

451bHF

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

→ **Series 451bHF**



■ 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 |
| EC type examination | D/G/H, L |
| GOST-R | D/G/H, F (L) |
| Requirements | |
| TRD 721 | DIN EN 12828 |
| TRD 421 | DIN EN ISO 4126-1 |
| DIN 4751 Part 2 | PED 97/23/EC |
| DIN 4757 Part 1 and Part 2 | |

Classification society

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



■ 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 |

■ 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. |
|----------|--------------|---|

■ 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 |
|-----------|----------------------|---|

■ 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-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

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

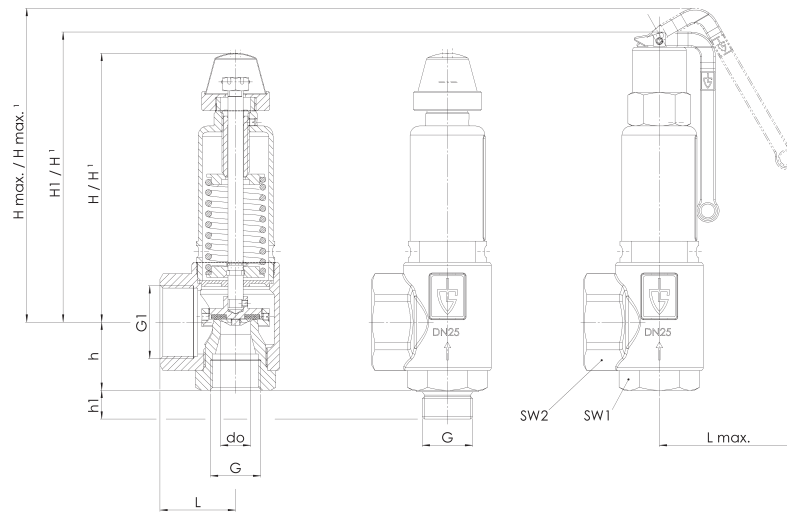
■ OPTIONS

| |
|------------------------------|
| Special versions on request. |
|------------------------------|

■ INDIVIDUAL SELECTION / VALVE CONFIGURATION

| Series 451bHF: Connection, installation dimensions, ranges of adjustment | | | | | | | |
|--|------|-----------|-------------|-------------|-------------|-------------|---------|
| Nominal diameter | DN | 15 | 20 | 25 | 32 | 32 | 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" (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 | 138 | 178 | 241 | 241 | 241 |
| | H1 | 91 | 158 | 192 | 264 | 264 | 264 |
| | Hmax | 103 | 173 | 207 | 277 | 277 | 277 |
| | 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 | 30 | 30 | |
| 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 | | | |

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 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 kW | 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 |
| | 1,5 | 56 | 90 | 3,1 | 124 | 200 | 9,0 | 192 | 309 | 14,7 | 336 | 542 | 25,5 |
| Steam II kg/h | 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 |
| | 3 | 89 | 148 | 4,4 | 210 | 349 | 12,7 | 320 | 532 | 20,8 | 555 | 924 | 36,0 |
| Water III m³/h | 3,5 | 99 | 166 | 4,7 | 234 | 392 | 13,7 | 357 | 597 | 22,4 | 619 | 1036 | 38,9 |
| | 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.