716 Safety Relief Valves

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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

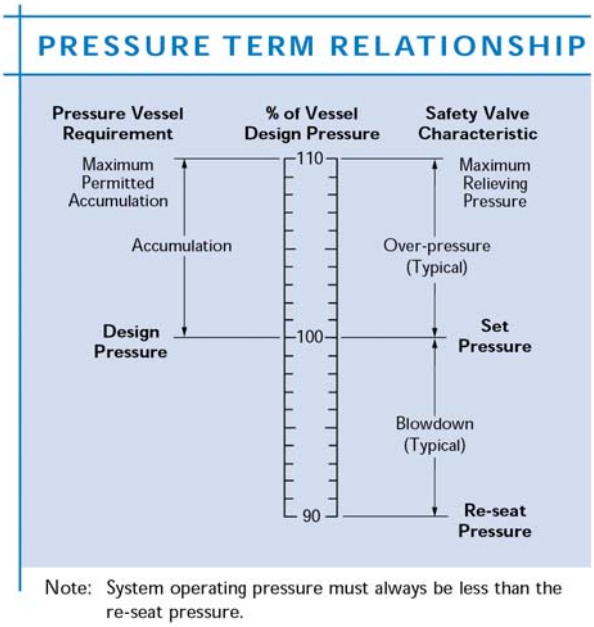
Set Pressure
The pressure measured at the valve inlet at which a safety relief valve should commence to lift under service conditions.
Overpressure
The pressure increase above set pressure at the valve inlet at which the discharge capacity is attained. Usually expressed as a percentage of set pressure.
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 Un-vented boilers	Hot Water	706 716 746/766 Pop 716T
Boiler, pipeline and vessel protection	Steam	706/716 746 756/766 Pop 1640B 300
Compressor pipeline and receiver protection	Air	706 716 746 POP 1640B 300
Pipeline and vessel protection	Cold Water	706 716 746 1640B 300
Pump Protection	Liquids	480/485
Process pipeline, pump and vessel protection	Process/Corrosive Liquids	716 Stainless steel 746 Stainless steel 490 Stainless steel
Clean steam and hygienic environments	Steam and Gases	716 Stainless steel 746 Stainless steel
Pipework, tank and equipment protection	Cryogenic Gases	776
Pipework, tank and equipment protection	Cold & Fine Gases	716 776
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.

716
Safety Relief Valve

TECHNICAL SPECIFICATION

Approvals

BS6759 Pt 1, 2, & 3

PED certified Category IV

Materials

Body - Bronze (-29°C to 220°C)
- Stainless Steel (-29°C to 260°C)
- Cast iron (0°C to 220°C)

Trim - EPDM to 150°C
- Aflas to 200°C
- PTFE to 220°C
- Stainless Steel up to 230°C

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 (not CI)

Flanged In x Screwed Out (not CI)

Flanged In x Flanged Out (CI only)

Construction

Top Guided / Full Lift

Cap Options

Open lever

Pressure tight dome

Sizing

Refer to Capacity Charts

Size Range

Size	Orifice mm^2	Min (Barg) Pressure	Max Pressure (Barg) CI & SS All media	Bronze Gas & liquid	Bronze Steam & hot water
DN15 (1/2")	109	0.35	12.5	32*+	22*+
DN20 (3/4")	314	0.35	12.5	24.5*+	22*+
DN25 (1")	415	0.35	12.5	20.5*+	20*+
DN32 (1-1/4")	660	0.35	12.5	18+	18+
DN40 (1-1/2")	1075	0.35	12.5	18+	18+
DN50 (2")	1662	0.35	12.5	18+	18+

*EPDM disc limited to 12.5 Barg on the three sizes shown

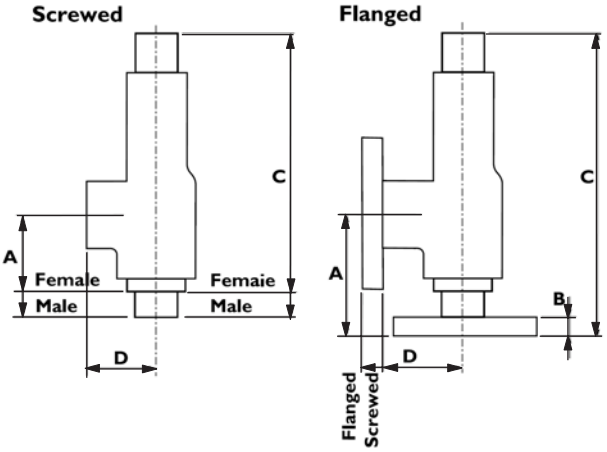
+ PTFE disc limited to 12.5 Barg on all sizes

Performance

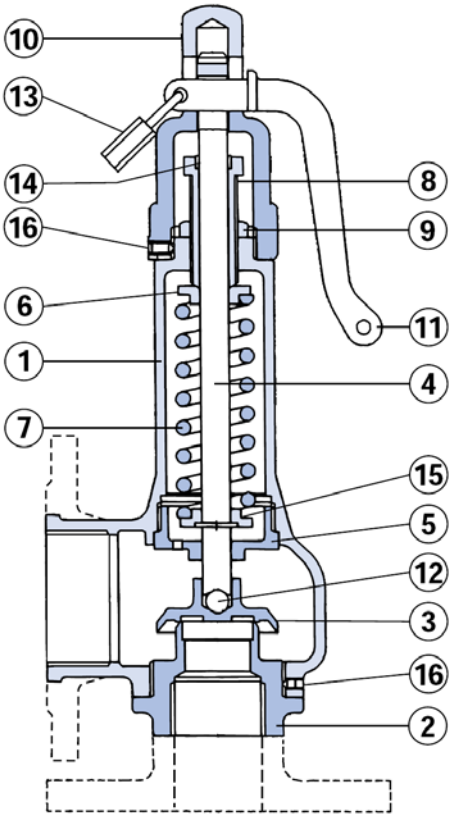
	Kdr	Over pressure	Blow down
Steam	0.7	5%	15%*
Hot water	0.7	5%	15%*
Air / Gas	0.7	10%	10%*
Liquid	0.46	10%	20%+

* or 0.3 Barg min , + or 0.6 Barg min

DIMENSIONS



PARTS

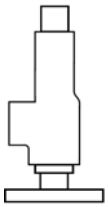
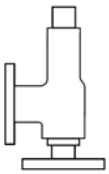


ITEM	PART	MATERIAL		
		Cast Iron	**St.St.**	**Bronze**
1	Body	Cast Iron	St.St	Bronze
2	Seat	St.St	St.St	Bronze
3*	Disc	Various	Various	Various
4	Spindle	Brass	St.St	Brass
5	Guide	Bronze	Nickel alloy	Bronze
6	Top Spring Cap	Brass	St.St	Brass
7*	Spring	Chrome vanadium	St.St	Chrome vanadium
8	Adjusting Screw	Brass	St.St	Brass
9	Lock Nut	Brass	St.St	Brass
10+	Dome	Nylon	St.St	Nylon
11	Lever	Bronze	N/A	Brass
12*	Ball	St.St	Monel	St.St
13	Padlock	Brass	N/A	Brass
14	Bush	PTFE	PTFE	PTFE
15	Bottom Spring Cap	Brass	St.St	Brass
16	Pinning Screw	Steel	St.St	Brass

Note:
*** Recommended spares.**
+ Synthetic dome should not be adjacent to external heat sources.
Flange options: BS10 Table E, F and H, BS4504, PN16/25 and ANSI 150.

FIGURE NUMBERING

716 [ ] [ ] [ ]

CODE	TRIM	BODY	CONNECTIONS	CAP
AS	St. Steel	St. Steel	Screwed in and out (Inlet available Male or Female) 	**D** Pressure tight dome
BS	Aflas			
TS	PTFE			
ES	EPDM	Bronze		**L** Open lever
VS	Aflas			
SS	St. Steel			
PS	PTFE			
AF	St. Steel	St. Steel	Flanged in screwed out 	
BF	Aflas			
TF	PTFE			
EF	EPDM	Bronze		
VF	Aflas			
SF	St. Steel			
PF	PTFE			
CF	EPDM	Cast Iron	Flanged in and out 	
DF	Aflas			
FF	St Steel			
GF	PTFE			

Valve Type	Valve Size	Inlet	Outlet	A	B	'C' Dome	'C' Lever	D	Weight (kg)
Male x Female	DN15	1/2"	3/4"	58	–	173	192.5	40	1.0
	DN20	3/4"	1-1/ 4"	63	–	229	252	55	1.6
	DN25	1"	1-1/2"	70	–	257	280	60	2.1
	DN32	1-1/4"	2"	80	–	318.5	351	70	4.0
	DN40	1-1/2"	2-1/2"	91	–	366.5	405.5	81	7.0
	DN50	2"	3"	110	–	414.5	456.5	96	10.0
Female x Female	DN15	1/2"	3/4"	40	–	158	178	40	1.0
	DN20	3/4"	1-1/4"	44	–	209	232	55	1.6
	DN25	1"	1-1/2"	48	–	235	258	60	2.1
	DN32	1-1/4"	2"	58	–	295	328	70	4.0
	DN40	1-1/2"	2-1/2"	67	–	340	380	81	7.0
	DN50	2"	3"	80	–	382	424	96	10.0
Flange x Female	DN20	3/4"	1-1/4"	75	10	242	265	55	2.5
	DN25	1"	1-1/2"	75	11	261	284	60	3.2
	DN32	1-1/4"	2"	95	12.7	332	365	70	5.7
	DN40	1-1/2"	2-1/2"	105	12.7	379	418	81	9.0
	DN50	2"	3"	120	12.7	422	464	96	12.5
Flange x Flange	DN25	1"	1-1/2"	105	11	293	316	100	6.6
	DN32	1-1/4"	1-1/2"	115	12.7	353	386	110	10.4
	DN40	1-1/2"	2-1/2"	140	12.7	415	454	115	15.6
	DN50	2"	3"	150	12.7	454	496	120	21.4

All dimensions in mm

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

Set Pressure (Barg)	Valve Type 716 (BS6759 Pt2)					
	DN15	DN20	DN25	DN32	DN40	DN50
0.35	18.3	52.6	69.6	111	180	279
1.0	31.2	89.9	119	189	308	476
2.0	48.8	140	186	295	481	744
3.0	63.5	183	242	384	626	968
4.0	79.7	230	303	482	786	1215
5.0	95.9	276	365	580	945	1462
6.0	112	323	427	678	1105	1708
7.0	128	369	488	776	1265	1955
8.0	144	416	550	874	1424	2202
9.0	161	463	611	972	1584	2449
10.0	177	509	673	1070	1744	2696
12.0	209	603	796	1267	2063	3189
12.5	217	626	827	1316	2143	3313
14.0	242	696	920	1463	2382	3683
16.0	274	789	1043	1659	2701	4177
18.0	306	882	1166	1855	3021	4670
20.0	339	976	1289			
22.0	371	1069				
24.0	403	1162				
26.0	436					
28.0	468					
30.0	501					
32.0	533					
34.0						
36.0	Maximum pressure per size based on 716 bronze valve.					
38.0						
40.0	716 C1 and SS maximum pressure 12.5 Barg.					

* 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 716 (BS6759 Pt1 @ 5% Overpressure)†					
		DN15	DN20	DN25	DN32	DN40	DN50
0.35	108	35.6	103	136	216	351	543
1.0	120	70.5	203	269	427	696	1075
2.0	134	125	359	475	755	1230	1902
3.0	144	167	480	635	1010	1645	2543
4.0	152	209	602	795	1265	2060	3185
5.0	159	251	723	955	1519	2475	3826
6.0	165	293	844	1115	1774	2889	4467
7.0	170	335	965	1276	2029	3304	5108
8.0	175	377	1086	1436	2283	3719	5750
9.0	180	419	1207	1596	2538	4134	6391
10.0	184	461	1329	1756	2793	4549	7032
12.0	192	545	1571	2076	3302	5378	8315
12.5	193	566	1632	2156	3429	5586	8636
14.0	198	629	1831	2397	3811	6208	9598
16.0	204	714	2056	2717	4321	7038	10880
18.0	210	798	2298	3037	4830	7867	12163
20.0	215	882	2540	3357			
22.0	220	966	2783				
24.0	224						
26.0	228						
28.0	232						
30.0	236						
32.0	239						
34.0	243						
36.0	246	Maximum pressure per size based on 716					
38.0	249	bronze valve.					
40.0	252	716 C1 and SS maximum pressure 12.5 Barg.					

* 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 716 (BS6759 Pt3)					
	DN15	DN20	DN25	DN32	DN40	DN50
0.35	27.6	79.4	105	167	272	420
1.0	44.6	129	170	270	440	680
2.0	63.1	182	240	382	622	962
3.0	77.3	223	294	468	762	1178
4.0	89.3	257	340	540	880	1361
5.0	99.8	287	380	604	984	1521
6.0	109	315	416	662	1078	1667
7.0	118	340	449	715	1164	1800
8.0	126	364	481	764	1245	1924
9.0	134	386	510	811	1320	2041
10.0	141	406	537	854	1392	2152
12.0	155	445	589	936	1525	2357
12.5	158	454	601	955	1556	2406
14.0	167	481	636	1011	1647	2546
16.0	179	514	680	1081	1760	2722
18.0	189	545	721	1146	1867	2887
20.0	200	575	760			
22.0	209	603				
24.0	219	639				
26.0	227					
28.0	236					
30.0	244					
32.0	252					
34.0						
36.0	Maximum pressure per size based on 716					
38.0	bronze valve.					
40.0	716 C1 and SS maximum pressure 12.5 Barg.					

*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 716 (BS6759 Pt1 @ 5% Overpressure)†					
	DN15	DN20	DN25	DN32	DN40	DN50
0.35	54.5	157	208	330	538	832
1.0	61.9	178	236	374	611	944
2.0	78.2	225	298	473	771	1192
3.0	105	301	398	633	1031	1594
4.0	131	377	498	792	1291	1996
5.0	157	453	599	952	1551	2398
6.0	184	529	699	1112	1811	2799
7.0	210	605	799	1271	2071	3201
8.0	236	681	900	1431	2331	3603
9.0	263	757	1000	1590	2591	4005
10.0	289	833	1100	1750	2851	4407
12.0	342	984	1301	2069	3370	5211
12.5	355	1022	1351	2149	3500	5412
14.0	394	1136	1501	2388	3890	6015
16.0	447	1288	1703	2708	4410	6818
18.0	500	1440	1903	3027	4930	7622
20.0	553	1592	2104			
22.0	605	1744				
24.0						
26.0						
28.0						
30.0						
32.0						
34.0						
36.0	Maximum pressure per size based on 716					
38.0	bronze valve.					
40.0	For 716 C1 and SS maximum pressure 12.5 barg.					

* 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%

716 SPRING SELECTION CHARTS

DN15 Spring Range

Part No	Barg	Psig	Colour code
C0074	0.35 – 1.0	5 – 15	Red
C2133	1.0 – 1.7	15 – 25	Blue
C2134	1.7 – 2.4	25 – 35	Orange
C2135	2.4 – 4.1	35 – 60	Orange/Blue
C2136	4.1 – 6.9	60 – 100	Green/White
C2137	6.9 – 10.3	100 – 150	Green/Blue
C2138	10.3 – 12.4	150 – 180	White/Blue
C2181	12.4 – 15.5	180 – 225	—
C0623	15.5 – 18.6	225 – 270	White
C2169	18.6 – 22.1	270 – 320	—
C0645	22.1 – 26.5	320 – 384	Red/Yellow
C2201	26.5 – 27.6	384 – 400	—
C0651	27.6 – 32.0	400 – 464	Red/Green

DN20 Spring Range

Part No	Barg	Psig	Colour code
C0686	0.35 – 1.0	5 – 14	Red
C0688	1.0 – 2.1	14 – 30	Blue
C0689	2.1 – 2.8	30 – 40	Orange
C2125	2.8 – 3.8	40 – 55	Orange/Blue
C0690	3.8 – 5.5	55 – 80	Purple
C2126	5.5 – 7.6	80 – 110	Green/White
C0691	7.6 – 10.3	110 – 150	Green/Blue
C2127	10.3 – 12.4	150 – 180	White/Blue
C2178	12.4 – 15.5	180 – 225	—
C0693	15.5 – 18.6	225 – 270	White
C2170	18.6 – 20.3	270 – 295	—
C0694	20.3 – 24.5	295 – 355	Red/Yellow

DN25 Spring Range

Part No	Barg	Psig	Colour code
C2119	0.35 – 1.0	5 – 14	Red
C2120	1.0 – 1.7	14 – 25	Blue
C2121	1.7 – 3.1	25 – 45	Orange
C2114	3.1 – 4.1	45 – 60	Orange/Blue
C2113	4.1 – 5.5	60 – 80	Purple
C2122	5.5 – 8.6	80 – 125	Green/White
C2123	8.6 – 10.7	125 – 155	Green/Blue
C2124	10.7 – 12.8	155 – 185	White/Blue
C2202	12.8 – 13.2	185 – 192	—
C2234	13.2 – 15.4	192 – 223	—
C2203	15.4 – 17.6	223 – 255	—
C2235	17.6 - 20.5	255 - 297	-

DN32 Spring Range

Part No	Barg	Psig	Colour code
C0452	0.35 – 1.0	5 – 14	Red
C0457	1.0 – 1.7	14 – 25	Blue
C0461	1.7 – 3.1	25 – 45	Orange
C0467	3.1 – 4.1	45 – 60	Orange/Blue
C0469	4.1 – 5.5	60 – 80	Purple
C0472	5.5 – 8.6	80 – 125	Green/White
C0475	8.6 – 10.3	125 – 150	Green/Blue
C0476	10.3 – 12.8	150 – 185	White/Blue
C0477	11.4 – 13.8	166 – 200	—
C0478	12.6 – 15.2	183 – 220	—
C0479	13.9 – 16.8	202 – 243	—
C0480	15.4 – 18.5	223 – 268	—

DN40 Spring Range

Part No	Barg	Psig	Colour code
C0508	0.35 – 1.0	5 – 14	Red
C0492	1.0 – 1.7	14 – 25	Blue
C0495	1.7 – 3.1	25 – 45	Orange
C0498	3.1 – 4.1	45 – 60	Orange/Blue
C0499	4.1 – 5.5	60 – 80	Purple
C0501	5.5 – 8.6	80 – 125	Green/White
C0503	8.6 – 10.3	125 – 150	Green/Blue
C0504	10.3 – 12.8	150 – 185	White/Blue
C0505	11.4 – 13.8	166 – 200	—
C0506	12.6 – 15.2	183 – 220	—
C0507	15.4 – 18.5	223 – 268	—

DN50 Spring Range

Part No	Barg	Psig	Colour code
C0919	0.35 – 1.0	5 – 14	Red
C0922	1.0 – 1.7	14 – 25	Blue
C0924	1.7 – 3.1	25 – 45	Orange
C1400	3.1 – 4.1	45 – 60	Orange/Blue
C0928	4.1 – 5.5	60 – 80	Purple
C0930	5.5 – 8.6	80 – 125	Green/White
C0933	8.6 – 10.3	125 – 150	Green/Blue
C0934	10.3 – 12.8	150 – 185	White/Blue
C0935	11.4 – 13.8	166 – 200	—
C0936	12.8 – 15.4	185 – 223	—
C0937	14.5 – 17.4	210 – 253	—
C0939	15.4 – 18.5	223 – 268	—

- Springs up to 12.5 Barg (181 Psig) listed above for all materials comply with the requirements of BS6759: Part 1.
- The cast iron 716 is only available up to 13 Barg (188 Psig) on any medium.
- The stainless steel 716 is only available up to 12.5 Barg (181 Psig) on any medium.
- Stainless steel springs are available for 716 to the same pressures as shown above.
- **Spring charts for 746/756/766/776 are available on request.**

700 SERIES TECHNICAL SPECIFICATION

Fig. No	706	716	746	756	766	776
Body Material	Bronze	Bronze Cast Iron Stainless Steel	Cast Steel Stainless Steel	Cast Iron	Cast Steel Cast Steel	Bronze
Code **Approvals** Part	1, 2, & 3	**BS6759** 1, 2, & 3	1, 2, & 3#	1	1	**ADMERKBLATT** **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 1/2" – 2"	DN15-50 1/2" – 2"	DN25-100 1" – 4"	DN25-80 1" – 3"	DN40-80 1-1/2" – 3"	DN15-50 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 Flanged	Screwed Flanged	Flanged	Flanged	Flanged	Screwed
Trim Options	Brass EPDM (WRC) Viton	Stainless Aflas EPDM	Stainless Aflas EPDM	Stainless EPDM	Stainless EPDM	KEL F (PCTFE)
Cap Options	Dome Open lever	Dome Open lever	Dome Open lever 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 80%	SS 5.5 Barg 80%	SS 16 Barg 80%	CS 12 Barg —	CS 12 Barg —	SS 5.5 Barg 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	□	