→ Series 451

451

Safety valves made of stainless steel, angle-type with threaded connections



SUITABLE FOR

Liquids	neutral and non-neutral	
Air, gases and vapours	neutral and non-neutral	
Steam		

EXAMPLES OF USE

For the protection of:
- pressure tanks and -systems for neutral / non-neutral vapours, gases and liquids
- steam boilers and steam plants
- bulk transport vehicles for liquid, granular and dusty goods.[1]

Please observe plant-specific regulations and use of appropriate valve version and sealing material.

- chemical plants, biogas plants
- process equipment construction and medical technology (sterilizers, autoclaves)
- secondary areas in the food-, beverage-, pharmaceutical- and cosmetics-industries

Safety valves are set and sealed at the factory.

MATERIAL

SPECIFICATION

1/2“ – 2“	– 60°C to + 400°C depending on version	0,5 – 70 bar

APPROVALS

TÜV-Type test approval 666, 684	**D/G, F, F/K/S[1]**
EC type examination	**S/G, L, F/K/S[1]**
GOST-R	**D/G (S/G), F (L), F/K/S[1]**

Requirements

AD 2000 Data sheet A2
TRD 421
TRB 801 No. 22 and No. 23[1]
DIN EN ISO 4126-1
PED 97/23/EC

Classification society

Germanischer Lloyd	GL
Lloyd's Register EMEA	LR EMEA
American Bureau of Shipping	ABS
Det Norske Veritas	DNV
Bureau Veritas	BV

MATERIALS

Component	Material	DIN EN	ASME
Inlet body	Stainless steel	1.4404	316 L
Outlet body	Stainless steel	1.4408	CF8M
Internal parts	Stainless steel	1.4404	316 L
Spring	Stainless steel	1.4310	302
Bellows (optional)	Stainless steel	1.4571	316 Ti

[1]only for versions with bellows

VALVE VERSION

s	Standard, non-gastight version of the spring housing	for neutral media without counter pressure.
b	with bellows	for neutral and non-neutral media and/or counter pressure up to 4 bar. Spring, moving parts and the environment are protected from being affected by the medium.
t	gastight version of spring housing	for neutral and non-neutral media without counter pressure. The environment is protected from being affected by the medium. Only available without lifting device.
tb	gastight version with bellows	for neutral and non-neutral an particularly for flammable, toxic and environmentally hazardous media and/or counter pressure up to 4 bar. Spring, moving parts and the environment are protected from being affected by the medium. **Double gastight.**

MEDIUM

G	gaseous	Air, vapours, gases and - depending on safety valve version and seal - also for steam
F	liquid	The temperature of the medium under atmospheric pressure must not reach boiling point
GF	gaseous and liquid	Air, vapours, gases, liquids and - depending on safety valve version and seal - also for steam

TYPE OF LIFTING MECHANISM

K	Standard with twist-type lifting mechanism
L	Lifting lever
O	without lifting device, standard for gastight versions

AVAILABLE NOMINAL DIAMETERS AND CONNECTION SIZES

Nominal diameter DN		**15**	**20**	**25**		**32**	
Inlet		1/2“ (15)	3/4“ (20)	1“ (25)	1 1/4“ (32)	1 1/2“ (40)	2“ (50)
Outlet	1/2“ (15)	■					
	3/4“ (20)						
	1“ (25)	■					
	1 1/4“ (32)		■				
	1 1/2“ (40)			■			
	2“ (50)				■	■	■

TYPE OF CONNECTION INLET / OUTLET THREADED CONNECTIONS

f / f	Standard	Female thread BSP-P / Female thread BSP-P	DIN EN ISO 228-1 / DIN EN ISO 228-1
m / f	on request	Male thread BSP-P / Female thread BSP-P	DIN EN ISO 228-1 / DIN EN ISO 228-1
Against surcharge			
BSP-Tf / f		Female thread BSP-T / Female thread BSP-P	DIN EN 10226, ISO 7-1 / DIN EN ISO 228-1
BSP-Tm / f		Male thread BSP-T / Female thread BSP-P	DIN EN 10226, ISO 7-1 / DIN EN ISO 228-1
Further connection types available on request			

SEALS

NBR	Nitrile rubber	Elastomere moulded seal with metallic support up to 25 bar	–30°C to +130°C
EPDM	Ethylene propylene diene	Elastomere moulded seal with metallic support up to 25 bar	–40°C to +170°C
FKM	Fluorcarbon	Elastomere moulded seal with metallic support up to 25 bar	–20°C to +200°C
PTFE	Polytetrafluoroethylene	Flat seal up to 25 bar	–60°C to +225°C
PTFE+Kohle	Polytetrafluoroethylene + carbon	Flat seal from 25 bar	–60°C to +225°C
Against surcharge			
FFKM	Perfluorinated rubber	Elastomere moulded seal with metallic support up to 25 bar	–10°C to +260°C
MD	Metal-to-metal sealing	Flat seal	–60°C to +400°C

OPTIONS

Special versions on request.

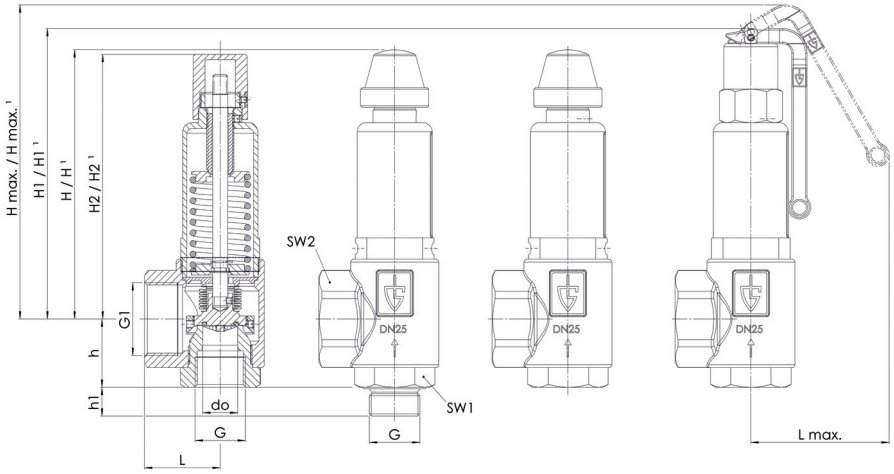
NOMINAL DIAMETERS, CONNECTIONS, INSTALLATION DIMENSIONS

Series 451: Connection, installation dimensions, ranges of adjustment

Nominal diameter	DN		15		20	25		32	
Connection DIN EN ISO 228	G		1/2" (15)		3/4" (20)	1" (25)	1 1/4" (32)	1 1/2" (40)	2" (50)
Outlet DIN EN ISO 228	G1	1/2" (15)	1" (25)	1" (25)	1 1/4" (32)	1 1/2" (40)	2" (50)	2" (50)	2" (50)
Installation dimensions in mm	L	34	40	40	43	50	61	61	61
	Lmax	65	65	65	91	92	92	92	92
	H / H[1]	79 / 79	77 / 77	131 / 131	138 / 138	178 / 178	241 / 263	241 / 263	241 / 263
	H1 / H1[1]	93 / 93	91 / 91	149 / 149	158 / 158	192 / 192	264 / 286	264 / 286	264 / 286
	H2 / H2[1]	79 / 79	77 / 77	131 / 131	139 / 139	175 / 175	241 / 263	241 / 263	241 / 263
	Hmax / Hmax[1]	105 / 105	103 / 103	164 / 164	173 / 173	207 / 207	277 / 299	277 / 299	277 / 299
	h	28	30	30	39	45	55	69	74
	h1	15	15	15	16	18	20	23	25
	SW1	30	30	30	36	46	55	55	70
	SW2	-	40	40	50	58	70	70	70
	do	15,8	15,8	15,8	18	23	30	30	30
Weight	kg	0,4	0,4	0,8	1,0	1,8	4,0	4,0	4,0
Range of adjustment	bar	0,5[2]-25	0,5[2]-25	25,1-70	0,5-70	0,5-70	0,5-70	0,5-70	0,5-70

[1]Dimension for the version with bellows
[2]Version with bellows only available from 1 bar

MAIN DIMENSIONS, INSTALLATION DIMENSIONS



INDIVIDUAL SELECTION / VALVE CONFIGURATION

Series	Valve version	Medium	Lifting device	Nominal diameter DN	Connection type		Connection size		Seal	Options	Set pressure	Quantity
					Inlet	Outlet	Inlet	Outlet				
451	*b*	*F*	*L*	*15*	*m*	*f*	*15*	*25*	*EPDM*		*15,0*	*2*
451												
451												
451												

In this table you can configure a valve according to your individual requirements (similar to the *example* shown, which should be deleted before you enter your own data). Please complete the table by hand using the abbreviations in this datasheet and then fax it to: +49(0)7141.4889488
Please do not forget to add your personal data so that our sales team can contact you.

Name

First Name

Company

Telephone

E-Mail

CAPACITY TABLE

Series 451: Blowing-off rates at approx. 10% above set pressure

Nominal diameter DN		15				20			25			32		
				Bellows										
				without	with									
Set pressure bar		I	II	III	III	I	II	III	I	II	III	I	II	III
	0,5	56**	42**	2,3**	1,9**	127	96	5,4	199	150	8,8	353	266	15,4
	1	87	69	3,1	2,5	189	151	7,3	291	232	12,0	515	411	20,8
Air l	1,5	113	90	3,8	3,1	252	200	9,0	390	309	14,7	683	542	25,5
Nm³/h	2	141	111	4,4	3,6	316	249	10,4	489	385	16,9	832	656	29,4
	2,5	165	129	5,0	4,0	383	300	11,6	583	457	18,9	1012	793	32,9
Steam II	3	189	148	5,4	4,4	447	349	12,7	681	532	20,8	1182	924	36,0
kg/h	3,5	214	166	5,9	4,7	504	392	13,7	768	597	22,4	1333	1036	38,9
	4	238	184	6,3	5,0	561	435	14,7	855	663	24,0	1484	1151	41,6
Water III	4,5	262	203	6,7	5,3	618	478	15,6	942	729	25,4	1635	1265	44,1
m³/h	5	286	221	7,0	5,6	675	521	16,4	1029	794	26,8	1786	1378	46,5
	5,5	310	239	7,4	5,9	732	564	17,2	1116	860	28,1	1937	1492	48,8
	6	335	257	7,7	6,2	790	608	18,0	1203	926	29,3	2088	1607	50,9
	6,5	359	275	8,0	6,4	847	650	18,7	1290	990	30,5	2239	1719	53,0
	7	383	293	8,3	6,6	904	692	19,4	1377	1054	31,7	2390	1830	55,0
	7,5	407	311	8,6	6,9	961	735	20,1	1464	1119	32,8	2542	1943	56,9
	8	431	329	8,9	7,1	1018	777	20,8	1552	1184	33,9	2693	2056	58,8
	8,5	456	347	9,2	7,3	1075	820	21,4	1639	1249	34,9	2844	2168	60,6
	9	480	365	9,4	7,5	1132	862	22,0	1726	1314	35,9	2995	2281	62,4
	9,5	504	383	9,7	7,7	1190	905	22,6	1813	1379	36,9	3146	2392	64,1
	10	528	401	9,9	7,9	1247	947	23,2	1900	1443	37,9	3297	2504	65,8
	11	577	437	10,4	8,3	1361	1031	24,3	2074	1571	39,7	3599	2727	69,0
	12	625	472	10,9	8,7	1475	1115	25,4	2248	1699	41,5	3902	2948	72,0
	13	674	508	11,3	9,1	1590	1199	26,5	2422	1827	43,2	4204	3172	75,0
	14	722	544	11,8	9,4	1704	1284	27,5	2596	1957	44,8	4506	3396	77,8
	15	770	580	12,2	9,7	1818	1368	28,4	2771	2085	46,4	4808	3618	80,5
	16	819	616	12,6	10,1	1932	1453	29,4	2945	2214	47,9	5111	3842	83,2
	17	867	650	13,0	10,4	2047	1535	30,3	3119	2339	49,4	5413	4059	85,7
	18	916	686	13,3	10,7	2161	1619	31,1	3293	2467	50,8	5715	4281	88,2
	19	964	721	13,7	11,0	2275	1703	32,0	3467	2594	52,2	6017	4503	90,6
	20	1013	757	14,0	11,2	2390	1787	32,8	3641	2723	53,6	6320	4726	93,0
	21	1061	793	14,4	11,5	2504	1872	33,6	3816	2852	54,9	6622	4950	95,3
	22	1109	829	14,7	11,8	2618	1956	34,4	3990	2981	56,2	6924	5173	97,5
	23	1158	865	15,1	12,1	2732	2040	35,2	4164	3109	57,5	7226	5396	99,7
	24	1206	900	15,4	12,3	2847	2125	35,9	4338	3238	58,7	7529	5619	101,9
	25	1255	936	15,7	12,6	2961	2209	36,7	4512	3366	59,9	7831	5842	104,0
	26	1303	972*	16,0	12,8	3075	2294*	37,4	4686	3496*	61,1	8133	6067*	106,0
	27	1352	1008*	16,3	13,1	3190	2379*	38,1	4860	3626*	62,3	8435	6293*	108,0
	28	1400	1044*	16,6	13,3	3304	2465*	38,8	5035	3756*	63,4	8738	6518*	110,0
	29	1449	1081*	16,9	13,5	3418	2550*	39,5	5209	3886*	64,5	9040	6744*	112,0
	30	1497	1114*	17,2	13,8	3532	2628*	40,2	5383	4005*	65,6	9342	6951*	113,9
	32	1594	1186*	17,8	14,2	3761	2799*	41,5	5731	4265*	67,8	9947	7401*	117,6
	34	1691	1258*	18,3	14,7	3990	2969*	42,8	6080	4524*	69,9	10551	7851*	121,2
	36	1788	1330*	18,8	15,1	4218	3139*	44,0	6428	4783*	71,9	11156	8301*	124,8
	38	1884	1402*	19,4	15,5	4447	3309*	45,2	6776	5042*	73,9	11760	8751*	128,2
	40	1981	1474*	19,9	15,9	4675	3479*	46,4	7124	5301*	75,8	12365	9200*	131,5
	42	2078	1547*	20,4	16,3	4904	3650*	47,6	7473	5562*	77,6	12969	9653*	134,8
	44	2175	1619*	20,8	16,7	5132	3821*	48,7	7821	5823*	79,5	13574	10105*	137,9
	46	2272	1692*	21,3	17,0	5361	3992*	49,8	8169	6083*	81,3	14178	10558*	141,0
	48	2369	1764*	21,8	17,4	5589	4163*	50,8	8518	6344*	83,0	14783	11011*	144,1
	50	2466	1837*	22,2	17,8	5818	4335*	51,9	8866	6606*	84,7	15387	11464*	147,0
	52	2562	1910*	22,7	18,1	6047	4506*	52,9	9214	6867*	86,4	15992	11917*	149,9
	54	2659	1984*	23,1	18,5	6275	4681*	53,9	9563	7134*	88,0	16596	12380*	152,8
	56	2756	2061*	23,5	18,8	6504	4868*	54,9	9911	7412*	89,7	17200	12864*	155,6
	58	2853	2136*	23,9	19,1	6732	5040*	55,9	10259	7681*	91,2	17805	13330*	158,4
	60	2950	2209*	24,3	19,5	6961	5213*	56,8	10608	7943*	92,8	18409	13786*	161,1
	62	3047	2282*	24,7	19,8	7189	5385*	57,8	10956	8206*	94,3	19014	14242*	163,7
	64	3144	2355*	25,1	20,1	7418	5558*	58,7	11304	8469*	95,8	19618	14699*	166,3
	66	3240	2428*	25,5	20,4	7647	5730*	59,6	11652	8732*	97,3	20223	15155*	168,9
	68	3337	2502*	25,9	20,7	7875	5905*	60,5	12001	8998*	98,8	20827	15616*	171,5
	70	3434	2578*	26,3	21,0	8104	6082*	61,4	12349	9269*	100,2	21432	16086*	174,0

*) only possible with metal-to-metal sealing
**) Version with bellows only available from 1 bar