# Bailey

# 706 Safety Relief Valves

## 706 S a fe t y R e l i e f Va l ve s

### INTRODUCTION

The effects of exceeding safe pressure levels in an unprotected pressure vessel or system, can have catastrophic effects on both plant and personnel.
Safety relief valves should be used to protect any pressurised system from the effects of exceeding its design pressure limit.
A safety relief valve is designed to automatically discharge gas, vapour or liquid from any pressure containing system, preventing a predetermined safe pressure being exceeded, and protecting plant and personnel.

**Safety Valve**
A valve which automatically discharges gases and vapours so as to prevent a predetermined safe pressure being exceeded. It is characterised by a rapid full opening action and is used for steam, gases or vapour service.
**Relief Valve**
A valve which automatically discharges fluid, usually liquid, when a predetermined upstream pressure is exceeded. The term is commonly used for pressure relieving valves in which the lift is proportional to the increase in pressure above the set pressure.
**Safety Relief Valve**
A valve which will automatically discharge gases, vapours or liquids, to prevent a predetermined safe pressure being exceeded. It is characterised by a rapid opening action.

### DEFINITIONS

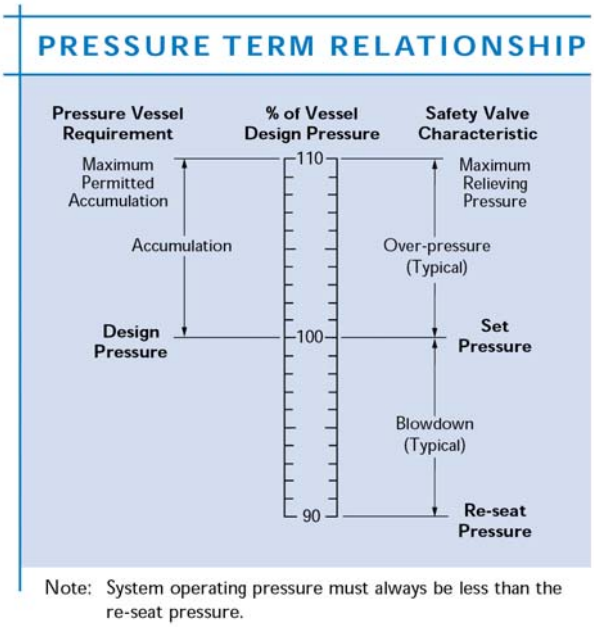
**Set Pressure**
The pressure measured at the valve inlet at which a safety relief valve should commence to lift under service conditions.
**Overpressure**
The pressure increase above set pressure at the valve inlet at which the discharge capacity is attained. Usually expressed as a percentage of set pressure.
**Accumulation**
The pressure increase over a maximum safe working pressure of the vessel or system when the safety relief valve is discharging at its rated capacity is called accumulation. The term refers to the vessel or system to be protected and not to the valve. Accumulation is the same as over-pressure when the valve is set at the design pressure of the vessel.
**Re-Seat Pressure**
The pressure measured at the valve inlet at which the safety relief valve closes.
**Blow-Down**
The difference between the set pressure and the re-seating pressure expressed as a percentage of the set pressure or as a pressure difference.
**Simmer**
The pressure zone between the valve set pressure and the popping pressure. In this pressure zone the valve is only slightly open and therefore discharging a small percentage of its rated capacity.
**Popping Pressure**
The pressure at which the valve disc rapidly moves from a slightly open (simmer) position to a practically full open position.
**Superimposed Back Pressure**
Pressure higher than atmosphere in the safety relief valve outlet. This may result from discharge into the common disposal system of other safety relief valves or devices, or as a result of a specific design requirement. Back pressure can be either constant or variable depending on the operating conditions.
**Built Up Back Pressure**
The pressure existing at the outlet of a safety relief valve caused by flow through the valve into the disposal system.

**Differential Set Pressure**
This is the difference between the set pressure and the constant superimposed back pressure. It is applicable only when a conventional type safety relief valve is used to discharge against constant superimposed back pressure. (It is the pressure at which the safety valve is set at on the test bench without back pressure.)

**Cold Differential Set Pressure**
The pressure at which a safety relief valve, intended for high temperature service, is set on a test rig using a test fluid at ambient temperature. The cold differential test pressure will be higher than the set pressure, in order to compensate for the effect of elevated temperature on the valve.

**Valve Lift**
The actual travel of the valve disc away from the seat when the valve is relieving.

**Discharge Capacity**
Actual rate of discharge of service media, which can be expressed in mass flow or volumetric terms.




**Equivalent Capacity**
Calculated mass or volumetric flow rate of the valve of a given test fluid. The fluids commonly used for test purposes are steam, air and water.

## SAFETY RELIEF VALV E – APPLICATIONS

| Application | Medium | Safety Relief Valve Type |
|---|---|---|
| Vented boilers<br>Un-vented boilers | Hot Water | 706<br>716<br>746/766<br>Pop<br>716T |
| Boiler, pipeline and vessel protection | Steam | 706/716<br>746<br>756/766<br>Pop<br>1640B<br>300 |
| Compressor pipeline and receiver protection | Air | 706<br>716<br>746<br>POP<br>1640B<br>300 |
| Pipeline and vessel protection | Cold Water | 706<br>716<br>746<br>1640B<br>300 |
| Pump Protection | Liquids | 480/485 |
| Process pipeline, pump and vessel protection | Process/Corrosive Liquids | 716 Stainless steel<br>746 Stainless steel<br>490 Stainless steel |
| Clean steam and hygienic environments | Steam and Gases | 716 Stainless steel<br>746 Stainless steel |
| Pipework, tank and equipment protection | Cryogenic Gases | 776 |
| Pipework, tank and equipment protection | Cold & Fine Gases | 716<br>776 |
| Blowers, bulk transfer, tank duty, road/rail transfers | Air | 616D |

The selection of figure number for each application depends on:
Pressure - capacity - material - temperature - fluid - connection required.

# 706
## Safety Relief Valve

### TECHNICAL SPECIFICATION

**Approvals**

BS6759 Pt 1, 2, & 3
PED certified Category IV
Water Regulation Advisory Scheme (WRAS)

**Materials**

Body - Bronze to 220°C
Trim - Viton to 200°C
- Brass to 220°C
- EPDM for potable water to 95°C

Note: The brass disc (not soft discs) should be used on all steam applications

**Maximum Back Pressure**

| | |
|---|---|
| Barg | 5.5 |
| Constant | 80% |
| Built-up | 10% |
| Variable | 0% |

(Total % must not exceed Barg shown)

**Connections**

Screwed In x Screwed Out
Flanged In x Screwed Out

**Construction**

Top Guided / High Lift

**Cap Options**

Open lever
Pressure tight dome

**Sizing**

Refer to Capacity Charts

**Size Range**

| Size | Orifice mm² | Min (Barg) Pressure | Max (Barg) Pressure |
|---|---|---|---|
| DN15 (1/2") | 126 | 0.35 | 12.5 |
| DN20 (3/4") | 364 | 0.35 | 12.5 |
| DN25 (1") | 481 | 0.35 | 12.5 |
| DN32 (1-1/4") | 791 | 0.35 | 12.5 |
| DN40 (1-1/2") | 1240 | 0.35 | 12.5 |
| DN50 (2") | 1943 | 0.35 | 12.5 |

**Performance**

| | Kdr | Over pressure | Blow down |
|---|---|---|---|
| Steam | 0.173 | 10% | 15%* |
| Hot water | 0.173 | 10% | 15%* |
| Air / Gas | 0.173 | 10% | 10%* |
| Liquid | 0.149 | 10% | 20%+ |

* or 0.3 Barg min , + or 0.6 Barg min

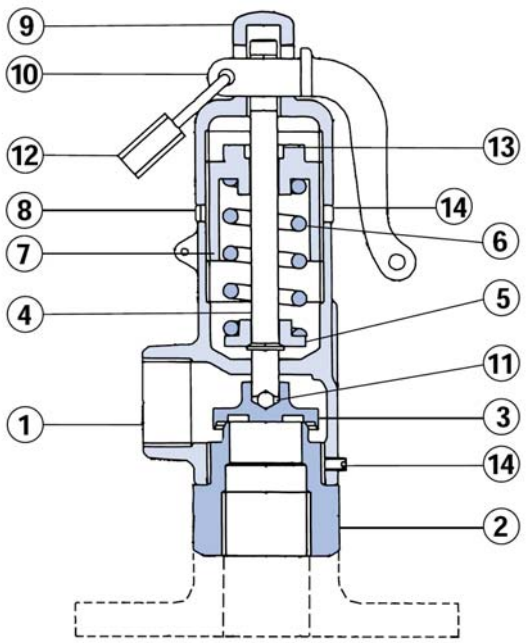
### DESIGN

The 706 Safety Relief Valve is designed to take full advantage of its high lift capability by incorporating top guiding, which provides an unobstructed seat bore.

Positive re-seating is achieved by a freely pivoting disc in the standard valve. The Viton trim is suitable for air, gas, vapour, or liquid duties up to 200°C providing good resistance to chemical attack. The metal disc option is primarily designed for use on steam duties and high temperature duties above 200°C.
An EPDM disc is also available for potable water duties up to 95°C.

Test levers are available for inline safety checking, alternatively a sealed dome can be supplied for service conditions requiring a pressure tight seal on the discharge side, eg. liquid service with enclosed discharge.

## PARTS




| ITEM | PART | MATERIAL |
|---|---|---|
| 1 | Body | Bronze |
| 2 | Seat | Bronze |
| 3* | Disc | Various |
| 4 | Spindle | Brass |
| 5 | Spring Cap | Brass |
| 6* | Spring | Chrome vanadium |
| 7 | Adjusting Screw | Bronze |
| 8 | Locking Ring | Bronze |
| 9+ | Dome | Nylon |
| 10 | Lever | Bronze |
| 11* | Ball | Stainless Steel |
| 12 | Padlock | Brass |
| 13 | Bush | PTFE |
| 14 | Pinning Screw | Steel |

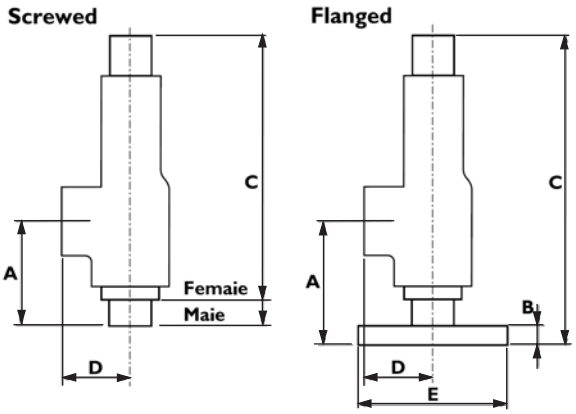
**Note:**

*** Recommended spares.**

**+ Synthetic dome should not be adjacent to external heat sources.**

**Flange options: BS10 Table E and F, BS4504 PN16/25 and ANSI 150.**

## DIMENSIONS




## FIGURE NUMBERING

**706** ☐ ☐ ☐

| TRIM | CONNECTIONS | | CAP |
|---|---|---|---|
| **E** EPDM<br>**V** Viton<br>**M** Metal | **S**<br>Screwed in and out (Inlet available Male or Female) |  | **D**<br>Pressure tight dome |
| | **F**<br>Flanged in screwed out |  | **L**<br>Open lever |

| Valve Type | Valve Size | Inlet | Outlet | A | 'C' ' Dome | C' Lever | D | Weight (kg) | |
|---|---|---|---|---|---|---|---|---|---|
| Male x Female | DN15 | 1/2" | 1/2" | 48 | 129 | 151 | 29 | 1.0 | |
| | DN20 | 3/4" | 3/4" | 56 | 159 | 181 | 37 | 1.6 | |
| | DN25 | 1" | 1" | 78 | 185 | 208 | 40 | 2.0 | |
| | DN32 | 1-1/4" | 1-1/4" | 90 | 205 | 238 | 48 | 3.5 | |
| | DN40 | 1-1/2" | 1-1/2" | 93 | 241 | 274 | 56 | 5.0 | |
| | DN50 | 2" | 2" | 110 | 299 | 334 | 71 | 7.0 | |
| Female x Female | DN15 | 1/2" | 1/2" | 40 | 111 | 133 | 29 | 0.6 | |
| | DN20 | 3/4" | 3/4" | 46 | 140 | 162 | 37 | 1.0 | |
| | DN25 | 1" | 1" | 56 | 163 | 186 | 40 | 1.5 | |
| | DN32 | 1-1/4" | 1-1/4" | 67 | 182 | 215 | 48 | 3.0 | |
| | DN40 | 1-1/2" | 1-1/2" | 67 | 216 | 249 | 56 | 4.5 | |
| | DN50 | 2" | 2" | 79 | 268 | 303 | 71 | 6.0 | |

| Valve Type | Valve Size | Inlet | Outlet | A | B | 'C' Dome | 'C' Lever | D | E | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| Flanged x Female | DN20 | 3/4" | 3/4" | 70 | 10 | 164 | 186 | 37 | 114 | 1.9 |
| | DN25 | 1" | 1" | 71 | 11 | 179 | 202 | 40 | 121 | 2.6 |
| | DN32 | 1-1/4" | 1-1/ 4" | 90 | 12.7 | 206 | 239 | 48 | 140 | 4.7 |
| | DN40 | 1-1/2" | 1-1/2" | 94 | 12.7 | 243 | 276 | 56 | 150 | 6.5 |
| | DN50 | 2" | 2" | 110 | 12.7 | 298 | 333 | 71 | 165 | 8.5 |

## AIR CAPACITY CHART (l/s) @ 0.3 Barg or 10% overpressure* and 15°C

| Set Pressure (Barg) | Valve Type 706 (BS6759 Pt2) | | | | | |
|---|---|---|---|---|---|---|
| | DN15 | DN20 | DN25 | DN32 | DN40 | DN50 |
| 0.35 | 5.03 | 14.5 | 19.2 | 31.5 | 49.5 | 77.5 |
| 1.0 | 8.97 | 25.9 | 34.2 | 56.3 | 88.3 | 138 |
| 2.0 | 13.9 | 40.0 | 52.9 | 87.0 | 136 | 214 |
| 3.0 | 18.1 | 52.4 | 69.2 | 114 | 178 | 280 |
| 4.0 | 22.8 | 65.8 | 86.9 | 143 | 224 | 351 |
| 5.0 | 27.3 | 79.1 | 105 | 172 | 270 | 422 |
| 6.0 | 32.0 | 92.5 | 122 | 201 | 315 | 493 |
| 7.0 | 36.6 | 106 | 140 | 230 | 361 | 565 |
| 8.0 | 41.3 | 119 | 158 | 259 | 406 | 636 |
| 9.0 | 45.9 | 133 | 175 | 288 | 452 | 708 |
| 10.0 | 50.5 | 146 | 193 | 317 | 497 | 779 |
| 12.0 | 59.8 | 173 | 228 | 375 | 588 | 921 |
| 12.5 | 62.1 | 179 | 237 | 390 | 611 | 957 |
| 14.0 | | | | | | |
| 16.0 | | | | | | |
| 18.0 | | | | | | |
| 20.0 | | | | | | |
| 22.0 | | | | | | |
| 24.0 | | | | | | |
| 26.0 | | | | | | |
| 28.0 | | | | | | |
| 30.0 | | | | | | |
| 32.0 | | | | | | |
| 34.0 | | | | | | |
| 36.0 | | | | | | |
| 38.0 | | | | | | |
| 40.0 | | | | | | |

* Minimum overpressure = 0.07 Barg at set pressure less than 1.0 Barg.

**Useful Conversions**

$Nm^3/h$ = 1/sec x 3.60

SCFM = 1/sec x 2.12

**Other Gases**

If you wish to use the valve on other compatible gases, the sizing details above can be used. The valve capacity will however change depending on the specific gravity of the flowing gas. Multiply the valve air capacity by $1/\sqrt{SG}$ to give the gas capacity. SG = specific gravity (relative to air = 1).

## SATURATED STEAM CAPACITY CHART (kg/h)

| Set Pressure (Barg) | Saturated Steam Temp. °C | Valve Type 706 (BS6759 Pt1 @ 10% Overpressure)* | | | | | |
|---|---|---|---|---|---|---|---|
| | | DN15 | DN20 | DN25 | DN32 | DN40 | DN50 |
| 0.35 | 108 | 11.1 | 32.0 | 42.3 | 69.5 | 109 | 171 |
| 1.0 | 120 | 22.3 | 64.4 | 85.1 | 140 | 219 | 344 |
| 2.0 | 134 | 36.6 | 106 | 140 | 230 | 360 | 564 |
| 3.0 | 144 | 49.4 | 143 | 188 | 310 | 486 | 761 |
| 4.0 | 152 | 62.0 | 179 | 237 | 389 | 610 | 955 |
| 5.0 | 159 | 74.5 | 215 | 285 | 468 | 734 | 1150 |
| 6.0 | 165 | 87.1 | 252 | 333 | 547 | 857 | 1344 |
| 7.0 | 170 | 99.7 | 288 | 381 | 626 | 981 | 1538 |
| 8.0 | 175 | 112 | 324 | 429 | 705 | 1105 | 1732 |
| 9.0 | 180 | 125 | 361 | 477 | 784 | 1229 | 1926 |
| 10.0 | 184 | 138 | 397 | 525 | 863 | 1353 | 2120 |
| 12.0 | 192 | 163 | 470 | 621 | 1021 | 1601 | 2508 |
| 12.5 | 193 | 169 | 488 | 645 | 1061 | 1663 | 2605 |
| 14.0 | 198 | | | | | | |
| 16.0 | 204 | | | | | | |
| 18.0 | 210 | | | | | | |
| 20.0 | 215 | | | | | | |
| 22.0 | 220 | | | | | | |
| 24.0 | 224 | | | | | | |
| 26.0 | 228 | | | | | | |
| 28.0 | 232 | | | | | | |
| 30.0 | 236 | | | | | | |
| 32.0 | 239 | | | | | | |
| 34.0 | 243 | | | | | | |
| 36.0 | 246 | | | | | | |
| 38.0 | 249 | | | | | | |
| 40.0 | 252 | | | | | | |

* Minimum overpressure = 0.07 Barg at set pressure less than 0.7 Barg.
Minimum overpressure = 0.07 Barg at set pressure less than 1.0 Barg.

**Useful Conversions**

lbs/h = kg/h x 2.2046

**Other Temperatures**

The steam tables on these pages are based on saturated steam, at the temperatures shown. For steam systems operating at higher temperatures, the above capacities will need to be derated by using the super heat correction factor.

## WATER CAPACITY CHART (l/min) @ 10% overpressure* @ 20°C

| Set Pressure (Barg) | Valve Type 706 (BS6759 Pt3) | | | | | |
|---|---|---|---|---|---|---|
| | DN15 | DN20 | DN25 | DN32 | DN40 | DN50 |
| 0.35 | 10.3 | 29.8 | 39.4 | 64.8 | 102 | 159 |
| 1.0 | 16.7 | 48.3 | 63.8 | 105 | 164 | 258 |
| 2.0 | 23.6 | 68.3 | 90.2 | 148 | 233 | 364 |
| 3.0 | 28.9 | 83.6 | 111 | 182 | 286 | 446 |
| 4.0 | 33.4 | 96.5 | 128 | 210 | 329 | 515 |
| 5.0 | 37.4 | 108 | 143 | 235 | 368 | 576 |
| 6.0 | 40.9 | 118 | 156 | 257 | 403 | 631 |
| 7.0 | 44.2 | 128 | 169 | 278 | 435 | 682 |
| 8.0 | 47.3 | 137 | 180 | 297 | 465 | 729 |
| 9.0 | 50.1 | 145 | 191 | 315 | 493 | 773 |
| 10.0 | 52.8 | 153 | 202 | 332 | 520 | 815 |
| 12.0 | 57.9 | 167 | 221 | 363 | 570 | 893 |
| 12.5 | 59.1 | 171 | 226 | 371 | 581 | 911 |
| 14.0 | | | | | | |
| 16.0 | | | | | | |
| 18.0 | | | | | | |
| 20.0 | | | | | | |
| 22.0 | | | | | | |
| 24.0 | | | | | | |
| 26.0 | | | | | | |
| 28.0 | | | | | | |
| 30.0 | | | | | | |
| 32.0 | | | | | | |
| 34.0 | | | | | | |
| 36.0 | | | | | | |
| 38.0 | | | | | | |
| 40.0 | | | | | | |

*Minimum overpressure = 0.07 Barg at set pressure less than 0.7 Barg.

**Useful Conversions**

Igpm = 1/min x 0.22

$m^3$/min = 1/min x 0.001

**Other Liquids**

If you wish to use the valve on other compatible liquids, the sizing details above can be used. The valve capacity will however change depending on the specific gravity of the flowing liquid. Multiply the valve water capacity by $1/\sqrt{SG}$ to give the liquid capacity. SG = specific gravity (relative to water = 1).

## HOT WATER CAPACITY CHART (kW) FOR A PRESSURISED (un-vented) SYSTEM

| Set Pressure (Barg) | Valve Type 706 (BS6759 Pt1 @ 10% Overpressure)* | | | | | |
|---|---|---|---|---|---|---|
| | DN15 | DN20 | DN25 | DN32 | DN40 | DN50 |
| 0.35 | 14.3 | 41.4 | 54.7 | 89.9 | 141 | 221 |
| 1.0 | 16.4 | 47.5 | 62.8 | 103 | 162 | 254 |
| 2.0 | 23.1 | 66.9 | 88.4 | 145 | 228 | 357 |
| 3.0 | 30.9 | 89.4 | 118 | 194 | 304 | 477 |
| 4.0 | 38.8 | 112 | 148 | 244 | 382 | 599 |
| 5.0 | 46.7 | 135 | 178 | 293 | 460 | 720 |
| 6.0 | 54.6 | 158 | 208 | 343 | 537 | 842 |
| 7.0 | 62.5 | 181 | 239 | 392 | 615 | 964 |
| 8.0 | 70.5 | 203 | 269 | 442 | 693 | 1085 |
| 9.0 | 78.3 | 226 | 299 | 491 | 770 | 1207 |
| 10.0 | 86.2 | 249 | 329 | 541 | 848 | 1329 |
| 12.0 | 102 | 294 | 389 | 640 | 1003 | 1572 |
| 12.5 | 106 | 306 | 404 | 665 | 1042 | 1633 |
| 14.0 | | | | | | |
| 16.0 | | | | | | |
| 18.0 | | | | | | |
| 20.0 | | | | | | |
| 22.0 | | | | | | |
| 24.0 | | | | | | |
| 26.0 | | | | | | |
| 28.0 | | | | | | |
| 30.0 | | | | | | |
| 32.0 | | | | | | |
| 34.0 | | | | | | |
| 36.0 | | | | | | |
| 38.0 | | | | | | |
| 40.0 | | | | | | |

* Minimum overpressure = 0.07 Barg at set pressure less than 0.7 Barg.
Minimum overpressure = 0.07 Barg at set pressure less than 1.0 Barg.

**NOTE:**
**Pressurised (un-vented) hot water systems** have the entire discharge capacity handled solely by the valve. **Open vented systems** take into account the discharge capacities of the vent. Hence the equivalent discharge of the valve/system is considered to be double the above chart capacities.

## INSTALLATION

Safety Relief Valves should always be installed in an upright position with their spring chamber vertical.
All packing materials should be removed from the valve connections prior to installation.

**Pressure Vessels**

When fitting a Safety Relief Valve onto pressure vessels, the inlet connection pipe should be as short as possible and the bore should be at least equivalent to the nominal bore size of the valve.
The pressure drop between the vessel and the valve should be no more than 3% at rated capacity.
A pressure-tight dome should be specified when:
1) A back pressure must be contained within the relieving system.
2) A head of liquid is built up within the valve body and consequently needs to be contained.
3) The relieving medium is toxic, corrosive or environmentally unfriendly.

**Pipelines**

When fitting a Safety Relief Valve into a pipeline, the inlet connecting pipe leading from the main pipeline to the Safety Relief Valve should be as short as possible, so that the inlet pressure drop is no more than 3% of rated capacity. In addition, it is advised that the Safety Relief Valve is placed a sufficient distance downstream of the pressure source. This will protect the valve from the adverse effects of pressure pulsations.

**Discharge Pipelines**

These should be equal to or larger than the valve outlet, with adequate supports, minimum number of bends and overall length. Unless balanced bellows valves are installed, the maximum built up backpressure should not exceed 10% of the set pressure, although the 746, 756 and the 766 can handle higher back pressure if required. Steam service valves should be adequately drained.
Alignment of the discharge or drain should present no risk to persons or property. Protection from the collection of rainwater or condensation in the discharge pipe is advisable.

**System Cleansing**

It is essential that new installations are fully flushed and all debris removed prior to installing the valve as serious damage can be caused to valve seats, resulting in subsequent leakage.

**Pressure Adjustment**

Every valve is fitted with a suitable spring and tested before leaving the factory. Valves can be preset on request but to alter the set pressure, the adjusting screw, when viewed from the top, should be screwed downwards in a clockwise direction to increase the set pressure and upwards in an anti-clockwise direction to decrease it. Set pressure adjustment must be carried out by experienced and approved personnel. Any change in set pressure must be within the range of the existing spring, if it exceeds the range, a new spring will be required. The cap lead seal must be re-made after any adjustment to the set pressure.

**Blow-down Adjustment (POP, 756 & 766 valves only)**

The blow-down ring (part no. 8) is set before the valve leaves the factory and normally no further adjustment will be necessary. However, if the reseating pressure has to be altered in service, the blow-down ring should be screwed (downwards) clockwise to raise the re-seat, popping and simmer pressures. If the blowdown ring is screwed (upwards) anti-clockwise the re-seat, popping and simmer pressures will lower. When re-inserting the setting screw (part no 9.) it should always be placed to engage a slot in the blow-down ring. The standard blowdown is 5% for 756, 10% for 766 and 10% for a POP type valve (minimum 0.3 Barg for all three valve types).
For recommended settings, please contact our technical sales office who will be pleased to help.

**COLD DIFFERENTIAL TEST PRESSURE**

When setting a valve intended for use at high temperature on a test rig using a test fluid at ambient temperatures, it is necessary to set the valve at a slightly higher pressure, so that it will open at the correct set pressure under operating conditions. The necessary allowance is shown in the following table.

| Operating temperature | Increase in set pressure at ambient temperature |
|---|---|
| Up to 121°C | None |
| 122°C to 316°C | 1% |
| 317°C to 427°C | 2% |

# 706 SPRING SELECTION CHARTS

**DN15 Spring Range**

| Part No | Barg | Psig | Colour code |
|---|---|---|---|
| C2193 | 0.35 – 1.0 | 5 – 15 | Red |
| C2194 | 1.0 – 1.7 | 15 – 25 | Blue |
| C2195 | 1.7 – 2.4 | 25 – 35 | Orange |
| C2196 | 2.4 – 3.5 | 35 – 50 | Orange/Blue |
| C2197 | 3.5 – 5.5 | 50 – 80 | Green/White |
| C2198 | 5.5 – 8.3 | 80 – 120 | Green/Blue |
| C2199 | 8.3 – 12.5 | 120 – 180 | White/Blue |

**DN20 Spring Rang**

| Part No | Barg | Psig | Colour code |
|---|---|---|---|
| C2187 | 0.35 – 1.0 | 5 – 15 | Red |
| C2188 | 1.0 – 1.7 | 15 – 25 | Blue |
| C2189 | 1.7 – 3.5 | 25 – 50 | Orange |
| C2190 | 3.5 – 6.9 | 50 – 100 | Orange/Blue |
| C2191 | 6.9 – 10.3 | 100 – 150 | Purple |
| C2192* | 10.3 – 12.5 | 150 – 180 | Green/White |
| C2200† | 10.3 – 12.5 | 150 – 180 | White/Blue |

* For air or steam

† For water or liquids

**DN25 Spring Range**

| Part No | Barg | Psig | Colour code |
|---|---|---|---|
| C0139 | 0.35 – 1.0 | 5 – 15 | Red |
| C0145 | 1.0 – 1.7 | 15 – 25 | Blue |
| C0147 | 1.7 – 2.4 | 25 – 35 | Orange |
| C2182 | 2.4 – 4.1 | 35 – 60 | Orange/Blue |
| **Air and Pumped Liquids only** | | | |
| C2183 | 4.1 – 5.5 | 60 – 80 | Purple |
| C2184 | 5.5 – 8.3 | 80 – 120 | Green/White |
| C2185 | 8.3 – 10.3 | 120 – 150 | Green/Blue |
| C2186 | 10.3 – 12.5 | 150 – 180 | White/Blue |
| **Steam and Hot Water only** | | | |
| C2183 | 4.1 – 6.9 | 60 – 100 | Purple |
| C2184 | 6.9 – 10.3 | 100 – 150 | Green/White |
| C2185 | 10.3 – 12.5 | 150 – 180 | Green/Blue |

**DN32 Spring Range**

| Part No | Barg | Psig | Colour code |
|---|---|---|---|
| C2220 | 0.35 – 1.0 | 5 – 15 | Red |
| C0174 | 1.0 – 1.7 | 15 – 25 | Blue |
| C2213 | 1.7 – 2.4 | 25 – 35 | Orange |
| C2221 | 2.4 – 4.1 | 35 – 60 | Orange/Blue |
| C2214 | 4.1 – 5.5 | 60 – 80 | Purple |
| C2222 | 5.5 – 8.3 | 80 – 120 | Green/White |
| C2215 | 8.3 – 10.3 | 120 – 150 | Green/Blue |
| C2223 | 10.3 – 12.5 | 150 – 180 | White/Blue |

**DN40 Spring Rang**

| Part No | Barg | Psig | Colour code |
|---|---|---|---|
| C2224 | 0.35 – 1.0 | 5 – 15 | Red |
| C2216 | 1.0 – 1.7 | 15 – 25 | Blue |
| C0709 | 1.7 – 2.4 | 25 – 35 | Orange |
| C2225 | 2.4 – 4.1 | 35 – 60 | Orange/Blue |
| C2226 | 4.1 – 5.5 | 60 – 80 | Purple |
| C2217 | 5.5 – 8.3 | 80 – 120 | Green/White |
| C2208 | 8.3 – 10.3 | 120 – 150 | Green/Blue |
| C2218 | 10.3 – 12.5 | 150 – 180 | White/Blue |

**DN50 Spring Range**

| Part No | Barg | Psig | Colour code |
|---|---|---|---|
| C2227 | 0.35 – 1.0 | 5 – 15 | Red |
| C0718 | 1.0 – 1.7 | 15 – 25 | Blue |
| C0719 | 1.7 – 2.4 | 25 – 35 | Orange |
| C2219 | 2.4 – 4.1 | 35 – 60 | Orange/Blue |
| C2228 | 4.1 – 5.5 | 60 – 80 | Purple |
| C2229 | 5.5 – 8.3 | 80 – 120 | Green/White |
| C2209 | 8.3 – 10.3 | 120 – 150 | Green/Blue |
| C2230 | 10.3 – 12.5 | 150 – 180 | White/Blue |

Springs listed above comply with the requirements of BS6759: Part 1.

## 700 SERIES TECHNICAL SPECIFICATION

| Fig. No | 706 | 716 | 746 | 756 | 766 | 776 |
|---|---|---|---|---|---|---|
| **Body Material** | Bronze | Bronze<br>Cast Iron<br>Stainless Steel | Cast Steel<br>Stainless Steel | Cast Iron | Cast Steel<br>Cast Steel | Bronze |
| Code<br>**Approvals** Part | 1, 2, & 3 | **BS6759**<br>1, 2, & 3 | 1, 2, & 3# | 1 | 1 | **ADMERKBLATT**<br>**A2** |
| **Top Guided** | Yes | Yes | Yes | Yes | Yes | Yes |
| **Lift** | High Lift | Full Lift | Full Lift | Full Lift | High Lift | Full Lift |
| **Size Range** | DN15-50<br>1/2" – 2" | DN15-50<br>1/2" – 2" | DN25-100<br>1" – 4" | DN25-80<br>1" – 3" | DN40-80<br>1-1/2" – 3" | DN15-50<br>1/2" – 2" |
| **Orifice Areas** (mm2) | | | | | | |
| DN15 | 126 | 109 | — | — | — | |
| DN20 | 364 | 314 | — | — | — | |
| DN25 | 481 | 415 | 415 | 415 | — | Sizing data |
| DN32 | 791 | 660 | 660 | 660 | — | to TUV |
| DN40 | 1240 | 1075 | 1075 | 1075 | 2280 | available |
| DN50 | 1943 | 1662 | 1662 | 1662 | 4054 | on request. |
| DN65 | — | — | 2827 | 2827 | 6334 | |
| DN80 | — | — | 4301 | 4301 | 9121 | |
| DN100 | — | — | 6648 | — | — | |
| **Pressure Range†** (Barg) | 0.35 to 12.5 | 0.35 to 32 | 0.35 to 40 | 0.35 to 24 | 0.35 to 24 | 1 to 41.3 |
| **Temp Range** (°C) (with suitable material) | –59 to +220 | –90 to +260 | –40 to +427 | –29 to +300 | –29 to +230 | –196 to +60 |
| **Connection** | Screwed<br>Flanged | Screwed<br>Flanged | Flanged | Flanged | Flanged | Screwed |
| **Trim Options** | Brass<br>EPDM (WRC)<br>Viton | Stainless<br>Aflas<br>EPDM | Stainless<br>Aflas<br>EPDM | Stainless<br>EPDM | Stainless<br>EPDM | KEL F<br>(PCTFE) |
| **Cap Options** | Dome<br>Open lever | Dome<br>Open lever | Dome<br>Open lever<br>Packed lever | Open lever | Open lever | Dome |
| **Kdr. Cert. Coeff.** Steam/Hot Water/Gases | 0.173 | 0.7 | 0.7 | 0.716 | 0.4 | — |
| **Kdr. Cert. Coeff.** Liquids | 0.149 | 0.46 | 0.46 | — | — | — |
| **Pressure Maximum Back Pressure*** Constant | Brz 5.5 Barg<br>80% | SS 5.5 Barg<br>80% | SS 16 Barg<br>80% | CS 12 Barg<br>— | CS 12 Barg<br>— | SS 5.5 Barg<br>80% |
| Built-up | 10% | 10% | 10% | 50% | 50% | 10% |
| Variable | — | — | 40% | — | — | — |

*For higher back pressures consult factory. **Resilient 766 is limited to 10%.
†For maximum pressure per size and material refer to capacity and spring charts, pages 14 to 23.
††716 EPDM Seat, max pressure of 12.5 Barg on DN 15, 20, 25 and 18 Barg on DN 32, 40, 50.
#746 is also available ASME VIII and AD Merkblatt A2 certified, details available on request.

| Material | Seat | | Body□ | |
|---|---|---|---|---|
| Temperature | EPDM (WRC) | -40 °C to 95 °C | Bronze BSI 400 - LG2 | -196 c to 232 °C□ |
| Limitations | EPDM | -50 °C to 150 °C | Cast Iron BSI 452-260 | -10 C to 300 °C□ |
| | Aflas | -10 °C to 200 °C | Carbon Steel SA216-WCB | -29 C to 427 °C□ |
| | Brass | -59 °C to 232 °C | Stainless Steel 316/CF8M | -90 C to 427 °C□ |
| | Stainless Steel | -90 °C to 232 °C | □ | |