



→ **Series 451bHF**

451bHF

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



■ **SUITABLE FOR**

Liquids	neutral and non-neutral	
Hot water		

■ **EXAMPLES OF USE**

For the protection of:

- combined heating- and cooling systems
- cooling- and/or heating circuits as well as heat exchanger of co-generation plants (CHP)
- cooling systems and closed cooling circuits

as well as:

- thermostatically protected closed-circuit water heating systems with flow temperatures up to 120°C for all static heights or rated output above 350 kW.

- heating- and cooling plants in building- and industrial technology
- co-generation plants (CHP)
- cooling- and chilling technology

Safety valves are set and sealed at the factory.

■ **APPROVALS**

TÜV Type test approval 665, 684	D/G/H, F
EU type examination	D/G/H, L
TSG ZF001-2006	D/G/H, L
TR ZU 032/2013 - TR ZU 010/2011	D/G/H, F (L)

Requirements	
TRD 721	DIN EN ISO 4126-1
TRD 421	PED 2014/68/EU
DIN 4751 Part 2	SWKI HE301-01
DIN 4757 Part 1 and Part 2	
DIN EN 12828	

Classification society	
DNV	DNV
Lloyd's Register EMEA	LR EMEA
American Bureau of Shipping	ABS
Bureau Veritas	BV
Russian Maritime Register of Shipping	RS



■ **MATERIAL**



■ **SPECIFICATION**



1/2" – 2"



- 40°C to + 120°C



0,5 – 25 bar

■ **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	Stainless steel	1.4571	316 Ti

Series 451bHF ■ VALVE VERSION

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.
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■ MEDIUM

HF	Hot water and liquid	Hot water with flow temperature $\leq 120^{\circ}\text{C}$ in hot water systems and/or liquids in cooling or chilling circuits with up to 100% glycol
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■ TYPE OF LIFTING MECHANISM

K	Standard with twist-type lifting mechanism
L	Lifting lever

■ 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-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

EPDM	Ethylene propylene diene	Elastomere moulded seal with metallic support	-40°C to +120°C
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■ OPTIONS

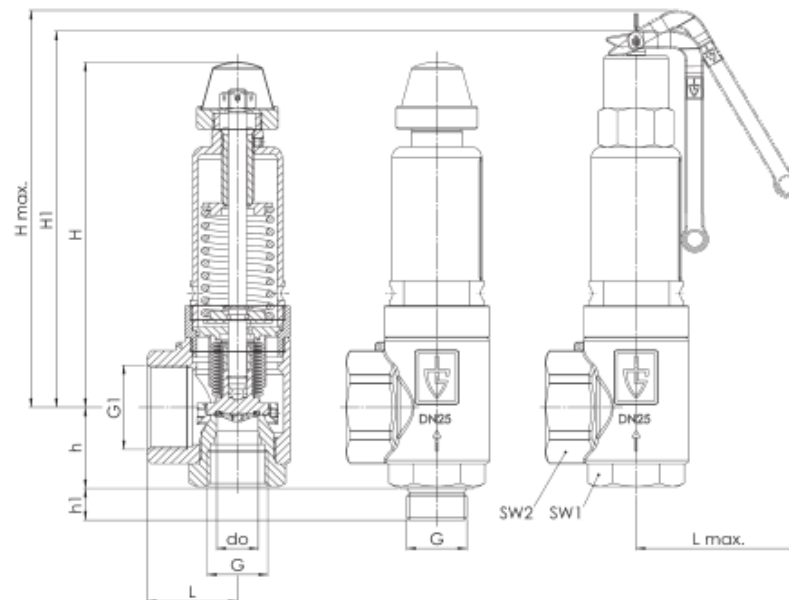
Special versions on request.

NOMINAL DIAMETERS, CONNECTIONS, INSTALLATION DIMENSIONS

Series 451bHF: Connection, installation dimensions, ranges of adjustment

Nominal diameter	DN	15	20	25	32	32	50
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" (25)	1 1/4" (32)	1 1/2" (40)	2" (50)	2" (50)	2" (50)
Installation dimensions in mm	L	40	43	50	61	61	61
	Lmax	65	91	92	92	92	92
	H	77	152	196	263	263	263
	H1	91	174	210	286	286	286
	Hmax	103	184	225	299	299	299
	h	30	39	45	55	69	74
	h1	15	16	18	20	23	25
	SW1	30	36	46	55	55	70
	SW2	40	50	58	70	70	70
	do	15,8	18	23	30,3	30,3	30,3
Weight	kg	0,4	1,0	1,8	4,0	4,0	4,0
Range of adjustment	bar	1-25	0,5-25	0,5-25	0,5-25	0,5-25	0,5-25

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	HF	K	20	m	f	20	32	EPDM		4,5	3
451	b	HF	L	32	f	f	40	50	EPDM		6,0	2
451	b	HF							EPDM			
451	b	HF							EPDM			

■ CAPACITY TABLE ACC. TO ISO 4126-1 / AD2000 A2

Series 451bHF: Blowing-off rates at 10% above set pressure														
Nominal diameter DN	Set pressure bar	15			20			25			32			
		I	II	III	I	II	III	I	II	III	I	II	III	
Heating I	0,5	-	-	-	62	96	5,4	96	150	8,8	171	266	15,4	
	1	44	69	2,5	95	151	7,3	146	232	12,0	258	411	20,8	
	kW	1,5	56	90	3,1	124	200	9,0	192	309	14,7	336	542	25,5
Steam II	2	68	111	3,6	152	249	10,4	236	385	16,9	401	656	29,4	
	2,5	79	129	4,0	182	300	11,6	277	457	18,9	481	793	32,9	
	kg/h	3	89	148	4,4	210	349	12,7	320	532	20,8	555	924	36,0
Water III	3,5	99	166	4,7	234	392	13,7	357	597	22,4	619	1036	38,9	
	m³/h	4	109	184	5,0	258	435	14,7	393	663	24,0	682	1151	41,6
	4,5	119	203	5,3	282	478	15,6	430	729	25,4	746	1265	44,1	
	5	129	221	5,6	305	521	16,4	465	794	26,8	808	1378	46,5	
	5,5	139	239	5,9	329	564	17,2	501	860	28,1	870	1492	48,8	
	6	149	257	6,2	352	608	18,0	537	926	29,3	931	1607	50,9	
	6,5	159	275	6,4	375	650	18,7	571	990	30,5	992	1719	53,0	
	7	168	293	6,6	397	692	19,4	605	1054	31,7	1051	1830	55,0	
	7,5	178	311	6,9	420	735	20,1	640	1119	32,8	1111	1943	56,9	
	8	187	329	7,1	442	777	20,8	674	1184	33,9	1170	2056	58,8	
	8,5	197	347	7,3	465	820	21,4	708	1249	34,9	1229	2168	60,6	
	9	206	365	7,5	487	862	22,0	742	1314	35,9	1287	2281	62,4	
	9,5	215	383	7,7	508	905	22,6	775	1379	36,9	1345	2392	64,1	
	10	225	401	7,9	530	947	23,2	808	1443	37,9	1402	2504	65,8	
	11	243	437	8,3	573	1031	24,3	873	1571	39,7	1516	2727	69,0	
	12	261	472	8,7	615	1115	25,4	938	1699	41,5	1628	2948	72,0	
	13	279	508	9,1	658	1199	26,5	1002	1827	43,2	1739	3172	75,0	
14	296	544	9,4	699	1284	27,5	1066	1957	44,8	1849	3396	77,8		
15	314	580	9,7	740	1368	28,4	1127	2085	46,4	1957	3618	80,5		
16	331	616	10,1	781	1453	29,4	1190	2214	47,9	2065	3842	83,2		
17	348	650	10,4	820	1535	30,3	1250	2339	49,4	2169	4059	85,7		
18	364	686	10,7	860	1619	31,1	1311	2467	50,8	2274	4281	88,2		
19	381	721	11,0	899	1703	32,0	1370	2594	52,2	2378	4503	90,6		
20	398	757	11,2	938	1787	32,8	1430	2723	53,6	2482	4726	93,0		
21	414	793	11,5	978	1872	33,6	1490	2852	54,9	2586	4950	95,3		
22	431	829	11,8	1017	1956	34,4	1549	2981	56,2	2689	5173	97,5		
23	447	865	12,1	1055	2040	35,2	1608	3109	57,5	2791	5396	99,7		
24	463	900	12,3	1093	2125	35,9	1666	3238	58,7	2891	5619	101,9		
25	479	936	12,6	1131	2209	36,7	1723	3366	59,9	2990	5842	104,0		

In order to achieve the highest possible heating output, up to three valves per system can be installed.

To protect indirectly heated heat generators in accordance with DIN 4751 Part 2 the safety valves have to be rated for the flow rate of the expansion water. For the valid blow-off capacities in m³/h water see this capacity chart.