

TI-P316-01
CTLS Issue 18

SV615 Safety Valve

Description

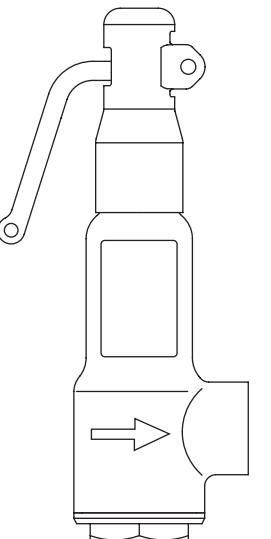
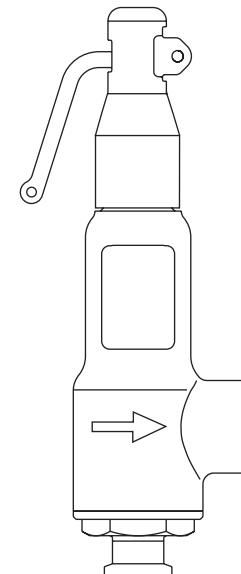
The SV615 full lift, full nozzle safety valve is suitable for steam, air, inert industrial gas and non-hazardous liquid service.

Applications

The SV615 is suitable for the protection of steam or hot water boilers, generators, vessels, receivers and air compressors, autoclaves, downstream of pressure reducing valves and for general pressure relief applications.

Available types

Valves are available in sizes ranging from DN15 to DN50 and have a bronze body with female screwed connections and a stainless steel nozzle. There is also the option of a 1" sanitary clamp inlet connection on the smaller sizes. All valves have a closed bonnet with either a lifting lever or closed cap (gas tight cap option). An optional soft seal is available in Nitrile, EPDM or Viton. Where frequent washdown occurs or aesthetic appearance is a consideration, this product can also be supplied with an electroless nickel plated (ELNP) finish to the body, lever housing (or sealed cap) and lever. A mechanically fastened stainless steel name-plate can also be provided - For full details contact Spirax Sarco.



Screwed female version

1" Sanitary clamp version

Standards and approvals

The SV615 complies with the requirements of EN ISO 4126:2004 and carries the CE mark indicating full compliance with the requirements of the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations.

The Approval Authority and Notified Body is the Royal and Sun Alliance.

Seat tightness complies with ASME/API STD 527- Revision 2002.

Certification

A manufacturers' Typical Test Report is provided as standard for each valve which will include valve set and hydraulic test pressure. Also available on request is material certification in accordance with EN 10204 3.1.

Sizes and end connections

DN15, DN20, DN25, DN32, DN40 and DN50.

Inlet connections

Screwed BSP (BS 21 parallel) or NPT female connections.

1" Sanitary clamp compatible (DN15, DN20 and DN25 sizes only)

BS 4825/ISO 2852/DIN 32676 - Safety valves with these connections have a surface finish of 0.8 µm on primary wetted parts.

Outlet connections

Screwed BSP (BS 21 parallel) or NPT female connection.

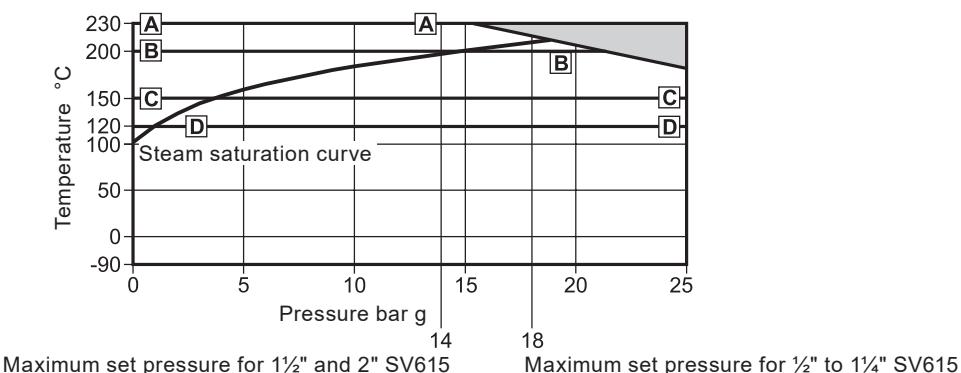
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Control systems

Safety valves

Pressure/temperature limits



The product **must not** be used in this region.

A - A Maximum operating temperature with metal seat.

B - B Maximum operating temperature with Viton seat.

C - C Maximum operating temperature with EPDM seat.

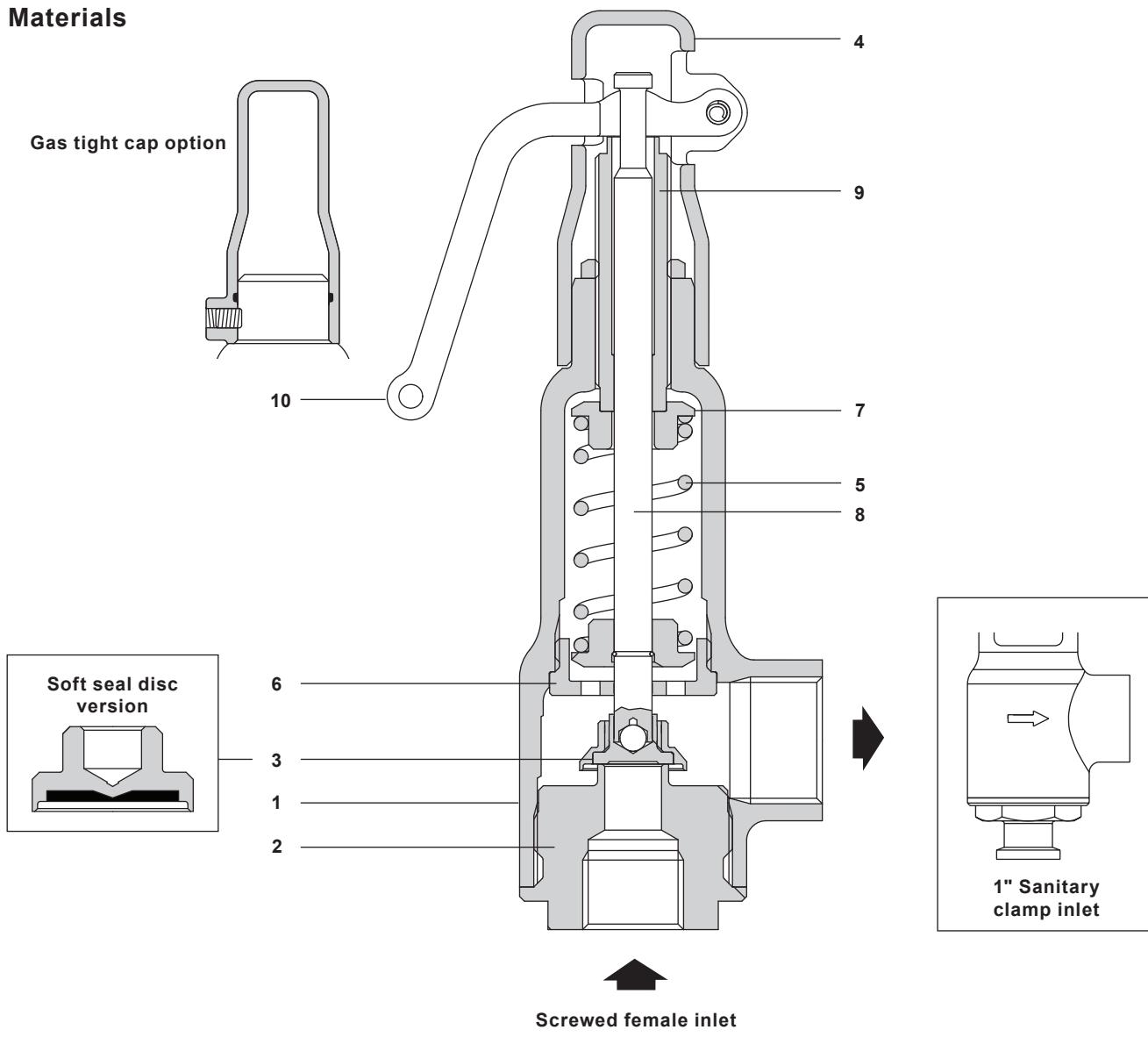
D - D Maximum operating temperature with Nitrile seat.

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	Body design conditions		PN25
Set pressure range	Maximum	½" to 1¼"	18 bar g
		1½" and 2"	14 bar g
	Minimum		0.3 bar g
Temperature	Metal seat	Minimum	-90 °C
		Maximum	+230 °C
	* Nitrile seat	Minimum	-30 °C
		Maximum	+120 °C
	* EPDM seat	Minimum	-50 °C
		Maximum	+150 °C
	* Viton seat	Minimum	-20 °C
		Maximum	+200 °C
Performance data	Overpressure	Steam	5%
		Gas	10%
		Liquid	10%
	Blowdown limits	Steam, gas	10%
		Liquids	20%
	Derated coefficient of discharge values	Steam, gas	0.71
		Liquid	0.52
Maximum permitted backpressure		10% of set pressure	
Tested at a maximum inlet cold hydraulic test pressure of:		37.5 bar g	

* Note: Soft seal inserts are not suitable for steam applications.

Materials



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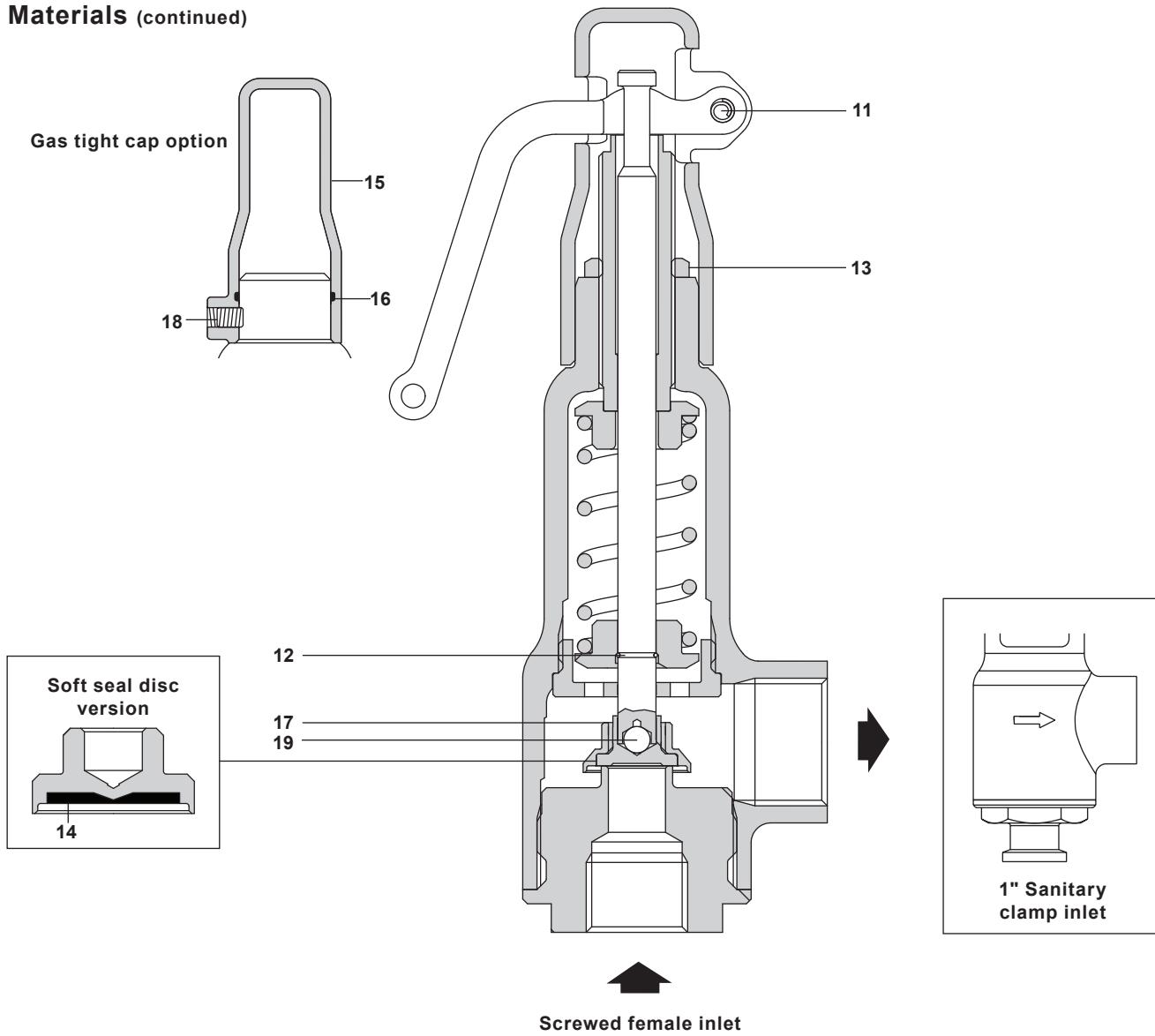
No.	Part	Material	
1	Body	Bronze	BS EN 1982 CC491KM
	DN15 and DN20	Stainless steel	BS 970 431 S29
2	Nozzle	DN25 to DN50	BS 3146 Pt2 Gr. ANC2
	Sanitary connections	Stainless steel	ASTM A276 316L
3	Disc	Stainless steel	ASTM A276 316L
4	Lever housing	Bronze	BS EN 1982 CC491KM
5	Spring	Chrome-vanadium alloy steel	BS 2803 735 A50 HS
6	Stem guide	Brass	BS 2872 CZ 121
7	Spring end plate	Brass	BS EN 12165 - CW617N
8	Stem	Stainless steel	BS 970 431 S29
9	Adjustment screw	Brass	BS 2874 CZ 121
10	Lever	SG iron	Zinc plated

Materials continued on the next page

Control systems

Safety valves

Materials (continued)



No.	Part	Material	
11	Pivot pin	Stainless steel	AISI 304
12	Circlip	Stainless steel	BS 2056 316 S42
13	Adjuster lock-nut	Brass	BS 2872 CZ 121
		Stainless steel/Nitrile insert	ASTM A276 316/bonded Nitrile 4490 (90 IRHD)
14	Soft seal disc	Stainless steel/EPDM insert	ASTM A276 316/bonded EPDM 2064 (75 IRHD)
		Stainless steel/Viton insert	ASTM A276 316/bonded Viton F81 (85 IRHD)
15	Sealed cap	Bronze	BS EN 1982 CC491KM
16	Cap seal	Nitrile	
17	Skirt	Brass	BS 2874 CZ 121
18	Grub screw	Steel	
19	Ball	Stainless steel	

Table 1 - SV615 flow capacity for saturated steam in kilograms per hour (kg/h)

(calculated in accordance with EN ISO 4126:2004 at 5% overpressure)

Derated coefficient of discharge (Kdr) = 0.71

Valve size DN in/out	15/20	20/32	25/40	32/50	40/65	50/80
Flow area (mm ²)	113	314	452	661	1 075	1 662
Set pressure (bar g)	Flow capacity for dry saturated steam kg/h					
0.5	71	198	285	417	678	1 049
1.0	95	263	379	554	901	1 393
1.5	118	328	472	690	1 122	1 734
2.0	141	392	564	824	1 341	2 073
2.5	164	455	655	959	1 559	2 410
3.0	187	519	747	1 092	1 776	2 746
3.5	209	582	838	1 225	1 993	3 081
4.0	232	645	929	1 358	2 008	3 414
4.5	255	708	1 019	1 490	2 424	3 747
5.0	277	771	1 109	1 622	2 638	4 079
5.5	300	833	1 199	1 754	2 853	4 410
6.0	322	896	1 289	1 886	3 067	4 741
6.5	345	958	1 379	2 017	3 280	5 071
7.0	367	1 020	1 469	2 148	3 494	5 401
7.5	390	1 083	1 559	2 279	3 707	5 731
8.0	412	1 145	1 648	2 410	3 920	6 060
8.5	434	1 207	1 737	2 541	4 132	6 389
9.0	457	1 269	1 827	2 672	4 345	6 717
9.5	479	1 331	1 916	2 802	4 557	7 046
10.0	501	1 393	2 005	2 933	4 769	7 374
11.0	546	1 517	2 184	3 194	5 194	8 030
12.0	591	1 641	2 362	3 454	5 618	8 685
13.0	635	1 765	2 540	3 715	6 042	9 340
14.0	680	1 888	2 718	3 975		
15.0	724	2 012	2 897	4 236		
16.0	769	2 136	3 075	4 496		
17.0	813	2 260	3 253	4 757		
18.0	858	2 384	3 431	5 018		

Control systems

Safety valves

Table 2 - SV615 flow capacity for air in litres per second (normal l/s) at 0 °C and 1.013 bar a
 (calculated in accordance with EN ISO 4126:2004 at 10% overpressure)
 Derated coefficient of discharge (Kdr) = 0.71

Valve size DN in/out	15/20	20/32	25/40	32/50	40/65	50/80
Flow area (mm ²)	113	314	452	661	1 075	1 662

Set pressure (bar g)	Flow capacity for air l/s					
0.5	24	67	97	142	230	356
1.0	33	91	131	191	311	481
1.5	41	115	165	241	392	606
2.0	50	138	199	291	473	732
3.0	67	186	267	391	635	982
4.0	84	233	335	490	797	1 233
5.0	101	280	403	590	959	1 483
6.0	118	328	472	690	1 121	1 734
7.0	135	375	540	789	1 283	1 984
8.0	152	422	608	889	1 446	2 235
9.0	169	470	676	988	1 608	2 485
10.0	186	517	744	1 088	1 770	2 736
11.0	203	564	812	1 188	1 932	2 986
12.0	220	612	880	1 287	2 094	3 237
13.0	237	659	948	1 387	2 256	3 487
14.0	254	706	1 017	1 487	2 418	3 738
16.0	288	801	1 153	1 686		
18.0	322	896	1 289	1 885		

Table 3 - SV615 flow capacity for water in kilogrammes per hour (kg/h) at 20 °C
 (calculated in accordance with EN ISO 4126:2004 at 10% overpressure)
 Derated coefficient of discharge (Kdr) = 0.52

Valve size DN in/out	15/20	20/32	25/40	32/50	40/65	50/80
Flow area (mm ²)	113	314	452	661	1 075	1 662

Set pressure (bar g)	Flow capacity for water kg/h					
0.5	2 216	6 159	8 866	12 965	21 086	32 599
1.0	3 135	8 710	12 538	18 335	29 819	46 102
1.5	3 839	10 668	15 356	22 456	36 521	56 463
2.0	4 433	12 318	17 731	25 930	42 171	65 198
3.0	5 429	15 086	21 717	31 758	51 649	79 851
4.0	6 269	17 420	25 076	36 671	59 639	92 204
5.0	7 009	19 476	28 036	40 999	66 678	103 088
6.0	7 678	21 335	30 712	44 913	73 042	112 927
7.0	8 293	23 045	33 173	48 511	78 895	121 975
8.0	8 866	24 636	35 463	51 861	84 342	130 397
9.0	9 404	26 130	37 614	55 006	89 458	138 307
10.0	9 912	27 544	39 649	57 982	94 297	145 788
11.0	10 396	28 888	41 584	60 812	98 900	152 904
12.0	10 858	30 172	43 433	63 516	103 298	159 703
13.0	11 302	31 405	45 207	66 110	107 515	166 224
14.0	11 728	32 590	46 913	68 605	111 574	172 499
16.0	12 538	34 840	50 152	73 342		
18.0	13 299	36 954	53 194	77 791		

Control systems**Safety valves****Table 4 - SV615 flow capacities for hot water in kilowatts (kW) at or above 100 °C**

(calculated in accordance with EN ISO 4126:2004)

Derated coefficient of discharge (Kdr) = 0.52

Valve size DN in/out	15/20	20/32	25/40	32/50	40/65	50/80
Flow area (mm ²)	113	314	452	661	1075	1662

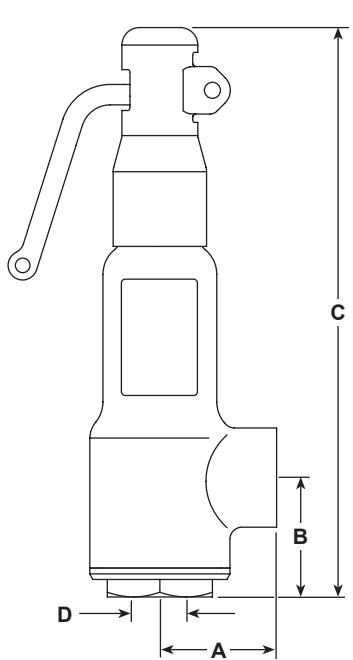
Set pressure (bar g)	Flow capacity for hot water kW					
0.5	29.96	83.26	119.86	175.27	285.06	440.71
1.0	40.60	112.81	162.39	237.47	386.21	597.09
1.5	51.23	142.36	204.92	299.66	487.36	753.47
2.0	61.86	171.96	247.45	361.86	588.51	909.86
3.0	83.13	230.99	332.51	486.24	790.81	1222.62
4.0	104.39	290.08	417.57	610.63	993.11	1535.38
5.0	125.66	349.17	502.63	735.02	1195.42	1848.15
6.0	146.92	408.26	587.69	859.41	1397.72	2160.91
7.0	168.19	467.36	672.75	983.80	1600.12	2473.67
8.0	189.45	526.45	757.81	1108.18	1802.32	2786.43
9.0	210.72	585.54	842.88	1232.57	2004.62	3099.20
10.0	231.98	644.63	927.94	1356.96	2206.92	3411.96
11.0	253.25	703.72	1013.00	1481.35	2409.22	3724.72
12.0	274.51	762.81	1098.06	1605.74	2611.52	4037.49
13.0	295.78	821.90	1183.12	1730.12	2813.82	4350.25
14.0	317.04	880.99	1268.18	1854.51	3016.12	4663.01
16.0	359.58	999.17	1438.30	2103.29		
18.0	402.11	1117.36	1608.42	2352.06		

Sizing and selectionRefer to:- <http://www.spiraxsarco.com/prs/product-sizing.asp>

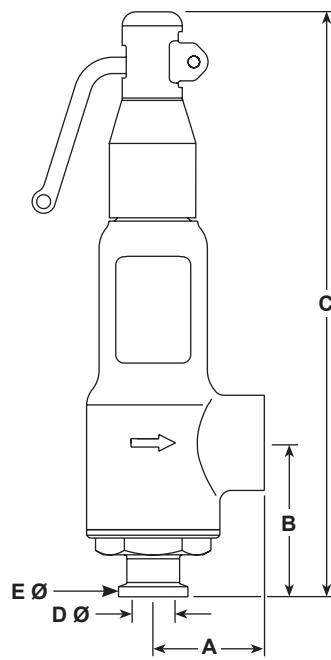
Dimensions/weights (approximate) in mm and kg

	Size	Connection			Flow				Weight
		Inlet	Outlet	A	B	C*	E Ø	D Ø	
Screwed BSPF x BSPF or NPTF x NPTF	DN15	1/2"	3/4"	40	40	194	-	12	1.3
	DN20	3/4"	1 1/4"	55	44	229	-	20	2.4
	DN25	1"	1 1/2"	60	48	242	-	24	2.9
	DN32	1 1/4"	2"	70	58	279	-	29	4.2
	DN40	1 1/2"	2 1/2"	81	67	365	-	37	8.8
	DN50	2"	3"	96	80	420	-	46	13.0
Sanitary clamp	DN15	1"	3/4"	40	55	209	50.5	12	1.4
	DN20	1"	1 1/4"	55	60	245	50.5	20	2.6
	DN25	1"	1 1/2"	60	64	258	50.5	24	3.1

* Applies to sealed cap and lever designs.



Screwed version



Sanitary clamp version

Control systems**Safety valves****Safety information, installation and maintenance**

For full details see the Installation and Maintenance Instructions (IM-P316-03) supplied with the product.

Installation note:

The safety valve should always be fitted with the centre line of the spring housing vertically above the valve. Ensure the discharge pipework system is sized correctly.

SV615 safety valve selection guide:

Model type	SV615	SV615
Configuration	A = Closed bonnet/easing lever	A
	B = Closed bonnet/sealed cap	
Seal material	S = Stainless steel	N
	N = Nitrile	
	E = EPDM	
Finish	V = Viton	
	P = Electroless nickel plated (ELNP)	
	Q = ELNP and stainless steel name-plate	
Size	DN15, DN20, DN25, DN32, DN40 and DN50	DN15
Connections (Inlet x Outlet)	BSPF x BSPF NPTF x NPTF Clamp x BSPF	BSPF x BSPF

Selection example

SV615	A	N		DN15	BSPF x BSPF
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If ELNP finish is required, add 'P'.

How to order example:

1 off Spirax Sarco SV615AN safety valve having DN15 screwed BSPF x BSPF connections, set at 6 bar g.

TI-S13-27
CTLs Issue 15

SV60 Safety Valve

Description

The SV60 is a range of full lift flanged safety valves suitable for use on steam, inert industrial gas and water services. Please contact Spirax Sarco for suitability of any other media.

Available types

Model and material		Bonnet and cap configuration
SV604	Carbon steel	Closed bonnet
		Open type easing lever Sealed cap
SV607	SG iron	Open bonnet
		Packed easing lever - DN20 to DN100 only Open type easing lever

Applications

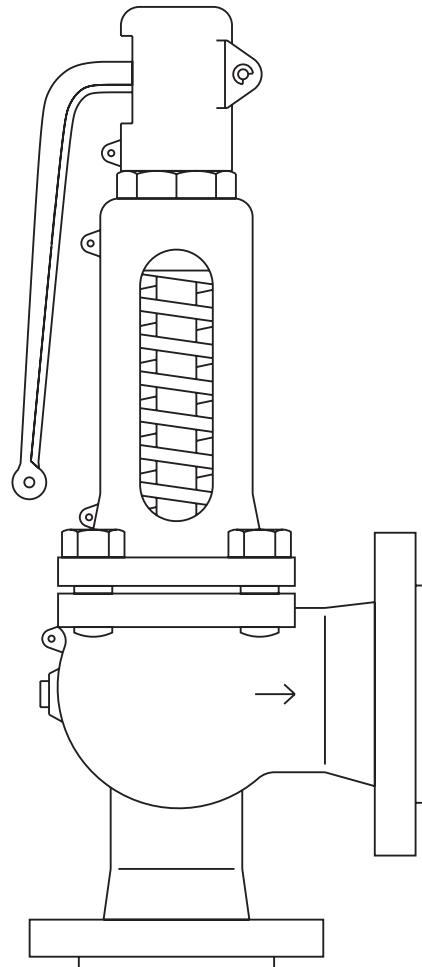
The SV60 is suitable for the protection of steam boilers, pipelines, pressure vessels, compressors and receivers and most general process industry applications.

Certification

A manufacturers' Typical Test Report is provided as standard for each valve which will include valve set and hydraulic test pressure. Also available on request is material certification in accordance with EN 10204 3.1.

Standards and approvals

The **SV60** carries the mark and complies with the requirements of the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations falling within Category 4 for Group 2 gases.
Seat tightness to ASME/API Standard 527-1992.
Lloyds Register (LR) type approval - Certificate number 01/00125 (E2).
The **SV604** (PN flanged) is approved by the TÜV to AD-Merkblatt A2, AD-Merkblatt A4, TRD 421, Vd TÜV 100, 100/4.



Sizes and end connections

Inlet sizes: DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN100, DN125 and DN150.

Valve type	Inlet connection	Outlet connection
SV607	PN16 (DN65 to DN150 only)	PN16
	PN25	PN16
SV604	PN40	PN16
	ASME 300	ASME 150

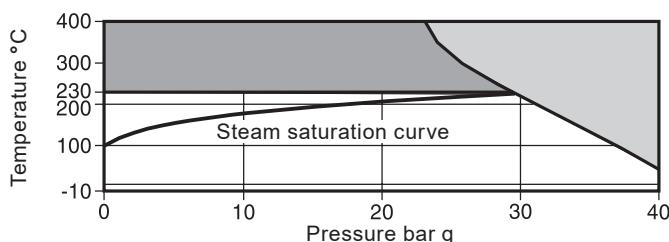
Standard PN flanges are to EN 1092 and ASME 300 flanges to EN 1759-1.

Control systems

Safety valves

Pressure/temperature limits - SV604

PN40 inlet



Body design conditions

PN40

	Size	Saturated steam	Air	Water
	DN20 x DN32	29 bar g	40 bar g	40 bar g
	DN25 x DN40	29 bar g	40 bar g	40 bar g
	DN32 x DN50	29 bar g	40 bar g	40 bar g
	DN40 x DN65	29 bar g	40 bar g	40 bar g
Set pressure range maximum	DN50 x DN80	29 bar g	40 bar g	40 bar g
	DN65 x DN100	29 bar g	32 bar g	32 bar g
	DN80 x DN125	29 bar g	32 bar g	32 bar g
	DN100 x DN150	25 bar g	25 bar g	25 bar g
	DN125 x DN200	20 bar g	20 bar g	20 bar g
	DN150 x DN250	16 bar g	16 bar g	16 bar g

Set pressure range minimum

0.2 bar g

Temperature	Maximum	400°C
	Minimum	-10°C

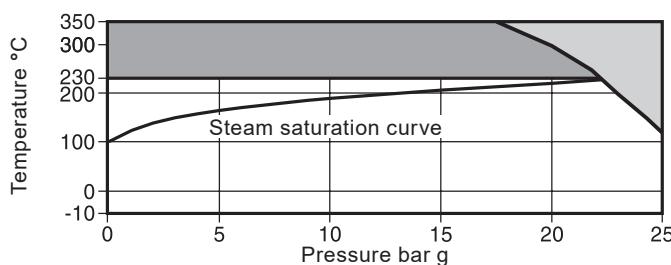
Performance data	Overpressure	Steam	5%
		Liquids and gas	10%
	Blowdown limit	Steam and gas	10%
	Backpressure limit	Liquids	20%
			10% of set pressure

Designed for a maximum inlet cold hydraulic test pressure of:

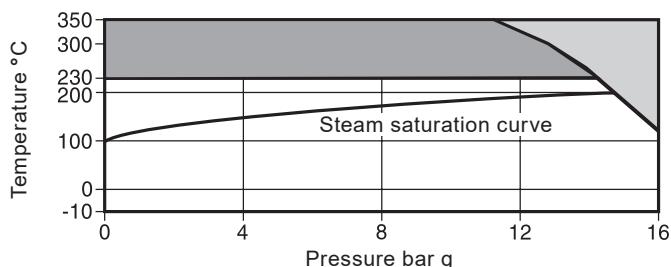
60 bar g

Pressure/temperature limits - SV607

PN25 inlet



PN16 inlet



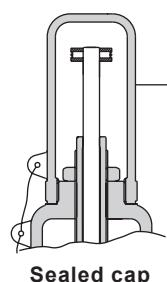
Body design conditions

	Size	Saturated steam	Air	Water	
PN25	DN20 x DN32	22.5 bar g	25 bar g	25 bar g	
	DN25 x DN40	22.5 bar g	25 bar g	25 bar g	
	DN32 x DN50	22.5 bar g	25 bar g	25 bar g	
	DN40 x DN65	22.5 bar g	25 bar g	25 bar g	
	DN50 x DN80	22.5 bar g	25 bar g	25 bar g	
	DN65 x DN100	22.5 bar g	25 bar g	25 bar g	
	DN80 x DN125	22.5 bar g	25 bar g	25 bar g	
	DN100 x DN150	22.5 bar g	25 bar g	25 bar g	
	DN125 x DN200	20 bar g	20 bar g	20 bar g	
	DN150 x DN250	16 bar g	16 bar g	16 bar g	
PN16	DN65 x DN100	14.6 bar g	16 bar g	16 bar g	
	DN80 x DN125	14.6 bar g	16 bar g	16 bar g	
	DN100 x DN150	14.6 bar g	16 bar g	16 bar g	
	DN125 x DN200	14.6 bar g	16 bar g	16 bar g	
	DN150 x DN250	14.6 bar g	16 bar g	16 bar g	
Set pressure range maximum				0.2 bar g	
Temperature	Maximum			350°C	
	Minimum			-10°C	
Performance data	Overpressure	Steam		5%	
		Liquids and gas		10%	
	Blowdown limit	Steam and gas		10%	
		Liquids		20%	
Backpressure limit			10% of set pressure		
Designed for a maximum inlet cold hydraulic test pressure of:		PN25	38 bar g		
		PN16	24 bar g		

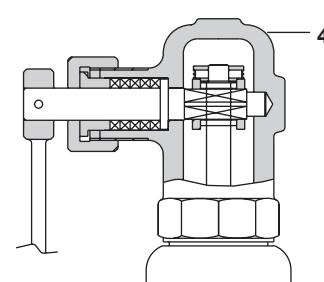
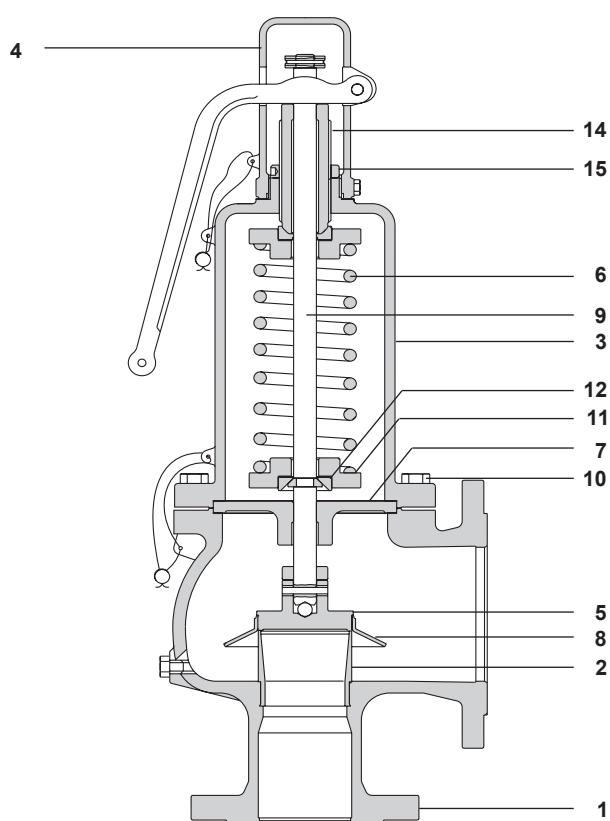
Control systems

Safety valves

Materials



Sealed cap



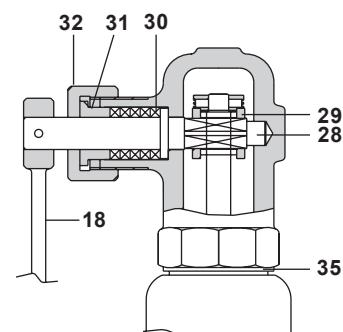
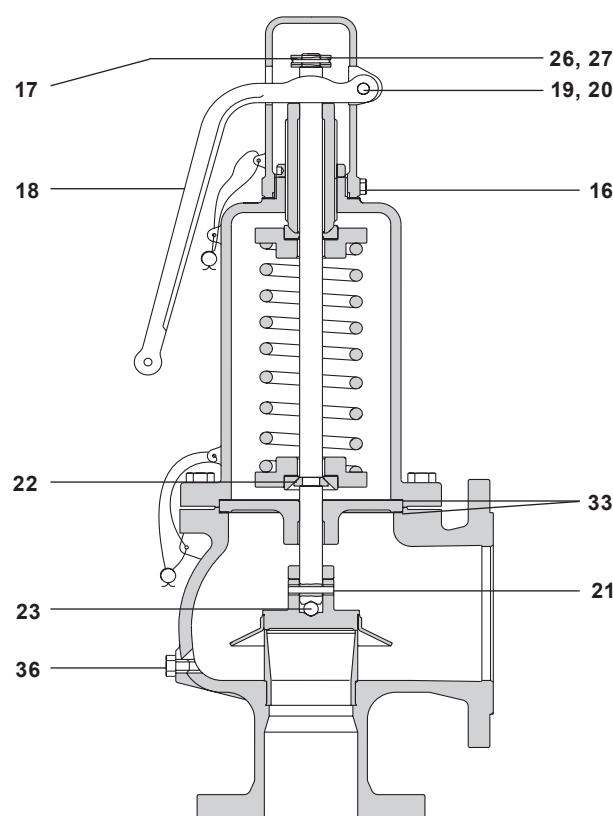
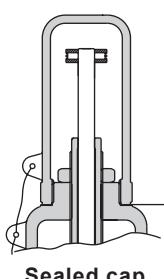
Packed easing lever
(DN20 to DN100 only)

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No.	Part	Material	SV607/SV604
1	Body	SG iron/carbon steel	GJS-400-18LT/1.0619 + N
2	Seat	Stainless steel	DN20-DN100 1.4057 or for DN125-DN150 ANC2
3	Bonnet	SG iron/carbon steel	GJS-400-18LT/1.0619 + N
4	Cap	SG iron	GJS-400-15
5	Disc	Stainless steel, hardened 47-52 HRC (Hardened Rockwell 'C' Scale)	DN20 - DN100 1.4021 or for DN125 - DN150 CA15
6	Spring	Standard For temperatures above 230°C	Chrome-vanadium alloy steel Tungsten alloy steel
7	Guide plate	SG iron	GJS-400-15
8	Skirt	Stainless steel	DN20 - DN100 1.4301 or for DN125 - DN150 1.4308
9	Stem	Stainless steel	1.4021
10	Body bolts	Steel	CK35
11*	Spring plate	Carbon steel	C45E
12*	Bearing ring (DN80 to DN150 only)	Stainless steel	1.4021
13	Spacer	Stainless steel	1.4021
14	Adjustment screw	Stainless steel	1.4021
15	Lock-nut	Zinc plated carbon steel	

Materials

Packed easing lever
(DN20 to DN100 only)

No.	Part	Material	SV607/SV604
16	Screw	Zinc plated steel	
17	Collar	Zinc plated carbon steel	
18	Lever	SG iron	GJS-400-15
19	Cross pin	Zinc plated carbon steel	
20	Circlip	Spring steel	
21	Disc pin	Spring steel	DIN 7343, A304
22	Collets	Stainless steel	1.4021
23	Stem ball	Stainless steel	
26	Collar pin	Zinc plated carbon steel	
27	Collar circlip	Spring stainless steel	
28	Packed lever spindle	Stainless steel	ASTM A276 431
29	Lifting fork	Carbon steel	
30	Gland packing	Graphite	
31	Gland	Stainless steel	ASTM A276 304
32	Gland nut	Carbon steel	
33	Guide plate gaskets (2 off)	Reinforced exfoliated graphite	
34	Sealed cap gasket	Universal SA	
35	Packed lever cap gasket	Universal SA	
36	Body drain plug 1/2 BSP	Steel	

* Note: The spring plate (11) and bearing ring design (12) varies according to the valve size and set pressure.

Control systems

Safety valves

Table 1 - SV60 flow capacity for dry saturated steam in kilogrammes per hour (kg/h)
(calculated at 10% overpressure. In accordance with EN ISO 4126)

Valve size DN in/out	20/32	25/40	32/50	40/65	50/80	65/100	80/125	100/150	125/200	150/250
Flow area (mm ²)	230	445	740	1140	1979	2734	4185	6504	8659	12272

Set pressure (bar g)	Dry saturated steam, kg/h									
0.5	129	269	401	525	875	1357	1889	3053	4299	6203
1.0	192	403	608	812	1315	2014	2831	4635	6380	9190
1.5	254	538	816	1102	1764	2726	3793	6190	8502	12235
2.0	312	661	1005	1363	2187	3367	4775	7775	10665	15337
2.5	369	789	1187	1636	2631	3981	5652	9162	12791	18388
3.0	427	911	1354	1867	3002	4609	6551	10651	14805	21278
3.5	485	1023	1521	2097	3372	5251	7471	12139	16864	24233
4.0	538	1148	1688	2326	3801	5825	8289	13662	18709	26883
4.5	591	1261	1854	2555	4175	6398	9104	15006	20549	29527
5.0	644	1374	2019	2783	4548	6970	9917	16347	22385	32165
5.5	697	1487	2185	3011	4920	7540	10729	17685	24217	34798
6.0	750	1599	2350	3239	5291	8110	11539	19021	26046	37427
6.5	802	1711	2514	3466	5662	8678	12349	20354	27873	40052
7.0	855	1823	2679	3693	6033	9246	13157	21687	29697	42673
7.5	907	1935	2843	3919	6403	9814	13964	23017	31519	45291
8.0	959	2047	3007	4145	6773	10380	14771	24346	33339	47907
8.5	1012	2158	3172	4372	7143	10947	15577	25675	35159	50521
9.0	1064	2270	3336	4598	7512	11513	16382	27003	36976	53133
9.5	1116	2381	3499	4824	7881	12078	17187	28329	38793	55743
10.0	1169	2493	3663	5049	8250	12644	17991	29655	40608	58352
11.0	1273	2715	3991	5501	8987	13774	19599	32305	44237	63566
12.0	1377	2938	4318	5952	9724	14903	21206	34955	47866	68780
13.0	1482	3161	4645	6402	10460	16032	22812	37601	51490	73989
14.0	1586	3383	4972	6853	11197	17161	24419	40250	55117	79199
15.0	1690	3606	5299	7304	11934	18290	26025	42898	58743	84410
16.0	1795	3829	5626	7755	12671	19420	27633	45547	62371	89623
17.0	1899	4051	5954	8206	13408	20549	29240	48196	65999	-
18.0	2004	4274	6281	8658	14146	21680	30849	50847	69630	-
19.0	2108	4497	6609	9110	14884	22812	32460	53504	73267	-
20.0	2213	4721	6937	9562	15623	23944	34070	56158	76902	-
21.0	2318	4944	7266	10015	16363	25078	35684	58818	-	-
22.0	2423	5168	7594	10468	17103	26212	37298	61479	-	-
23.0	2528	5392	7924	10922	17844	27348	38915	64144	-	-
24.0	2633	5616	8253	11376	18587	28487	40535	66814	-	-
25.0	2738	5841	8584	11831	19331	29626	42156	69487	-	-
26.0	2844	6065	8914	12286	20074	30766	43777	-	-	-
27.0	2949	6291	9245	12743	20820	31909	45404	-	-	-
28.0	3058	6524	9587	13214	21590	33089	47083	-	-	-
29.0	3163	6748	9917	13669	22333	34228	48704	-	-	-

Table 2 - SV60 flow capacity for air - normal m³/h at 0°C and 1013 mbar
(calculated in accordance with AD-MERKBLATT A2 and TRD 421)

Valve size DN in/out	20/32	25/40	32/50	40/65	50/80	65/100	80/125	100/150	125/200	150/250
Orifice (mm)	17.0	23.8	30.6	38.0	50.1	59.0	73.0	91.0	105	125
Flow area (mm ²)	230	445	740	1140	1 979	2 734	4 185	6 504	8 659	12 272
α_w (P > 4 bar)	0.78	0.86	0.76	0.68	0.64	0.71	0.66	0.70	0.72	0.73

Set pressure (bar g)	Flow capacity for air m ³ /h									
0.5	145	304	456	472	996	1521	2 115	3 466	4 809	6 955
1.0	227	480	728	973	1 578	2 419	3 383	5 514	7 621	10 975
1.5	303	643	975	1 323	2 125	3 251	4 572	7 434	10 267	14 753
2.0	377	802	1 211	1 657	2 657	4 062	5 742	9 328	12 885	18 509
2.5	450	956	1 438	1 978	3 171	4 853	6 892	11 195	15 467	22 232
3.0	522	1 107	1 656	2 289	3 672	5 627	8 026	13 015	18 018	25 924
3.5	593	1 255	1 868	2 591	4 161	6 388	9 146	14 837	20 542	29 590
4.0	660	1 411	2 074	2 858	4 670	7 157	10 184	16 785	22 986	33 029
4.5	728	1 554	2 285	3 149	5 145	7 884	11 219	18 491	25 321	36 385
5.0	795	1 697	2 496	3 439	5 619	8 611	12 254	20 196	27 657	39 741
5.5	862	1 841	2 706	3 730	6 094	9 338	13 289	21 902	29 992	43 097
6.0	929	1 984	2 917	4 020	6 568	10 065	14 324	23 607	32 328	46 452
6.5	996	2 127	3 128	4 310	7 043	10 793	15 359	25 313	34 663	49 808
7.0	1 063	2 271	3 339	4 601	7 517	11 520	16 393	27 018	36 999	53 164
7.5	1 130	2 414	3 549	4 891	7 992	12 247	17 428	28 724	39 334	56 520
8.0	1 197	2 557	3 760	5 182	8 466	12 974	18 463	30 429	41 670	59 876
8.5	1 264	2 701	3 971	5 472	8 941	13 701	19 498	32 135	44 005	63 232
9.0	1 332	2 844	4 182	5 763	9 415	14 428	20 533	33 840	46 341	66 588
9.5	1 399	2 987	4 392	6 053	9 890	15 156	21 567	35 546	48 677	69 944
10.0	1 466	3 131	4 603	6 343	10 365	15 883	22 602	37 251	51 012	73 300
11.0	1 600	3 417	5 025	6 924	11 314	17 337	24 672	40 662	55 683	80 012
12.0	1 734	3 704	5 446	7 505	12 263	18 791	26 741	44 073	60 354	86 724
13.0	1 868	3 990	5 868	8 086	13 212	20 246	28 811	47 484	65 025	93 436
14.0	2 003	4 277	6 289	8 667	14 161	21 700	30 881	50 895	69 696	100 148
15.0	2 137	4 564	6 711	9 248	15 110	23 154	32 950	54 306	74 367	106 860
16.0	2 271	4 850	7 132	9 828	16 059	24 609	35 020	57 717	79 038	113 572
17.0	2 405	5 137	7 554	10 409	17 008	26 063	37 090	61 129	83 709	-
18.0	2 539	5 424	7 975	10 990	17 957	27 517	39 159	64 540	88 380	-
19.0	2 674	5 710	8 397	11 571	18 906	28 972	41 229	67 951	93 051	-

Continued on next page

Control systems

Safety valves

Table 2 - SV60 flow capacity for air - normal m³/h at 0°C and 1013 mbar
(calculated in accordance with AD-MERKBLATT A2 and TRD 421)

Valve size DN in/out	20/32	25/40	32/50	40/65	50/80	65/100	80/125	100/150	125/200	150/250
Orifice (mm)	17.0	23.8	30.6	38.0	50.1	59.0	73.0	91.0	105	125
Flow area (mm ²)	230	445	740	1 140	1 979	2 734	4 185	6 504	8 659	12 272
α_w (P > 4 bar)	0.78	0.86	0.76	0.68	0.64	0.71	0.66	0.70	0.72	0.73

Set pressure (bar g)	Flow capacity for air m ³ /h									
20.0	2 808	5 997	8 818	12 152	19 855	30 426	43 299	71 362	97 723	-
21.0	2 942	6 284	9 240	12 733	20 804	31 880	45 368	74 773	-	-
22.0	3 076	6 570	9 661	13 314	21 753	33 335	47 438	78 184	-	-
23.0	3 210	6 857	10 083	13 894	22 702	34 789	49 507	81 595	-	-
24.0	3 345	7 144	10 504	14 475	23 651	36 243	51 577	85 006	-	-
25.0	3 479	7 430	10 926	15 056	24 600	37 698	53 647	88 417	-	-
26.0	3 613	7 717	11 347	15 637	25 549	39 152	55 716	-	-	-
27.0	3 747	8 004	11 769	16 218	26 498	40 606	57 786	-	-	-
28.0	3 882	8 290	12 190	16 799	27 447	42 061	59 856	-	-	-
29.0	4 016	8 577	12 612	17 379	28 397	43 515	61 925	-	-	-
30.0	4 150	8 864	13 033	17 960	29 346	44 969	63 995	-	-	-
31.0	4 284	9 150	13 455	18 541	30 295	46 424	66 064	-	-	-
32.0	4 418	9 437	13 876	19 122	31 244	47 878	68 134	-	-	-
33.0	4 553	9 724	14 298	19 703	31 907	-	-	-	-	-
34.0	4 687	10 010	14 719	20 284	32 865	-	-	-	-	-
35.0	4 821	10 297	15 141	20 865	33 809	-	-	-	-	-
36.0	4 955	10 583	15 562	21 445	34 749	-	-	-	-	-
37.0	5 089	10 870	15 984	22 026	35 690	-	-	-	-	-
38.0	5 224	11 157	16 405	22 607	36 631	-	-	-	-	-
39.0	5 358	11 443	16 826	23 188	37 572	-	-	-	-	-
40.0	5 492	11 730	17 248	23 769	38 514	-	-	-	-	-

Table 3 - SV60 flow capacity for water in tonnes/h at 25% overpressure
(calculated in accordance with AD-MERKBLATT A2 and TRD 421)

Valve size DN in/out	20/32	25/40	32/50	40/65	50/80	65/100	80/125	100/150	125/200	150/250
Orifice (mm)	17.0	23.8	30.6	38.0	50.1	59.0	73.0	91.0	105	125
Flow area (mm ²)	230	445	740	1140	1979	2734	4185	6504	8659	12272
α_w	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Set pressure (bar g)	Flow capacity for water tonnes/h									
0.5	4.6	8.9	14.9	22.9	39.8	55.0	84.1	130.8	174.1	246.7
1.0	6.5	12.6	21.0	32.4	56.3	77.7	119.0	184.9	246.2	348.9
2.0	9.2	17.9	29.8	45.8	79.6	109.9	168.3	261.5	348.2	493.5
3.0	11.3	21.9	36.5	56.1	97.5	134.6	206.1	320.3	426.4	604.4
4.0	13.1	25.3	42.1	64.8	112.6	155.5	238.0	369.9	492.4	697.9
5.0	14.6	28.3	47.1	72.5	125.8	173.8	266.1	413.5	550.5	780.2
6.0	16.0	31.0	51.6	79.4	137.8	190.4	291.5	453.0	603.1	854.7
7.0	17.3	33.5	55.7	85.8	148.9	205.7	314.9	489.3	651.4	923.2
8.0	18.5	35.8	59.5	91.7	159.2	219.9	336.6	523.1	696.4	986.9
9.0	19.6	37.9	63.1	97.2	168.8	233.2	357.0	554.8	738.6	1046.8
10.0	20.6	40.0	66.6	102.5	178.0	245.8	376.3	584.8	778.6	1103.4
11.0	21.7	42.0	69.8	107.5	186.6	257.8	394.7	613.3	816.6	1157.3
12.0	22.6	43.8	72.9	112.3	194.9	269.3	412.2	640.6	852.9	1208.7
13.0	23.5	45.6	75.9	116.9	202.9	280.3	429.1	666.8	887.7	1258.1
14.0	24.4	47.3	78.8	121.3	210.6	290.9	445.3	691.9	921.2	1305.6
15.0	25.3	49.0	81.5	125.5	218.0	301.1	460.9	716.2	953.5	1351.4
16.0	26.1	50.6	84.2	129.7	225.1	310.9	476.0	739.7	984.8	1395.7
17.0	26.9	52.2	86.8	133.7	232.0	320.5	490.7	762.5	1015.1	-
18.0	27.7	53.7	89.3	137.5	238.8	329.8	504.9	784.6	1044.6	-
19.0	28.5	55.1	91.7	141.3	245.3	338.8	518.7	806.1	1073.2	-
20.0	29.2	56.6	94.1	145.0	251.7	347.6	532.2	827.0	1101.1	-
21.0	29.9	58.0	96.5	148.6	257.9	356.2	545.3	847.4	-	-
22.0	30.6	59.3	98.7	152.0	264.0	364.6	558.2	867.4	-	-
23.0	31.3	60.7	100.9	155.5	269.9	372.8	570.7	886.9	-	-
24.0	32.0	62.0	103.1	158.8	275.7	380.8	583.0	906.0	-	-
25.0	32.6	63.2	105.2	162.1	281.4	388.7	595.0	940.0	-	-
26.0	33.3	64.5	107.3	165.3	287.0	396.4	606.8	-	-	-
27.0	33.9	65.7	109.4	168.4	292.4	403.9	618.4	-	-	-
28.0	34.6	66.9	111.4	171.5	297.8	411.3	629.7	-	-	-
29.0	35.2	68.1	113.3	174.6	303.1	418.6	640.9	-	-	-

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Continued on next page

Control systems

Safety valves

Table 3 - SV60 flow capacity for water in tonnes/h at 25% overpressure
(calculated in accordance with AD-MERKBLATT A2 and TRD 421)

Valve size DN in/out	20/32	25/40	32/50	40/65	50/80	65/100	80/125	100/150	125/200	150/250
Orifice (mm)	17.0	23.8	30.6	38.0	50.1	59.0	73.0	91.0	105	125
Flow area (mm ²)	230	445	740	1140	1979	2734	4185	6504	8659	12272
α_w	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

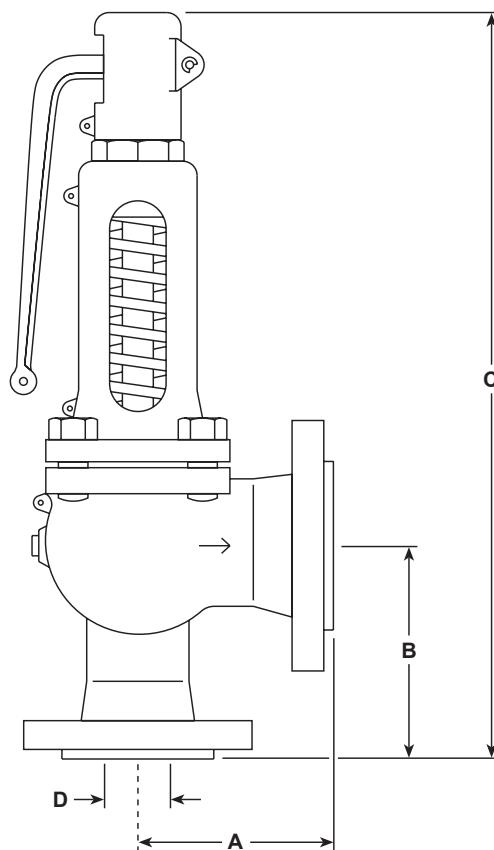
Set pressure (bar g)	Flow capacity for water tonnes/h									
30.0	35.8	69.3	115.3	177.6	308.2	425.8	651.8	-	-	-
31.0	36.4	70.4	117.2	180.5	313.3	432.8	662.6	-	-	-
32.0	36.9	71.6	119.1	183.4	318.3	439.7	673.2	-	-	-
33.0	37.5	72.7	120.9	186.2	323.3	-	-	-	-	-
34.0	38.1	73.8	122.7	189.0	328.1	-	-	-	-	-
35.0	38.6	74.8	124.5	191.8	332.9	-	-	-	-	-
36.0	39.2	75.9	126.3	194.5	337.7	-	-	-	-	-
37.0	39.7	76.9	128.0	197.2	342.3	-	-	-	-	-
38.0	40.3	78.0	129.7	199.8	346.9	-	-	-	-	-
39.0	40.8	79.0	131.4	202.4	351.4	-	-	-	-	-
40.0	41.3	80.0	133.1	205.0	355.9	-	-	-	-	-

Table 4 α_w/Kdr values for SV60 safety valves

Size	Set pressure (bar g)									
	0.2 - 0.49	0.5 - 0.99	1.0 - 1.49	1.5 - 1.99	2.0 - 2.49	2.5 - 2.99	3.0 - 3.49	3.5 - 3.99	Above 4.0	
DN20 x DN32	0.56	0.62	0.69	0.73	0.75	0.76	0.77	0.78	0.78	
DN25 x DN40	0.62	0.67	0.75	0.80	0.82	0.84	0.85	0.85	0.86	
DN32 x DN50	0.56	0.60	0.68	0.73	0.75	0.76	0.76	0.76	0.76	
DN40 x DN65	0.45	0.51	0.59	0.64	0.66	0.68	0.68	0.68	0.68	
DN50 x DN80	0.47	0.49	0.55	0.59	0.61	0.63	0.63	0.63	0.64	
DN65 x DN100	0.50	0.55	0.61	0.66	0.68	0.69	0.70	0.71	0.71	
DN80 x DN125	0.45	0.50	0.56	0.60	0.63	0.64	0.65	0.66	0.66	
DN100 x DN150	0.48	0.52	0.59	0.63	0.66	0.67	0.68	0.69	0.70	
DN125 x DN200	0.50	0.55	0.61	0.65	0.68	0.70	0.71	0.72	0.72	
DN150 x DN250	0.51	0.56	0.62	0.66	0.69	0.71	0.72	0.73	0.73	

Sizing and selectionRefer to:- <http://www.spiraxsarco.com/prs/product-sizing.asp>**Dimensions/weights (approximate) in mm and kg**

Size Inlet/Outlet	Dimensions				Weight	
	A	B	C	Flow Ø D	SV604	SV607
DN20 - DN32	85	95	385	17.0	10.5	10.5
DN25 - DN40	100	105	435	23.8	12.5	11.5
DN32 - DN50	110	115	450	30.6	16.0	15.0
DN40 - DN65	115	140	520	38.0	18.0	18.0
DN50 - DN80	120	150	535	50.1	20.0	22.0
DN65 - DN100	140	170	710	59.0	40.0	38.0
DN80 - DN125	160	195	790	73.0	56.0	53.0
DN100 - DN150	180	220	835	91.0	77.0	75.0
DN125 - DN200	200	250	1042	105.0	120.0	115.0
DN150 - DN250	225	285	1165	125.0	190.0	180.0



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Control systems**Safety valves****Safety information, installation and maintenance**

For full details see the Installation and Maintenance Instructions (IM-P137-01) supplied with the product.

Installation note:

The safety valve should always be fitted with the centre line of the spring housing vertically above the valve.

Open bonnet valves are recommended for all steam boiler applications and **must be used** for valves fitted with Tungsten alloy springs.

SV60 safety valve selection guide:

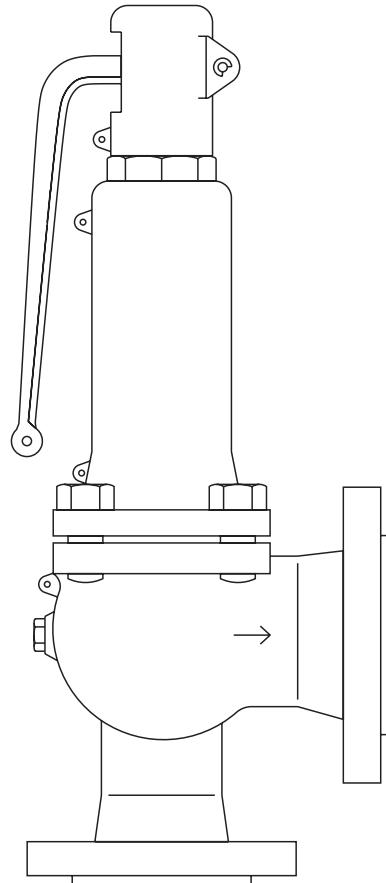
Model type	SV60	SV60
Body material	4 = Carbon steel 7 = SG iron	4
Configuration	A = Closed bonnet/easing lever B = Closed bonnet/sealed cap C = Closed bonnet/packed lever (DN20 to DN100 only) D = Open bonnet/easing lever	A
Seal material	S = Stainless steel with chrome-vanadium alloy steel spring T = Stainless steel with tungsten alloy steel spring	S
Size	DN20 to DN150	DN20
Inlet connection	PN16 (DN65 to DN150 only), PN25, PN40 or ASME (ANSI) 300	PN40
Selection example	SV60	4
		A
		S
		DN20
		PN40

How to order example

1 off Spirax Sarco SV604AS, DN20 flanged PN40 safety valve with a set pressure of 6 bar g.

TI-P317-02
CTLS Issue 5

SV60H Safety Valve



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Description

The SV60H is a range of full lift safety valves suitable for the protection of hot water generators. The construction is characterised by an EPDM bellows and elastomer seat seal to ensure leak free operation.

Available types

Set pressure range	1 to 10 bar g (in 0.5 bar increments)
Body materials	SV604H Carbon steel SV607H SG iron
'O' ring seat seals in accordance with Vd TÜV-Merkblatt SV100/4	EPDM, Viton

Applications

The SV60H is designed to protect hot water generators from overpressure in accordance with DIN 4751, Side 2, for temperatures up to 120 °C.

Certification

A manufacturers' Typical Test Report is provided as standard for each valve which will include valve set and hydraulic test pressure.

Also available on request is material certification in accordance with EN 10204 3.1.

Standards and approvals

The SV60H carries the CE mark and complies with the requirements of the Pressure Equipment Directive (PED) and falls within Category 4 for Group 2 gases.

The SV60H is approved by the TÜV to TRD 421, TRD 721 and Vd TÜV Merkblatt SV100 and 100/4.

Size and end connections

Inlet sizes DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN100, DN125 and DN150

Valve type	Inlet connection	Outlet connection
SV607H	PN16 (DN65 to DN150 only)	PN16
	PN25	PN16
SV604H	PN40	PN16

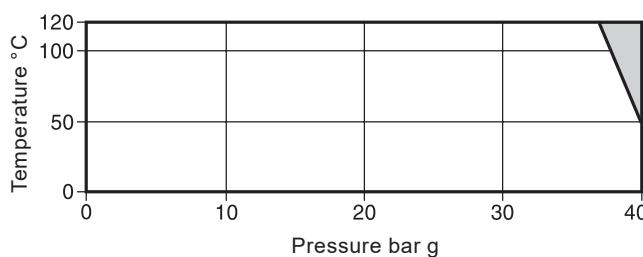
Control systems

Safety valves

Pressure/temperature limits

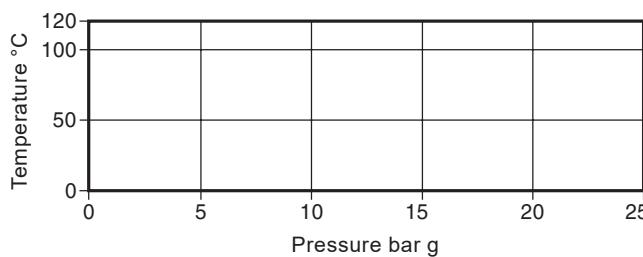
Please contact Spirax Sarco, when so required, for relevant details regarding the maximum allowable limits that the shell can withstand.

SV604H PN40 inlet

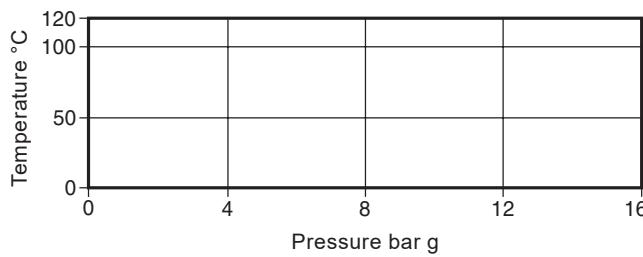


The product **must not** be used in this region.

SV607H PN25 inlet

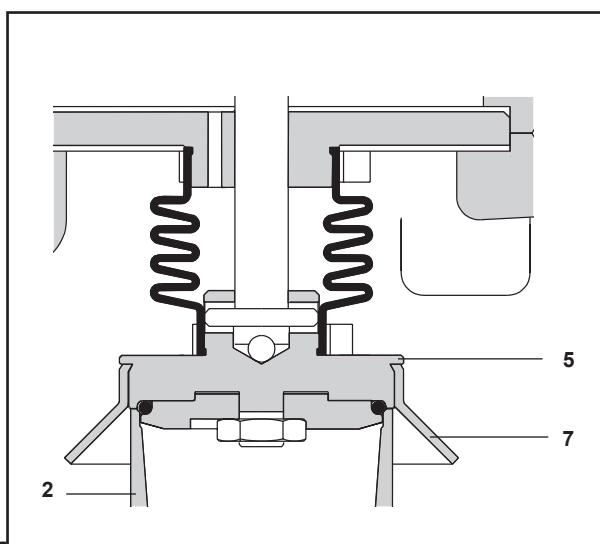
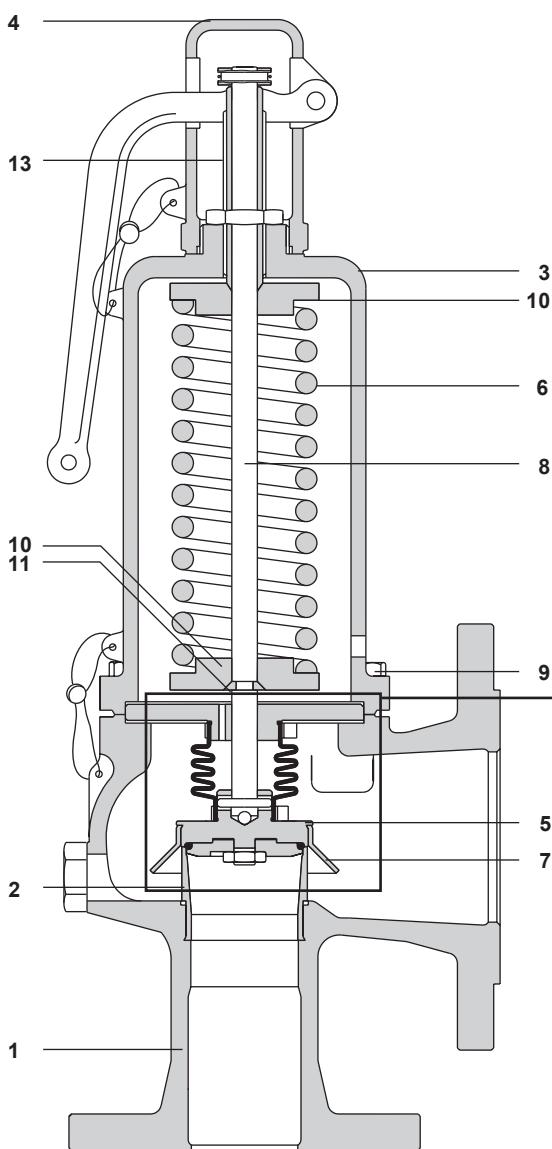


SV607H PN16 inlet



Body design conditions	SV604H	PN40
	SV607H	PN16 or PN25
Set pressure range	Maximum	10 bar g
	Minimum	1 bar g
Temperature	EPDM seat	Minimum 5 °C Maximum 120 °C
	Viton seat	Minimum 5 °C Maximum 120 °C
Performance data	Overpressure	10%
	Blowdown limit	10% of set pressure
	Derated coefficient of discharge values	0.5
	Backpressure limit	Up to 10% of set pressure
Designed for a maximum inlet cold hydraulic test pressure of:	PN40	60 bar g
	PN25	38 bar g
	PN16	24 bar g

Materials



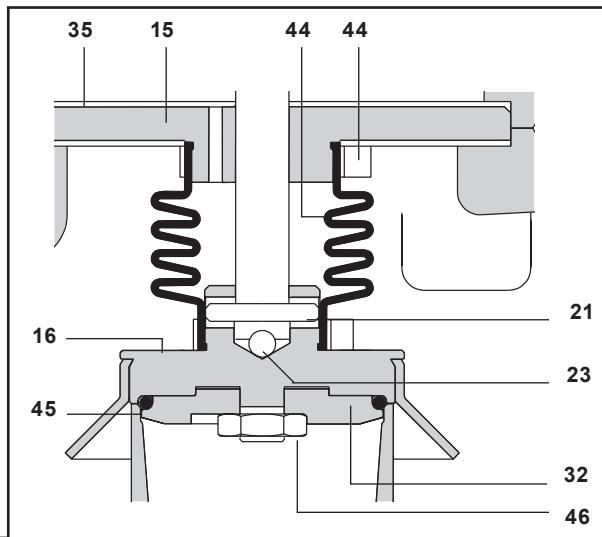
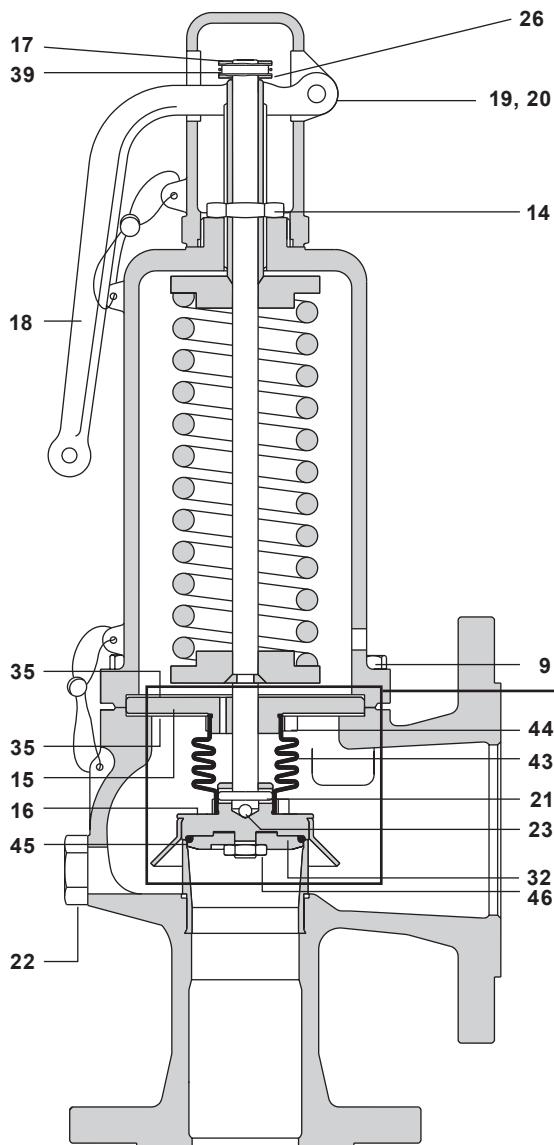
No.	Part	Material	
1	Body	SV604H	Carbon steel 1.0619 + N
		SV607H	SG iron GJS-400-18 LT
2	Seat	DN20-DN100	Stainless steel 1.4057
		DN125-DN150	Stainless steel ANC2
3	Bonnet	SV604H	Carbon steel 1.0619 + N
		SV607H	SG iron GJS-400-18 LT
4	Cap		SG iron GJS-400-15
5	Disc	DN20-DN125	Stainless steel 1.4021
		DN150	Stainless steel CA15
6	Spring		Chrome-vanadium alloy steel
7	Skirt	DN20-DN100	Stainless steel 1.4301
		DN125-DN150	Stainless steel 1.4308
8	Stem		Stainless steel 1.4021
9	Body bolts		Steel CK35
10	Spring plate		Carbon steel C45E
11	Collets		Steel 1.4021
13	Adjustment screw		Stainless steel 1.4021

Materials continued on the next page

Control systems

Safety valves

Materials (continued)

4.7
26

No.	Part	Material	
14	Lock-nut	Zinc plated carbon steel	
15	Guide plate	SG iron	GJS-400-15
17	Collar	Zinc plated carbon steel	
18	Lever	SG iron	GJS-400-15
19	Lever cross pin	Zinc plated carbon steel	
20	Circlip	Spring steel	
21	Disc pin	Spring steel	
22	Body drain plug 1/2" BSP	Steel	DIN 7343, A304
23	Stem ball	Stainless steel	
26	Collar pin	Zinc plated carbon steel	
32	'O' ring washer	Stainless steel	1.4021
35	Guide plate gasket (2 off)	Reinforced exfoliated graphite	
39	Collar circlip	Spring steel	
43	Bellows	EPDM	
44	Hose clamp	Stainless steel	
45	'O' ring	EPDM/Viton	
46	Nut	Stainless steel	

Table 1 - SV60H flow capacities for hot water in kilowatts (kW) at or above 100 °C (calculated in accordance with TRD 721)

Valve size DN	20/32	25/40	32/50	40/65	50/80	65/100	80/125	100/150	125/200	150/250
Orifice (mm)	17.0	23.8	30.6	38.0	50.1	59.0	73.0	91.0	105	125
Area (mm²)	230	445	740	1140	1979	2734	4185	6504	8659	12272

Set pressure (bar g)	Flow capacity for hot water kW									
1.0	122	236	327	504	875	1172	1795	3050	4061	5756
1.5	149	288	437	673	1168	1569	2402	3733	4970	7044
2.0	176	341	531	818	1421	1883	2882	4416	5879	8333
2.5	204	394	580	894	1552	2143	3281	5099	6789	9621
3.0	229	443	653	1005	1745	2411	3691	5737	7637	10824
3.5	256	496	730	1125	1953	2698	4131	6419	8546	12112
4.0	282	545	803	1237	2147	2966	4541	7057	9395	13315
4.5	307	594	875	1349	2341	3234	4951	7694	10244	14518
5.0	333	643	948	1460	2535	3502	5361	8332	11092	15720
5.5	358	693	1020	1572	2729	3770	5771	8969	11941	16923
6.0	382	738	1088	1676	2909	4019	6152	9561	12729	18040
6.5	414	802	1181	1819	3158	4363	6679	10380	13820	19586
7.0	431	833	1228	1891	3283	4536	6943	10790	14365	20359
7.5	456	882	1300	2003	3477	4804	7353	11428	15214	21562
8.0	480	928	1368	2107	3657	5052	7734	12019	16002	22679
8.5	500	967	1425	2195	3810	5263	8056	12520	16669	23624
9.0	529	1023	1507	2322	4031	5569	8525	13249	17638	24998
9.5	556	1076	1585	2442	4239	5856	8964	13932	18548	26287
10.0	574	1111	1637	2522	4378	6048	9257	14387	19154	27146

Table 2 - TRD 721 sizing

The safety valve discharge capacity expressed as heat output p of the heat generator in kW is calculated according to the following formula:

$$P = A_o \cdot \alpha_w \cdot K$$

Valve size DN	20/32	25/40	32/50	40/65	50/80	65/100	80/125	100/150	125/200	150/250
Orifice (mm) do	17.0	23.8	30.6	38.0	50.1	59.0	73.0	91.0	105	125
Area (mm²) Ao	230	445	740	1140	1979	2734	4185	6504	8659	12272

Set pressure bar g	αw values									
1.0	0.79	0.79	0.66	0.66	0.66	0.64	0.64	0.70	0.70	0.70
1.5	0.79	0.79	0.72	0.72	0.72	0.70	0.70	0.70	0.70	0.70
2.0	0.79	0.79	0.74	0.74	0.74	0.71	0.71	0.70	0.70	0.70
2.5 to 10	0.79	0.79	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70

Control systems

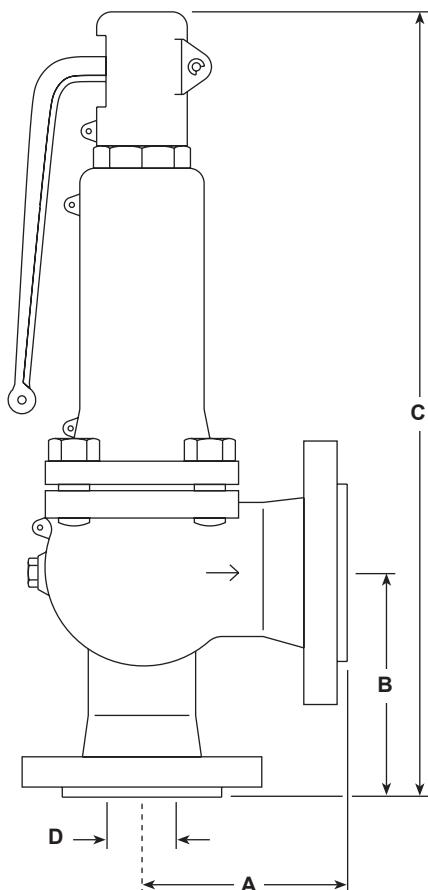
Safety valves

Constant K depending on the set pressure (bar g)

Set pressure bar g	K
1.0	0.67
1.5	0.82
2.0	0.97
2.5	1.12
3.0	1.26
3.5	1.41
4.0	1.55
4.5	1.69
5.0	1.83
6.0	2.10
7.0	2.37
8.0	2.64
9.0	2.91
10.0	3.16

Dimensions/weights (approximate) in mm and kg

Size Inlet - Outlet	Dimensions				Weight	
	A	B	C	Flow Ø D	SV604H	SV607H
DN20 - DN32	85	95	385	17.0	10.5	10.5
DN25 - DN40	100	105	435	23.8	12.5	11.5
DN32 - DN50	110	115	450	30.6	16.0	15.0
DN40 - DN65	115	140	520	38.0	18.0	18.0
DN50 - DN80	120	150	535	50.1	20.0	22.0
DN65 - DN100	140	170	710	59.0	40.0	38.0
DN80 - DN125	160	195	790	73.0	56.0	53.0
DN100 - DN150	180	220	835	91.0	77.0	75.0
DN125 - DN200	200	250	1042	105.0	120.0	115.0
DN150 - DN250	225	285	1165	125.0	190.0	180.0



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P317-01) supplied with the product.

Installation note: The safety valve should always be fitted with the centre line of the spring housing vertically above the valve.

Sizing and selection

In accordance with TRD 721. See Tables 1 and 2, page 5.

SV60H safety valve selection guide:

Model type	SV60	SV60
Body material	4H = Carbon steel 7H = SG iron	4H
Configuration	A = Closed bonnet / easing lever	A
Seal material	E = EPDM V = Viton	E
Size	DN20 to DN150	DN20
Inlet connection	PN16 (DN65 to DN150 only) PN25, PN40	PN40
Selection example	SV60 - 4H - A - E - DN20 - PN40	29

How to order

Example: 1 off Spirax Sarco SV604HAE, DN20 flanged PN40 safety valve with a set pressure of 6 bar g.

