

# Safety Valve

with bellow, standard

AT 4522, 4523, 4577, 4578

Dimension range	PN	Temperature range	Material
DN 15-150	40	-85°C to +450 °C	Steel
DN 15-100	40	-270°C to +400 °C	Stainless steel

## Range of Application

Safety valve for protection of pressure vessels and piping systems with liquids, air, gases and steam. Suitable as safety valve also when back-pressure is varying. Provided with back-pressure compensating and sealing stainless steel bellows.

## Quality Assurance

Approved by TÜV and several other classification authorities.  
Fulfills the requirements according to ISO 4126.  
Certificate SS-EN 10204, type 2, 3 and from most of the classification authorities.  
Type of certificate has to be specified upon ordering.

## CE-marking

Meets the requirements in AFS 2016:1 and 2014/68/EU (Pressure Equipment Directive) according to category IV, fluids group 1 and 2.



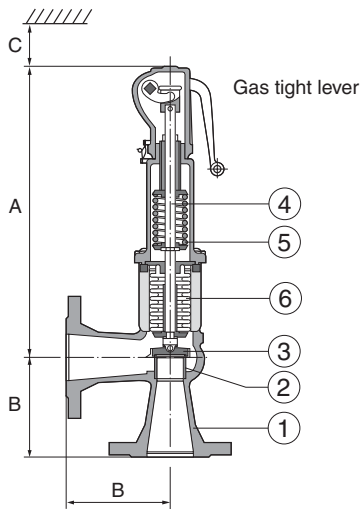
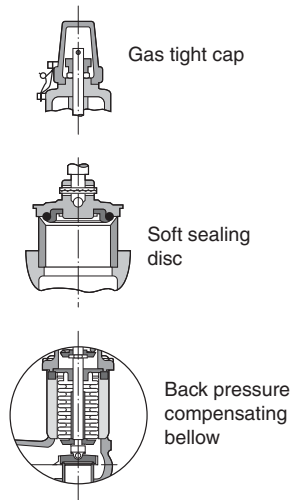
## Material Specification

	AT 4522/AT 4523	AT 4577/AT 4578	
1	Body	1.0619/SA 216 WCB	1.4408/SA 351 CF8M
2	Seat	1.4404/316L	1.4404/316L
3	Disc	1.4122/Hardened stainless steel	1.4404/316L
4	Spindle	1.4404/316L	1.4404/316L
5	Spring	1.1200,1.8159,1.7102/Spring steel	1.4310/Stainless steel
6	Bellows	1.4571/316Ti	1.4571/316Ti
	Bonnet spacer	1.4404/316L	1.4404/316L
7	Guide	1.4104,1.0501,1.0570/Chrome- or stainless steel	1.4404/316L
	Bushing for guide	1.4104 tenifer/Chrome steel	-
8	Bonnet	1.7040/Nodular iron Gr.60-40-18	1.4408,1.4404/ SA 351 CF8M,SA 479 316L
9	Spring plate 2 pcs	1.0718/Steel	1.4404/316L
1	Adjusting screw	1.4104 PTFE/Chrome steel PTFE	1.4404 PTFE/316L PTFE
1	Ball	1.3541/Hardened stainless steel	1.4401/316
2	Cap	1.0718/12L13	1.4404/316L
3	Soft seal	EPDM (D)	EPDM (D)
3	Soft seal	Neoprene (K)	Neoprene (K)
3	Soft seal	Viton® (L)	Viton® (L)

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## Dimension and Weight

AT4522, 4523											
DN	15	20	25	32	40	50	65	80	100	125	150
Flow diameter	12	18	18	18	23	29	37	46	60	74	92
A (4)	272	250	250	255	275	300	390	445	505	625	740
B	90	95	100	105	115	125	145	155	175	200	225
C	150	150	150	200	200	250	250	300	350	400	450
Weight	6,3	6,4	6,4	8,4	9,6	13	16	21,6	35,6	52,1	78,4

Measurements in mm, weight in kg. (4)= with gastight lifting device

AT 4577, 4578											
DN	15	20	25	32	40	50	65	80	100		
Flow diameter	12	18	18	18	23	29	37	46	60		
A (4)	272	250	250	255	275	300	390	445	505		
B	90	95	100	105	115	125	145	155	175		
C	150	150	150	200	200	250	250	300	350		
Weight	6,3	6,4	6,4	8,4	9,6	13	16	21,6	35,6		

Measurements in mm, weight in kg. (2)= with gas tight cap (4)= with gas tight lifting device

## Function and Design

Spring loaded and directly acting safety valve with standard characteristics, with stainless steel bellows. The bellows can compensate for varying back-pressure up to around 35 % of the set pressure. In addition, the bellows protect the moving parts against dirt, corrosion and temperature. With lifting device for manual testing or with gas tight cap. If possible, a soft sealing disc should be used since it has better tightness and is easier to renovate.

## Technical Information

### Overpressure

The safety valve is fully open at an overpressure exceeding the set pressure with a maximum of 10 %.

For set pressure lower than 1,0 bar, the overpressure is set pressure + 0,1 bar. If lower overpressure is requested please contact Armatec.

### Blowdown

Steam/air/gases:	Max 10% at set pressure $\geq$ 3,0 bar Max 0,3 bar at set pressure $<$ 3,0 bar
Liquids:	Max 20% at set pressure $\geq$ 3,0 bar Max 0,6 bar at set pressure $<$ 3,0 bar

If lower blowdown pressure is requested please contact Armatec

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## Pressure and temperature

DN	AT 4522/AT 4523		AT 4577/AT 4578	
	Set pressure max. bar	Temp. -85°C to +450°C	Set pressure- max. bar	Temp. -270°C to +400°C
15	40		40	
20	40		40	
25	40		40	
32	40		40	
40	40		40	
50	40		40	
65	40		26	
80	35		25	
100	30		22	
125	32		-	
150	16		-	

Pressure and temperatures according to applied standards for each valve material.

At temperatures above 200 °C the temperature has to be specified in the order, so that a high temperature spring is used.

If other temperatures and pressures limits are requested please contact Armatec.

## Soft sealing

### Temperature range soft sealed safety valves; AT 4523 and 4578

O-ring	Neoprene (CR) K -40°C to +100°C, e.g. refrigerants Ethylene (EPDM) D -45°C to +150°C, e.g. hot water and low temperature steam Viton (FPM) L -20°C to +180°C, e.g. oil and air
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## Additional information

Sizing based on submitted data can be performed on request.

Please state: Fluid, density (for liquids), capacity/power, maximum temperature and set pressure

Bar implies bar gauge: bar(ö), bar(g), bar(e), atö or kg/cm<sup>2</sup> if nothing else is stated.

Nm<sup>3</sup>/h implies "free" capacity air/gas (N=normal) and is equal with m<sup>3</sup>/h if other is not stated.

### Coefficient of discharge steam/gases ?d D/G

DN15 metal to metal: 0,62

DN15 soft sealed: 0,59

DN20: 0,29

DN25-150: 0,38

### Coefficient of discharge liquids ?d F

DN15 metal to metal: 0,48

DN15 soft sealed: 0,47

DN20: 0,19

DN25-150: 0,25

Flow diameter, Do see Dimension and weight.

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## Sizing DN15-50

DN Seat Pset bar	15 Met. 12mm			15 Soft 12mm			20 18mm			25+32 18mm			40 23mm			50 29mm		
	Stea	Air	Water	Stea	Air	Water	Stea	Air	Water	Stea	Air	Water	Stea	Air	Water	Stea	Air	Water
	m			m			m			m			m			m		
0, 2	36	43	1678	35	41	1633	1	1	1500	32	38	1967	53	63	3211	84	99	5111
0, 5	57	70	2378	54	66	2333	32	39	2111	68	84	2789	111	137	4544	177	217	7233
1	81	102	3222	77	97	3156	72	90	2867	106	133	3767	173	218	6156	277	347	9789
2	128	163	4556	121	156	4467	133	170	4056	178	227	5333	290	370	8711	461	588	13889
3	172	221	5578	163	210	5467	184	237	4967	240	309	6533	392	504	10667	624	802	17000
4	214	278	6433	203	264	6300	233	301	5733	306	396	7544	499	646	12333	793	1026	19556
5	257	333	7200	-	317	7056	279	363	6411	366	476	5100	598	777	13778	950	1233	21889
6	299	390	7878	-	370	7722	326	424	7022	426	556	9233	696	908	15111	1106	1433	24000
7	341	447	8511	-	424	8344	371	486	7578	486	637	9978	793	1039	16333	1256	1644	25889
8	383	503	9100	-	478	8922	417	547	8111	546	717	10667	891	1167	17444	1411	1856	27667
9	426	560	9656	-	532	9467	462	609	8600	606	798	11333	989	1300	18444	1567	2067	29333
10	467	617	10178	-	586	9978	508	670	9067	666	878	11889	1087	1433	19444	1722	2278	31000
12	551	729	11111	-	692	10889	599	793	9922	784	1039	13111	1278	1689	21333	2033	2689	33889
14	634	842	12000	-	800	11778	690	916	10722	904	1189	14111	1467	1956	23000	2344	3111	36667
16	718	954	12889	-	907	12667	781	1039	11444	1023	1356	15111	1667	2211	24667	2656	3522	39111
18	802	1068	13667	-	1014	13444	872	1156	12111	1133	1511	16000	1856	2478	26111	2967	3944	41556
20	887	1178	14444	-	1122	14111	963	1278	12778	1256	1678	16889	2056	2744	27556	3278	4367	43778
22	971	1289	15111	-	1222	14778	1056	1400	13444	1378	1833	17667	2256	3000	28889	3589	4778	45889
24	1056	1400	15778	-	1333	15444	1144	1522	14000	1500	2000	18444	2444	3267	30111	3900	5200	48000
26	1133	1511	16444	-	1433	16111	1233	1644	14667	1622	2156	19222	2644	3533	31444	4211	5611	49889
28	1222	1622	17000	-	1544	16667	1322	1767	15111	1744	2322	20000	2844	3789	32556	4522	6033	51778
30	1300	1744	17667	-	1656	17333	1422	1889	15667	1867	2478	20667	3044	4056	33667	4844	6456	53556
32	1389	1856	18222	-	1767	17889	1511	2011	16222	1989	2644	21333	3244	4322	34778	5156	6867	55333
34	-	1967	18778	-	1867	18444	-	2133	16667	-	2800	22000	-	4578	35889	-	7289	57111
36	-	2078	19333	-	1978	19000	-	2267	17222	-	2967	22667	-	4844	36889	-	7700	58778
38	-	2189	19889	-	2078	19444	-	2389	17667	-	3122	23222	-	5111	38000	-	8122	60333
40	-	2300	20333	-	2189	19889	-	2511	18111	-	3289	23889	-	5367	38889	-	8544	61889

Pset = set pressure

According to applied standards the value above should be multiplied with the safety factor 0,9.

Saturated steam in kg/h. Air in Nm<sup>3</sup>/h (free air) at 0°C and atmospheric pressure 1013 mbar(a). Water in kg/h at 20°C.

Capacities are given for an overpressure of 10% of set pressure.

Contact Armatec for sizing with other fluids etc.

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## Sizing DN65-150

DN	65			80			100			125			150		
	37mm			46mm			60mm			74mm			92mm		
	Seat	Pset		Seat	Pset		Seat	Pset		Seat	Pset		Seat	Pset	
bar	Steam	Air	Water	Steam	Air	Water	Steam	Air	Water	Steam	Air	Water	Steam	Air	Water
0,2	137	162	8322	211	250	12889	359	426	21889	547	647	33333	844	1001	51444
0,5	288	353	11778	446	546	18222	758	929	30889	1144	1411	47111	1778	2178	72778
1	450	564	15889	694	873	24667	1178	1478	41889	1789	2256	63778	2778	3489	98556
2	751	957	22556	1156	1478	34778	1967	2511	59222	3000	3822	90111	4644	5911	138889
3	1016	1300	27556	1567	2011	42667	2667	3422	72556	4056	5211	110333	6278	8067	171111
4	1289	1667	31889	1989	2578	49222	3389	3422	83778	5156	6667	127778	7978	10311	196667
5	1544	2000	35667	2389	3100	55111	4056	4389	93667	6178	8033	142222	9556	12333	220000
6	1800	2344	39000	2778	3622	60333	4733	5278	102667	7200	9389	155556	11111	14444	241111
7	2044	2689	42111	3167	4156	65111	5400	6178	110889	8211	10756	168889	12667	16556	261111
8	2300	3022	45111	3556	4678	69667	6056	7067	118889	9222	12111	180000	14222	18667	278889
9	2556	3367	47778	3944	5200	73889	6722	7967	125556	10233	13444	191111	15778	20778	295556
10	2811	3700	50333	4344	5733	77889	7389	8856	132222	11222	14778	201111	17333	22889	311111
12	3311	4389	55222	5122	6778	85333	8711	9744	145556	13222	17556	221111	20444	27111	341111
14	4322	5067	59667	5900	7833	92111	10044	11444	156667	15222	20222	238889	23556	31333	368889
16	4822	5744	63778	6678	8878	98556	11333	13222	167778	17222	23000	254444	26667	35444	394444
18	5333	6422	67556	7456	9933	104444	12667	15111	177778	19222	25667	270000	29889	40222	417778
20	5844	7100	71222	8244	10989	110111	14000	16889	187778	21333	28333	285556	-	-	-
22	6344	7789	74778	9033	12000	115556	15333	18667	196667	23333	31111	298889	-	-	-
24	6856	8467	78000	9811	13000	121111	16667	20444	205556	25333	33778	312222	-	-	-
26	7367	9144	81222	10600	14111	125556	18000	22222	213333	-	-	-	-	-	-
38	7889	9822	84333	11333	15111	130000	19333	24000	222222	-	-	-	-	-	-
30	8400	10500	87222	12111	16222	134444	20667	25778	230000	-	-	-	-	-	-
32	-	11111	90111	12889	17222	138889	22000	29333	236667	-	-	-	-	-	-
34	-	11778	92889	-	18333	143333	-	31667	244444	-	-	-	-	-	-
36	-	-	-	-	19667	147778	-	33444	251111	-	-	-	-	-	-
38	-	-	-	-	20667	152222	-	-	-	-	-	-	-	-	-
40	-	-	-	-	21778	155556	-	-	-	-	-	-	-	-	-

Pset = set pressure

According to applied standards the value above should be multiplied with the safety factor 0,9.

Saturated steam in kg/h. Air in Nm<sup>3</sup>/h (free air) at 0°C and atmospheric pressure 1013 mbar(a). Water in kg/h at 20°C.

Capacities are given for an overpressure of 10% of set pressure.

Contact Armatec for sizing with other fluids etc.

## Accessories and Options

Test Gag for blocking the safety valve

Lift stopper

Soft sealing O-ring of Kalrez (FFKM) C for temperature range 0-250 °C.

Heating jacket.

## Installation

Connection	Flanges drilled acc. to	
	AT 4522/AT 4523	AT 4577/AT 4578
Inlet	DIN EN 1092-1, PN40	DIN EN 1092-1, PN40
Outlet	DIN EN 1092-1, PN40	DIN EN 1092-1, PN40

See separate installation instruction. The valve should be mounted with the bonnet in vertical position. The stainless steel bellows has a connection for drainage piping or for leak detection piping (which can show if the bellows are broken). Mounted protection plug is removed and replaced on site with appropriate device.

## Maintenance and Spare parts

See separate installation and maintenance instruction.

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## Marking

Manufacturer, Armatec article number, DN, PN, CE-marking, material and arrow showing the flow direction.

TÜV approval label with manufacturer fig. no. 433 mounted on body.

Set pressure is punched on the outlet flange and on the TÜV approval label.

## How to order

### Metal seated safety valve with stainless steel bellow

Example: AT 4522-4-5,0-25

AT 4522	-4	-5,0	-25
Fig. no AT 4522=steel AT 4577=stainless steel	design -2=gas tight cap -4=gas tight lifting device	Set pressure (barg)	DN

### Soft seated safety valve with stainless steel bellow

Exempel: AT 4523D4-5,0-25

AT 4523	D	4	-5,0	-25
Fig.no. AT 4523=steel AT 4578=stainless steel	O-ring D=EPDM L=Viton K=Neoprene N=Nitrile	Design 2=gas tight cap 4=gas tight lifting device	Set pressure (barg)	DN