

→ Series 451bH

451bH

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



■ SUITABLE FOR

Hot water



■ EXAMPLES OF USE

For the protection of:

- thermostatically protected closed-circuit water heating systems with flow temperatures of up to 120°C for all static heights or rated output above 350 kW according to TRD 721, DIN 4751 and DIN EN 12828. Should the thermostatic limiting and control unit fail, the safety valve has to blow-off the total heating output of the boiler as hot water and steam.
- Closed-circuit solar heating plants according to DIN 4757-1 und 2 with flow temperatures up to 120°C for all static heights.
- district heating sub-stations, district heating building substations and domestic systems suitable for connection to a hot water district heating network according to DIN 4747-1 und AGFW 505.
- heating plants for building technology and industrial applications
- co-generation plants (CHP)
- biogas plants
- district heating transfer stations, building sub-stations
- solar plants

Safety valves are set and sealed at the factory.



■ MATERIAL



■ SPECIFICATION



■ APPROVALS

| | |
|---------------------------------|----------------------------|
| TÜV Type test approval 665 | D/G/H |
| EU type examination | D/G/H |
| TSG ZF001-2006 | D/G/H |
| TR ZU 032/2013 - TR ZU 010/2011 | D/G/H |
| Requirements | |
| TRD 721 | DIN 4757 Part 1 and Part 2 |
| AGFW 505 | DIN EN 12828 |
| DIN 4751 Part 2 | DIN EN ISO 4126-1 |
| DIN 4747 Part 1 | PED 2014/68/EU |
| UK PESR 2016 No. 1105 | SWKI HE301-01 |

Classification society

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

■ 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 |

| | | |
|----------|--------------|---|
| 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

| | | |
|----------|-----------|---|
| H | Hot water | Flow temperature ≤ 120°C in water heating systems |
|----------|-----------|---|

■ 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 up to 25 bar | -10°C to +120°C |
|-------------|--------------------------|--|-----------------|

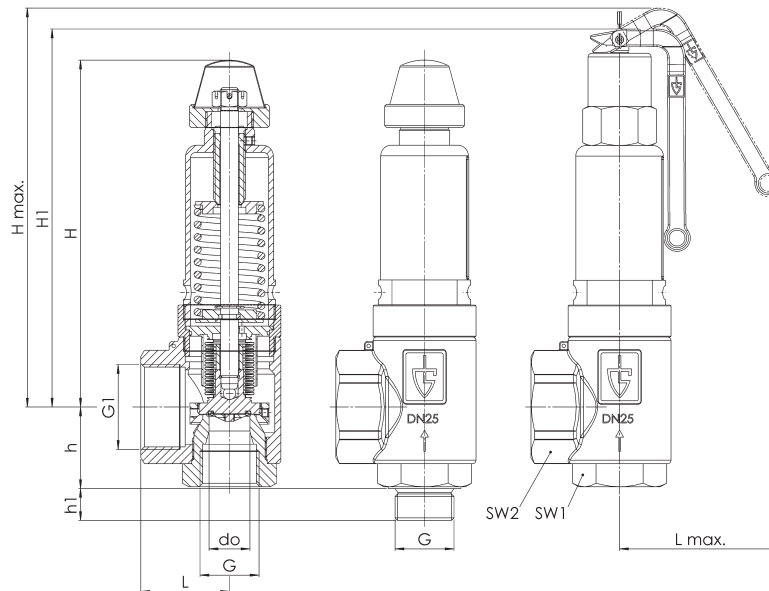
■ OPTIONS

Special versions on request.

NOMINAL DIAMETERS, CONNECTIONS, INSTALLATION DIMENSIONS

| Series 451bH: Connection, installation dimensions, ranges of adjustment | | | | | | | |
|---|------|-----------|-------------|-------------|-------------|-------------|---------|
| Nominal diameter | DN | 15 | 20 | 25 | 32 | 40 | 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 | H | K | 25 | f | f | 25 | 40 | EPDM | | 5,5 | 5 |
| 451 | b | H | L | 32 | f | f | 40 | 50 | EPDM | | 4,0 | 3 |
| 451 | b | H | | | | | | | EPDM | | | |
| 451 | b | H | | | | | | | EPDM | | | |

ENQUIRY

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| Series 451bH: Blowing-off rates at 10% above set pressure | | | | | | | | | |
|---|-----|-----|-----|------|------|------|------|------|------|
| Nominal diameter DN | | 15 | | 20 | | 25 | | 32 | |
| Set pressure bar | | I | II | I | II | I | II | I | II |
| Heating I | 0,5 | - | - | 62 | 96 | 96 | 150 | 171 | 266 |
| | 1 | 44 | 70 | 95 | 151 | 146 | 232 | 258 | 411 |
| kW | 1,5 | 56 | 90 | 124 | 200 | 192 | 309 | 336 | 542 |
| | 2 | 68 | 111 | 152 | 249 | 236 | 385 | 401 | 656 |
| Steam II | 2,5 | 79 | 129 | 182 | 300 | 277 | 457 | 481 | 793 |
| | 3 | 89 | 148 | 210 | 349 | 320 | 532 | 555 | 924 |
| kg/h | 3,5 | 99 | 166 | 234 | 392 | 357 | 597 | 619 | 1036 |
| | 4 | 109 | 184 | 258 | 435 | 393 | 663 | 682 | 1151 |
| | 4,5 | 119 | 203 | 282 | 478 | 430 | 729 | 746 | 1265 |
| | 5 | 129 | 221 | 305 | 521 | 465 | 794 | 808 | 1378 |
| | 5,5 | 139 | 239 | 329 | 564 | 501 | 860 | 870 | 1492 |
| | 6 | 149 | 257 | 352 | 608 | 537 | 926 | 931 | 1607 |
| | 6,5 | 159 | 275 | 375 | 650 | 571 | 990 | 992 | 1719 |
| | 7 | 168 | 293 | 397 | 692 | 605 | 1054 | 1051 | 1830 |
| | 7,5 | 178 | 311 | 420 | 735 | 640 | 1119 | 1111 | 1943 |
| | 8 | 187 | 329 | 442 | 777 | 674 | 1184 | 1170 | 2056 |
| | 8,5 | 197 | 347 | 465 | 820 | 708 | 1249 | 1229 | 2168 |
| | 9 | 206 | 365 | 487 | 862 | 742 | 1314 | 1287 | 2281 |
| | 9,5 | 215 | 383 | 508 | 905 | 775 | 1379 | 1345 | 2392 |
| | 10 | 225 | 401 | 530 | 947 | 808 | 1443 | 1402 | 2504 |
| | 11 | 243 | 437 | 573 | 1031 | 873 | 1571 | 1516 | 2727 |
| | 12 | 261 | 472 | 615 | 1115 | 938 | 1699 | 1628 | 2948 |
| | 13 | 279 | 508 | 658 | 1199 | 1002 | 1827 | 1739 | 3172 |
| | 14 | 296 | 544 | 699 | 1284 | 1066 | 1957 | 1849 | 3396 |
| | 15 | 314 | 580 | 740 | 1368 | 1127 | 2085 | 1957 | 3618 |
| | 16 | 331 | 616 | 781 | 1453 | 1190 | 2214 | 2065 | 3842 |
| | 17 | 348 | 650 | 820 | 1535 | 1250 | 2339 | 2169 | 4059 |
| | 18 | 364 | 686 | 860 | 1619 | 1311 | 2467 | 2274 | 4281 |
| | 19 | 381 | 721 | 899 | 1703 | 1370 | 2594 | 2378 | 4503 |
| | 20 | 398 | 757 | 938 | 1787 | 1430 | 2723 | 2482 | 4726 |
| | 21 | 414 | 793 | 978 | 1872 | 1490 | 2852 | 2586 | 4950 |
| | 22 | 431 | 829 | 1017 | 1956 | 1549 | 2981 | 2689 | 5173 |
| | 23 | 447 | 865 | 1055 | 2040 | 1608 | 3109 | 2791 | 5396 |
| | 24 | 463 | 900 | 1093 | 2125 | 1666 | 3238 | 2891 | 5619 |
| | 25 | 479 | 936 | 1131 | 2209 | 1723 | 3366 | 2990 | 5842 |

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 capacity chart **451bHF on datasheet 9.8**