV	$W = \frac{A(Ps+1)}{Kd(1+0.0018 \times Td)}$	<i>Td</i> : difference between relieving temp. and saturated temp. (0 for saturated steam) <i>Tsh</i> : superheated steam temperature (0 for saturated steam)	ວ° ວ
BV	$W = \frac{A}{Kd} \cdot \frac{L}{dt} \cdot \frac{1.02Ps + 1}{\left(1 + \frac{Tsh}{556}\right)}$	<i>L</i> : safety valve lift <i>dt</i> : safety valve throat diameter	mm mm
KR	$W = \frac{A}{Kd} \frac{1.05Ps + 1.0}{\left(1 + \frac{Tsh}{556}\right)}$		

For the Rules and Regulations of other classification societies, please contact us.

SJ/SL1 () () ~3 () () series safety valves: Parts name



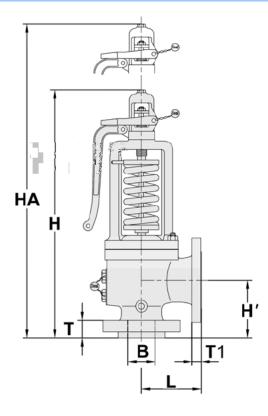
SJ/SL1 () () ~3 () () series safety valves: Standard material

	Model	SJ/SL()3()	SJ/SL()5()	SJ/SL()6()
	Max. operating temperature	400°C 750°F	510°C 950°F	570°C 1060°F
	Nozzle seat *1	ASTM A105	ASTM A182-F12	ASTM A182-F22
	Disc	SUS630…(≦32	0° C) or B637 No. 7750 (Inconel	X)····(>320°℃)
	Disc collar		SUS420J2	
	Holder		SUS403	
	Body	SCPH2 or A216 Gr. WCB	SCPH21 or A217 Gr. WC6	SCPH32 or A217 Gr. WC9
	Yoke	SCPH2 or A216 Gr. WCB	SCPH21 or A	217 Gr. WC6
	Spindle	SUS403	SUS	431
	Guide		SUS403 or SCS1	
	Upper and lower adjusting rings		SUS304 or SCS13A	
	Upper lock bolt	SUS403	SUS	431
ame	Lower lock bolt	SUS403	SUS	431
Parts name	Spring washer and spring retainer		S25C	
Pal	Spring		Carbon steel or alloy steel	
	Adj. screw		SUS403	
	Adj. screw locknut		SUS304	
	Lift stopper		SUS420J2	
	Step ring		SUS420J2	
	Stud bolt and nut	SNB7	/ S45C	SNB16 / A194 Gr.4
	Сар		FCMB310	
	Upper lever		FCMB310	
	Lower lever		FCMB310	
	Pin		SUS304	
	Back pres. adj. needle & locknut *2		SUS304 / SS400	
	Back press. adj. cock *2		SCS13A	

* 1: This part is clad with stellite on the seating surface.

* 2: For the back pressure adjusting mechanism, either a back pressure adjusting needle or a back pressure adjusting cock is maker standard.

SJ1 () () ~ 3 () () series safety valves: Operating range and dimensions



Safety valve: major dimensions and weight

Max. operating Flange thickness Screw d meter Inlet Face-to-face Overall Disassembly pressure Outlet Installation Throat area Outle Weiah Inlet F diamete dimension length height Inlet Outlet Drain Needle Туре MPaG F dimensions diamete mm² Rc Rp 400 450 В H Н HA T1 kg 25xF2x40 283 5 1/2 1/2 32xG2x50 452 4 1/2 3/4 JIS B 8210 (1994) 10K RF 40xH2x65 706.8 1/2 3/4 50xJ2x80 1134.1 1/2 문 65xL1x100 1885.7 1/2 ş SJ109 80xMx125 2533 9 1/2 B 22201 1.07 1.07 90xN3x150 3739 3 1/2 1-1/4 4560.4 1-1/4 100xP2x150 1/2 ŝ 125xQ2x200 6082.1 3/4 1-1/4 3/4 1-1/4 125xQ3x200 7208.1 150xRx200 10386 9 3/4 1-1/4 200xTx250 18385.4 3/4 1-1/2 283 5 1/2 1/2 25xF2x40 1/2 3/4 32xG2x50 452.4 40xH2x65 706.8 1/2 3/4 JIS B 8210 (1994) 20K RF 1134.1 1/2 문 50xJ2x80 Ę 65xL1x100 1885.7 1/2 SJ209 2.15 2.15 80xMx125 2533 9 1/2 90xN3x150 1/2 1-1/4 ŝ 1/2 100xP2x15 15(1-1/4 ŝ 125xQ2x200 6082.1 3/4 1-1/4 3/4 125xQ3x200 7208.1 1-1/4 10386 9 3/4 1-1/4 150xRx200 200xTx250 1.56 1 56 18385.4 3/4 1-1/2 25xF2x40 283 5 1/2 3/4 32xG2x50 452 4 1/2 3/4 JIS B 8210 (1994) 30K RF 40xH2x65 706.8 1/2 뿝 1134.1 1/2 50xJ2x80 Ę 1885.7 1/2 1-1/4 65xL1x100 SJ309 3.23 3 23 B 2220 80xMx125 2533 9 1/2 1-1/4 90xN3x150 3739 3 1/2 1-1/4 4560.4 3/4 ŝ 100xP2x150 1 - 1/43/4 1-1/4 125xQ2x200 125xQ3x200 7208 1 3/4 1-1/4 150xRx250 2.15 2.15 10386 9 3/4 1-1/4

"Installation dimensions" are the nominal sizes of the inlet and outlet flanges. "Inlet diameter" denotes the inner diameter of the safety valve inlet and may therefore differ from the inlet flange size depending on safety valves.

(Unit: mm)

SJ1 () () ~ 3 () () series safety valves: Operating range and dimensions

Safety valve: major dimensions and weight

(Unit: mm) Face-to-face Flange thickness Max. operating pressure Inlet Overall)isassembly Screw d Outle Installation Throat area Outlet Weight Drain Inlet MPaG amete dim Inlet Outlet Туре length height Needl F dimensions mm² diamete 220 🗆 350□ В н HA T T1 Rc Rp kg Н 32xF2x40 283.5 1/2 1/2 452.4 1/2 3/4 40xG2x50 50xH2x65 문 706.8 1/2 3/4 1134.1 65x.J2x80 1/2 문 ă 10K 80xL1x100 1885 7 1/2 JIS B 2220 (1996) SJ204 90xMx125 2533.9 1/2 1.07 1.07 1.07 100xN3x150 3739.3 1/2 1-1/4 JIS B 2 4560.4 1/2 1-1/4 125xP2x150 3/4 1-1/4 150xQ2x200 6082.1 3/4 7208 1 150xQ3x200 1-1/4 3/4 200xRx200 10386.9 1-1/4 18385 4 250xTx250 3/4 1-1/2 32xF2x40 283.5 1/2 1/2 40xG2x50 452.4 1/2 3/4 50xH2x65 706.8 1/2 3/4 문 1134.1 1/2 65xJ2x80 JISB 2220 (1996) 30K 문 80xL1x100 1885.7 1/2 Ę SJ204-3 2.15 2.15 2.15 90xMx125 2533.9 1/2 **JIS B 2220** 100xN3x150 3739.3 1/2 1-1/4 125xP2x150 4560.4 1/2 1-1/4 150xQ2x200 6082.1 3/4 1-1/4 150xQ3x200 7208.1 3/4 1-1/4 200xRx200 10386.9 3/4 1-1/4 1 56 1 56 1.56 18385.4 3/4 1-1/2 250xTx250 32xF2x40 283.5 1/23/4 452.4 3/4 40xG2x50 1/2 腔 50xH2x65 706.8 1/2 ę 문 65xJ2x80 1134.1 1/2 ₹ JISB 2220 (1996) 80xL1x100 1885.7 1/2 1-1/4 SJ304-4 3 23 3 23 3.23 B 2220 90xMx125 2533 9 1/2 1-1/4 100xN3x150 3739.3 1/2 1-1/4 4560.4 3/4 1-1/4 125xP2x150 ŝ 6082.1 3/4 1-1/4 150xQ2x200 3/4 1-1/4 150xQ3x200 7208.1 2 15 2 15 2 15 3/4 200xRx250 10386.9 1-1/4

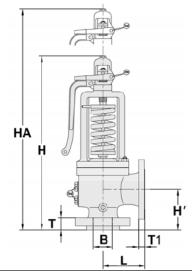
		Outlet		Max. o	perating p	ressure	Inlet	Threat area	Outlet	Face-	to-face	Overall	Disassembly	Flange t	hickness		liameter	Weight
Туре	Inlet F	F	Installation dimensions		MPaG		diameter	Throat area mm ²	diameter	dime	nsion	length	height	Inlet	Outlet	Drain	Needle	weight
		1.1		400 □	510 □	538 □	В		ulameter	Н	L	H	HA	Т	T1	Rc	Rp	kg
			1-1/4xF2x1-1/2				25	283 5	40	120	110	400	540	40	16	1/2	1/2	17
			1-1/2xG2x2				32	452.4	50	125	120	435	610	44	16	1/2	3/4	23
			2xH2x2-1/2				40	706.8	65	135	130	520	730	46	18	1/2	3/4	31
	ш	ш	2-1/2xJ2x3				50	1134.1	80	155	152	625	865	44	20	1/2	1	47
	ANSI 300Lb RF	ANSI 150Lb RF	3xL1x4				65	1885.7	100	170	166	690	975	48	24	1/2	1	63
SJ201	20	20L	3-1/2xMx5	2.15	2.15	1.79	80	2533 9	125	180	164	710	1000	50	24	1/2	1	71
3	313(11	4xN3x6				90	3739 3	150	190	184	800	1150	52	26	1/2	1-1/4	94
	NNS	NS	5xP2x6				100	4560.4	150	200	204	885	1235	54	26	1/2	1-1/4	120
	1		6xQ2x8				115	6082.1	200	220	227	1010	1460	56	29	3/4	1-1/4	178
	8x1	6xQ3x8				125	7208.1	200	240	237	1060	1510	56	29	3/4	1-1/4	198	
		8xRx8				150	10386 9	200	250	247	1190	1705	60	29	3/4	1-1/4	290	
			10xTx10	1 56	1.56	1.56	200	18385.4	250	292	290	1395	2065	66	31	3/4	1-1/2	465
			1-1/4xF2x1-1/2				25	283 5	40	120	120	425	595	42	16	1/2	1/2	20
			1-1/2xG2x2				32	452.4	50	125	120	505	710	44	16	1/2	3/4	27
	ц.,	┺	2xH2x2-1/2				40	706.8	65	135	130	595	840	46	18	1/2	1	40
4	600Lb RF	РВ	2-1/2xJ2x3				50	1134.1	80	165	157	670	960	48	20	1/2	1	54
SJ301-4	00	150Lb	3xL1x4	3 23	3 23	3.23	65	1885.7	100	180	171	745	1095	56	24	1/2	1-1/4	75
SJ3	316	5	3-1/2xMx5			0.20	80	2533 9	125	202	184	840	1195	56	24	1/2	1-1/4	100
	ANSI	ANSI	4xN3x6				90	3739 3	150	210	204	865	1220	56	26	1/2	1-1/4	112
			5xP2x6				100	4560.4	150	215	224	985	1435	63	26	3/4	1-1/4	167
	5	5xQ2x8				115	6082.1	200	226	227	1120	1635	66	29	3/4	1-1/4	240	
			5xQ3x8				125	7208.1	200	241	257	1160	1685	63	29	3/4	1-1/4	265
SJ301-5	ANSI 900Lb RF	ANSI 150Lb RF	6xRx10	2.15	2.15	2.15	150	10386 9	250	268	267	1190	1705	74	31	3/4	1-1/4	310

"Installation dimensions" are the nominal sizes of the inlet and outlet flanges. "Inlet diameter" denotes the inner diameter of the safety valve inlet and may therefore differ from the inlet flange size depending on safety valves.

SL1 () () ~ 3 () () series safety valves: Operating range and dimensions

Safety valve: major dimensions and weight

(Unit: mm)



Type		Outlet	Installation	Max. o	perating p	ressure	Inlet	Throat area	Outlet	Face-t	o-face	Overall	Disassembly	Flange t	hickness	Screw of	liameter	Weight
Type	Inlet F	F	dimensions		MPaG		diameter	mm ²	diameter	dime	nsion	length	height	Inlet	Outlet	Drain	Needle	Ŭ
		· •		40□	230	400 □	В			H	L	Н	HA	T	T1	Rc	Rp	kg
			3/4xDx1				20	78.5	25	92	96	345	470	30	14 5	3/8	1/2	11
			1xDx2				25	78.5	50	105	114	360	485	32	16	3/8	1/2	13
			1xEx2				25	138.9	50	105	114	360	485	32	16	3/8	1/2	13
			1-1/2xFx2				40	216.4	50	124	121	380	505	39	16	1/2	1/2	16
			1-1/2xGx2-1/2				40	353.0	65	124	121	410	550	39	18	1/2	1/2	19
	Ł	R	1-1/2xHx3	1 96	127		40	555.7	80	130	124	440	610	39	20	1/2	3/4	23
Ξ	9	g	2xJx3	1.50	121	0.65	50	907.9	80	137	124	515	720	41	20	1/2	3/4	30
SL101	ANSI 150Lb	ansi 150lb	3xKx4			0.05	80	1294.6	100	156	162	620	860	47	24	1/2	3/4	51
S	<u>v</u>	S	3xLx4				80	2010 9	100	156	165	680	965	47	24	1/2	3/4	59
	AN	AN	4xMx6				100	2533.9	150	178	184	700	990	50	26	1/2	3/4	71
			4xNx6				100	3058.1	150	197	210	790	1140	50	26	1/2	1-1/4	90
			4xPx6				100	4500.7	150	181	229	875	1230	50	26	1/2	1-1/4	110
		6xQx8	1.12	1.12		150	7791 3	200	240	241	1050	1500	44	29	3/4	1-1/4	200	
			6xRx8	0.68	0.68		150	11272.0	200	240	241	1155	1675	44	29	3/4	1-1/4	260
			8xTx10	0.44	0.44	0.44	200	18385.4	250	276	279	1380	2055	48	31	3/4	1-1/2	400
			3/4xDx1				20	78.5	25	92	96	345	470	30	14 5	3/8	1/2	11
			1xDx2				25	78.5	50	105	114	360	485	32	16	3/8	1/2	13
			1xEx2				25	138.9	50	105	114	360	485	32	16	3/8	1/2	13
			1-1/2xFx2				40	216.4	50	124	121	380	505	39	16	1/2	1/2	16
			1-1/2xGx2-1/2				40	353.0	65	124	121	410	550	39	18	1/2	1/2	20
	┺	노	1-1/2xHx3	196	196	1 96	40	555.7	80	130	124	440	610	39	20	1/2	3/4	24
-	9		2xJx3	1 30	1 90	1 90	50	907.9	80	137	124	515	720	41	20	1/2	3/4	31
SL201	ANSI 300Lb	ANSI 150Lb	3xKx4				80	1294.6	100	156	162	620	860	47	24	1/2	1	53
S	Si Si	S,	3xLx4				80	2010.9	100	156	165	680	965	47	24	1/2	1	61
	AN	AN	4xMx6				100	2533 9	150	178	184	700	990	50	26	1/2	1	73
			4xNx6				100	3058.1	150	197	210	790	1140	50	26	1/2	1-1/4	92
			4xPx6				100	4500.7	150	181	229	875	1230	50	26	1/2	1-1/4	112
			6xQx8	1.12	1.12	1.12	150	7791.3	200	240	241	1050	1500	55	29	1/2	1-1/4	205
			6xRx8	0.68	0.68	0.68	150	11272.0	200	240	241	1155	1675	56	29	3/4	1-1/4	265
			8xTx10	0.44	0.44	0.44	200	18385.4	250	276	279	1380	2055	60	31	3/4	1-1/2	410

		Outlet	Installation	Max. o	perating p	ressure	Inlet	Throat area	Outlet	Face-t	o-face	Overall	Disassembly	Flange t	hickness	Screw of	liameter	Weight
Туре	Inlet F	F	dimensions		MPaG		diameter	mm ²	diameter	dime	nsion	length	height	Inlet	Outlet	Drain	Needle	weight
		1	umensions	230□	400□	510□	В	mme	ulameter	H	L	Н	HA	Т	T1	Rc	Rp	kg
			1xDx2				25	78.5	50	105	114	360	485	32	16	3/8	1/2	14
			1xEx2				25	138.9	50	105	114	360	485	32	16	3/8	1/2	14
	1-1 2xt	1-1/2xFx2				40	216.4	50	124	152	380	505	40	16	1/2	1/2	19	
	보 날 <u>2차</u> 보 날 <u>21</u>	1-1/2xGx2-1/2				40	353.0	65	124	152	420	590	40	18	1/2	3/4	22	
		2xHx3	3.72	3.45		50	555.7	80	130	124	500	705	41	20	1/2	3/4	31	
		R	2-1/2xJx4	3.12	3.40	2.62	65	907.9	100	137	143	595	835	44	24	1/2	3/4	46
õ		OLL	3xKx4				80	1294.6	100	156	162	665	955	47	24	1/2	3/4	60
SLS		_	3xLx6				80	2010.9	150	179	181	765	1115	50	26	1/2	1-1/4	90
	ANSI	ANSI	4xMx6				100	2533.9	150	178	184	840	1195	50	26	1/2	1-1/4	105
	•	<	4xNx6				100	3058.1	150	197	210	865	1215	50	26	1/2	1-1/4	113
			4xPx6	2.94	2 94		100	4500.7	150	225	254	1005	1455	50	26	1/2	1-1/4	160
			6xQx8	2.06	2.06	2.06	150	7791.3	200	240	241	1050	1500	55	29	1/2	1-1/4	220
			6xRx10	1.56	1 56	1 56	150	11272.0	250	240	267	1155	1675	56	31	3/4	1-1/4	285
			8xTx10	1.50	1.00	1 30	200	18385.4	250	276	279	1380	2055	60	31	3/4	1-1/2	420

"Installation dimensions" are the nominal sizes of the inlet and outlet flanges. "Inlet diameter" denotes the inner diameter of the safety valve inlet and may therefore differ from the inlet flange size depending on safety valves.

SL1 () () ~ 3 () () series safety valves: Operating range and dimensions

Safety valve: major dimensions and weight

(Unit: mm)

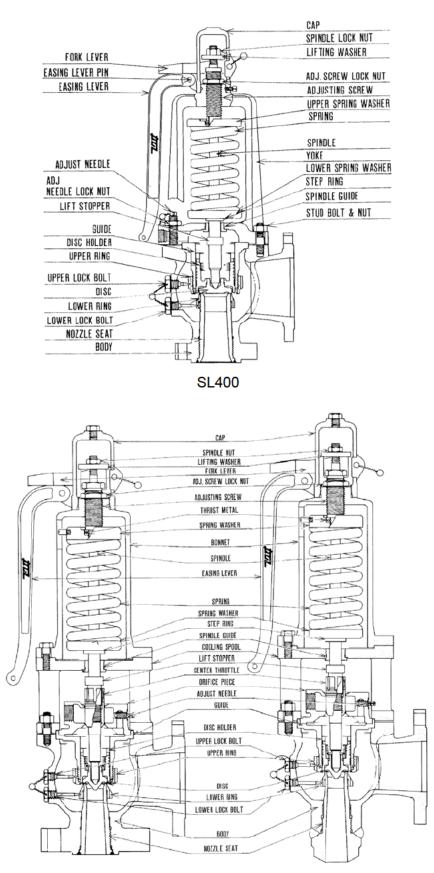
Turno	Inlet	Outlet		Max. op pres	sure	Inlet diameter	Throat area	Outlet		o-face	Overall length	Disassembly height		nge ness	Screw	diameter	Weight
Туре	F	F	dimensions	MP	aG	ulametei	mm ²	diameter	unic	IISIOII	iciigui	neight	Inlet	Outlet	Drain	Needle	
				220	300	В			Ĥ	L	Н	HA	Т	T1	Rc	Rp	kg
			20xDx25			20	78.5	25	92	96	345	470	30	14	3/8	1/2	11
			25xDx50			25	78.5	50	105	114	360	485	32	16	3/8	1/2	13
			25xEx50	1.18		25	138.9	50	105	114	360	485	32	16	3/8	1/2	13
	┺		40xFx50		0.98	40	216.4	50	124	121	380	505	39	16	1/2	1/2	16
	¥	RF	40xGx65			40	353.0	65	124	121	410	550	39	18	1/2	1/2	19
	-	¥	40xHx80	1.13		40	555.7	80	130	124	440	610	39	20	1/2	3/4	23
Z	966	10	50xJx80	1.15		50	907.9	80	137	124	515	720	41	20	1/2	3/4	30
Ę	(19	50	80xKx100	0.98	0.93	80	1294.6	100	156	162	620	860	47	24	1/2	1	51
ร	20	22	80xLx100	0.88	0.83	80	2010.9	100	156	165	680	965	47	24	1/2	1	59
	ä	В	100xMx150	0.00	0.05	100	2533.9	150	178	184	700	990	50	26	1/2	1	71
	m	SIL	100xNx150	0.78	0.73	100	3058.1	150	197	210	790	1140	50	26	1/2	1-1/4	90
	SIL		100xPx150	0.73	0.68	100	4500.7	150	181	229	875	1230	50	22	1/2	1-1/4	110
			150xQx200	0.98	0.83	150	7791.3	200	240	241	1050	1500	44	29	1/2	1-1/4	200
			150xRx200	0.68	0.68	150	11272.0	200	240	241	1155	1675	44	29	3/4	1-1/4	260
			200xTx250	0.45	0.45	200	18385.4	250	276	279	1380	2055	48	31	3/4	1-1/2	400

Turno	Inlet	Outle	Installation	Мах. ор	erating p MPaG	oressure	Inlet diameter	Throat area	Outlet		to-face nsion	Overall length	Disassembly height		nge iness	Screw	diameter	Weight
Туре	F	F	dimensions		WFa0		ulameter	mm ²	diameter	uine	IISIUII	iengui	neight	Inlet	Outlet	Drain	Needle	
				220	300 □	400□	В			H	L	Н	HA	Т	T1	Rc	Rp	kg
	25)	20xDx25				20	78.5	25	92	96	345	470	30	14	3/8	1/2	11	
	원 <u>1</u> 125	25xDx50				25	78.5	50	105	114	360	485	32	16	3/8	1/2	13	
	96) 20K RF 10K RF 20 75 75 25 75 75 26 75 75 27 75 75 75 27 75 75 75 75 75 75 75 75 75 75 75 75 75	25xEx50				25	138.9	50	105	114	360	485	32	16	3/8	1/2	13	
		40xFx50				40	216.4	50	124	121	380	505	39	16	1/2	1/2	16	
		40xGx65	1.96	1.96	1.96	40	353.0	65	124	121	410	550	39	18	1/2	1/2	19	
		40xHx80	1.50	1.50	1.50	40	555.7	80	130	124	440	610	39	20	1/2	3/4	24	
z		50xJx80				50	907.9	80	137	124	515	720	41	20	1/2	3/4	31	
5	(19	5	80xKx100				80	1294.6	100	156	162	620	860	47	24	1/2	1	53
SL		22	80xLx100				80	2010.9	100	156	165	680	965	47	24	1/2	1	61
	2220	В	100xMx150				100	2533.9	150	178	184	700	990	50	26	1/2	1	73
	B	SIL	100xNx150	1.86	1.86	1.86	100	3058.1	150	197	210	790	1140	50	26	1/2	1-1/4	92
	SIL		100xPx150	1.76	1.76	1.76	100	4500.7	150	181	229	875	1230	50	26	1/2	1-1/4	112
	`		150xQx200	1.18	1.18	1.18	150	7791.3	200	240	241	1050	1500	55	55	1/2	1-1/4	205
			150xRx200	0.68	0.68	0.68	150	11272.0	200	240	241	1155	1675	56	56	3/4	1-1/4	265
			200xTx250	0.44	0.44	0.44	200	18385.4	250	276	279	1380	2055	48	31	3/4	1-1/2	410

Туре	Inlet	Outle	Installation	Max. op	erating p MPaG	oressure	Inlet diameter	Throat area	Outlet	dime	io-face	Overall length	Disassembly height	thick	nge ness		diameter	Weight
.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	F	F	dimensions					mm ²	diameter					Inlet	Outlet	Drain	Needle	
				300 □	400	490	В			H'	L	Н	HA	Т	T1	Rc	Rp	kg
			25xDx50				25	78.5	50	105	114	360	485	32	16	3/8	1/2	14
			25xEx50	0.70			25	138.9	50	105	114	360	485	32	16	3/8	1/2	14
	塍		40xFx50	3.72	2.94	2.04	40	216.4	50	124	152	380	505	40	16	1/2	1/2	19
		ш	40xGx65		2.94	2.84	40	353.0	65	124	152	420	590	40	18	1/2	3/4	22
	30K	R	50xHx80	3,53			50	555.7	80	130	124	500	705	41	20	1/2	3/4	31
		Я	65xJx100	5.55			65	907.9	100	137	143	595	835	44	24	1/2	1	46
ğ	966	20 1	80xKx100	3,13	2.64	2.45	80	1294.6	100	156	162	665	955	47	24	1/2	1	60
Ц.	5	2	100xLx150	3.13	2.04	2.40	100	2010.9	150	179	181	765	1115	50	26	1/2	1-1/4	90
	220	В 2	100xMx150	3.04	2.55	2 25	100	2533.9	150	178	184	840	1195	50	26	1/2	1-1/4	105
	B 2	SIC	100xNx150	2.74	2.25	2.15	100	3058.1	150	197	210	865	1215	50	26	1/2	1-1/4	113
		ſ	100xPx150	2.55	2.15	1 96	100	4500.7	150	225	254	1005	1455	50	26	1/2	1-1/4	160
	SL		150xQx200	2.06	2.06	1.08	150	7791.3	200	240	241	1050	1500	55	29	1/2	1-1/4	220
			150xRx250	1.37	1.18	0.68	150	11272.0	250	240	267	1155	1675	56	31	3/4	1-1/4	285
			200xTx250	0.78	0.78	0.78	200	18385.4	250	276	279	1380	2055	60	31	3/4	1-1/2	420

"Installation dimensions" are the nominal sizes of the inlet and outlet flanges. "Inlet diameter" denotes the inner diameter of the safety valve inlet and may therefore differ from the inlet flange size depending on safety valves.

SL4 () () ~6 () () series safety valves: Parts name



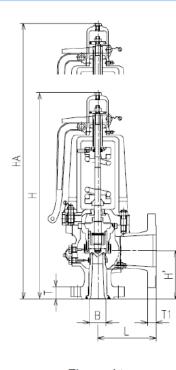
SL400 - 600

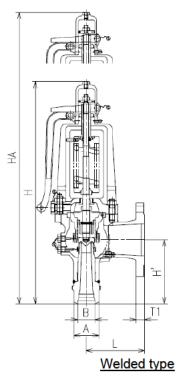
SL400 - 600															(Un	it: mm²)
Orifice designation	F1	G1	Н	J	к	К2	L	М	M2	N2	Ρ	Q0	Q1	Q	R	т
Throat area	216.4	353.0	555.7	855.3	1294.6	1727.6	2010.9	2533.9	2587.7	3421.2	4500.7	5462.9	6418.4	7791.3	11272.0	18337.3

			SL()3()	SL()5()	SL()6()
	Max. ope	erating temperature	400°C 750°F	510°C 950°F	570°C 1060°F
	Nozzle seat *1		ASTM A105	ASTM A182-F12	ASTM A182-F22
	Disc	SJ/SL4()()~5()()	SUS630···(≦3	20° C) or B637 No. 7750 (Incone	I X)····(>320°C)
	DISC	SL6()()		B637 No. 7750 (Inconel X)	
	Disc collar			SUS420J2	
	Holder			SUS403	
	Valve body		SCPH2 or A216 Gr. WCB	SCPH21 or A217 Gr. WC6	SCPH32 or A217 Gr. WC9
	Yoke	Yoke		SCPH2 or A216 Gr. WCB	
	TUNE	spindle Guide		SUS630	
	Cooling spool		A105 or A2	16 Gr. WCB	A182-F12 or A217 Gr. WC6
	Spindle Guide		SUS403	SUS	431
	Guide			SUS403 or SCS1	
部	Upper and low	er adjusting rings		SUS304 or SCS13A	
	Upper lock bol	t	SUS403	SUS	431
品	Lower lock bol	t	SUS403	SUS	431
名	Spring washer			S25C	
称	Spring	Spring retainer		S25C	
	retainer	Bearing	as	per JIS B1532 Thrust Ball Bearing	ng
	Spring			Carbon steel or alloy steel	
	Adj. screw			SUS403	
	Adj. screw lock	knut		SUS304	
	Lift stopper			SUS420J2	
	Step ring			SUP10	
	Stud bolt and r		SNB7	/ S45C	SNB16 / A194 Gr.4
	-	bolt (SL600 K~R)		S45C	
	Сар			FCMB310	
	Upper lever			FCMB310	
	Lower lever			FCMB310	
	Pin	e i		SUS304	
	Back press. ad	•		SCS13A	

 \times 1: This part is clad with stellite on the seating surface.

SL4 () () series safety valves: Operating range and dimensions





Flanged type

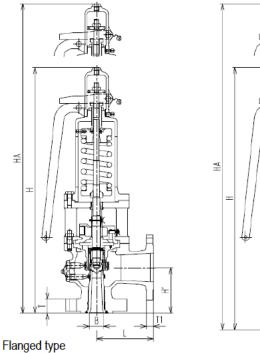
Safety valve: major dimensions and weight

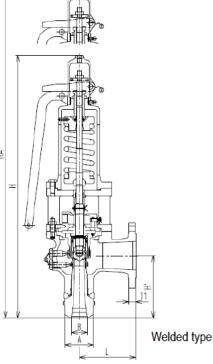
Sa	fety	val	/e: major o	dimer	nsion	s and	d weig	ght									(Unit:	mm)
Туре	Inlet F	Outlet	Installation dimensions	Max. o	perating p MPaG	ressure	Inlet diameter	Throat area	Outlet diameter	Face-f dime	to-face nsion	Overall length	Disassembly height	Flange t Inlet	hickness Outlet	Screw O	diameter Needle	Weight
		F	amensions	400°C	510°C	570°C	В	007	diameter	H	L	Н	HA	Т	T1	Rc	Rp	kg
			1.1/2xFx2.1/2				40	216.4	65	130	140	475	545	33	19.1	1/2	3/4	25
			1.1/2xGx3				40	353.0	80	130	140	475	545	35	19.1	1/2	3/4	25
			1.1/2xHx3				40	555.7	80	140	140	580	670	33	19.1	1/2	3/4	35
			2xJx4				50	855 3	100	150	180	645	740	36	24	1/2	3/4	52
			2.1/2xKx6				65	1294.6	150	185	180	810	920	39	26	1/2	3/4	78
			2.1/2xK2x6	5.5			65	1727.6	150	185	180	810	920	39	26	1/2	1	82
			2xJx4 2.1/2xKx6 2.1/2xK2x6 3xLx6 3xMx6 3xMx6 3xM2x6	5.5			80	2010.9	150	190	200	825	935	48	26	1/2	1	92
	RF	R	3xMx6				80	2533.9	150	190	200	860	1000	48	26	1/2	1	115
401	ANSI 600Lb	150Lb	3xM2x6		4.4	2.2	80	2587.7	150	190	200	860	1000	48	26	1/2	1	115
SL	160	115	4xN2x6			2.2	100	3421.2	150	215	220	995	1135	52	26	1/2	1	165
	NS	ANSI	4xPx6				100	4500.7	150	235	250	1110	1270	60	26	1/2	1-1/4	205
	•	•	4xPx8				100	4500.7	200	235	250	1110	1270	60	29	1/2	1-1/4	205
			6xQ0x8				150	5462.9	200	255	250	1240	1410	62	29	3/4	1-1/4	290
			6xQ1x8				150	6418.4	200	255	260	1360	1560	62	29	3/4	1-1/4	350
			6xQx8	4.8			150	7791.3	200	285	270	1460	1690	62	29	3/4	1-1/4	445
			6xQx10				150	7791.3	250	285	280	1460	1690	62	31	3/4	1-1/4	445
			6xRx10	1			150	11272.0	250	290	300	1485	1745	70	31	3/4	1-1/4	480
			8xTx12	3.4	3.4	1	200	18337.3	300	320	300	1670	1980	68	32	3/4	1-1/4	650

Туре	inlet	Outlet	let Installation dimensions	Max. operating	Inlet diameter	Inlet neo	k outside (A	diameter	Throat area	Outlet	Face-t dime	o-face nsion	Overall length	Disassembly height	Flange thickness	Screw O	diameter Needle	Weight
Type	Inet	F	dimensions	pressure MPaG	В	400°C	510°C	570°C	mm ²	diameter	H'	L	Н	HA	T1	Rc	Rp	kg
			1.1/2xFx2.1/2		40	64	64	67	216.4	65	165	140	515	585	19.1	1/2	3/4	25
			1.1/2xGx3		40	64	64	67	353.0	80	165	140	515	585	19.1	1/2	3/4	25
			1.1/2xHx3		40	67	67	70	555.7	80	165	140	610	700	19.1	1/2	3/4	35
			2xJx4		50	80	80	80	855.3	100	200	180	695	790	24	1/2	3/4	52
			2.1/2xKx6		65	92	92	98	1294.6	150	250	180	875	985	26	1/2	3/4	78
			2.1/2xK2x6	55	65	92	92	98	1727.6	150	250	180	875	985	26	1/2	1	82
			3xLx6	55	76	105	105	105	2010.9	150	250	200	885	995	26	1/2	1	92
	be	R	3xMx6		76	105	105	114	2533.9	150	250	200	920	1060	26	1/2	1	115
103	Welded type	150Lb	3xM2x6		76	105	105	114	2587.7	150	250	200	920	1060	26	1/2	1	115
ъ.	8	115	4xN2x6		102	140	140	146	3421.2	150	250	220	1025	1165	26	1/2	1	165
	×	ANSI	4xPx6]	102	146	146	152	4500.7	150	330	250	1200	1360	26	1/2	1-1/4	205
		4	4xPx8		102	146	146	152	4500.7	200	330	250	1200	1360	29	1/2	1-1/4	205
			6xQ0x8		152	203	203	210	5462.9	200	330	250	1320	1490	29	3/4	1-1/4	290
			6xQ1x8		152	203	203	210	6418.4	200	350	260	1435	1625	29	3/4	1-1/4	350
			6xQx8	4.8	152	203	203	210	7791.3	200	350	270	1520	1750	29	3/4	1-1/4	445
			6xQx10		152	203	203	210	7791.3	250	350	280	1520	1750	31	3/4	1-1/4	445
			6xRx10		152	210	210	232	11272.0	250	350	300	1545	1805	31	3/4	1-1/4	480
			8xTx12	3.4	203	230	230	240	18337.3	300	360	300	1720	2030	32	3/4	1-1/4	650

"Installation dimensions" are the nominal sizes of the inlet and outlet flanges. "Inlet diameter" denotes the inner diameter of the safety valve inlet and may therefore differ from the inlet flange size depending on safety valves.

SL5 () () series safety valves: Operating range and dimensions





Safety valve: major dimensions and weight

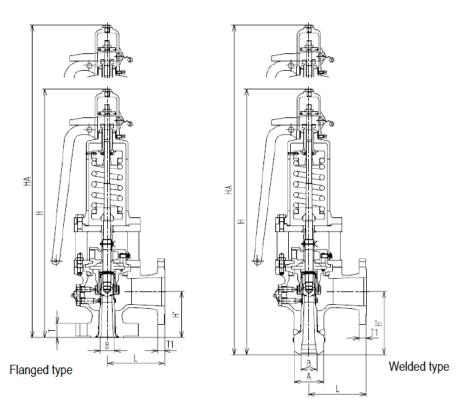
_			re. majei										-				(0.1	,
Tu	Inle	tOutlet	Installation	Max. op	erating p MPaG	oressure	Inlet diameter	Throat area	Outlet		to-face	Overall length	Disassembly height		ange kness		rew neter	Weight
Ту	F	F	dimensions		in uo		anameter	mm ²	diameter	unic	noion	longui	neight	Inlet	Outlet	Drain	Needle	
				400°C	510°C	570°C	В			H	L	н	HA	Т	T1	Rc	Rp	kg
			1.1/2xF1x3				40	216.4	80	140	155	695	920	45	19.1	1/2	3/4	48
			1.1/2xG1x3				40	353.0	80	140	155	695	920	45	19.1	1/2	3/4	48
			1.1/2xHx3				40	555.7	80	140	155	695	920	45	19.1	1/2	3/4	48
			2xJx4				50	855.3	100	150	180	855	1140	49	24	1/2	3/4	78
			2.1/2xKx6				65	1294.6	150	185	180	895	1180	50	26	1/2	3/4	83
	L.	ш	2.1/2xK2x6				65	1727.6	150	195	200	965	1280	53	26	1/2	1	123
	2	Ľ	3xLx6				80	2010.9	150	195	200	970	1285	52	26	1/2	1	123
Ξ	2	2	3xMx6	6.18	6.18		80	2533.9	150	220	220	1120	1500	52	26	1/2	1	176
, and a second sec		150L	3xM2x6	0.10	0.10	3.55	80	2587.7	150	220	220	1120	1500	52	26	1/2	1	176
U	6	ā	4xN2x6				100	3421.2	150	230	250	1210	1650	60	26	1/2	1	210
	ANSI	ANSI	4xPx6				100	4500.7	150	250	270	1360	1825	68	26	1/2	1-1/4	287
			4xPx8				100	4500.7	200	250	270	1370	1835	68	29	1/2	1-1/4	290
			6xQ0x8				150	5462.9	200	280	280	1550	2120	70	29	3/4	1-1/4	378
			6xQ1x8				150	6418.4	200	290	280	1620	2210	70	29	3/4	1-1/4	433
			6xQx8				150	7791.3	200	290	300	1630	2220	70	29	3/4	1-1/4	490
			6xQx10				150	7791.3	250	290	300	1630	2220	70	31	3/4	1-1/4	490
			6xRx10	5.49	5.49		150	11272.0	250	290	300	1695	2315	70	31	3/4	1-1/4	550

Туре	inlet	Outlet F		Max. operating pressure	Inlet diameter		neck ou diameter A		Throat area mm ²	Outlet diameter		o-face nsion	Overall length	Disassembly height	Flange hickness	dia	rew neter Needle	Weight
				MPaG	В	400°C	510°C	570°C			H'	L	Н	HA	T1	Rc	Rp	kg
			1.1/2xF1x3		40	70	70	80	216.4	80	165	155	720	945	19.1	1/2	3/4	48
			1.1/2xG1x3		40	70	70	80	353.0	80	165	155	720	945	19.1	1/2	3/4	48
			1.1/2xHx3		40	70	70	80	555.7	80	165	155	720	945	19.1	1/2	3/4	48
			2xJx4		50	83	83	90	855.3	100	200	180	905	1190	24	1/2	3/4	78
			2.1/2xKx6		65	102	102	110	1294.6	150	250	180	960	1245	26	1/2	3/4	83
			2.1/2xK2x6		65	102	102	110	1727.6	150	250	200	1020	1335	26	1/2	1	123
	8	R	3xLx6		76	108	108	125	2010.9	150	250	200	1025	1340	26	1/2	1	123
3	type	SOLb	3xMx6	6,18	76	117	117	130	2533.9	150	250	220	1150	1530	26	1/2	1	176
-50	8	150	3xM2x6	0.10	76	117	117	130	2587.7	150	250	220	1150	1530	26	1/2	1	176
S	Welded		4xN2x6		102	146	146	152	3421.2	150	250	250	1230	1670	26	1/2	1	210
	≥	ANSI	4xPx6		102	156	156	168	4500.7	150	330	270	1440	1905	26	1/2	1-1/4	287
			4xPx8		102	156	156	168	4500.7	200	330	270	1450	1915	29	1/2	1-1/4	290
			6xQ0x8		152	200	200	210	5462.9	200	330	280	1600	2170	29	3/4	1-1/4	378
			6xQ1x8		152	210	210	222	6418.4	200	330	280	1660	2250	29	3/4	1-1/4	433
			6xQx8		152	210	210	222	7791.3	200	350	300	1810	2560	29	3/4	1-1/4	490
			6xQx10		152	210	210	222	7791.3	250	350	300	1810	2560	31	3/4	1-1/4	490
			6xRx10	5.49	152	216	216	240	11272.0	250	350	300	1810	2560	31	3/4	1-1/4	550

"Installation dimensions" are the nominal sizes of the inlet and outlet flanges. "Inlet diameter" denotes the inner diameter of the safety valve inlet and may therefore differ from the inlet flange size depending on safety valves.

(Unit: mm)

SL6 () () series safety valves: Operating range and dimensions



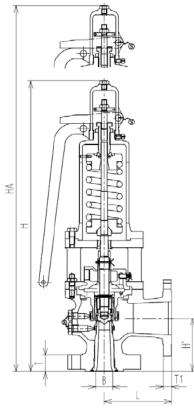
Safety valve: major dimensions and weight

Sa	fety	val	ve: majo	r dim	ensio	ns ar	nd we	ight									(Unit:	mm)
Туре	Inlet	Outle	Installation	Max. op	erating p MPaG		Inlet diameter	Throat area	Outlet		o-face	Overall length	Disassembly height	thick	nge (ness	Screw diameter		Weigh
Type	F	F	dimensions	400%0				mm ²	diameter			Ŭ	<u> </u>	Inlet T	Outlet		Needle	
				400°C	510°C	570°C	В			H'	L	Н	HA		T1	Rc	Rp	kg
			1.1/2xF1x3				40	216.4	80	150	155	705	930	48	19.1	1/2	3/4	53
			1.1/2xG1x3				40	353.0	80	150	155	705	930	48	19.1	1/2	3/4	53
			1.1/2xHx3				40	555.7	80	150	155	705	930	48	19.1	1/2	3/4	53
			2.1/2xJx4				50	855.3	100	168	200	870	1100	57	24	1/2	3/4	100
			2.1/2xKx6				50	1294.6	150	195	240	965	1280	57	26	1/2	3/4	134
	ш	ш	2.1/2xK2x6				65	1727.6	150	195	240	1085	1460	62	26	1/2	1	188
	RF	2	3xLx6				80	2010.9	150	210	250	1175	1620	67	26	1/2	1	225
3	500Lb	50Lb	3xMx6	10.3	10.3		80	2533.9	150	230	250	1305	1770	73	26	1/2	1	300
Tec	50(50	3xM2x6	10.5	10.5	5.58	80	2587.7	150	230	250	1305	1770	73	26	1/2	1	300
S	<u> </u>	511	4xN2x6				100	3421.2	150	240	280	1340	1805	74	26	1/2	1	308
	ANSI	ANSI	4xPx6				100	4500.7	150	260	280	1550	2150	74	26	1/2	1-1/4	345
	◄	4	4xPx8				100	4500.7	200	260	280	1550	2150	74	29	1/2	1-1/4	345
			6xQ0x8				150	5462.9	200	290	320	1640	2265	100	29	3/4	1-1/4	470
			6xQ1x8				150	6418.4	200	330	320	1790	2540	100	29	3/4	1-1/4	530
			6xQx8				150	7791.3	200	340	320	1920	2700	100	29	3/4	1-1/4	570
			6xQx10				150	7791.3	250	340	330	1920	2700	100	31	3/4	1-1/4	570
			6xRx10	8.23	8.23		150	11272.0	250	340	330	1920	2700	100	31	3/4	1-1/4	650

Туре	inle	Outlet F	Installation	Max. operating	Inlet diameter		neck ou diameter A		Throat area	Outlet	dime		Overall length	Disassembly height	Flange thickness	dia		Weigh
		F	dimensions	pressure MPaG	В	400°C	510°C	570°C	mm ²	diameter	H'	L	Н	HA	T1	Rc	Needle Rp	kg
			1-1/2xF1x3		40	76	76	86	216.4	80	165	155	720	945	19.1	1/2	3/4	53
			1-1/2xG1x3		40	76	76	86	353.0	80	165	155	720	945	19.1	1/2	3/4	53
			1-1/2xHx3		40	76	76	86	555.7	80	165	155	720	945	19.1	1/2	3/4	53
			2xJx4		50	90	90	102	855.3	100	200	200	900	1185	24	1/2	3/4	100
			2-1/2xKx6		65	108	108	125	1294.6	150	250	240	1020	1335	26	1/2	3/4	134
			2-1/2xK2x6		65	120	120	135	1727.6	150	250	240	1140	1515	26	1/2	1	188
	8	RF	3xLx6		76	124	124	140	2010.9	150	250	250	1215	1660	26	1/2	1	225
8	typ	50Lb	3xMx6	10.3	76	137	137	155	2533.9	150	250	250	1325	1790	26	1/2	1	300
L6	8	150	3xM2x6	10.5	76	137	137	155	2587.7	150	250	250	1325	1790	26	1/2	1	300
S	Veld		4xN2x6		102	160	160	175	3421.2	150	280	280	1380	1845	26	1/2	1	308
	3	ANSI	4xPx6		102	170	170	180	4500.7	150	330	280	1620	2220	26	1/2	1-1/4	345
			4xPx8		102	170	170	180	4500.7	200	330	280	1620	2220	29	1/2	1-1/4	345
			6xQ0x8		152	216	216	230	5462.9	200	350	320	1700	2325	29	3/4	1-1/4	470
			6xQ1x8		152	216	216	230	6418.4	200	390	320	1850	2600	29	3/4	1-1/4	530
			6xQx8		152	216	216	230	7791.3	200	400	320	1980	2760	29	3/4	1-1/4	570
			6xQx10		152	216	216	230	7791.3	250	400	330	1980	2760	31	3/4	1-1/4	570
			6xRx10	8.23	152	216	216	240	11272.0	250	400	330	1980	2760	31	3/4	1-1/4	650

"Installation dimensions" are the nominal sizes of the inlet and outlet flanges. "Inlet diameter" denotes the inner diameter of the safety valve inlet and may therefore differ from the inlet flange size depending on safety valves.

SL7 () (), 8 () () series safety valves: Operating range & dimensions (Flanged type)



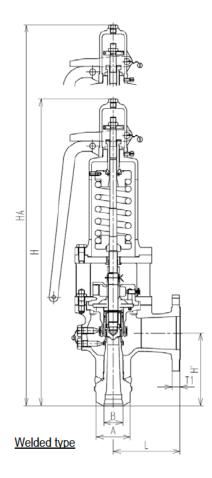
Flanged type

Sofoty volv	o: moior	dimonoiono	and woight
Salely valv		dimensions	and weight

Sa	fety	valv	ve: major d	imen	sions	and	weigł	nt									(Unit	: mm)
Туре	Inlet	Outlet	Installation	Max. op	erating p MPaG		Inlet diameter	Throat area	Outlet	Face-t	o-face	Overall length	Disassembly height	thick		Screw	diameter	
Type	F	F	dimensions	400°C	510°C	570°C	В	mm ²	diameter	H	1	H	HA	Inlet T	Outlet T1	Drain	Needle Rp	kg
			1-1/2xF1x4		0.00	0.00	40	216.4	80	220	200	920	1200	65	29	1/2	1/2	102
			1-1/2xG1x4				40	353.0	80	220	200	920	1200	65	29	1/2	1/2	102
	RF	RF	1-1/2xHx4				40	555.7	80	220	200	920	1200	65	32	1/2	3/4	102
-	500Lb	٩	2xJx4				50	855.3	100	220	220	980	1295	74	32	1/2	3/4	148
701	200	300Lb	2-1/2xKx6	13.7	13.7	9.28	65	1294.6	150	270	240	1160	1530	84	37	1/2	1-1/4	217
SL	\sim	33	2-1/2xK2x6				65	1727.6	150	270	240	1250	1690	84	37	3/4	1-1/4	250
	ANSI	ISN	3xLx6				80	2010.9	150	280	260	1260	1260	96	37	3/4	1-1/2	258
	◄	1	3xMx6				80	2533.9	150	280	260	1525	1525	96	37	3/4	1-1/2	447
			3xM2x6				80	2587.7	150	280	260	1545	1545	96	37	3/4	1-1/2	447
			1-1/2xF1x4				40	216.4	80	220	200	920	1200	65	29	1/2	1/2	110
	ш		1-1/2xG1x4				40	353.0	80	220	200	920	1200	65	29	1/2	1/2	110
	RF	RF	1-1/2xHx4				40	555.7	80	220	200	920	1200	1260 96 1525 96 1545 96 1200 65 1200 65 1200 65	32	1/2	3/4	110
5	ГР	Р	2xJx4				50	855.3	100	220	220	980	1295	74	32	1/2	1	155
8	500L	300Lb	2-1/2xKx6	17.1	17.1	9.28	65	1294.6	150	270	240	1160	1530	84	37	1/2	1-1/4	225
S	<pre>CN</pre>		2-1/2xK2x6				65	1727.6	150	270	240	1250	1690	84	37	3/4	1-1/4	260
	ANSI	NSI	3xLx6				80	2010.9	150	280	260	1260		96	37	3/4	1-1/2	265
	◄		3xMx6			80 2533.9 150 80 2587.7 150	280	260	1525	1525	96	37	3/4	1-1/2	450			
			3xM2x6				80	2587.7	150	280	260	1545	1545	96	37	3/4	1-1/2	450

Note: For SL ()6 (), some have the max. operating pressure exceed the ANSI pressure-temperature rating, and those failing to meet the ANSI standard must not be used. For details, see ANSI B16.34 "PRESSURE-TEMPERATURE RATING TABLE."

SL7 () () ~ 9 () () series safety valves: Operating range & dimensions (Welded type)



Safety valve: major dimensions and weight

(Unit: mm)

ou	<u> </u>	T Call	e. major c	-													<u>`</u>	
Туре	Inlet	Outlet F	Installation dimensions	Max. operating pressure	Inlet diameter	(neck ou diamete A	r	Throat area mm²	Outlet diameter			Overall length	Disassembly height	Flange thickness		Needle Rp	Weight
				MPaG	В	400°C	510°C	570°C			H	L	Н	HA	T1	RL	кр	kg
			1-1/2xF1x4		40	90	90	100	216.4	100	250	200	950	1230	29	1/2	1/2	102
		ш	1-1/2xG1x4		40	90	90	100	353.0	100	250	200	950	1230	29	1/2	1/2	102
	type	RF	1-1/2xHx4		40	90	90	100	555.7	100	250	200	950	1230	32	1/2	3/4	102
8	₹	300Lb	2xJx4		50	110	110	120	855.3	100	250	220	1010	1325	32	1/2	1	148
SL703	Welded	30(2-1/2xKx6	13.7	65	120	120	135	1294.6	150	305	240	1200	1575	37	1/2	1-1/4	217
S	/elc	ISN	2-1/2xK2x6		65	130	130	150	1727.6	150	305	240	1285	1725	37	3/4	1-1/4	250
	5	N N	3xLx6		76	140	140	155	2010.9	150	305	260	1285	1725	37	3/4	1-1/2	258
			3xMx6		76	150	150	170	2533.9	150	305	260	1570	2115	37	3/4	1-1/2	447
			3xM2x6		76	150	150	170	2587.7	150	305	260	1570	2115	37	3/4	1-1/2	447
			1-1/2xF1x4		40	95	95	105	216.4	100	250	200	950	1230	29	1/2	1/2	110
		RF	1-1/2xG1x4	17.1	40	95	95	105	353.0	100	250	200	950	1230	29	1/2	1/2	110
	B	8	1-1/2xHx4		40	95	95	105	555.7	100	250	200	950	1230	32	1/2	3/4	110
03	₹	300Lb	2xJx4		17.1	50	110	110	130	855.3	100	250	220	1010	1325	32	1/2	1
SL803	Welded type	8	2-1/2xKx6	17.1	65	130	130	145	1294.6	150	305	240	1200	1575	37	1/2	1-1/4	225
w w	le le	ANSI	2-1/2xK2x6		65	145	145	160	1727.6	150	305	240	1285	1725	37	3/4	1-1/4	260
	>	AN	3xLx6		76	150	155	170	2010.9	150	305	260	1285	1725	37	3/4	1-1/2	265
			3xMx6		76	160	165	185	2533.9	150	305	260	1570	2115	37	3/4	1-1/2	450
			3xM2x6		76	160	165	185	2587.7	150	305	260	1570	2115	37	3/4	1-1/2	450
			1-1/2xF1x4		40 40	105	105	120	216.4	100 100	250 250	200	950 950	1230	29 29	1/2	1/2	110 110
		R	1-1/2xG1x4		40				353.0					1230				
	type	q	1-1/2xHx4 2xJx4		40 50	105 125	105 125	120 145	555.7 855.3	100 100	250 250	200 220	950 1125	1230 1490	32 32	1/2	3/4	110 200
See .	d p	300Lb	2xJx4 2-1/2xKx6	20.6	50 65	125	125	145	1294.6	100	305	220	1125	1490	32	1/2	1-1/4	200
SL903	ep	30	2-1/2xK2x6	20.0	65	145	145	180	1727.6	150	305	240	1200	1850	37	3/4	1-1/4	280
	Welded	ANSI	3xLx6		76	160	170	195	2010.9	150	305	240	1535	2000	37	3/4	1-1/4	300
	-	A	3xMx6	1	76	165	180	210	2533.9	150	305	260	1610	2195	37	3/4	1-1/2	480
			3xM2x6	1	76	165	180	210	2587.7	150	305	260	1610	2195	37	3/4	1-1/2	480
		1	JAIVIZAU		10	105	100	210	2001.1	150	303	200	1010	2135	31	0/4	1-1/Z	400

Electromagnetic pressure relief valves: PSH-ER series

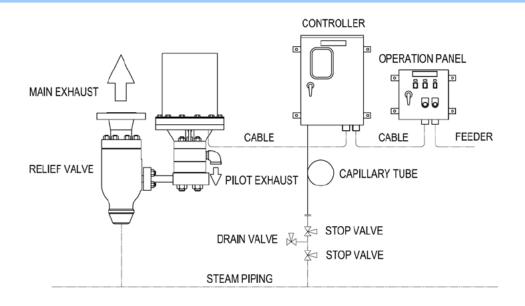
PSH-ER series solenoid operated pressure relief valves are operated for opening and closing using electricity (or electromagnet) as a source of power.

PSH-ER series valves consist of a main valve, a pilot valve, a solenoid (or electromagnet) assembly, a controller and an operation panel. In comparison with ordinary spring-loaded safety valves, this series features:

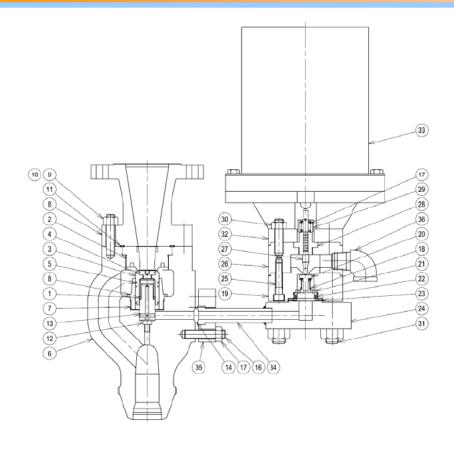
- Permits perfect prevention of leaks until the set pressure is reached
- Permits accurate and reliable popping pressure setting by use of a pressure sensor
- Performs reliable blowdown (2% blowdown achieved)

Thus this valve series contributes to improving boiler operating efficiency and reducing costs.

Product configuration



Structure and major materials



NO.	ITEM	MATERIAL
01	SPRING	B637-7750
02	NOZZLE	A182-F22 HF
03	DISC	B637-7750
04	DISC CENTER	B637-7750
05	PISTON RING	THERMORIC
06	BODY	A217-WC9
07	GUIDE	SUS316
08	VALVE OUTLET	A182-F22
09	STUD BOLT	SNB16
10	NUT	A194-4
11	GASKET	B637-7750
12	ORIFICE	SUS316
13	DUMPER	B637-7750
14	GASKET	SUS321
15	STUD BOLT	SNB16
16	NUT	A194-4
17	SPRING	SUS304
18	SPRING	B637-7750
19	SEAT	A182-F22
20	DISC	B637-7750
21	GUIDE	K-MONEL
22	GUIDE RETAINER	SUS420J2
23	GASKET	ASBESTO FREE
24	FLANGE	SUS316
25	HEX,SOCKET HEAD BOLT	SUS304-A2
26	BODY	A182-F22
27	SPINDLE	STELLITE
28	SPINDLE GUIDE	K-MONEL
29	SPRING COVER	SUS304
30	STUD BOLT&NUT	SNB16 & A194-4
31	STUD BOLT&NUT	SNB16 & A194-4
32	COOLING SPOOL	A216-WCB
33	SOLENOID ASSY.	
34	CONNECTION PIPE	SUS316
35	FLANGE	SUS316
36	ELBOW	SCS13

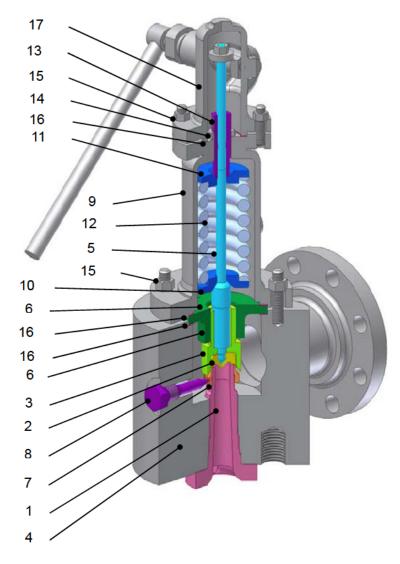
RECL-PE series: Relief valves for high temperature/high pressure liquids

This RECL-PE series has been developed mainly for feed-water heaters and other equipment that deal with high temperature and high pressure liquids, and its structure and materials used are, on the design stage, carefully selected in consideration of harsh operating conditions involving high temperatures and high pressures. Relief valves of this series feature the optimized shapes of major sections that have realized smooth operation for liquid service, and a forged body that accommodates excess piping reaction force, as well as the surface hardening treatment of the sliding section to allow continuous valve operation. For details, please contact our Business Dept.

Product specifications

Operating pressure range	5.72 - 42.5MPa
Operating temperature range	142 - 371°C
Blowdown	15%
ASME certified discharge coefficient	K=0.717 (ASME Sec. VIII)

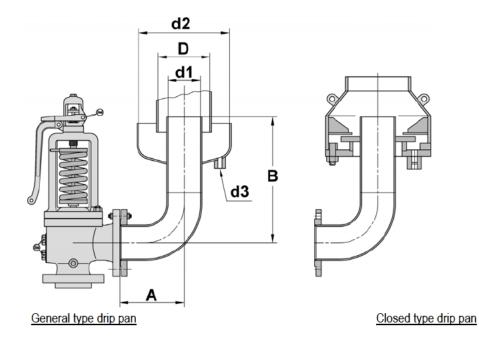
Parts name and major materials



	Parts name	Major material
1	Nozzle seat	A105
2	Disc	SUS630
3	Holder	SUS403
4	Body	A105
5	Spindle	SUS403
6	Guide	SUS304
7	Adjusting ring	SUS304
8	Lock bolt	S20C
9	Bonnet	SCPH2
10	Spring washer	S25C
11	Spring retainer	S25C
12	Spring	Spring steel
13	Adjusting screw	SUS403
14	Jam nut	SS400
15	Stud bolt & nut	SNB7/S45C
16	Gasket	Non-asbestos or dead soft steel
17	Сар	SCPH2

More than 90% of reported safety valve problems are seat leaks, and this problem is mostly due to binding or immobilization of a discharge pipe of safety valve.

In order to prevent such a seat-leak problem, we manufacture drip pans most suited to our safety valves. Please order them together with safety valves.



	Dimensio	nal table fo	r general t	type drip p	bans
1					

			<u> </u>			
Safety valve outlet diameter	d1	d2	d3	A	В	D
25	25	50	Rc3/8	40	150	125
40	40	65	Rc3/8	60	225	125
50	50	80	Rc1/2	80	270	150
65	65	90	Rc1/2	100	365	200
80	80	125	Rc1/2	120	380	200
100	100	150	Rc3/4	160	395	250
125	125	175	Rc3/4	195	430	300
150	150	200	Rc1	235	460	300
200	200	250	Rc1	310	600	400

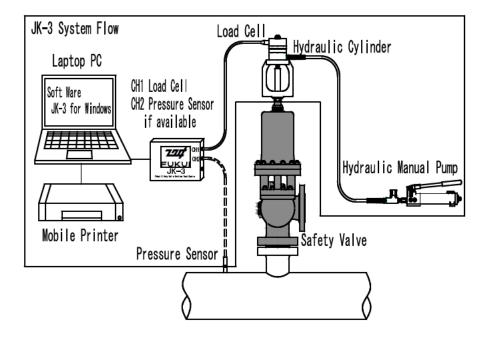
Safety valve operation test required for periodic inspection of boilers Use our JK-3 to save time and money, instead of testing on an actual boiler!

The JK-1 features:

- Permits tests at normal operating pressure;
- Permits tests at low fuel cost, lost cost and low noise;
- Permits direct reading of a load with high reliability;
- Uses a PC for simple, reliable and speedy tests; and
- Displays measurement results on the spot.

A jack-up test is performed to check a safety valve for its popping pressure while a boiler or other equipment under protection by the safety valve is in operation at the operating pressure. This field tester contributes not only to reducing test costs but also to environmental measures in the neighborhood, thus presenting a convenient test method. For details, please contact our Business Department.





SL & SJ series safety valves: Discharging capacity table for LRS (Unit: kg/h)

Series							S	L							
Orifice	D	E	F	G	н	J	К	L	М	N	P		Q	R	Т
Set P (MPa)	78.5	138.9	216.4	353	555.7	907.9	1294.6	2010.9	2533.9	3058.1	450	0.7 77	91.3	11272	18385.4
0. 1	73	129	202	329	517	845	1206	1873	2360	2848	41	91 7	7255	10496	17120
0. 2	109	193	301	491	772	1262	1799	2795	3522	4250	62	256 10	0829	15667	25554
0.3	145	257	400	653	1027	1678	2393	3717	4684	5653	83	320 14	403	20838	33988
0. 4	181	320	499	814	1282	2095	2987	4640	5847	7056	103	385 17	7977	26008	42421
0.5	217	384	599	976	1537	2511	3581	5562	7009	8459	124	49 21	551	31179	50855
0. 6	253	448	698	1138	1792	2928	4175	6485	8171	9862	14	514 25	5125	36350	59289
0. 7	289	512	797	1300	2047	3344	4769	7407	9334	11264	165	578 28	3699	41520	67722
0. 8	325	575	896	1462	2302	3761	5362	8330	10496	12667	186	643 32	2273	46691	76156
0. 9	361	639	996	1624	2557	4177	5956	9252	11658	14070	207	07 35	5847	51862	84590
1.0	397	703	1095	1786	2812	4594	6550	10174	12821	15473	227	72 39	9421	57032	93023
1.1	433	766	1194	1948	3067	5010	7144	11097	13983	16876	248	336 42	2995	62203	101457
1. 2	469	830	1293	2110	3321	5427	7738	12019	15145	18278	269	001 46	6569	67373	109891
1. 3	505	894	1393	2272	3576	5843	8332	12942	16308	19681	289	66 50	0143	72544	118324
1.4	541	958	1492	2434	3831	6260	8926	13864	17470	21084	310	030 53	3717	77715	126758
1.5	577	1021	1591	2596	4086	6676	9519	14787	18632	22487	330	95 57	7291	82885	135192
1.6	613	1085	1691	2758	_	7092	10113	15709	19795	23890	351		0865	88056	143625
1.7	649	1149	1790	2920	_	7509	10707	16631	20957	25292	372		1439	93227	152059
1.8	685	1213	1889	3081	4851	7925	11301	17554	22119	26695	392		3013	98397	160493
1. 9	721	1276	1988	3243		8342	11895	18476	23282	28098	413		587	103568	168926
2. 0	757	1340	2088	3405		8758	12489	19399	24444	29501	434		5161	108739	177360
2. 1	793	1404	2187	3567	5616	9175	13083	20321	25606	30904	454	_	3735	113909	185794
2. 2	829	1467	2286	3729	_	9591	13676	21244	26769	32306	475		2309	119080	194227
2.3	865	1531	2385	3891	6125	10008	14270	22166	27931	33709	496		5883	124251	202661
2. 4	901	1595	2485	4053		10424	14864	23088	29093	35112	516	_	9457	129421	211095
2.5	937	1659	2584	4215		10841	15458	24011	30256	36515	537		3031	134592	219528
2.6	973	1722	2683	4377		11257	16052	24933	31418	37918	558		6605	139762	227962
2.7	1009	1786	2782	4539		11674	16646	25856	32580	39320	578		0179	144933	236396
2.8	1045	1850	2882	4701	7400	12090	17240	26778	33743	40723	599		3753	150104	244829
2.9	1081	1913	2981	4863	_	12507	17833	27701	34905	42126	619		7327	155274	253263
3. 0	1117	1977	3080	5025	7910	12923	18427	28623	36067	43529	640	063 110	0901	160445	261697
Series								SJ							
Orific	e F2	G	a2	H2	J2	L1	м	N3	P2	Q	2	Q3		R	т
Set P (MPa)	28.5	5 45	2.4 7	06.8	1134.1	1885.7	2533.9	3739.3	4560	.4 608	32.1	7208.1	10	0386.9	18385.4
0. 1	20	6 4	421	658	1056	1756	2360	3482	424	47 5	664	6712	2	9672	17120
0.2	2 39	94	629	982	1576	2621	3522	5197	633	39 8	454	10019)	14437	25554
0.3	3 52	24	836	1307	2097	3486	4684	6913	843	30 11	244	13325	5	19201	33988
0.4			044	1631	2617	4351	5847	8628	_		033	16632	_	23966	42421
0.5	_		251	1955	3137	5216	7009	10343	_		823	19938	_	28731	50855
0.6	_		459	2279	3657	6081	8171	12058	_		613	23244	_	33495	59289
0.7	_	44 1	666	2603	4177	6946	9334	13774	1679	98 22	403	26551		38260	67722

0. 2	394	629	982	1576	2621	3522	5197	6339	8454	10019	14437	25554
0.3	524	836	1307	2097	3486	4684	6913	8430	11244	13325	19201	33988
0.4	654	1044	1631	2617	4351	5847	8628	10522	14033	16632	23966	42421
0.5	784	1251	1955	3137	5216	7009	10343	12614	16823	19938	28731	50855
0.6	914	1459	2279	3657	6081	8171	12058	14706	19613	23244	33495	59289
0. 7	1044	1666	2603	4177	6946	9334	13774	16798	22403	26551	38260	67722
0.8	1174	1874	2928	4698	7811	10496	15489	18890	25193	29857	43025	76156
0.9	1304	2081	3252	5218	8676	11658	17204	20982	27983	33164	47789	84590
1.0	1434	2289	3576	5738	9541	12821	18919	23074	30773	36470	52554	93023
1.1	1564	2497	3900	6258	10406	13983	20635	25166	33563	39777	57319	101457
1.2	1694	2704	4225	6779	11271	15145	22350	27258	36353	43083	62083	109891
1.3	1825	2912	4549	7299	12136	16308	24065	29350	39143	46390	66848	118324
1.4	1955	3119	4873	7819	13001	17470	25781	31442	41933	49696	71612	126758
1.5	2085	3327	5197	8339	13866	18632	27496	33534	44723	53003	76377	135192
1.6	2215	3534	5521	8860	14731	19795	29211	35626	47513	56309	81142	143625
1.7	2345	3742	5846	9380	15596	20957	30926	37717	50303	59616	85906	152059
1.8	2475	3949	6170	9900	16461	22119	32642	39809	53093	62922	90671	160493
1.9	2605	4157	6494	10420	17326	23282	34357	41901	55883	66229	95436	168926
2.0	2735	4364	6818	10940	18191	24444	36072	43993	58673	69535	100200	177360
2.1	2865	4572	7143	11461	19056	25606	37788	46085	61463	72841	104965	185794
2. 2	2995	4779	7467	11981	19921	26769	39503	48177	64253	76148	109729	194227
2.3	3125	4987	7791	12501	20786	27931	41218	50269	67043	79454	114494	202661
2.4	3255	5194	8115	13021	21651	29093	42933	52361	69833	82761	119259	211095
2.5	3385	5402	8439	13542	22516	30256	44649	54453	72623	86067	124023	219528
2.6	3515	5609	8764	14062	23381	31418	46364	56545	75412	89374	128788	227962
2.7	3645	5817	9088	14582	24246	32580	48079	58637	78202	92680	133553	236396
2.8	3775	6024	9412	15102	25111	33743	49794	60729	80992	95987	138317	244829
2.9	3905	6232	9736	15622	25976	34905	51510	62821	83782	99293	143082	253263
3.0	4035	6439	10061	16143	26841	36067	53225	64912	86572	102600	147847	261697

SL & SJ series safety valves: Discharging capacity table for NK (Unit: kg/h)

Series							S	L						
Orifice	D	E	F	G	н	J	К	L	М	N	Р	Q	R	Т
Set P (MPa)	78.5	138.9	216.4	353	555.7	907.9	1294.6	2010.9	2533.9	3058.1	4500.7	7791.3	11272	18385.4
0.1	72	127	198	322	508	829	1183	1837	2315	2794	4111	7117	10297	16795
0.2	108	191	298 398	486 650	765	1250 1671	1783 2383	2769	3489 4664	4211 5628	6197	10729	15522 20746	25317
0.3	144 181	256 320	499	813	1023 1280	2092	2383	3701 4633	5838	7046	8284 10370	14340 17951	25971	33838 42360
0.5	217	384	599	977	1538	2513	3583	5565	7013	8463	12456	21562	31195	50882
0.6	254	449	699	1141	1795	2933	4183	6497	8187	9881	14542	25174	36420	59403
0.7	290	513	799	1304	2053	3354	4783	7429	9361	11298	16628	28785	41644	67925
0.8	326	578	900	1468	2311	3775	5383	8361	10536	12716	18714	32396	46869	76446
0.9	363	642	1000	1631	2568	4196	5983	9293	11710	14133	20800	36007	52094	84968
1.0	399 436	706	1100 1201	1795 1959	2826	4617 5037	6583 7183	10225	12885 14059	15550 16968	22886 24972	39619	57318 62543	93490 102011
1.1	430	771 835	1301	2122	3083 3341	5458	7783	11157 12090	15234	18385	27058	43230 46841	67767	110533
1.3	508	899	1401	2286	3598	5879	8383	13022	16408	19803	29144	50453	72992	119055
1.4	545	964	1502	2449	3856	6300	8983	13954	17583	21220	31230	54064	78216	127576
1.5	581	1028	1602	2613	4114	6721	9583	14886	18757	22638	33316	57675	83441	136098
1.6	617	1093	1702	2777	4371	7142	10183	15818	19932	24055	35403	61286	88666	144620
1.7	654	1157	1803	2940	4629	7562	10783	16750	21106	25472	37489	64898	93890	153141
1.8 1.9	690 727	1221 1286	1903 2003	3104 3268	4886 5144	7983 8404	11383 11983	17682 18614	22281 23455	26890 28307	39575 41661	68509 72120	99115 104339	161663 170184
2.0	763	1350	2103	3431	5401	8825	12584	19546	24630	29725	43747	75731	104339	178706
2.0	799	1414	2204	3595	5659	9246	13184	20478	25804	31142	45833	79343	114788	187228
2.2	836	1479	2304	3758	5917	9666	13784	21410	26978	32560	47919	82954	120013	195749
2.3	872	1543	2404	3922	6174	10087	14384	22342	28153	33977	50005	86565	125238	204271
2.4	909	1608	2505	4086	6432	10508	14984	23274	29327	35394	52091	90177	130462	212793
2.5	945	1672	2605	4249	6689	10929	15584	24206	30502	36812	54177	93788	135687	221314
2.6 2.7	981 1018	1736 1801	2705 2806	4413 4576	6947 7204	11350 11770	16184 16784	25138 26070	31676 32851	38229 39647	56263 58349	97399 101010	140911 146136	229836 238358
2.8	1054	1865	2906	4740	7462	12191	17384	27002	34025	41064	60435	104622	151360	246879
2.9	1090	1930	3006	4904	7720	12612	17984	27934	35200	42482	62521	108233	156585	255401
3.0	1127	1994	3106	5067	7977	13033	18584	28866	36374	43899	64608	111844	161810	263922
				0007	1311	10000	10004	20000	00074	40099	04000	111044	101010	200322
Series				0007	1311	13033			00074	43033	04000	111044	101010	200322
Series	e F2						ę	SJ						
Series Orifice Set P (MPa)	e F2 28.5	G	2	H2 06.8	J2 1134.1	L1 1885.7			P2		2	Q3	R 10386.9	T 18385.4
Orifice		G 452	2	H2	J2	L1	M	SJ N3	P2	2 G 0.4 608	2	Q3	R	T
Orifice Set P (MPa) 0.1 0.2	28.5 25 39	G 452 59	2 2.4 7 413 623	H2 06.8 646 973	J2 1134.1 1036 1562	L1 1885.7 1723 2597	M 2533.9	SJ N3 3739.3 3416 5149	P2 4560 5 41 9 62	C G 0.4 608 66 5	22 32.1 7 5556 3375	Q3 208.1 6585 9926	R 10386.9	T 18385.4
Orifice Set P (MPa) 0.1 0.2 0.3	28.5 25 39 52	G 452 59 22	2 2 2.4 7 413 623 833	H2 06.8 0 646 0 973 1 1301 0	J2 1134.1 1036 1562 2087	L1 1885.7 1723 2597 3471	M 2533.9 2315 3489 4664	SJ N3 3739.3 3416 5149 6882	P2 4560 6 41 9 62 2 83	66 5 80 8 93 11	22 32.1 7 5556 3375 194	Q3 208.1 6585 9926 13267	R 10386.9 9488 14303 19117	T 18385.4 16795 25317 33838
Orifice Set P (MPa) 0.1 0.2 0.3 0.4	28.5 25 39 52 65	G 452 59 00 22 53 1	2 2.4 7 413 623 833 042	H2 06.8 046 046 046 046 046 046 046 046 046 046	J2 1134.1 1036 1562 2087 2613 2	L1 1885.7 1723 2597 3471 4345	M 2533.9 2315 3489 4664 5838	SJ N3 3739.3 3416 5149 6882 8615	P2 4560 5 41 9 62 2 83 5 105	2 C 2.4 608 66 55 80 88 93 11 07 14	22 32.1 7 5556 3375 194 9013 9013 9013 9013 9013 9013 9013 9013	Q3 208.1 5585 9926 13267 16607 1	R 10386.9 9488 14303 19117 23931	T 18385.4 16795 25317 33838 42360
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5	28.5 25 39 52 65 78	G 452 59 22 53 1 35 1	2 7 2.4 7 413 623 8 833 0 042 2 252 9	H2 06.8 646 973 1301 1628 1956	J2 I 1134.1 I 1036 I 2087 I 2613 I 3139 I	L1 1885.7 1723 2597 3471 4345 5219	M 2533.9 2315 3489 4664 5838 7013	SJ N3 3739.3 3416 5149 6882 8615 10349	P2 4560 5 41 9 62 2 83 5 105 9 126	G 0.4 608 66 5 80 8 93 11 07 14 21 16	22 7 32.1 7 5556 3 375 1 194 - 6013 5 8832 5	Q3 208.1 20	R 10386.9 9488 14303 19117 23931 28746	T 18385.4 16795 25317 33838 42360 50882
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6	28.5 25 39 52 65 78 91	G 452 59 22 53 11 55 1 6 1	2 7 2.4 7 413 623 8 833 0 042 2 52 462 0	H2 06.8 646 973 1301 1628 1956 2284	J2 I 1134.1 I 1036 I 2087 I 2613 I 3139 I 3664 I	L1 1885.7 1723 2597 3471 4345 5219 6093	M 2533.9 2315 3489 4664 5838 7013 8187	SJ N3 3739.3 3416 5149 6882 8615 10349 12082	P2 4560 5 41 9 62 2 83 5 105 9 126 2 147	G 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19	22 7 32.1 7 5556 3 375 1 194 - 6013 - 6832 - 651 -	Q3 208.1 6585 9926 113267 113267 116607 119948 23289 111526	R 10386.9 9488 14303 19117 23931 28746 33560	T 18385.4 16795 25317 33838 42360 50882 59403
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5	28.5 25 39 52 65 78 91	G 452 59 22 33 11 35 1 6 11 47 1	2 7 2.4 7 413 623 8 833 0 042 2 52 462 0	H2 06.8 646 973 1301 1628 1956	J2 I 1134.1 I 1036 I 2087 I 2613 I 3139 I	L1 1885.7 1723 2597 3471 4345 5219	M 2533.9 2315 3489 4664 5838 7013	SJ N3 3739.3 3416 5149 6882 8615 10349	P2 4560 6 41 9 62 83 5 105 9 126 2 147 5 168	C 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19 48 22	22 7 32.1 7 5556 375 194 32 6013 3832 6651 2470	Q3 208.1 20	R 10386.9 9488 14303 19117 23931 28746	T 18385.4 16795 25317 33838 42360 50882
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7	28.5 25 39 52 65 78 91 104	G 455 59 22 33 10 35 1 6 1 47 1 79 1	2 7 2.4 7 413 623 8 833 0 042 2 252 4 671 6	H2 906.8 973 1301 1628 1956 2284 2611 1	J2 I 1134.1 I 1036 I 2087 I 2087 I 3139 I 3664 I 4190 I 5241 I	L1 1885.7 1723 2597 3471 4345 5219 6093 6967	M 2533.9 2315 3489 4664 5838 7013 8187 9361	SJ N3 3739.3 3416 5149 6882 8615 10349 12082 13815	P2 4560 6 41 9 62 83 105 9 126 2 147 5 168 8	C C 0.4 600 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25	22 7 32.1 7 5556 3 375 1 194 9 6013 6 8832 9 651 9 4470 9 289 1	Q3 208.1 20	R 10386.9 9488 14303 19117 23931 28746 33560 38374	T 18385.4 16795 25317 33838 42360 50882 59403 67925
Orifice Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0	28.5 25 39 52 65 78 91 104 117 131 144	G 452 59 22 53 10 53 11 55 11 6 11 77 11 79 11 0 22 2 2	2 7 2.4 7 413 6 623 8 833 0 042 2 52 4 671 8 881 0 091 3 300 1	H2 646 973 1301 1628 1956 2284 2611 2939 3266 3594 1	J2 1 1134.1 1 1036 1 2087 2 2087 2 3139 3 3664 4 4190 4 5241 5	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885	SJ N3 3739.3 3416 5149 6882 8619 10349 12082 13819 15548 17281 19014	P2 4560 6 41 9 62 83 105 9 126 147 5 168 8 189 1 210 4	C C 0.4 600 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30	22 7 32.1 7 5556 9 375 1 194 9 013 9 832 9 651 9 651 9 6289 9 108 9 9927 1	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26630 2 29971 3 33312 3	R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.7 0.8 0.9 1.0 1.1	28.5 25 39 52 65 78 91 104 117 131 144 157	G 452 59 22 53 10 53 11 53 11 6 11 7 7 9 11 0 22 2 7 3 2 2 7 3 2	2 2 2.4 7 413 6 623 8 833 0 042 2 510 1 7 8 8 7 7 7 7 8 8 7 7 7 7 7 7 7 7 7 7 7 7 7	H2 646 973 1301 1628 1956 2284 2611 2939 3266 3594 3922 6	J2 1 1134.1 1 1036 1 2087 2 2087 2 3139 3 3664 4 4190 4 5241 5 5767 6	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059	SJ N3 3739.3 3416 5149 6882 8615 10349 12082 13815 15548 17281 19014 20748	P2 4560 6 41 9 62 83 105 9 126 2 147 5 168 3 189 1 210 4 231 3 253	G 0.4 600 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33	22 7 32.1 7 5556 3 194 4 4013 1 8832 1 651 1 6289 1 108 1 9927 1 7747 1	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26630 2 29971 3 33312 3 39994 1	R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.7 0.8 0.9 1.0 1.1 1.2	28.5 25 39 52 65 78 91 104 117 131 144 157 170	G 455 59 22 33 11 35 11 6 11 77 1 79 1 1 0 2 2 2 2 73 2 34 2	2 7 2.4 7 413 6 623 6 833 7 042 7 252 7 462 7 671 7 881 7 091 7 300 7 510 7 720 7	H2 646 973 646 973 1301 1628 1956 2284 2011 2284 22611 22939 23266 3594 3922 4249	J2 1134.1 1036 1562 2087 2613 3139 3664 4190 4716 5241 5767 6293 6818	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234	SJ N3 3739.3 3416 5149 6882 8615 10349 12082 13815 15548 17281 19014 20748 2248	P2 4560 6 41 9 62 83 70 105 105 105 105 105 1105	C C 0.4 600 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36	22 7 32.1 7 5556 - 194 - 194 - 4013 - 8832 - 651 - 6289 - 1008 - 9927 - 7477 - 5566 -	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26630 2 29971 3 33312 3 36653 3 39994 4	R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632 62446	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 110533
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3	28.5 25 39 52 65 78 91 104 117 131 144 157 170 183	G 452 59 60 60 61 75 10 61 11 79 11 00 22 73 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 72 73 72 73 73 73 74 75 75 75 75 75 75 75 75 75 75 75 75 75	2 413 623 833 042 252 462 671 881 091 300 510 720 930	H2 973 973 1301 1628 1956 2284 2611 2939 3266 3594 3922 4249 4577 1	J2 1 1134.1 1 1036 1 1562 2 2087 2 2013 3 3139 3 3664 4 4190 4 5241 5 5767 6 6818 7	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337 12211	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234 16408	SJ N3 3739.3 3416 5149 6882 8615 10349 12082 13815 15548 17281 19014 20748 22481 24214	P2 4560 6 41 9 62 83 75 168 8 189 1 2103 4 231 3 253 4 295	C 0.4 600 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39	22 7 32.1 7 3556 - 375 - 194 - 013 - 651 - 6651 - 2289 - 108 - 9927 - 6566 - 3385 -	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26300 2 29971 3 33653 3 39994 4 46676 2	R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632 62446 67260	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 110533 119055
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.1 1.2 1.3 1.4	28.5 25 39 52 65 78 91 104 117 131 144 157 170 183	G 452 59 60 22 53 11 55 11 6 17 11 79 11 0 22 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 22 73 73 73 73 73	2 7 2.4 7 413 6 623 6 833 7 042 7 252 7 462 7 671 7 881 7 091 7 300 7 510 7 720 7	H2 646 973 646 973 1301 1628 1956 2284 2011 2284 22611 22939 23266 3594 3922 4249	J2 1134.1 1036 1562 2087 2613 3139 3664 4190 4716 5241 5767 6293 6818	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234	SJ N3 3739.3 3416 5149 6882 8615 10349 12082 13815 15548 17281 19014 20748 2248	P2 4560 6 44560 6 41 9 6 2 83 105 1105	C 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 445 42	12 7 32.1 7 3556 3 1375 1 194 1 013 1 8322 1 1651 1 289 1 108 1 9927 1 3566 1 3855 1 2204 1	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26630 2 29971 3 33312 3 36653 3 39994 4	R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632 62446	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 110533
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3	28.5 25 39 52 65 78 91 104 117 131 144 157 170 183 196	G 452 59 50 52 53 10 55 11 6 11 7 7 11 7 9 11 6 11 7 9 11 7 9 11 7 9 11 7 9 11 7 9 12 2 2 7 3 2 2 7 3 2 2 2 3 5 5 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 5 1 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 1 3 1 1 1 3 1 1 1 3 1 1 3 1 1 3 1 1 1 3 1 1 3 1 1 1 3 1 1 1 3 1 1 1 1 3 1 1 1 1 1 2 2 2 1 1 1 1	2 7 2.4 7 413 6 623 8 833 9 042 9 252 9 462 9 671 9 881 9 091 9 300 9 510 9 720 9 930 1 139 9	H2 973 973 973 1301 1628 1956 2284 2611 2939 2261 3594 3592 14249 4577 4904 1	J2 1134.1 1036 1562 2087 2613 3139 3664 4190 4716 5241 5767 6293 6818 7344 7870	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337 12211 13085	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234 16408 17583	SJ N3 3739.3 3416 5149 6882 8619 10349 12082 13819 15548 17281 19014 20748 22481 24214 25947	P2 4560 6 44560 6 41 9 6 2 83 105 1105	G 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 45 42 58 45	12 7 32.1 7 3556 1 3375 1 194 1 013 1 8322 1 6511 1 2289 1 108 1 927 1 5566 1 9385 1 20385 1 2044 1	Q3 208.1 6585 9926 9926 1 13267 1 16607 1 19948 2 23289 2 26630 2 29971 3 36653 3 39994 4 43335 4 46676 5	R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632 62446 67260 72075	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 110533 119055 127576
Orifica Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.1 1.2 1.3 1.4 1.5	28.5 25 39 52 65 78 91 104 117 131 144 157 170 183 196 209 223	G 452 59 60 60 72 73 75 71 79 71 70 72 73 72 73 72 73 72 73 72 73 72 73 72 73 72 73 72 73 72 73 73 73 73 73 73 73 73 73 73 73 73 73	2 7 2.4 7 413 6 623 8 833 9 042 9 252 4 671 8 881 9 091 9 300 9 510 7 720 9 930 1 139 3 49	H2 9 06.8 9 973 1 1301 1 1628 1 1956 2 2284 1 2611 2 3266 3 3594 3 3594 3 3922 1 4249 1 4577 4 4904 1 5232 1	J2 1134.1 1036 1562 2087 2613 3139 3664 4190 4716 5241 5767 6293 6818 7344 7870 8395	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337 12211 13085 13959	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234 16408 17583 18757	SJ N3 3739.3 3416 5149 6882 8615 10349 12082 13815 15548 17281 19014 20748 22481 24214 25947 27680	P2 4560 6 4560 6 41 9 6 2 83 105 1168	C 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 45 42 58 45 72 47	22 7 32.1 7 3556 7 3375 104 3375 104 3375 104 3631 103 3289 103 3289 103 3289 103 3285 103 3285 103 3285 103 3284 103	Q3 208.1 6585 9926 1 9926 1	R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632 62446 67260 72075 76889	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 10533 119055 127576 136098
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12885 14059 15234 16408 17583 18757 19932 21106 22281 23455 24630 25804 26978 28153 29327</td><td>SJ N3 3739.3 3416 5149 6882 8615 10349 12082 13815 15548 17281 19014 20748 22788 24214 24214 25941 24214 24214 25941 31146 32880 34613 36346 38079 39812 41545 43279 45012</td><td>P2 4560 6 4560 6 410 2 8 5 105 9 126 2 147 5 168 3 126 2 147 5 168 3 253 1 274 4 295 7 316 3378 358 379 0 401 3 422 443 9 464 2 485 5 5 5 5 5 5 5 5</td><td>C C 0.4 600 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 45 42 58 45 72 47 86 50 00 53 13 56 27 59 41 61 55 64 68 67 82 70 96 73</td><td>22 32.1 7 32.1 7 5556 375 194 32.1 194 32.5 32.1 194 32.3 32.1 194 32.2 32.1 1013 32.2 32.2 1051 32.8 32.2 108 32.2 32.2 108.3 32.2 32.2 108.4 32.2 32.2 109.7 32.5 32.2 101.8 32.2 32.2 102.3 32.2 32.2 102.3 32.2 32.2 102.3 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 102.3 32.2 32.2 103.2 32.2 32.2 <td>Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26630 2 2971 3 33312 3 36653 3 39994 4 43335 4 46676 5 56699 6 60040 6 63381 6 66722 7 70063 7 73404 7 76745 8 80366 8 90108 9</td><td>R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632 62446 67260 72075 76889 81703 86518 91332 96146 100961 105775 110589 115404 120218</td><td>T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 110533 119055 127576 136098 144620 153141 161663 170184 178706 187228 195749 204271 212793</td></td></td<>	2 7 2.4 7 413 623 623 2 833 0 042 2 252 462 671 8 881 0 091 300 510 7 930 1 930 1 930 1 930 1 930 1 930 1 930 1 930 1 139 1 349 1 978 1 188 3 397 1 607 1 817 0 026 2 236 446	H2 I 06.8 I 06.8 I 046 I 1301 I 142 I 1956 I 2284 I 2284 I 2284 I 2393 I 3266 I 3594 I 3922 I 4249 I 4577 I 4904 I 5232 I 5560 I 5887 I 6215 I 6542 I 7198 I 7525 I 78533 I	J2 1134.1 1036 1562 2087 2613 3139 3664 4190 4716 5241 5767 6293 6818 7344 7870 8395 8921 9446 9972 10498 11023 12600 13126 13652 14177	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337 12211 13085 13959 14833 15707 16581 17455 18329 19203 20077 20951 21825	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234 16408 17583 18757 19932 21106 22281 23455 24630 25804 26978 28153 29327	SJ N3 3739.3 3416 5149 6882 8615 10349 12082 13815 15548 17281 19014 20748 22788 24214 24214 25941 24214 24214 25941 31146 32880 34613 36346 38079 39812 41545 43279 45012	P2 4560 6 4560 6 410 2 8 5 105 9 126 2 147 5 168 3 126 2 147 5 168 3 253 1 274 4 295 7 316 3378 358 379 0 401 3 422 443 9 464 2 485 5 5 5 5 5 5 5 5	C C 0.4 600 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 45 42 58 45 72 47 86 50 00 53 13 56 27 59 41 61 55 64 68 67 82 70 96 73	22 32.1 7 32.1 7 5556 375 194 32.1 194 32.5 32.1 194 32.3 32.1 194 32.2 32.1 1013 32.2 32.2 1051 32.8 32.2 108 32.2 32.2 108.3 32.2 32.2 108.4 32.2 32.2 109.7 32.5 32.2 101.8 32.2 32.2 102.3 32.2 32.2 102.3 32.2 32.2 102.3 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 101.8 32.2 32.2 102.3 32.2 32.2 103.2 32.2 32.2 <td>Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26630 2 2971 3 33312 3 36653 3 39994 4 43335 4 46676 5 56699 6 60040 6 63381 6 66722 7 70063 7 73404 7 76745 8 80366 8 90108 9</td> <td>R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632 62446 67260 72075 76889 81703 86518 91332 96146 100961 105775 110589 115404 120218</td> <td>T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 110533 119055 127576 136098 144620 153141 161663 170184 178706 187228 195749 204271 212793</td>	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26630 2 2971 3 33312 3 36653 3 39994 4 43335 4 46676 5 56699 6 60040 6 63381 6 66722 7 70063 7 73404 7 76745 8 80366 8 90108 9	R 10386.9 9488 14303 19117 23931 28746 33560 38374 43189 48003 52817 57632 62446 67260 72075 76889 81703 86518 91332 96146 100961 105775 110589 115404 120218	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 110533 119055 127576 136098 144620 153141 161663 170184 178706 187228 195749 204271 212793
Orifice Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7	28.5 252 39 52 65 78 91 104 117 131 144 157 170 183 196 209 223 236 249 262 275 288 301 315 328 341 354 367	G 452 59 22 33 34 35 1 35 1 35 1 35 1 35 1 10 22 13 147 10 21 10 22 11 12 13 13 13 13 13 14 15 13 15 13 15 13 14 15	2 7 2.4 7 413 623 623 2 833 0 042 2 252 462 671 8 881 0 091 3 300 5 510 7 930 1 930 1 930 1 930 1 930 1 930 1 930 1 930 1 930 1 930 1 930 1 930 1 930 1 139 1 349 1 978 1 188 3 397 1 607 1 236 1 446 1 655 8	H2 I 06.8 I 06.8 I 046 I 973 I 1301 I 14249 I 3266 I 3594 I 3922 I 4249 I 5232 I 5560 I 5587 I 6542 I 6542 I 7198 I 7525 I 8181 I 8508 I 9163 I	J2 1134.1 1036 1562 2087 2087 2087 2087 2087 3139 3664 4190 4716 5241 5767 6293 6818 7344 7870 8395 8921 9446 9972 10498 11023 12600 13126 13652 14177 14703	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337 12211 13085 13959 14833 15707 16581 17455 18329 19203 20077 20951 21825 22699 23573 24447	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234 16408 17583 18757 19932 21106 22281 23455 24630 25804 26978 28153 29327 30502 31676 32851	N3 3739.3 3739.3 3416 5149 6882 8619 10349 12082 13815 15548 17281 19014 20748 224214 25941 21146 32880 34613 36346 38079 39812 41545 43279 45012 46745 48478	P2 4560 6 41 9 6 105 9 105 9 126 2 13 253 1 210 4 231 3 253 1 274 4 295 7 316 3378 358 379 401 3 422 443 9 443 9 4443 9 4443 9 4443 9 4443 9 4644 2 485 5 5 5 5 5	C C 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 45 42 58 45 72 47 86 50 00 53 13 56 27 59 41 61 55 64 68 67 82 70 96 73 10 76 23 78	22 32.1 7 32.1 7 5556 3375 194 194 4013 1 32 194 1 1 4013 1 1 4013 1 1 4013 1 1 4013 1 1 4013 1 1 4013 1 1 4201 1 1 4202 1 1 4305 1 1 4305 1 1 4305 1 1 4305 1 1 4480 1 1 4305 1 1 4480 1 1 4480 1 1 9337 1 1 4213 1 1 4213 1 1 4251 1 1	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26630 2 2971 3 33312 3 36653 3 39994 4 43335 4 46676 5 56699 6 60040 6 63381 6 66722 7 70063 7 73404 7 76745 8 80366 8 90108 9	R 10386.9 9488 14303 19117 23931 28746 33560 33574 43189 48003 52817 57632 62446 67260 72075 76889 81703 86518 91332 96146 100961 105775 110589 115404 120218 125032 129847 134661	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 102031 102011 110533 119055 127576 136098 144620 153141 161663 170184 178706 187228 195749 204271 212793 221314 229836 238358
Orifice Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.3 2.3 2.4 2.5 2.6 2.7 2.8	28.5 252 39 52 65 78 91 104 117 131 144 157 170 183 996 209 223 236 249 262 275 288 301 315 328 341 354 367 380	G 452 59 22 33 35 10 22 33 10 22 35 11 35 11 10 22 11 12 13 147 10 21 11 12 13 13 13 13 13 13 14 15 13 14 15 13 13 14 15 15 16	2 7 2.4 7 413 623 623 9 252 9 462 9 671 9 881 9 510 7 720 9 930 1 139 9 559 9 768 9 978 9 188 9 397 60 607 8 817 9 026 9 236 9 6055 8 8655 9	H2 I 06.8 I 06.8 I 0461 I 1301 I 14249 I 2284 I 2284 I 2284 I 2393 I 3266 I 3922 I 4249 I 4577 I 4904 I 5560 I 5587 I 6542 I 6542 I 7198 I 7525 I 8181 I 8508 I 9163 I 9163 I	J2 1134.1 1036 1562 2087 2613 3139 3664 4190 4716 5241 5767 6293 6818 7344 9446 9972 10498 11023 11549 12600 13126 13652 14177 14703	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337 12211 13085 13959 14833 15707 16581 17455 18329 14833 15707 16581 17455 18329 19203 20077 20951 21825 22699 23573 24447 25321	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234 16408 17583 18757 19932 21106 22281 23455 24630 25804 26978 28153 29327 30502 31676 32851 34025	N3 3739.3 3739.3 3416 5149 6882 8619 10349 12082 13815 15548 17281 19014 20748 224214 225947 27680 29413 31146 32880 34613 36346 38079 445012 45012 46745 48478 50211	P2 4560 6 41 9 62 83 5 9 126 2 13 253 14 210 4 231 3 253 1 2100 4 2313 3 253 1 274 4 295 7 316 3373 358 3593 358 379 401 3422 4433 422 4485 506 9 464 2 485 506 9 5270 3 591 1 <td>G 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 45 42 58 45 72 47 86 50 00 53 13 56 27 59 41 61 55 64 68 67 82 70 96 73 10 76 23 78 37 81</td> <td>22 32.1 7 32.1 7 5556 3375 2 3 194 3 3 194 3 3 194 3 3 19556 3 3 194 3 3 1956 3 3 108 3 3 10927 3 3 1040 3 3 10566 3 3 1023 3 3 1023 3 3 1023 3 3 1023 3 3 10385 3 3 10480 3 3 1118 3 3 1118 3 3 10394 3 3 10324 3 3 10325 3 3 10326 3 3 10335 3 <t< td=""><td>Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26300 2 29711 3 33312 3 36653 3 39994 4 43335 4 46676 5 50017 5 5358 5 56699 6 66722 7 70063 7 73404 7 76745 8 804676 9 90108 9 93449 9 96790 6</td><td>R 10386.9 9488 14303 19117 23931 28746 33560 33560 33560 33560 33560 33574 43189 48003 52817 57632 62446 67260 72075 76889 81703 86518 91332 96146 100961 105775 110589 115404 120218 125032 129847 134661 139475</td><td>T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 102011 102031 110533 119055 127576 136098 144620 153141 161663 170184 178706 187228 195749 204271 212793 221314 229836 238358 246879</td></t<></td>	G 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 45 42 58 45 72 47 86 50 00 53 13 56 27 59 41 61 55 64 68 67 82 70 96 73 10 76 23 78 37 81	22 32.1 7 32.1 7 5556 3375 2 3 194 3 3 194 3 3 194 3 3 19556 3 3 194 3 3 1956 3 3 108 3 3 10927 3 3 1040 3 3 10566 3 3 1023 3 3 1023 3 3 1023 3 3 1023 3 3 10385 3 3 10480 3 3 1118 3 3 1118 3 3 10394 3 3 10324 3 3 10325 3 3 10326 3 3 10335 3 <t< td=""><td>Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26300 2 29711 3 33312 3 36653 3 39994 4 43335 4 46676 5 50017 5 5358 5 56699 6 66722 7 70063 7 73404 7 76745 8 804676 9 90108 9 93449 9 96790 6</td><td>R 10386.9 9488 14303 19117 23931 28746 33560 33560 33560 33560 33560 33574 43189 48003 52817 57632 62446 67260 72075 76889 81703 86518 91332 96146 100961 105775 110589 115404 120218 125032 129847 134661 139475</td><td>T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 102011 102031 110533 119055 127576 136098 144620 153141 161663 170184 178706 187228 195749 204271 212793 221314 229836 238358 246879</td></t<>	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26300 2 29711 3 33312 3 36653 3 39994 4 43335 4 46676 5 50017 5 5358 5 56699 6 66722 7 70063 7 73404 7 76745 8 804676 9 90108 9 93449 9 96790 6	R 10386.9 9488 14303 19117 23931 28746 33560 33560 33560 33560 33560 33574 43189 48003 52817 57632 62446 67260 72075 76889 81703 86518 91332 96146 100961 105775 110589 115404 120218 125032 129847 134661 139475	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 102011 102031 110533 119055 127576 136098 144620 153141 161663 170184 178706 187228 195749 204271 212793 221314 229836 238358 246879
Orifice Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7	28.5 252 39 52 65 78 91 104 117 131 144 157 170 183 996 209 223 236 249 262 275 288 301 315 328 341 354 367 380	G 452 59 22 33 35 10 22 33 10 22 33 11 12 23 147 10 22 13 147 10 22 13 20 21 22 22 13 23 24 4 26 27 33 33 34 35 36 37 4 36 4 50 55 57 57 57 57 57 57 57 57	2 7 2.4 7 413 623 623 9 623 9 623 9 623 9 623 9 623 9 623 9 601 9 300 9 510 9 720 9 930 1 349 9 559 9 768 9 978 1 188 3 397 1 607 9 817 1 026 2 236 1 865 1 075 2	H2 I 06.8 I 06.8 I 046 I 973 I 1301 I 14249 I 3266 I 3594 I 3922 I 4249 I 5232 I 5560 I 5587 I 6542 I 6542 I 7198 I 7525 I 8181 I 8508 I 9163 I	J2 1134.1 1036 1562 2087 2087 2087 2087 2087 3139 3664 4190 4716 5241 5767 6293 6818 7344 7870 8395 8921 9446 9972 10498 11023 12600 13126 13652 14177 14703	L1 1885.7 1723 2597 3471 4345 5219 6093 6967 7841 8715 9589 10463 11337 12211 13085 13959 14833 15707 16581 17455 18329 19203 20077 20951 21825 22699 23573 24447	M 2533.9 2315 3489 4664 5838 7013 8187 9361 10536 11710 12885 14059 15234 16408 17583 18757 19932 21106 22281 23455 24630 25804 26978 28153 29327 30502 31676 32851	N3 3739.3 3739.3 3416 5149 6882 8619 10349 12082 13815 15548 17281 19014 20748 224214 25941 21146 32880 34613 36346 38079 39812 41545 43279 45012 46745 48478	P2 4560 6 41 9 62 83 5 9 126 2 13 253 14 210 4 231 3 253 1 2100 4 231 3 253 1 274 4 295 7 316 3373 358 3593 358 379 441 295 3443 20 34422 4855 506 5070 3591 401 401	G 0.4 608 66 5 80 8 93 11 07 14 21 16 35 19 48 22 62 25 76 28 90 30 03 33 17 36 31 39 45 42 58 45 72 47 86 50 00 53 13 56 27 59 41 61 55 64 68 67 82 70 96 73 10 76 23 78 37 81 51 84	22	Q3 208.1 6585 9926 13267 1 16607 1 19948 2 23289 2 26300 2 2971 3 33312 3 36653 3 39994 4 43335 4 46676 5 50017 5 5358 5 56699 6 60040 6 63381 6 66722 7 70063 7 73404 7 76745 8 80086 9 90108 9 93449 9 96790 00131	R 10386.9 9488 14303 19117 23931 28746 33560 33574 43189 48003 52817 57632 62446 67260 72075 76889 81703 86518 91332 96146 100961 105775 110589 115404 120218 125032 129847 134661	T 18385.4 16795 25317 33838 42360 50882 59403 67925 76446 84968 93490 102011 110533 119055 127576 136098 144620 153141 161663 170184 178706 187228 195749 204271 212793 221314 229836 238358

SL & SJ series safety valves: Discharging capacity table for DNV (Unit: kg/h)

Series							SI	L						
Orifice	D	E	F	G	Н	J	К	L	М	N	Р	Q	R	Т
Set P (MPa)	78.5	138.9	216.4	353	555.7	907.9	1294.6	2010.9	2533.9	3058.1	4500.7	7791.3	-	18385.4
0.1	71	125	195	318	501	818	1166	1812	2283	2755	4055			16563
0.2	106 141	188 250	292 390	477 636	751 1001	1227 1636	1749 2333	2717 3623	3424 4566	4133 5510	6082 8109	_		24845 33127
0.3	141	313	487	795	1252	2045	2916	4529	5707	6888	10137		_	41409
0.5	212	375	585	954	1502	2454	3499	5435	6848	8265	12164			49690
0. 6	248	438	682	1113	1752	2863	4082	6341	7990	9643	14191	2456	7 35542	57972
0. 7	283	501	780	1272	2003	3272	4665	7246	9131	11020	16219	2807	7 40620	66254
0. 8	318	563	877	1431	2253	3681	5248	8152	10273	12398	18246	_		74535
0.9	354	626	975	1590	2503	4090	5832	9058	11414	13775	20273			82817
1.0 1.1	389 424	688 751	1072 1170	1749 1908	2753 3004	4499 4908	6415 6998	9964 10870	12555 13697	15153 16530	22301 24328			91099 99381
1. 2	424	813	1267	2067	3254	5317	7581	11776	14838	17908	26355	_	_	107662
1.3	495	876	1365	2226	3504	5725	8164	12681	15980	19285	28383	-		115944
1.4	530	939	1462	2385	3755	6134	8747	13587	17121	20663	30410	5264	4 76162	124226
1.5	566	1001	1560	2544	4005	<mark>6543</mark>	9330	14493	18262	22040	32437	56154	4 81240	132507
1.6	601	1064	1657	2703	4255	6952	9914	15399	19404	23418	34465	_		140789
1.7	636	1126	1755	2862	4506	7361	10497	16305	20545	24795	36492			149071
1.8 1.9	672 707	1189 1251	1852 1950	3021 3180	4756 5006	7770 8179	11080 11663	17210	21687 22828	26173 27550	38520 40547	_		157353 165634
2.0	707	1314	2047	3180	5006	8179	12246	18116 19022	22828	27550	40547		_	173916
2.0	743	1376	2145	3498	5507	8997	12829	19928	25303	30305	44602			182198
2. 2	813	1439	2242	3657	5757	9406	13413	20834	26252	31683	46629	_	_	190479
2. 3	849	1502	2339	3816	6008	<mark>9815</mark>	13996	21739	27394	33061	48656	8423	0 121859	198761
2. 4	884	1564	2437	3975	6258	10224	14579	22645	28535	34438	50684	_		207043
2.5	919	1627	2534	4134	6508	10633	15162	23551	29676	35816	52711	_		215325
2.6	955	1689	2632	4293	6759	11042	15745	24457	30818	37193	54738	_		223606
2. 7 2. 8	990 1025	1752 1814	2729	4452 4611	7009	11451 11860	16328 16911	25363 26269	31959 33100	38571 39948	56766 58793	_		231888 240170
2.8	1025	1877	2924	4011	7509	12269	17495	27174	34242	41326	60820	_	_	240170
3.0	1096	1940	3022	4929	7760	12678	18078	28080	35383	42703	62848	_		256733
Series														
361165								21						
Orific	e F2	G	2	H2	J2	L1		SJ N3	P2		2	Q3	R	т
Orific Set P (MPa)	e F2 28.5			H2 06.8	J2 1134.1	L1 1885.7	M 2533.9	SJ N3 3739.3	P2 4560		92 32.1	Q3 7208.1	R 10386.9	T 18385.4
Set P (MPa) 0.1	28.5	55 4 5	2.4 7 408	06.8 637	1134.1 1022	1885.7 1699	M 2533.9 2283	N3 3739.3 3369	4560 41(. 4 60 8	32.1 5479	7208.1 6494	10386.9 9358	18385.4 16563
Set P (MPa) 0.1 0.2	28.5 28 2 38	55 53	2.4 7 408 611	06.8 637 955	1134.1 1022 1533	1885.7 1699 2548	M 2533.9 2283 3424	N3 3739.3 3369 5053	4560 410 61	.4 608 08 5 63 8	32.1 5479 5219	7208.1 6494 9741	10386.9 9358 14036	18385.4 16563 24845
Set P (MPa) 0.1 0.2 0.3	28.5 28 2 3 3 3 5	45. 55 33 11	2.4 7 408 611 815	06.8 637 955 1274	1134.1 1022 1533 2043	1885.7 1699 2548 3398	M 2533.9 2283 3424 4566	N3 3739.3 3369 5053 6737	4560 410 610 7 82	.4 608 08 5 63 8 17 10	32.1 1 5479 1 3219 1 9959 1	7208.1 6494 9741 12988	10386.9 9358 14036 18715	18385.4 16563 24845 33127
Set P (MPa) 0.1 0.2 0.3 0.4	28.5 2 2 3 3 3 5 4 6	45. 55 33 11 39 1	2.4 7 408 611	06.8 637 955	1134.1 1022 1533	1885.7 1699 2548	M 2533.9 2283 3424	N3 3739.3 3369 5053	4560 410 611 7 82 102	.4 608 08 5 63 8 17 10 71 13	32.1 5479 5219	7208.1 6494 9741	10386.9 9358 14036	18385.4 16563 24845
Set P (MPa) 0.1 0.2 0.3	28.5 2 2 3 3 5 5 7 0	45: 55 33 11 39 1 66 1	2.4 7 408 611 815 019	06.8 637 955 1274 1592	1134.1 1022 1533 2043 2554	1885.7 1699 2548 3398 4247	M 2533.9 2283 3424 4566 5707	N3 3739.3 3369 5053 6737 8422	4560 410 610 7 82 102 6 123	.4 608 08 5 63 8 17 10 71 13 25 16	32.1 1 5479 2 3219 2 9959 3 6698 3	7208.1 6494 9741 12988 16234	10386.9 9358 9358 14036 18715 23394	18385.4 16563 24845 33127 41409
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Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2	28.5 2 38 2 38 3 5 4 63 5 70 5 70 6 89 7 102 3 114 0 122 0 140 1 153 2 160 3 178 4 197 5 200 6 217 7 223 3 242 0 255 0 2680 2 293 3 300	45 55 33 11 39 11 66 1 22 1 22 1 49 1 22 1 77 22 33 205 22 32 22 33 32 23 24 33 343 33 371 33 343 33 343 33 343 33 343 354 4 354 4 354 4 354 4 355	2.4 7 408 611 815 9 019 223 426 630 633 9 834 9 038 9 2242 9 445 9 649 9 853 9 057 9 261 9 8872 9 076 9 483 6687	06.8 9 637 9 1274 1 1592 1 1910 1 2229 2 2547 1 2865 3 3184 3 3502 3 4139 1 4457 1 5094 1 5094 1 50731 1 6049 1 6368 1 7004 7	1134.1 1 1022 1 1533 2 2043 2 3065 3 3576 4 4087 4 5109 5 5619 6 6641 7 7663 8 9195 9 9706 1 10217 1 1239 1 11239 1	1885.7 1699 2548 3398 4247 5096 5946 6795 7645 8494 9344 10193 11042 11892 12741 13591 14440 15289 16139 16988 17838 18687 19537	M 2533.9 2283 3424 4566 5707 6848 7990 9131 10273 11414 12555 13697 14838 15980 17121 18262 19404 20545 21687 22828 23969 25111 26252	N3 3739.3 3739.3 3369 5053 6737 8422 10106 11791 13475 15159 16844 18528 20212 21897 23581 25266 26950 28634 30319 32003 33687 35372 37056 38740	4560 410 610 82 102 123 123 1433 164: 164: 1844 2054 2255 2463 2255 2463 2257 2308 3286 33903 3492 369 369 369 3903 4100 431: 4519 4724 4930	.4 608 08 5 63 8 17 10 71 13 25 16 80 19 34 21 88 24 42 27 97 30 51 32 05 35 59 38 14 41 68 43 22 46 76 49 30 52 85 54 39 57 93 60 47 63 02 65	32.1 1 32.19 1 32.19 1 32.19 1 32.19 1 32.19 1 3698 1 4438 1 9177 1 4657 1 3397 1 3397 1 3377 1 3356 1 3356 1 3575 1 3314 1 2054 1 7933 1 2053 1 2273 1	7208.1 6494 9741 12988 129481 22728 25975 229222 32469 35716 38963 42210 45456 51950 55197 58444 61691 64938 71432 74679	10386.9 9358 14036 18715 23394 28073 32751 37430 42109 46788 51467 56145 60824 65503 70182 74861 79539 84218 88897 93576 98254 102933 107612	18385.4 16563 24845 33127 41409 49690 57972 66254 74535 82817 91099 99381 107662 115944 124226 132507 140789 149071 157353 165634 173916 182198 190479
Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.3 2.4 2.5	28.5 28.5 21 2 38 5 6 6 7 102 3 114 0 127 0 140 153 2 160 3 174 195 20 217 2293 2420 2550 263 2420 2553 20 263 2420 2530 2631 290 201 202 203 3000 4 319 5 332	45 55 33 11 39 11 66 12 14 94 12 14 92 15 22 17 22 13 24 15 22 16 32 22 16 33 26 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4	2.4 7 408 611 611 9 815 9 223 9 426 9 630 9 834 9 038 9 2242 9 649 9 853 9 057 9 261 9 464 9 668 9 872 9 076 9 279 9 483 9 687 9 298 9	06.8 0 637 955 1 1274 1 1 1592 1 1 1910 1 2 2229 1 2 2547 1 2 2865 3 184 3502 3 3 4139 1 4 4457 1 1 5094 1 1 5731 1 1 6049 1 1 6368 1 1 7004 1 1 7323 1 1 7959 1 1	1134.1 1022 1533 2043 2554 3065 3576 4087 4087 5109 5619 6130 6641 7152 7663 8174 8685 9195 9195 10217 10728 11239 12261 12282	1885.7 1699 2548 3398 4247 5096 5946 6795 7645 8494 9344 10193 11042 11892 12741 13591 14440 15289 16988 17838 18687 19537 20386 21235 22085	M 2533.9 2283 3424 4566 5707 6848 7990 9131 10273 11414 12555 13697 14838 15980 17121 18262 19404 20545 21687 22828 23969 25111 26252 27394 28535 29676	N3 3739.3 3739.3 3369 5053 6737 8422 10106 11791 13475 15159 16844 18528 20212 21897 23581 25266 26950 28634 30319 32003 33687 35372 37056 40425 42109 43794	4560 410 610 102 123 123 123 123 1433 1643 1643 2255 2255 2463 2255 2463 2670 2875 308 3286 3490 3690 3490 3900 4104 4313 4519 4724 4930 5133 4534	.4 608 08 5 63 8 17 10 71 13 25 16 80 19 34 21 88 24 42 27 97 30 51 32 05 35 59 38 14 41 68 43 22 46 76 49 30 52 85 54 39 57 93 60 47 63 02 65 56 68 10 71	32.1 32.1 32.1 3 3219 3 3219 3 30959 3 4338 3 9177 3 3397 3 3397 3 3397 3 3397 3 3397 3 3397 3 3356 3 3356 3 3357 3 3314 3 7533 3 3013 3 3752 3 3492 3	7208.1 6494 9741 12988 12988 12988 12987 22728 25975 229222 32469 35716 38963 42210 45456 48703 51950 58444 64938 641691 64938 71432 74679 81172 84419	10386.9 9358 14036 18715 23394 28073 32751 37430 42109 46788 51467 56145 60824 65503 70182 74861 79539 84218 88897 93576 98254 102933 107612 116970 121648	18385.4 16563 24845 33127 41409 49690 57972 66254 74535 82817 91099 99381 107662 115944 124226 132507 140789 149071 157353 165634 173916 182198 190479 198761 207043 215325
Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.2 2.5 2.6 2.6	28.5 28.5 29.5 20.5 30.5 4.63 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 7.722 5.70 7.722	45 55 33 11 39 11 39 11 39 11 39 11 39 11 39 11 22 11 22 11 22 11 22 12 13 232 22 33 24 33 34 33 35 26 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37 4 37	2.4 7 408 611 611 9 815 9 223 9 426 9 630 9 834 9 038 9 2242 9 649 9 853 9 057 9 261 9 464 9 668 9 872 9 076 9 279 9 483 9 6687 9 298 9 502 9	06.8 0 637 955 1 1274 1 1 1592 1 1 1910 1 2 2229 1 2 2547 1 2 3821 3 3 4139 1 3 4457 1 3 5094 1 3 5731 1 6 6049 1 3 6686 1 7 7004 1 7 7411 1 1 9595 1 1 8278 8 1	1134.1 1022 1533 2043 2554 3065 3576 4087 4087 5109 5619 6130 6641 7152 7663 8174 8685 9195 9195 10217 10728 11239 12261 12382 13793	1885.7 1699 2548 3398 4247 5096 5946 6795 7645 8494 9344 10193 11042 11892 12741 13591 14440 15289 16139 16988 17838 18687 19537 20386 21235 22934	M 2533.9 2283 3424 4566 5707 6848 7990 9131 10273 11414 12555 13697 14838 15980 17121 18262 19404 20545 21687 22828 23969 25111 26252 27394 28535 29676 30818	N3 3739.3 3739.3 3369 5053 6737 8422 10106 11791 13475 15159 16844 18528 20212 21897 23581 25266 26950 28634 30319 32003 33687 35372 37056 40425 42109 43794 45478	4560 410 610 102 123 123 123 123 1433 1643 1643 2255 22463 2257 2258 2463 2257 2308 3308 33903 43493 4313 44104 24313 44104 24313 4519 4724 544	.4 608 08 5 63 8 17 10 71 13 25 16 80 19 34 21 88 24 42 27 97 30 51 32 05 35 59 38 14 41 68 43 22 46 76 49 30 52 85 54 39 57 93 60 47 63 02 65 56 68 10 71 64 73	32.1 32.1 34.79 3 32.19 3 3219 3 3959 3 6698 3 6178 9 9177 3 3977 3 3137 3 6616 3 6356 3 63575 3 63575 3 63575 3 63575 3 6054 3 7794 3 70273 3 6013 3 6752 3 9971 3	7208.1 6494 9741 12988 12987 12988 19481 22728 25975 229222 32469 35716 38963 42210 45456 48703 55197 58444 61691 64938 71432 74679 81172 84419 87666	10386.9 9358 14036 18715 23394 28073 32751 37430 42109 46788 51467 56145 60824 65503 70182 74861 79539 84218 88897 93576 98254 102933 107612 112291 116970 121648 126327	18385.4 16563 24845 33127 41409 49690 57972 66254 74535 82817 91099 99381 107662 115944 124226 132507 140789 1490711 157353 165634 173916 182198 190479 198761 207043 215325 223606
Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.6 0.7 0.6 0.7 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7	28.5 28.5 21 2 38 5 4 63 5 7 10 114 153 114 153 2 160 3 174 195 20 211 7 2293 20 2642 20 2550 2680 2933 3000 4 319 5 3333 5 344 7 35	45 55 33 11 39 11 39 11 39 11 39 11 39 11 39 11 22 11 22 11 22 11 22 12 13 232 22 33 24 33 34 33 35 44 32 44 33 254 437 44 337 44 337 44 33 55 44 37 455 465 576 576	2.4 7 408 611 611 9 611 9 223 9 426 9 630 9 834 9 038 9 2242 9 649 9 853 9 057 9 261 9 445 9 668 9 872 9 483 9 6687 9 891 9 298 9 502 7	06.8 9 637 9 1274 1 1592 1 1910 1 2229 1 2547 1 2865 3 3184 3 3502 3 3821 1 4139 1 4457 1 5094 1 5731 1 6049 1 6368 1 7004 1 7323 1 7059 1 8278 1 8596 1	1134.1 1022 1533 2043 2554 3065 3576 4087 4087 5109 5619 6130 6641 7152 7663 8174 8685 9195 9706 10217 10728 11239 12261 12382 13793 14304	1885.7 1699 2548 3398 4247 5096 5946 6795 7645 8494 9344 10193 11042 11892 12741 13591 14440 15289 16988 17838 18687 19537 20386 21235 22934 23784	M 2533.9 2283 3424 4566 5707 6848 7990 9131 10273 11414 12555 13697 14838 15980 17121 18262 19404 20545 21687 22828 23969 25111 26252 27394 28535 29676 30818 31959	N3 3739.3 3739.3 3369 5053 6737 8422 10106 11791 13475 15159 16844 18528 20212 21897 23581 25266 26950 28634 30319 32003 33687 35372 37056 38740 40425 42109 43794 45478 47162	4560 410 610 102 123 123 123 123 1433 1643 1643 2255 2308 3280 3280 3280 3390 3410 3410 3410 3410 3410 3544 3544 3544 3554	.4 608 08 5 63 8 17 10 71 13 25 16 80 19 34 21 88 24 42 27 97 30 51 32 05 35 59 38 14 41 68 43 22 46 76 49 30 52 85 54 39 57 93 60 47 63 02 65 56 68 10 71 64 73 19 76	32.1 3 34.79 3 32.19 3 3219 3 3959 3 6698 3 9177 3 9177 3 3977 3 3977 3 3977 3 30137 3 3666 3 6016 3 3356 3 3356 3 3357 3 3358 3 3354 3 3355 3 3314 3 3314 3 3314 3 3314 3 3314 3 3033 3 3752 3 3997 3 3013 3 3013 3 3013 3 3013 3 3013 3 3013 3	7208.1 6494 9741 12988 12988 12988 19481 22728 25975 229222 32469 35716 38963 42210 45456 48703 51950 58444 64938 71432 74679 81172 84419 87666 90913	10386.9 9358 14036 18715 23394 28073 32751 37430 42109 46788 51467 56145 60824 65503 70182 74861 79539 84218 88897 93576 98254 102933 107612 112291 116970 121648 126327 131006	18385.4 16563 24845 33127 41409 49690 57972 66254 74535 82817 91099 99381 107662 115944 124226 132507 140789 149071 157353 165634 173916 182198 190479 198761 207043 215325 223606 231888
Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.6 0.7 0.6 0.7 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.8	28.5 28.5 21 2 38 5 4 63 5 7 10 3 114 153 114 153 2 160 3 178 4 199 5 20 211 7 2293 242 20 255 20 2680 2 293 3000 4 319 5 3300 4 319 5 3370	45 55 33 11 39 11 39 11 39 11 39 11 39 11 39 11 22 11 22 11 22 11 22 12 13 23 24 33 25 26 37 43 33 26 37 432 44 32 44 33 55 44 37 44 37 44 37 48 55 48 576 53 53 54 5	2.4 7 408 611 611 9 611 9 223 9 426 9 630 9 834 9 038 9 2242 9 649 9 853 9 057 9 668 9 872 9 668 9 872 9 668 9 891 9 687 9 502 9 910 9	06.8 9 637 9 1274 1 1592 1 1910 1 2229 1 2547 1 2865 3 3184 3 3502 3 34139 1 4457 1 5094 1 5731 1 6049 6 6686 1 7004 1 7323 1 7959 1 8278 1 8915 1 9233 1	1134.1 1022 1533 2043 2554 3065 3576 4087 4087 5109 5619 6130 6641 7152 7663 8174 8685 9195 9706 10217 10228 11239 12261 12771 13282 13793 14304 14815 1	1885.7 1699 2548 3398 4247 5096 5946 6795 7645 8494 9344 10193 11042 11892 12741 13591 14440 15289 16139 16988 17838 18687 19537 20386 21235 22085 22934 23784 24633	M 2533.9 2283 3424 4566 5707 6848 7990 9131 10273 11414 12555 13697 14838 15980 17121 18262 19404 20545 21687 22828 23969 25111 26252 27394 28535 29676 30818 31959 33100	N3 3739.3 3739.3 3369 5053 6737 8422 10106 11791 13475 15159 16844 18528 20212 21897 23581 25266 26950 28634 30319 32003 33687 35372 37056 40425 42109 43794 45478 47162 48847	4560 410 610 102 123 123 123 1433 1643 1643 1643 2255 2308 308 3280 3280 3280 33900 34101 3534 3554 3555	.4 608 08 5 63 8 17 10 71 13 25 16 80 19 34 21 88 24 42 27 97 30 51 32 05 35 59 38 14 41 68 43 22 46 76 49 30 52 85 54 39 57 93 60 47 63 02 65 56 68 10 71 64 73 19 76 73 79	32.1 1 34.79 1 32.19 1 3219 1 3219 1 3219 1 3698 1 6698 1 9177 1 9177 1 3977 1 3977 1 3977 1 3977 1 3977 1 30137 1 3056 1 3356 1 3357 1 3358 1 3354 1 3355 1 3354 1 3355 1 3354 1 3355 1 3314 1 3575 1 31314 1 314 1 315 1 316 1 317 1 3232 1	7208.1 6494 9741 12988 12988 12988 12987 22728 25975 29222 32469 35716 38963 42210 45456 48703 51950 58444 64938 64938 71432 74679 84419 87666 90913 94160	10386.9 9358 14036 18715 23394 28073 32751 37430 42109 46788 51467 56145 60824 65503 70182 74861 79539 84218 88897 93576 98254 102933 107612 112291 116970 121648 126327 131006 135685	18385.4 16563 24845 33127 41409 49690 57972 66254 74535 82817 91099 99381 107662 115944 124226 132507 140789 149071 157353 165634 173916 182198 190479 198761 207043 215325 223606 231888 240170
Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.6 0.7 0.6 0.7 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7	28.5 28.5 21 2 38 5 4 63 5 7 101 38 114 127 0 14 153 2 160 3 178 4 199 5 2017 2293 22025 220268 220268 220268 220273 3000 4 319 5 3300 4 319 5 3370 3371 3371	45 55 33 11 39 11 66 12 14 94 122 14 177 22 33 24 177 22 33 24 37 26 33 26 33 26 37 4 37 4 37 4 37 48 55 20 55 20 55 37 48 576 531	2.4 7 408 611 611 9 611 9 223 9 426 9 630 9 834 9 038 9 2242 9 649 9 853 9 057 9 261 9 445 9 668 9 872 9 483 9 6687 9 891 9 298 9 502 7	06.8 9 637 9 1274 1 1592 1 1910 1 2229 1 2547 1 2865 3 3184 3 3502 3 3821 1 4139 1 4457 1 5094 1 5731 1 6049 1 6368 1 7004 1 7323 1 7059 1 8278 1 8596 1	1134.1 1022 1533 2043 2554 3065 3576 4087 4087 5109 5619 6130 6641 7152 7663 8174 8685 9195 9706 10217 10728 11239 12261 12382 13793 14304	1885.7 1699 2548 3398 4247 5096 5946 6795 7645 8494 9344 10193 11042 11892 12741 13591 14440 15289 16988 17838 18687 19537 20386 21235 22934 23784	M 2533.9 2283 3424 4566 5707 6848 7990 9131 10273 11414 12555 13697 14838 15980 17121 18262 19404 20545 21687 22828 23969 25111 26252 27394 28535 29676 30818 31959	N3 3739.3 3739.3 3369 5053 6737 8422 10106 11791 13475 15159 16844 18528 20212 21897 23581 25266 26950 28634 30319 32003 33687 35372 37056 38740 40425 42109 43794 45478 47162	4560 410 610 102 123 123 123 143 1643 1643 1643 1235 1436 1643 2255 2463 2255 2463 2257 308 3280 3280 3390 34390 3693 33903 4313 4313 4313 4313 44100 44313 544 5544 5544 5554 595 6162	.4 608 08 5 63 8 17 10 71 13 25 16 80 19 34 21 88 24 42 27 97 30 51 32 05 35 59 38 14 41 68 43 22 46 76 49 30 52 85 54 39 57 93 60 02 65 56 68 10 71 64 73 19 76 73 79 27 82	32.1 1 32.1 1 3219 1 3219 1 3219 1 3698 1 6698 1 9177 1 3697 1 3177 1 3297 1 3356 1 6616 1 3356 1 3356 1 3357 1 3358 1 3354 1 35575 1 314 1 2054 1 3575 1 314 1 2054 1 3273 1 3273 1 3232 1 3971 1 4492 1 3971 1 4451 1 4451 1	7208.1 6494 9741 12988 12988 12988 19481 22728 25975 229222 32469 35716 38963 42210 45456 48703 51950 58444 64938 71432 74679 81172 84419 87666 90913	10386.9 9358 14036 18715 23394 28073 32751 37430 42109 46788 51467 56145 60824 65503 70182 74861 79539 84218 88897 93576 98254 102933 107612 112291 116970 121648 126327 131006	18385.4 16563 24845 33127 41409 49690 57972 66254 74535 82817 91099 99381 107662 115944 124226 132507 140789 1490711 157353 165634 173916 182198 190479 198761 207043 215325 223606 231888

SL & SJ series safety valves: Discharging capacity table for BV (Unit: kg/h)

Orifice							SI	_						
	D	Е	F	G	н	J	К	L	М	Ν	Р	Q	R	Т
Set P (MPa)	78.5	138.9	216.4	353	555.7	907.9	1294.6	2010.9	2533.9	3058.1	4500.7	7791.3	11272	18385.4
0,1	72	128	200	326	513	838	1194	1855	2338	2821	4152	7187		16961
0.2	108	191	200	484	763	1246	1777	2760	3478	4197	6177	10694	_	25234
0.2	143	253	394	643	1013	1655	2359	3665	4618	5573	8203	14200		33507
					_									
0.4	178	316	492	802	1263	2063	2942	4570	5758	6950	10228	17706		41781
0.5	214	378	589	961	1513	2472	3525	5475	6899	8326	12253	21212		50054
0.6	249	441	687	1120	1763	2880	4107	6380	8039	9702	14278	24718		58328
0.7	284	503	784	1279	2013	3289	4690	7284	9179	11078	16304	28224	4 40833	66601
0.8	320	566	881	1438	2263	3697	5272	8189	10319	12454	18329	31730	45905	74875
0.9	355	628	979	1596	2513	4106	5855	9094	11460	13830	20354	35236	5 50978	83148
1.0	390	691	1076	1755	2763	4515	6437	9999	12600	15206	22380	38742	2 56050	91421
1.1	426	753	1173	1914	3013	4923	7020	10904	13740	16583	24405	42248	61122	99695
1.2	461	816	1271	2073	3263	5332	7603	11809	14880	17959	26430	45754	4 66195	107968
1.3	496	878	1368	2232	3513	5740	8185	12714	16021	19335	28456	49260	0 71267	116242
1.4	532	941	1466	2391	3763	6149	8768	13619	17161	20711	30481	52767	7 76340	124515
1.5	567	1003	1563	2550	4014	6557	9350	14524	18301	22087	32506	56273		132789
1.6	602	1066	1660	2708	4264	6966	9933	15429	19441	23463	34532	59779	_	141062
1.7	638	1128	1758	2867	4204	7374	10515	16334	20582	24839	36557	63285	_	149335
1.7	673	1120	1855	3026		7783	11098		20582	24039	38582			157609
					4764			17238				66791		
1.9	708	1253	1952	3185	5014	8192	11681	18143	22862	27592	40608	70297	_	165882
2.0	744	1316	2050	3344	5264	8600	12263	19048	24002	28968	42633	73803		174156
2.1	779	1378	2147	3503	5514	9009	12846	19953	25143	30344	44658	77309	_	182429
2. 2	814	1441	2245	3661	5764	9417	13428	20858	26283	31720	46684	80815		190703
2.3	850	1503	2342	3820	6014	9826	14011	21763	27423	33096	48709	84321		198976
2.4	885	1566	2439	3979	6264	10234	14593	22668	28563	34472	50734	87827	7 127064	207249
2.5	920	1628	2537	4138	6514	10643	15176	23573	29704	35849	52759	91334	4 132136	215523
2.6	956	1691	2634	4297	6764	11051	15759	24478	30844	37225	54785	94840	0 137208	223796
2.7	991	1753	2732	4456	7014	11460	16341	25383	31984	38601	56810	98346	6 142281	232070
2.8	1026	1816	2829	4615	7264	11869	16924	26287	33124	39977	58835	101852	2 147353	240343
2.9	1062	1878	2926	4773	7514	12277	17506	27192	34265	41353	60861	105358		248617
3.0	1097	1941	3024	4932	7765	12686	18089	28097	35405	42729	62886	108864		256890
0.0	1007	1041	0024	1002	1100	12000	10000	20007	00100	42720	02000	100004	10/400	200000
Series							5	SJ						
Orific	e F2	G	2	H2	J2	L1	М	N3	P2	Q	2	Q3	R	т
Set P (MPa)	28.5										-	90	N	1
0.1		452		06.8	1134.1	1885.7	2533.9	3739.3	4560		32.1 7	208.1	10386.9	18385.4
	_	2	417	652	1046	1740	2338	3450	42	07 5	32.1 7 611	208.1 6649	10386.9 9582	18385.4 16961
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SL & SJ series safety valves: Discharging capacity table for KR (Unit: kg/h)

Series							S	L						
Orifice	D	E	F	G	н	J	К	L	м	N	Р	Q	R	т
Set P (MPa)	78.5	138.9	216.4	353	555.7	907.9	1294.6	2010.9	2533.9	3058.1	4500.7			18385.4
0.1	72	128	200	326		838	1195	1857	2340	2824	415			
0.2	110 147	194 260	302 405	493 660		1268 1697	1808 2420	2808 3759	3538 4737	4270 5717	628 841			
0.3	184	325	507	827		2127	3032	4710	5935	7163	10542			
0.5	221	391	609	994		2556	3645	5661	7134	8610	1267			
0. 6	258	457	712	1161	1827	2985	4257	6612	8332	10056	1480		0 37066	60456
0. 7	295	522	814	1328	2090	3415	4869	7564	9531	11502	16928	3 2930	5 42397	69152
0. 8	332	588	916	1495		3844	5482	8515	10729	12949	1905			_
0.9	370	654	1019	1662		4274	6094	9466	11928	14395	2118		-	
1.0	407	720 785	1121	1829 1996		4703 5132	6706 7319	10417	13126 14325	15842 17288	23314			95240 103935
1.1	444 481	851	1223 1326	2163		5562	7931	11368 12319	15523	18734	25443			
1.3	518	917	1428	2329		5991	8543	13270	16721	20181	2970	_		
1.4	555	982	1530	2496		6421	9156	14221	17920	21627	3182			
1.5	592	1048	1633	2663	4193	6850	9768	15172	19118	23074	33958	3 5878	6 85048	138719
1.6	629	1114	1735	2830	4456	7280	10380	16123	20317	24520	3608	7 6247	1 90379	147414
1.7	667	1179	1837	2997		7709	10992	17075	21515	25966	3821			
1.8	704	1245	1940	3164		8138	11605	18026	22714	27413	4034			_
1. 9 2. 0	741 778	1311 1376	2042 2145	3331 3498		8568 8997	12217 12829	18977 19928	23912 25111	28859 30305	42473			
2.0	815	1442	2145	3490		9427	13442	20879	26309	31752	4400			
2. 2	852	1508	2349	3832		9856	14054	21830	27508	33198	48859	_		199589
2.3	889	1574	2452	3999		10285	14666	22781	28706	34645	5098			208285
2. 4	926	1639	2554	4166	6558	10715	15279	23732	29905	36091	53110	6 9195	1 133030	216981
2. 5	964	1705	2656	4333		11144	15891	24683	31103	37537	5524			225677
2.6	1001	1771	2759	4500		11574	16503	25634	32302	38984	57374		-	
2. 7 2. 8	1038 1075	1836 1902	2861 2963	4667 4834		12003 12433	17116 17728	26586 27537	33500 34698	40430 41877	59502 6163			
2.8	1112	1962	3066	5001		12455	18340	28488	35897	43323	6376			260460
3.0	1149	2033	3168	5168		13291	18952	29439	37095	44769	6588			
Series													-	
Series								2.1						
Orific	e F2	G	2	H2	J2	L1		SJ N3	P2	0	2	Q3	R	т
Orific Set P (MPa)	e F2 28.5	G2 452		H2 06.8	J2 1134.1	L1 1885.7	M 2533.9	SJ N3 3739.3	P2	Q		Q3 7208.1	R 10386.9	T 18385.4
		452					М	N3	4560	.4 608				
Set P (MPa)	28.5 26	452 62 4	.4 7	06.8	1134.1	1885.7	M 2533.9	N3 3739.3	4560. 42	. <mark>4 608</mark> 11 5	32.1	7208.1	10386.9	18385.4
Set P (MPa) 0.1 0.2 0.3	28.5 26 39 53	452 62 4 96 6 80 8	4 70 418 532 6346 546	06.8 653 987 1321	1134.1 1047 1584 2120	1885.7 1741 2633 3525	M 2533.9 2340 3538 4737	N3 3739.3 3453 5222 6990	4560 42 630 852	.4 608 11 5 68 8 25 11	2.1 616 493 370	7208.1 6656 10065 13475	10386.9 9592 14504 19417	18385.4 16978 25673 34369
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Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6	28.5 26 39 53 66 79 93	452 52 4 66 6 30 8 54 10 98 12 32 14	2.4 70 \$118	06.8 653 987 1 1321 1 1656 1 1990 2324	1134.1 1047 1584 2120 2656 3193 3729	1885.7 1741 2633 3525 4417 5309 6201	M 2533.9 2340 3538 4737 5935 7134 8332	N3 3739.3 3453 5222 6990 8759 10527 12296	4560. 42 630 852 1068 1283 6 1499	.4 608 11 5 68 8 25 11 82 14 39 17 96 20	2.1 616 493 370 246 123 000	7208.1 6656 10065 13475 16884 20293 23702	10386.9 9592 14504 19417 24330 29242 34155	18385.4 16978 25673 34369 43065 51761 60456
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Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6	28.5 26 39 53 66 79 93 106 120	452 62 4 66 6 60 8 64 10 88 12 32 14 66 17 90 19	4 70 118	06.8 653 987 1 1321 1 1656 1 1990 2324	1134.1 1047 1584 2120 2656 3193 3729	1885.7 1741 2633 3525 4417 5309 6201	M 2533.9 2340 3538 4737 5935 7134 8332	N3 3739.3 3453 5222 6990 8759 10527 12296	4560. 4 421 630 852 1068 1283 1068 1283 1283 1499 1715 193	.4 608 11 5 68 8 25 11 82 14 39 17 96 20 53 22 10 25	2.1 616 493 370 246 123 000	7208.1 6656 10065 13475 16884 20293 23702	10386.9 9592 14504 19417 24330 29242 34155	18385.4 16978 25673 34369 43065 51761 60456
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Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9	28.5 26 39 53 66 79 93 106 120 133 146 160	452 32 4 36 6 30 8 34 10 38 12 32 14 36 17 30 19 34 21 39 23 33 25	.4 70 118	06.8 - 653 - 987 - 1321 - 1656 - 1990 - 2324 - 2658 - 2993 - 3327 -	1134.1 1047 1584 2120 2656 3193 3729 4266 4802 5338	1885.7 1741 2633 3525 4417 5309 6201 7093 7984 8876	M 2533.9 2340 3538 4737 5935 7134 8332 9531 10729 11928 13126 14325	N3 3739.3 3453 5222 6990 8759 10527 12296 14064 15833 17602 19370 21139	4560 42 630 852 1068 1283 1283 1499 1715 193 2140 2362 2578	.4 608 11 5 68 8 25 11 82 14 39 17 96 20 53 22 10 25 67 28 24 31	2.1 616 493 370 246 123 000 876 630	7208.1 6656 10065 13475 16884 20293 23702 27112 30521 33930 37339 40748	10386.9 9592 14504 19417 24330 29242 34155 39068 43981 48893	18385.4 16978 25673 34369 43065 51761 60456 69152 77848 86544
Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1	28.5 26 39 53 66 79 93 106 120 133 146 160 173	452 32 4 36 6 30 8 34 10 38 12 32 14 36 17 30 19 34 21 39 23 33 25 37 27	.4 70 118	06.8 653 987 1 1321 1 1656 1 1990 2 2324 2 2658 2 2993 3 3327 3 3661 3 3996 4	1134.1 1047 1584 2120 2656 3193 3729 4266 4802 5338 5875 6411 6948 1	1885.7 1741 2633 3525 4417 5309 6201 7093 7984 8876 9768 10660 11552	M 2533.9 2340 3538 4737 5935 7134 8332 9531 10729 11928 13126 14325 15523	N3 3739.3 3453 5222 6990 8759 10527 12296 14064 15833 17602 19370 21139 22907	4560 42 630 852 1068 1283 1283 1499 1719 193 2140 2362 2578 2578 2793	.4 608 11 .5 68 .8 25 .11 32 .14 39 .17 96 .20 53 .22 10 .25 67 .28 24 .31 31 .34 38 .37	2.1 - 616 - 493 - 370 - 246 - 123 - 000 - 876 - 753 - 506 - 383 - 260 -	7208.1 66556 10065 13475 16884 20293 23702 27112 30521 33930 37339 40748 44158	10386.9 9592 14504 19417 24330 29242 34155 39068 43981 48893 53806 58719 63631	18385.4 16978 25673 34369 43065 51761 60456 69152 77848 86544 95240 103935 112631
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Set P (MPa) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4	28.5 26 39 53 66 79 93 106 120 133 146 160 173 187 200 213 227 240	452 52 4 66 6 80 8 84 10 88 12 82 14 66 17 90 19 84 21 99 23 90 19 94 21 99 23 90 25 97 27 71 29 95 31 39 34 73 36 97 38	4 70 418	06.8 653 987 1 1321 1 1656 1 1990 2 2324 2 2658 2 3327 3 3661 3 3996 4 4330 4 4999 5 5367 2	1134.1 1047 1584 2120 2656 3193 3729 4266 4802 5338 5875 6411 6948 7484 8020 8557 9093	1885.7 1741 2633 3525 4417 5309 6201 7093 7984 8876 9768 10660 11552 12444 13336 14228	M 2533.9 2340 3538 4737 5935 7134 8332 9531 10729 11928 13126 14325 15523 16721 17920 19118	N3 3739.3 3453 5222 6990 8759 10527 12296 14064 15833 17602 19370 21139 22907 24676 26445 28213	4560 42 630 852 1068 1283 <td>.4 608 11 .5 68 .8 25 .11 32 .14 39 .17 96 .20 53 .22 10 .25 67 .28 24 .31 38 .37 .95 .40 .51 .43 .08 .45 .65 .48 .22 .51</td> <td>2.1 - 616 - 493 - 370 - 246 - 123 - 000 - 876 - 753 - 630 - 506 - 383 - 260 - 1136 - 890 -</td> <td>7208.1 6655 10065 13475 16884 20293 23702 27112 30521 33930 37339 40748 47567 50976 54385</td> <td>10386.9 9592 14504 19417 24330 29242 34155 39068 43981 48893 53806 58719 63631 68544 73457 78370</td> <td>18385.4 16978 25673 34369 43065 51761 60456 69152 77848 86544 95240 103935 112631 121327 130023 138719</td>	.4 608 11 .5 68 .8 25 .11 32 .14 39 .17 96 .20 53 .22 10 .25 67 .28 24 .31 38 .37 .95 .40 .51 .43 .08 .45 .65 .48 .22 .51	2.1 - 616 - 493 - 370 - 246 - 123 - 000 - 876 - 753 - 630 - 506 - 383 - 260 - 1136 - 890 -	7208.1 6655 10065 13475 16884 20293 23702 27112 30521 33930 37339 40748 47567 50976 54385	10386.9 9592 14504 19417 24330 29242 34155 39068 43981 48893 53806 58719 63631 68544 73457 78370	18385.4 16978 25673 34369 43065 51761 60456 69152 77848 86544 95240 103935 112631 121327 130023 138719
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SL & SJ series safety valves: Discharging capacity table for ABS (Unit: kg/h)

Omfee D E F G H J K L M P C C T<	Series							S	L						
0.1 0 142 222 362 570 931 127 206 238 344 444 996 1150 1837 220 0.3 153 220 421 687 1082 1786 221 301 443 695 845 697 1791 178 121 178 </td <td>Orifice</td> <td>D</td> <td>E</td> <td>F</td> <td>G</td> <td>Н</td> <td>J</td> <td>К</td> <td>L</td> <td>М</td> <td>N</td> <td>Р</td> <td>Q</td> <td>R</td> <td>Т</td>	Orifice	D	E	F	G	Н	J	К	L	М	N	Р	Q	R	Т
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Installation precautions for safety valves

Safety precautions

Below is a description about danger or fault that may occur if the following instruction is ignored and improper handling or operation is done



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Indicates a potentially hazardous situation which, if not avoided, could resulting in death or serious injury.

<u>注意</u>

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury,

or property damage.

j safety	危險	When hoisting a safety valve, do not get under it. To avoid an accident due to a falling object for instance, try to hoist a safety valve as vertically as possible. In addition, never get under a safety valve that is in a hoisted condition. Before hoisting, check the weight of the safety valve and use an appropriate hoisting tool in consideration of the valve weight.
Transporting and storing safety valves	注意	Never use the safety valve lever or cap for hoisting purposes. Hooking the lever or cap for lifting adversely affects the valve performance, and therefore it should be avoided. We recommend that a wire(s) or a nylon sling(s) be wound around the valve outlet neck and the bonnet or the yoke for lifting.
sporting	▲ 警告	Take care not to have a safety valve fall. Many of safety valves are of an angle type, meaning extreme instability. Therefore, when storing safety valves, avoid excess piling. Otherwise, they may be damaged by falling.
Trans	注意	Store safety valves indoors. Store safety valves indoors until they are actually installed. If it should ever be impossible to do so, then cover them with waterproof sheets or the like to avoid exposure to rain and wind.
	注意	Install safety valves vertically on the inlet piping. Install safety valves vertically on the boiler body or on the inlet piping for installation. If installed in a tilted condition, poor gastightness or instable operation may result. The allowable inclination of safety valve in terms of angle is within ±1° of the vertical line.
	警告	Take care in tightening the flange bolts. Before installing a safety valve, remove the dustproof cover each from the inlet and outlet, and check for foreign matter. Furthermore, when installing a flanged type safety valve, take care that the flange gasket is not out of place from the flange outer end, and that flange bolts are evenly tightened (this can be achieved by alternately and uniformly tightening). Poor tightening may result in leaks of steam, possibly leading to burns.
Installing safety valves	秋 警告	Make sure that the safety valve inlet piping is larger than the valve inlet diameter. Round off the corners of safety valve inlet piping to ensure smooth flow of steam to the safety valve from inside the boiler, and arrange its inside diameter to be at least equal to the nominal diameter of the safety valve. Dimension "R" of the corners of the recommended inlet pipe inside diameter is at least 1/4 of the inside diameter.
Installing s	注意	Make sure that the pressure loss across the safety valve inlet is below 2%. Design the pressure loss from the installation section to the safety valve to be less than 2% of the set pressure. When this pressure loss is larger, the safety valve may chatter at the time of valve operation. When installing a safety valve on an elbow, raise the elbow pipe diameter one size from the safety valve inlet diameter. In addition, use an elbow with a large curvature (i.e. long elbow) and provide appropriate supports in consideration of the reaction force generated at the time of valve operation.
	注意	Install a safety valve in a place sufficiently away from other valves and joints. When installing a safety valve in the pipeline, keep it sufficiently away from other valves and joints that may disturb a smooth flow of fluid. To be more specific, install a safety valve in a place away at least the distance equivalent to 10xD (D: pipe diameter) each upstream and downstream. Also, provide no branch pipe in the symmetrical position to the safety valve installation position. When installing two or more safety valves on the same header and line, take appropriate spacing into due consideration. If all the safety valves operate at one time, a malfunction may result due to a partially uneven distribution of pressure.

		Be careful of a reaction force at the time of popping action.
, 		Use a blowoff pipe of a size equivalent to or larger than the blowoff port diameter of safety valve.
ļ		Maintain the distance between the valve axis of safety valve and the center of blowoff pipe to be less than 4 times the blowoff port diameter. Such a blowoff pipe should be minimized in its length with no bending,
. I	警告	and it should be led to outside while making the structure as simple and reliable as possible.
. I	警告	Make sure that the back pressure that is generated inside the blowoff pipe at the time of valve operation is
. I		less than 10% of the set pressure. Failure to do so may result in unstable operation of the valve.
. I		In addition, the blowoff piping arrangement should be such that the safety valve is not unduly affected by
. I		possible thermal expansion of a boiler, equipment and/or a blowoff pipe.
		When installing a drain pipe on the blowoff pipe, keep the drain pipe open at its bottom end.
[•	Do not bind the safety valve with a drain pipe.
I	注意	To remove drain generated in the blow-off process of a safety valve, or rainwater, be sure to provide a drain
I	注惑	pipe separately from other pipes to avoid binding the safety valve. Furthermore, keep the drain pipe open
<u> </u>		at its bottom end and do not equip a cock or a valve at that end.
		When performing a hydrostatic pressure test, be careful of the test pressure.
I	注意	At the time of a hydrostatic test, check the test pressure and make sure that it is never exceeded. Some
I	注意	safety valves have a hydrostatic plug inserted in the nozzle seat for hydrostatic test purposes. In this case,
I		be sure to remove the hydrostatic plug in the period between after completing a hydrostatic pressure test
1 1	•	and before starting operation. For details, see the instruction manual. Do not tinker with the safety valve lever,
1 1	警告	The lever equipped on the safety valve should not be touched or lifted unless it becomes necessary. Doing
ý		so may cause the valve to malfunction.
Operating the safety valves	Â	Do not use a safety valve as a foothold.
8 8	警告	Do not use the installed safety valve as a foothold because damage may result. Accidental operation of
🚊		the valve in that condition may create a dangerous situation.
l äf		Be careful of the safety valve installation environment.
o S		If the safety valve installation environment is close to a heat source, or conversely it is exposed to a cold
÷	注意	wind, the valve may malfunction or cause poor gastightness due to uneven expansion or shrinkage
្ទ		caused by the thermal effect from outside. In such a case, change the installation place and take
ati a		measures for heat insulation. When installing heat insulation material, cover the valve body section down
	┝───┦	to its lower end while taking care not to cover the adjusting lock bolt.
ō	\wedge	When dismounting or disassembling the safety valve, be careful of the pressure. Before attempting to dismount the safety valve for maintenance or repair purposes, or to disassemble it in
i !	危険	an installed condition, check that no internal pressure exists in the equipment on which the safety valve is
i '		mounted. Failure to do so may result in a serious accident.
l 1		Secure a work space around the safety valve.
i !	注意	
 	注意	For disassembly, checking and adjustment purposes of safety valves, secure a work space around them. To allow a hoisting chain block to be used, a disassembling space is required above the safety valve.
1 '		TO allow a holstling chain block to be used, a disassembling space is required above the safety valve.

Warranty

We thank you for patronizing our FUKUI products

We provide our products under the standardized production process and strict quality control. However, in the event that a failure should occur due to our production deficiency, the product shall be repaired on a free-of-charge basis or replaced with a new one in accordance with the following warranty conditions. If this is applicable, then please feel free to contact us.

1. Warranty period

The warranty period shall be 12 months after operation is initiated, or it shall not exceed 18 months after delivery from the Factory, whichever comes earlier.

2. <u>Coverage</u>

If a failure responsible for us should occur within the warranty period, the product concerned shall be repaired or replaced with a new one on a free-of-charge basis. However, this shall not apply if any of the following conditions is met.

- 2-1. if seat leaks or unstable operation should occur due to foreign matter present inside the boiler or piping;
- 2-2. if the product was improperly handled or operated;
- 2-3. if the failure is due to other causes than ours.;
- 2-4. if unauthorized repair or modification was made;
- 2-5. if the product was handled, stored or operated under harsh environmental condition exceeding the design specification;
- 2-6. if the fault is due to parts declared to be subjected to quick wear, to the customer;
- 2-7. if the fault is due to a fire, flood damage, earthquake, lightning, other natural disaster or act of God; or
- 2-8. When making repairs or adjustments in the product installation place that is at an elevated level or at a dangerous position, or if the product is very heavy requiring a specialist and special tools and equipment (such as a crane and scaffolding) for dismounting and remounting, then costs related to this work shall not be covered by the warranty.

3. Plants in foreign countries

If a failure responsible for us should occur within the warranty period, we shall provide a replacement at our expense on an FOB or ex-factory basis under the same coverage condition as stated in section 2 above.

4. After-sales service

If a supervisor or worker(s) should be requested for dispatch to the site, traveling expenses, accommodation expenses, daily allowance and all other necessary expenses shall be separately charged to the customer.

CATALOG No. SP061024J

Appendix D

SP & SUP SERIES FUKUI SEISAKUSHO CO., LTD.

BRONZE CASTING FULL-BORE SAFETY VALVES

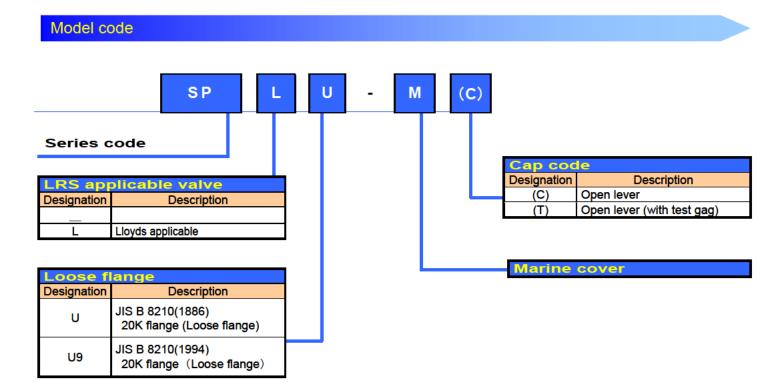
G

Features

- Adopts a needle structure for easy blowdown adjustment
- Type-approved by various classification societies
- Compact design with high performance

Applications:

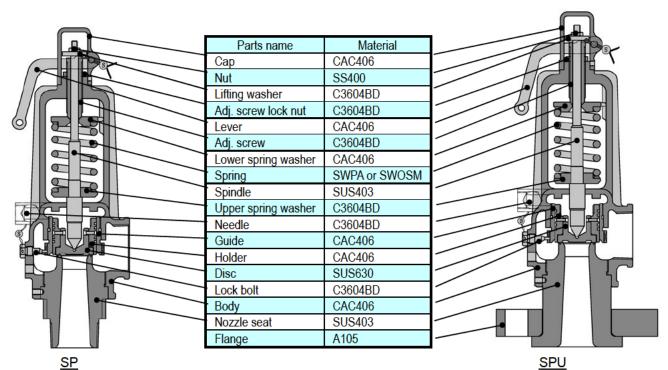
For use in the secondary-side piping of small boilers, package boilers, pressure vessels, steam headers, air headers, compressors, blowers, reducing valves



Set pressure range: 0.324 - 2.157 MPa Set temp. range : Max. 220 °C

Blowdown : 7 - 15 % Applicable fluids: Steam, air, non-corrosive gases, and noninflammable gases

Parts name and materials



<u>SP</u>

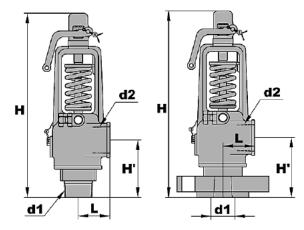
Dimensions and weight

SP Screw type

Nominal	Orifice area	Installat	Face-to-face dimension		Overall length	Weight	
diameter	(mm ²)	Inlet (d1)	Outlet (d ₂)	(L)	(H')	(H)	(kg)
20	176	R 1	Rc 1	45	85	260	2.0
25	283	R 1 ¹ /4	Rc 1 ¹ /4	50	90	290	3.0
32	452	R 1 ¹ /2	Rc 1 ¹ /2	55	100	325	4.0
40	706	R 2	Rc 2	65	115	370	7.0
50	1134	R 2 ¹ /2	Rc 2 ¹ /2	80	130	435	12.0

* For installation tube screws (inlet) R × (outlet) Rc are used.

Nominal diameter	Orifice area (mm ²)		ation size 210 20K		-to-face ension	Overall length	Weight
ulameter	(1111-)	Inlet (d1)	Outlet (d ₂)	(L)	(H')	(H)	(kg)
20	176	20A	Rc 1	45	90	265	5.0
25	283	25A	Rc 1 ¹ /4	50	100	300	6.0
32	452	32A	Rc 1 ¹ /2	55	110	335	8.0
40	706	40A	Rc 2	65	115	370	11.0
<mark>5</mark> 0	1134	50A	Rc 2 ¹ /2	80	140	445	17.0



* For installation, JIS B 8210 20K for inlet and Rc for outlet are respectively adopted.

CATALOG No. RE070227J

Appendix E

RE SERIES



Introduction

FUKUI RE series safety valves

FUKUI RE series safety valves are born out of our technology and experience in design and production of safety valves accumulated over about 50 years of business in this filed.

Various types of FUKUI safety valves have met a variety of customers' needs for many years, and the recent addition, to the lineup, of the RE series featuring a simple design, high performance and low cost makes us believe that we can contribute more to prevention against excessive pressure particularly in the process line. Fluids applicable include air, steam and other various gases, vapors and liquids.

- A disc and a disc holder are of an assembly structure. In addition, the disc is disc-shaped, presenting a simple design, and therefore minimizing the thermal effect by high temperatures. As a result, excellent sealing performance is attained against seat leaks.
- By forming the disc holder periphery to be umbrella-shaped for utilization of a fluid reaction force, an excess pressure (i.e. increased by less than 10% above the popping pressure) is created to allow perfect lifting of the disc. Furthermore, as a mechanism for attaining clear popping by acceleration of initial valve lifting at the time of valve operation, and also as a means of blowdown pressure adjustment, an adjusting ring is provided on the upper edge of the nozzle.
- The safety valves of this series consist of parts that are required as minimum, each having interchangeability. This means that minimum quantities of spares will do, allowing easy maintenance and significant cost reduction.
- The inlet/outlet face-to-face dimensions are in accordance with API Standard 526.

Overview

1. Standard installation method

- (a) For mounting flanges, raised face flanges specified in the following standards are adopted as standard.
 Class 150 - 2500 ASME B16.5 Standard
 Class 10K - 30K JIS
- (b) Flange bolt holes are arranged around the center. Ring joints, tongue type, and groove type flange faces can be manufactured upon request.

Valve major parts (Trim)

In FUKUI safety valves the valve major parts (trim) are a nozzle seat and disc only.

3. Balanced bellows type safety valve

Balanced bellows type safety valves are available from size D to T expect the nominal diameter 3/4D1.

- Application: Bellows type safety valves are mainly used in the following applications:
 - 1-1 In locations where a back pressure accumulates or occurs on the safety valve blowoff pipe side (secondary side) and where the back pressure varies to affect the popping pressure of the safety valve
 - 1-2 In locations where a back pressure fluid must not leak to outside when adjusting the safety valve blowoff pressure
 - 1-3 In case where corrosion of parts (spindle, springs) inside the bonnet by a fluid must be prevented.

To meet the above specifications, a balanced bellows type safety valve or a simple bellows seal type safety valve is selectively used. Further, a back pressure that occurs on the safety valve blowoff pipe side is classified as follows in accordance with its nature.

i) Superimposed back pressure

A pressure already accumulated on the blow-off pipe side (secondary side) before the safety valve pops.

ii) Built-up back pressure

A pressure that occurs on the blowoff pipe side (secondary side) by the flow of a fluid after the safety valve pops.

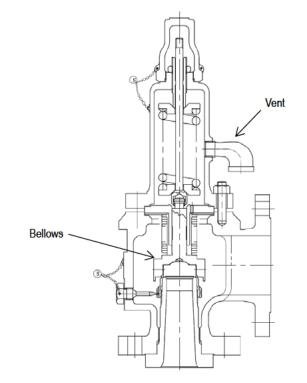
2) Structure: The structure of a bellows type safety valve is as shown in the figure on the right, and has the following features: The effective area of the bellows is equal to the surface area of the nozzle seat so that the part of disc covered by the bellows will not be subjected to the back pressure. This helps perfectly balance the top and bottom surfaces of the disc. Therefore, if a back pressure is imposed and it changes hard, the blowoff pressure will not be affected. In addition, the bellows is fixed with one end on the disc side, and the other end on the valve body and bonnet side. This means that the fluid path of the valve body and the bonnet section are blocked off, thus permitting no fluid leaks into the bonnet section. The disc holder guide section is housed in the bellows to avoid direct exposure to the blowoff fluid. Therefore, the vital sliding section is not subjected to damage, and the limited lift prevents excess compression of the bellows to protect the bellows from being damaged.

The bonnet must be provided with a gas releasing means (i.e. vent). If no vent is provided, the bonnet will serve as a totally closed chamber, failing to attain perfect balance. As a result the valve performance or the blowoff pressure will be adversely affected. In addition, detecting gas leaks from the vent holes enables us to readily know damage to the bellows.

Bellows:

Two types of bellows are available: molded bellows and welded bellows, and they are selectively used as specified in the table below.

Bellows type	Bellows spring constant (kgf/mm)	Press ure resist ance	Application	Bellows material
Molded bellows	large	small	If bellows can be molded for production	SUS316, SUS316L, etc
Welded bellows	small	large	If bellows <u>cannot</u> be molded for production	Titanium, Hastelloy, Monel, etc.

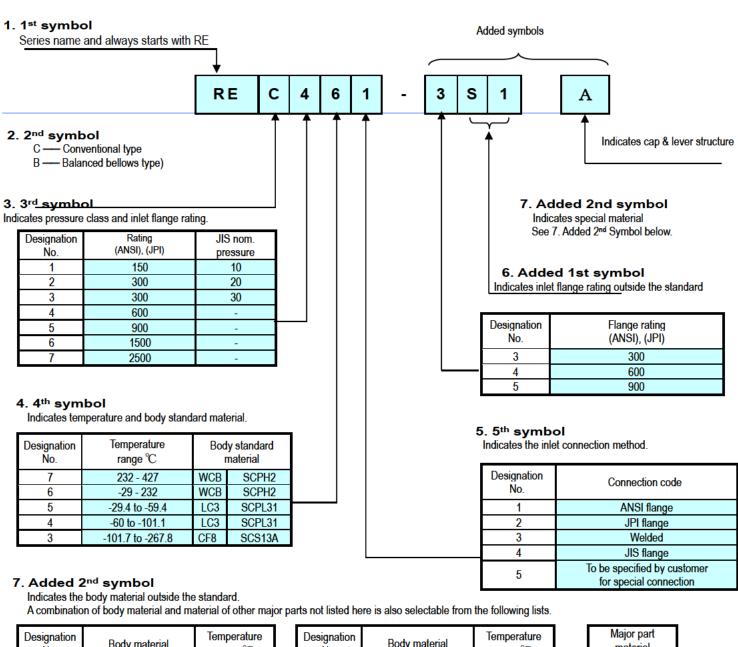


4. Min. set pressure

Туре	Orifice	Min. set pressure MPa
Conventional type REC	D - T 15 - 120	0.035
Balanced bellows type (REB)	D - T	0.175

Model code system

We at Fukui define the model code system as described in the following. Please use this code system when you specify a valve.

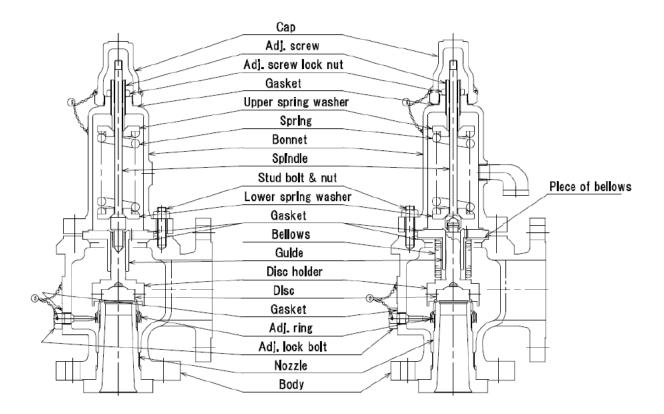


Designation No.	Body n	naterial	Temperature range ℃
	WCB	SCPH2	-5 - 400
C1	WC1	SCPH11	-5 - 450
C2	WC6 SCPH21		
C3	WC9 SCPH32		-5 - 538
C4	C5 SCPH32		
C5	LCB SCPL1		-45 - 350

Designation No.	Body n	Temperature range℃	
S	CF8	SCS13A	
S1	CF8M	SCS14A	-196 - 350
S2	CF3	SCS19A	-190 - 300
S3	CF3M SCS16A		

Major part
material
(nozzle, disc)
SUS304
SUS316
SUS304L
SUS316L
Monel
Hastelloy B
Hastelloy C

The temperature range each for designation Nos. C1 - C4 is as per JISG5151, C5 - C8 as per JISG5152, and S - S3 as per JISB8243, respectively.



REC and REB standard materials

Pa	rts name	1000 F - 800 F (538°C) - (427°C)	800 F - 450 F (427℃) - (232℃)	450 F20 F (232°C) - (-29°C)	-21 F75 F (-29.4℃) - (-59.4℃)	-76 F150 F (-60℃) - (-101.1℃)	-151 F - 450 F (-101.7℃) - (-267.8℃)	
		REC & REB()81	REC & REB()71	REC & REB()61	REC & REB()51	REC & REB()41	REC & REB()31	
		A217 WC6	A216	WCB		A351 Gr.CF8		
	Body	SCPH21	SC	PH2		SCS13A		
	D (A217 WCB	A216	WCB		A351 Gr.CF8		
	Bonnet	SCPH2		STPG ,S25C		SCS13A		
	Сар		SCPH2 or carbo	on steel		SCS13A		
	Nozzle seat			SUS304	or SCS13A			
	* Disc			SI	JS304			
*	Disc holder		SUS403			SUS304		
	Adjusting ring			SU	S304 or			
Adju	sting ring lock bolt	SUS304	Carbon	steel		SUS304		
a : 1	Guide sleeve	SUS304	SUS	304	SUS304			
Guide	Guide flange	SUS304	A105		SUS304			
	Spindle		SUS403			SUS304		
А	Adjusting screw		SUS403			SUS304		
Adjus	sting screw lock nut		Steel		SUS304			
Sprir	ng washer/retainer		Steel		SUS304			
	Spring	Alloys	steel	Carbon steel or alloy steel	SUS304			
	Stud bolt		SNB7		SUS304			
	Nut		Carbon steel			SUS304		
	* Bellows			SU	US316L			
* Piece of bellows		Non-asbe	estos or extra low carbo	n steel	PTFE			
* (Gasket (cap)	Non-asbe	estos or extra low carbo	n steel	PTFE			
* Gasket (bonnet)		Non-asbe	estos or extra low carbo	n steel	PTFE			
* G	Gasket (body)	Non-asbe	estos or extra low carbo	n steel	PTFE			
* Ga	asket (lock bolt)	Non-asbe	estos or extra low carbo	n steel		PTFE		
* Recommended spares								

* Recommended spares

Note: Production specifications and materials are subject to change without notice.

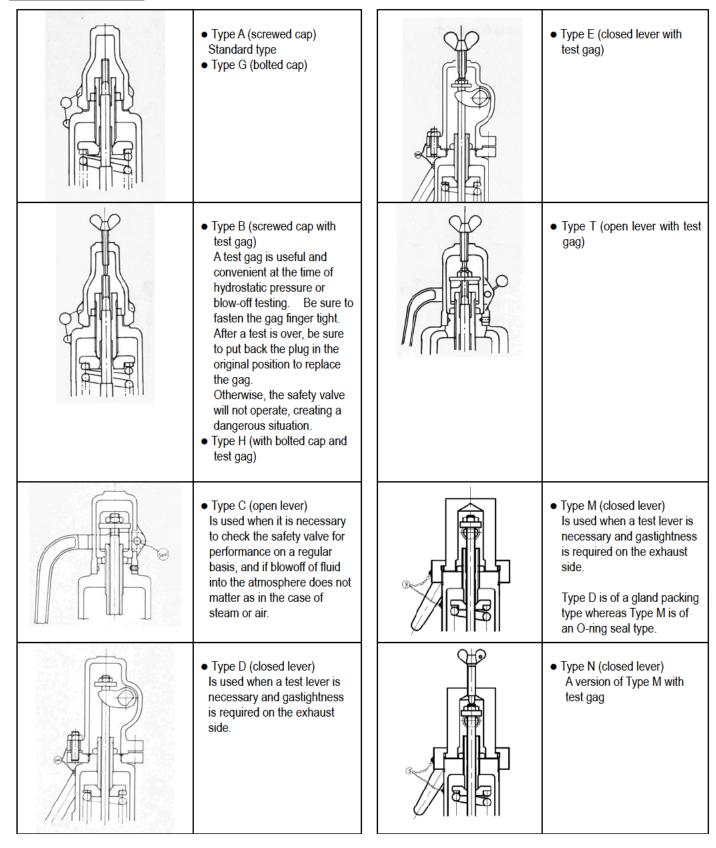
Special material

Parts name		S1 Internal (Spring a: exclue	parts ssembly	S13 All parts (Spring assembly excluded)		S1 All p:	-	S1 All p: (Spring a exclu	arts ssembly
		REC	REB	REC	REB	REC	REB	REC	REB
	Body	-			Gr.CF8M CS14A		Gr.CF8M CS14A		Gr.CF8 CS13A
	Bonnet	-		A351 (Grint Gr.CF8M CS14A	A351 (Gr.CF8M GCS14A	A351	Gr.CF8 CS13A
	Сар	-		A351 (Gr.CF8M CS14A	A351 (Gr.CF8M CS14A	A351	Gr.CF8 CS13A
	Nozzle seat		-		-		-		-
	Disc		-		-		-		-
	Disc holder	SUS	316	SU	S316	SUS	316	SU	S304
	Adjusting ring	SUS	316	SUS316		SUS316		-	
Adju	sting ring lock bolt	SUS	316	SUS316		SUS316		SUS304	
Guide	Guide sleeve	SUS316	SUS316	SU	S316	SUS316		-	
Guide	Guide flange	SUS316	-	SU	S316	SUS316		SUS304	
	Spindle	SUS316	-	SUS316		SUS316		SU	S304
A	djusting screw	SUS316	-	SUS316		SUS316		SU	S304
Adjus	ting screw lock nut	SUS316	-	SUS316		SUS316		SU	S304
Sprin	g washer/retainer	Nickel plated steel	-	Nickel plated steel		SUS316		SU	S304
	Spring	Nickel plated steel	-	Nickel plating (Carbon steel and alloy steel)		SUS304 and SUS316			-
	Stud bolt		-		-	-			
	Nut		-		-		-		-
	Bellows	none	-	none	-	none	-	none	-
Pie	ece of bellows	none	-	none	-	none	-	none	-
(Gasket (cap)	PTFE or extra l	ow carbon steel	PTFE or extra l	ow carbon steel	PTFE or extra	low carbon steel	PTFE or extra l	ow carbon steel
Ga	asket (bonnet)	PTFE or extra l	ow carbon steel	PTFE or extra l	ow carbon steel	PTFE or extra low carbon steel		PTFE or extra low carbon steel	
G	asket (body)	PTFE or extra l	ow carbon steel	PTFE or extra l	ow carbon steel	PTFE or extra l	low carbon steel	PTFE or extra low carbon steel	
Ga	sket (lock bolt)	PTFE or extra l	ow carbon steel	PTFE or extra l	ow carbon steel	PTFE or extra l	low carbon steel	PTFE or extra l	ow carbon steel

D		<mark>S18</mark>	S19	S 20	<u>821</u>
Parts name		REB	REB	REB	REB
Body		A351 Gr.CF8M or SCS14A	A351 Gr.CF8M or SCS14A		
	Bonnet	-	-	-	-
	Cap	-	-	-	-
	Nozzle seat	-	-	SUS304L	SUS316L
	Disc	-	-	SUS304L	SUS316L
	Disc holder	SUS304	SUS316	SUS304L	SUS316L
	Adjusting ring	-	SUS316	SUS304L	SUS316L
Adju	isting ring lock bolt	SUS304	SUS316	SUS304L	SUS316L
Guide	Guide sleeve	-	SUS316	SUS304L	SUS316L
Guide	Guide flange	-	-	-	-
	Spindle	-	-	-	-
A	Adjusting screw	-	-	-	-
Adjus	sting screw lock nut	-	-	-	-
Sprin	ng washer/retainer	-	-	-	-
	Spring	-	-	-	-
	Stud bolt	-	-	-	-
	Nut	-	-	-	-
	Bellows	-	-	-	-
Pi	iece of bellows	-	-	-	-
	Gasket (cap)	PTFE or extra low carbon steel			
G	asket (bonnet)	PTFE or extra low carbon steel			
(Gasket (body)	PTFE or extra low carbon steel			
Ga	asket (lock bolt)	PTFE or extra low carbon steel			

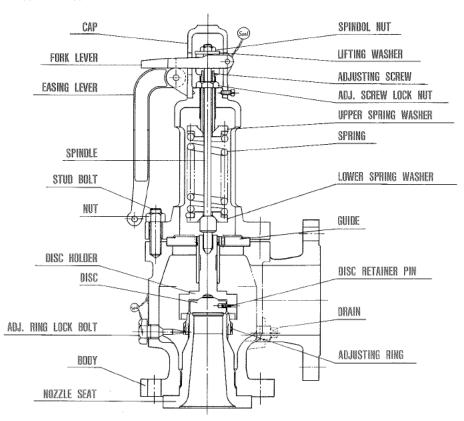
- indicates standard material.

Cap structure code



REC for steam service

The REC series for steam service is of an open bonnet type with a pressure class ranging from 150 to 600. The cap type is either Type C or Type T.



Standard materials

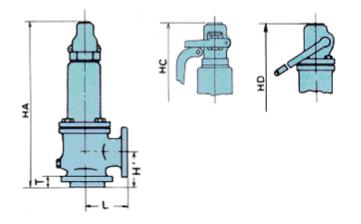
Parts name		Up to 800°F(427°C)	850°F(454°C)		
		REC()61-STM REC()81-STM			
		REC()71-STM			
	Body	A216 WCB,SCPH2	A217 WC6,SCPH2		
	Bonnet	A216 WC	B,SCPH2		
	Сар	Malleable			
N	lozzle seat	SUS304 o			
	Disc	Precipitation hardening type stainless	s steel or Inconel X-750 or equivalent		
D)isc holder	SUS	6403		
Ad	ljusting ring	SUS304 o	r SCS13A		
Adjusti	ng ring lock bolt	Carbon steel			
Guide	Guide sleeve	SUS304			
Guide	Guide flange	A105			
	Spindle	SUS403			
Adj	usting screw	SUS403			
Adjustir	ng screw lock nut	Steel			
Spring	washer/retainer	Steel			
	Spring	Carbon steel or alloy steel			
	Stud bolt	SNB7			
	Nut	Carbon steel			
Spindle nut		Steel			
Lif	iting washer	Steel			
(Open lever	Malleable cast iron			
	Fork lever	Malleable	e cast iron		

Note: Production specifications and material are subject to change without notice.

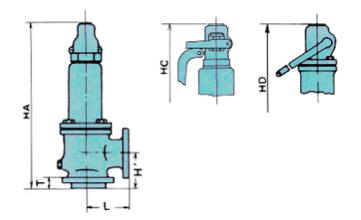
■ The effective surface areas for the RE series are as given in the tables below. Each surface area is stated in cm².

Orifice symbol	D	E	F	G
Surface area	0.882	1.815	2.433	3.836
Orifice symbol	н	J	к	L
Surface area	5.940	9.621	13.723	21.401
Orifice symbol	м	Ν	Р	Q
Surface area	26.878	32.675	47.784	84.134

Orifice symbol	R	Т
Surface area	119.403	188.692

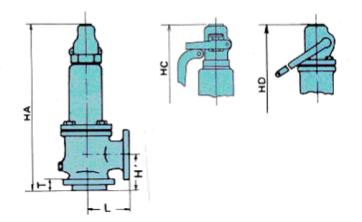


Dime	ensions and weight									(Unit: mm)
Nominal diameter	Vne		ANSI flange standard installation		Face-to-face dimension Inlet Outlet		Overall length			Weight (Type A) kgs
		Inlet	Outlet	H'	L		HA	HC	HD	5-
3/4 D1	REC 161,171	150#	150#	92	96	30	320	315	365	9
3/4 D1	REC 261,271	300	150	92	96	30	320	315	365	9
3/4 D1	REC 361,371,381	300	150	92	96	30	320	315	365	9
1D2	REC & REB 161,171	150	150	105	114	32	335	330	375	11
1D2	REC & REB 261,271	300	150	105	114	32	335	330	375	11
1D2	REC & REB 361,371,381	300	150	105	114	32	335	330	375	11
1D2	REC & REB 461,471,481	600	150	105	114	32	345	345	390	13
1 1/2 D2	REC 561,571,581	900	300	105	140	50	425	430	475	20
1 1/2 D2	REC 661,671,681	1500	300	105	140	50	425	430	475	20
1 1/2 D3	REC 761,771,781	2500	300	140	178	63	530	525	575	23
1E2	REC & REB 161,171	150	150	105	114	32	335	330	375	11
1E2	REC & REB 261,271	300	150	105	114	32	335	330	375	12
1E2	REC & REB 361,371,381	300	150	105	114	32	335	330	375	12
1E2	REC & REB 461,471,481	600	150	105	114	32	345	345	390	14
1 1/2 E2	REC 561,571,581	900	300	105	140	50	425	430	475	20
1 1/2 E2	REC 661,671,681	1500	300	105	140	50	425	430	475	20
1 1/2 E3	REC 761,771,781	2500	300	140	178	63	530	525	575	23
1 1/2 F2	REC & REB 161,171	150	150	124	121	39	350	350	395	15
1 1/2 F2	REC & REB 261,271	300	150	124	121	39	350	350	395	15
1 1/2 F2	REC & REB 361.371.381	300	150	124	152	40	350	350	395	15
1 1/2 F2	REC & REB 461,471,481	600	150	124	152	41	365	360	410	17
1 1/2 F3	REC & REB 561,571,581	900	300	124	165	50	445	450	495	27
1 1/2 F3	REC & REB 661,671,681	1500	300	124	165	50	445	450	495	27
1 1/2 F3	REC & REB 761,771,781	2500	300	140	178	63	530	525	575	35
1 1/2 G3	REC & REB 161,171	150	150	124	121	39	375	375	420	17
1 1/2 G3	REC & REB 261,271	300	150	124	121	39	375	375	420	17
1 1/2 G3	REC & REB 361,371,381	300	150	124	152	40	405	400	450	19
1 1/2 G3	REC & REB 461,471,481	600	150	124	152	41	405	400	450	21
1 1/2 G3	REC & REB 561,571,581	900	300	124	165	50	455	455	500	29
2G3	REC & REB 661,671,681	1500	300	156	171	57	555	550	600	37
2G3	REC & REB 761,771,781	2500	300	156	171	69	555	550	600	42

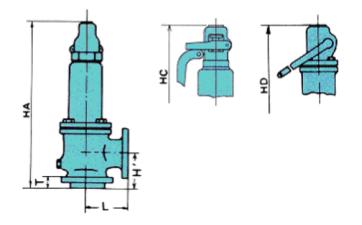


Face-to-face ANSI flange dimension Weight Inlet standard **Overall length** Nominal Type Outl flange (Type A) installation diameter inlet thickness kgs et H HD inlet Outlet HA HC 1 1/2 H3 REC & REB 161,171 150# 150# 1 1/2 H3 REC & REB 261,271 2H3 REC & REB 361,371 2H3 REC & REB 461,471 2H3 **REC & REB 381 REC & REB 481** 2H3 2H3 REC & REB 561,571,581 2H3 REC & REB 661,671,681 2J3 REC & REB 161,171 2J3 REC & REB 261,271 3J4 REC & REB 361,371 3J4 REC & REB 461,471 3J4 **REC & REB 381** 3J4 **REC & REB 481** 3J4 REC & REB 561,571 REC & REB 581 3J4 3J4 REC & REB 661.671.681 3K4 REC & REB 161,171 3K4 REC & REB 261,271 3K4 REC & REB 361,371 3K4 REC & REB 461,471 3K4 **REC & REB 381** 3K4 **REC & REB 481** 3K6 REC & REB 561,571 3K6 **REC & REB 581** 3K6 REC & REB 661,671,681 3L4 REC & REB 161,171 3L4 REC & REB 261,271 4L6 REC & REB 361,371,381 REC & REB 461,471 4L6 56.5 4L6 REC & REB 481 4L6 REC & REB 561,571,581 4L6 REC & REB 671.681

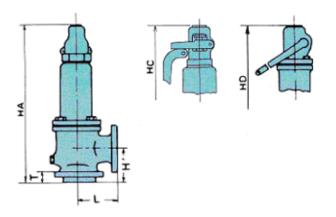
(Unit: mm)



🔳 Dime	ensions and weight									(Unit: mm)
Nominal	Туре	star	flange ndard	dime	to-face nsion	Inlet flange	Overall length			Weight (Type A) kgs
diameter	1,900	installation		Inlet	Outlet	thickness T				
		Inlet	Outlet	H'	L		HA	HC	HD	
4M6	REC & REB 161,171	150#	150#	178	184	50	645	640	685	58
4M6	REC & REB 261,271	300	150	178	184	50	645	640	685	72
4M6	REC & REB 361,371,381	300	150	178	184	50	760	755	820	90
4M6	REC & REB 461,471,481	600	150	178	203	56.5	820	815	880	111
4M6	REC & REB 571,581	900	150	197	222	63	835	830	900	121
4N6	REC & REB 161,171	150	150	197	210	50	710	705	755	76
4N6	REC & REB 261,271	300	150	197	210	50	710	705	755	81
4N6	REC & REB 361,371,381	300	150	197	210	50	840	835	905	105
4N6	REC & REB 461,471,481	600	150	197	222	56.5	840	835	905	113
4N6	REC & REB 571,581	900	150	197	222	63	840	835	905	125
4P6	REC & REB 161,171	150	150	181	229	50	850	845	915	83
4P6	REC & REB 261,271	300	150	181	229	50	850	845	915	105
4P6	REC & REB 361,371,381	300	150	225	254	50	945	940	1010	140
4P6	REC & REB 461,471,481	600	150	225	254	56.5	945	940	1010	142
4P6	REC & REB 571,581	900	150	225	254	63	945	940	1010	162
6Q8	REC & REB 161,171	150	150	240	241	44	990	985	1050	160
6Q8	REC & REB 261,271	300	150	240	241	55	990	985	1050	170
6Q8	REC & REB 361,371,381	300	150	240	241	56	1075	1070	1155	196
6Q8	REC & REB 461,471,481	600	150	240	241	66	1075	1070	1155	253
6R8	REC & REB 161,171	150	150	240	241	44	990	985	1055	220
6R8	REC & REB 261,271,281	300	150	240	241	56	990	985	1055	230
6R10	REC & REB 361,371	300	150	240	267	56	1080	1075	1155	250
6R10	REC & REB 461,471,481	600	150	240	267	66	1095	1090	1175	260
8T10	REC & REB 161,171	150	150	276	279	48	1085	1080	1165	245
8T10	REC & REB 261,271	300	150	276	279	60	1085	1080	1165	300
8T10	REC & REB 361,371,381	300	150	276	279	60	1140	1135	1220	300
8T10	REC & REB 461-3,471-3,481-	300	150	276	279	60	1270	1265	1350	320



Dime	ensions and weight									(Unit: mm)
Nominal diameter	Туре	ANSI flange standard installation		Face-to-face dimension		Inlet flange	Overall length			Weight (Type A)
ulameter		Inlet	Outlet	Inlet H'	Outlet L	thickness T	HA	HC	HD	kgs
20D25	REC 164,175	10 k	10 k	92	96	30	320	315	365	9
20D25	REC 264,275	20	10	92	96	30	320	315	365	9
20D25	REC 364,374,384,394	30	10	92	96	30	320	315	365	9
25D50	REC & REB 164,174	10	10	105	114	32	335	330	375	11
25D50	REC & REB 264,274	20	10	105	114	32	335	330	375	11
25D50	REC & REB 364,374,384,394	30	10	105	114	32	335	330	375	11
25E50	REC & REB 164,174	10	10	105	114	32	335	330	375	11
25E50	REC & REB 264,274	20	10	105	114	32	335	330	375	12
25E50	REC & REB 364,374,384,394	30	10	105	114	32	335	330	375	12
40F50	REC & REB 164,174	10	10	124	121	39	350	345	395	15
40F50	REC & REB 264,274	20	10	124	121	39	350	345	395	15
40F50	REC & REB 364,374,384,394	30	10	124	152	40	350	345	395	15
40G80	REC & REB 164,174	10	10	124	212	39	375	375	420	17
40G80	REC & REB 264,274	20	10	124	121	39	375	375	420	17
40G80	REC & REB 364,374,384,394	30	10	124	152	40	405	400	450	19
40H80	REC & REB 164,174	10	10	130	124	39	425	420	465	17
40H80	REC & REB 264,274	20	10	130	124	39	425	420	465	20
50H80	REC & REB 364,374(384,394)	30	10	130	124	41	460	460	505	22
50H80	REC & REB 384,394	30	10	130	124	44	460	460	505	22
50J80	REC & REB 164,174	10	10	137	124	41	475	475	520	23
50J80	REC & REB 264,274	20	10	137	124	41	475	475	520	24
80J100	REC & REB 364,374(384,394)	30	10	184	181	47	590	585	635	44
80J100	REC & REB 384,394	30	10	184	181	50	590	585	635	45
80K100	REC & REB 164,174	10	10	156	162	47	570	565	615	41
80K100	REC & REB 264,274	20	10	156	162	47	570	565	615	43
80K100	REC & REB 364,374(384,394)	30	10	156	162	47	605	600	650	47
80K100	REC & REB 384,394	30	10	156	162	50	605	6000	650	47
80L100	REC & REB 164,174	10	10	156	165	47	620	615	665	52
80L100	REC & REB 264,274	20	10	156	165	47	620	615	665	54
100L150	REC & REB 364,374,384,394	30	10	179	181	50	685	680	730	72



Dime	ensions and weight									(Unit: mm)
Nominal diameter	Туре	ANSI flange standard installation		Face-to-face dimension inlet Outlet		Inlet flange	Overall length			Weight (Type A)
		inlet	Outlet	H'	L	thickness T	HA	HC	HD	kgs
100M150	REC & REB 164,174	10 k	10 k	178	184	50	645	640	685	58
100M150	REC & REB 264,274	20	10	178	184	50	645	640	685	72
100M150	REC & REB 364,374,384,394	30	10	178	184	50	760	755	820	90
100N150	REC & REB 164,174	10	10	197	210	50	710	705	755	76
100N150	REC & REB 264,274	20	10	197	210	50	710	705	755	81
100N150	REC & REB 364,374,384,394	30	10	197	210	50	840	835	905	105
100P150	REC & REB 164,174	10	10	181	229	50	850	845	915	83
100P150	REC & REB 264,274	20	10	181	229	50	850	845	915	105
100P150	REC & REB 364,374,384,394	30	10	225	254	50	945	940	1010	140
150Q200	REC & REB 164,174	10	10	240	241	44	990	985	1050	160
150Q200	REC & REB 264,274	20	10	240	241	55	990	985	1050	170
150Q200	REC & REB 364,374,384,394	30	10	240	241	56	1075	1070	1155	196
150R200	REC & REB 164,174	10	10	240	241	44	990	985	1055	220
150R200	REC & REB 264,274	20	10	240	241	55	990	985	1055	230
150R250	REC & REB 364,374,384,394	30	10	240	267	56	1080	1075	1155	250
200T250	REC & REB 164,174	10	10	276	279	48	1085	1080	1165	245
200T250	REC & REB 264,274	20	10	276	279	48	1085	1080	1165	300
200T250	REC & REB 364,374,384,394	30	10	276	279	60	1140	1135	1220	300
200T250	REC & REB 464-3,474-3,484-3,494-3	30	10	276	279	<mark>60</mark>	1270	1265	1350	320



Head Office

6.1-Chome, Shodai Tajika, Hirakata, Osaka, Japan zip: 573-1134 TEL: +81-72-857-4527 FAX: +81-72-857-3324 e-mail: stm@fkis.co.jp Website: http://www.fkis.co.jp/



FUKUI SEISAKUSHO CO., LTD.