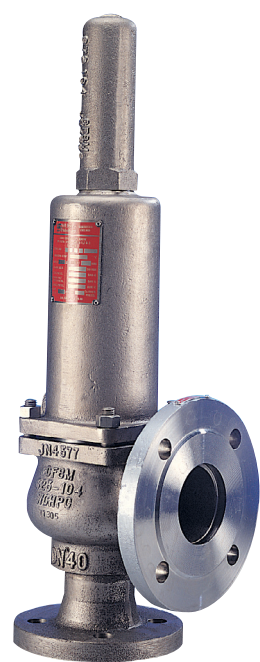


# KUNKLE BAILEY 746 SAFETY RELIEF VALVE

A top guided, full lift safety relief valve with an unobstructed seat bore to ensure the highest possible discharge rates, with the choice of conventional or balanced bellows designs.



## FEATURES

- Freely pivoting disc ensures correct alignment with the nozzle.
- Highest possible discharge rate maximizes plant protection.
- Special disc style for liquid applications enhances valve performance.
- Conventional arrangement suitable for applications where built up pressure will not exceed 5%.
- Conventional valve can also be used in systems with constant superimposed backpressure (up to 80%).
- Balanced bellows arrangement for applications where several safety relief valves discharge into a common discharge manifold or for variable back pressures to 40%.
- Choice of cap options.

## GENERAL APPLICATION

The 746 is certified to BS6759 pt 1, 2, 3 and is suitable for the protection of vessels, pipelines and equipment using hot or cold water; air; process or corrosive liquids and for clean steam and gases in hygienic environments.

## TECHNICAL DATA

Material:	Carbon steel, stainless steel
Sizes:	1" to 4" (DN 25 to 100)
Connections:	Flanged
Pressure Range:	5 to 580 psig (0.35 to 40 barg)
Temperature Range:	-51°F to 801°F (-46°C to 427°C)

# KUNKLE BAILEY 746 SAFETY RELIEF VALVE

## SPECIFICATIONS

### SPECIFICATIONS

#### Materials

- Body
- Carbon steel gr WCB from -20°F to 801°F (-29°C to 427°C)
  - Stainless steel gr CF8M from -51°F to 801°F (-46°C to 427°C)
- Trim
- Stainless steel from -51°F to 801°F (-46°C to 427°C)
  - FKM from -20°F to 392°F (-29°C to 200°C)
  - PTFE from -51°F to 428°F (-46°C to 220°C)
  - EPDM - hot water from -20°F to 302°F (-29°C to 150°C)

#### SIZE RANGE

Size, in (DN)	Orifice, mm <sup>2</sup>	Min pressure*, barg	Max pressure, barg
1 (25)	415	0.35	40
1¼ (32)	660	0.35	40
1½ (40)	1075	0.35	40
2 (50)	1662	0.35	40
2½ (65)	2827	0.35	35
3 (80)	4301	0.35	32
4 (100)	6648	0.35	25

\* Minimum pressure for bellows valves is greater than stated.

#### PERFORMANCE

	BS6759			ASME		
	Kdr	Over pressure	Blow down	Kdr	Over pressure	Blowdown
Steam	0.7	5%	15%*	0.738	10%	Fixed
Hot water ◇	0.7	5%	15%*	N/A	N/A	N/A
Air/Gas	0.7	10%	10%*	0.738	10%	Fixed
Liquid	0.46	10%	20%❖	0.482	10%	Fixed

\* or 0.3 barg min

◇ above 100°C

❖ or 0.6 barg min

N/A = Not available

#### Maximum Back Pressure

- Barg 16
- Constant 80%
- Built-up 5%
- Variable 40% (when bellows fitted)
- (Total % must not exceed barg shown)

#### Connections

Flanged in x flanged out

#### Cap Options

- Pressure tight dome
- Packed lever
- Open lever

#### Approvals

- BS6759 Pt 1, 2 and 3
- ASME VIII
- PED certified category IV

# KUNKLE BAILEY 746 SAFETY RELIEF VALVE

## PARTS AND MATERIALS/DIMENSIONS

### MATERIALS

Item	Part	Materials	
		Carbon steel	Stainless steel
1	Body	Carbon steel	Stainless steel
2	Bonnet	Carbon steel	Stainless steel
3	Cap	Carbon steel	Stainless steel
4	Seat	Stainless steel	Stainless steel
5*	Disc#	Stainless steel	Stainless steel
9	Guide plate	Stainless steel	Stainless steel
10(H)	Spindle	Stainless steel	Stainless steel
11	Spring plate	Stainless steel	Stainless steel
12	Adjusting screw	Stainless steel	Stainless steel
13	Locknut	Stainless steel	Stainless steel
18(H)	Body stud	Carbon steel	Stainless steel
19	Body nut	Carbon steel	Stainless steel
22(H)	Spring**	C.V	Stainless steel
23(B)*	Bellows unit	Stainless steel	Stainless steel
27*	Body/bonnet gasket	Garlock	Garlock
28*	Cap gasket	Garlock	Garlock
31*	Ball	Stainless steel	Stainless steel
33	Nameplate	Stainless steel	Stainless steel
34	Nameplate pin	Carbon steel	Stainless steel
41	Warranty seal	Lead/wire	Lead/wire
42	Drain plug	Carbon steel	Stainless steel
47(BH)	Spacing piece	Stainless steel	Stainless steel
62	Seat pin	Stainless steel	Stainless steel
69	Split collar	Stainless steel	Stainless steel
77	Adjusting screw bush	PTFE	PTFE
81(B)	Lift stop	Stainless steel	Stainless steel

### NOTES

B - Denotes used on bellows type valves.

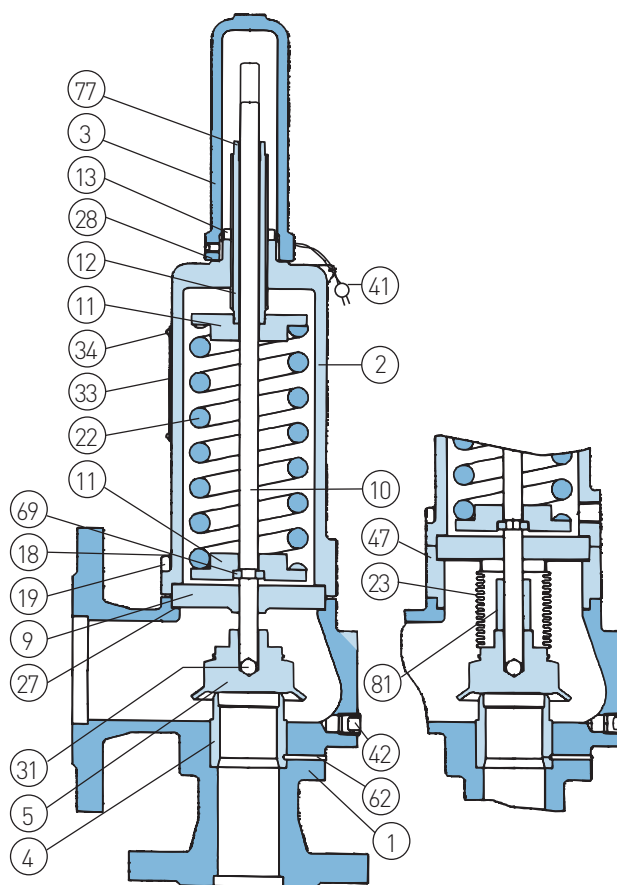
H - High pressure type valves; spacer, larger studs, spring and spindle.

# Resilient trims are available.

\* Recommended spares.

\*\* Other spring material options are available dependent on duty.

Recommended inspection every 12 months.



### DIMENSIONS

Valve size			A	C Dome	C Lever	C Bellows	Weight	
DN	Inlet	Outlet	mm	mm	mm	mm	D	(kg)
25	1"	1½"	105	410	410	445	100	8.5
32	1¼"	2"	115	455	455	490	110	14.0
40	1½"	2½"	140	570	570	605	115	20.0
50	2"	3"	150	615	615	665	120	30.0
65	2½"	4"	170	725	725	785	140	42.5
80	3"	5"	195	825/925H	825/925H	865/965H	160	64.5
100	4"	6"	220	925/1030H	925/1030H	955/1060	180	86.0

### NOTES

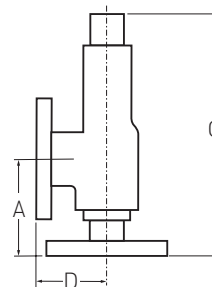
Flange sizes listed are for:

Carbon steel flanges PN 40x16

Others available on request

All dimensions in mm

Flanged x flanged



# KUNKLE BAILEY 746 SAFETY RELIEF VALVE

## AIR CAPACITY

### AIR CAPACITY (l/s) at 0.3 barg or 10% overpressure\* and 15°C

Set pressure (barg)	(BS6759 Pt2)#						
	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
0.35	69.6	109	178	275	467	711	1098
1.0	115	182	297	459	781	1188	1836
2.0	181	287	468	723	1231	1872	2894
3.0	242	384	626	968	1646	2505	3872
4.0	303	482	786	1215	2066	3144	4859
5.0	365	580	945	1462	2486	3782	5846
6.0	427	678	1105	1708	2906	4421	6834
7.0	488	776	1265	1955	3326	5060	7821
8.0	550	874	1424	2202	3746	5699	8808
9.0	611	972	1584	2449	4165	6337	9795
10.0	673	1070	1744	2696	4585	6976	10783
12.0	796	1267	2063	3189	5425	8253	12757
12.5	827	1316	2143	3313	5635	8573	13251
14.0	920	1463	2382	3683	6265	9531	14732
16.0	1043	1659	2701	4177	7104	10808	16706
18.0	1166	1855	3021	4670	7944	12086	18681
20.0	1289	2051	3340	5164	8784	13363	20655
22.0	1413	2247	3659	5658	9623	14641	22630
24.0	1536	2443	3979	6151	10463	15918	24605
26.0	1659	2639	4298	6645	11303	17196	
28.0	1782	2835	4617	7138	12142	18473	
30.0	1906	3031	4936	7632	12982	19751	
32.0	2029	3227	5256	8126	13822	21028	
34.0	2152	3423	5575	8619	14661		
36.0	2276	3619	5894	9113			
38.0	2399	3815	6214	9607			
40.0	2522	4011	6533	10100			

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

# The 746 can be sized/certified to ASME VIII - contact factory for details.

### Other Gases

If you wish to use the valve on other compatible gases, the sizing details above can be used.

However, the valve capacity will 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).

### Useful Conversions

$\text{Nm}^3/\text{h} = \text{l/sec} \times 3.60$

$\text{SCFM} = \text{l/sec} \times 2.12$

# KUNKLE BAILEY 746 SAFETY RELIEF VALVE

## STEAM CAPACITY/FSH CONVERSION

### SATURATED STEAM CAPACITY (kg/h)

Set pressure (barg)	BS6759 Pt1 at 5% Overpressure #*						
	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
0.35	124	198	322	498	847	1289	1992
1.0	269	429	698	1079	1836	2793	4317
2.0	457	727	1183	1830	3112	4735	7318
3.0	635	1010	1645	2543	4326	6581	10173
4.0	795	1265	2060	3185	5417	8241	12738
5.0	955	1519	2475	3826	6508	9901	15303
6.0	1115	1774	2889	4467	7598	11560	17869
7.0	1276	2029	3304	5108	8689	13220	20433
8.0	1436	2283	3719	5750	9780	14880	22999
9.0	1596	2538	4134	6391	10871	16539	25565
10.0	1756	2793	4549	7032	11962	18199	28130
12.0	2076	3302	5378	8315	14143	21518	33260
12.5	2156	3429	5586	8636	14689	22348	34543
14.0	2397	3811	6208	9598	16325	24838	38391
16.0	2717	4321	7038	10880	18587	28157	43522
18.0	3037	4830	7867	12163	20689	31476	48652
20.0	3357	5339	8697	13446	22871	34795	53783
22.0	3678	5849	9526	14728	25052	38115	58913
24.0	3998	6358	10356	16011	27234	41434	64044
26.0	4318	6868	11186	17293	29416	44753	
28.0	4638	7377	12015	18576	31598	48073	
30.0	4959	7886	12845	19859	33779	51392	
32.0	5279	8396	13675	21142	35961	54711	
34.0	5599	8905	14504	22424	38143		
36.0	5919	9414	15334	23707			
38.0	6240	9924	16164	24990			
40.0	6560	10433	16993	26272			

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

# The 746 can be sized/certified to ASME VIII - contact factory for details.

### FSH - SUPERHEAT STEAM CORRECTION

Set pressure (barg)	Saturated steam temperature, °C	Total steam temperature in degrees centigrade					
		150	200	260	310	370	430
1	120	1.00	0.98	0.93	0.88	0.84	0.80
4	150	1.00	0.99	0.93	0.88	0.84	0.81
7	170	1.00	0.99	0.94	0.89	0.84	0.81
10	361	1.00	0.99	0.94	0.89	0.85	0.81
14	180	1.00	0.99	0.95	0.89	0.85	0.81
18	210	-	1.00	0.95	0.90	0.85	0.81
24	220	-	1.00	0.96	0.90	0.86	0.82
34	240	-	1.00	0.96	0.92	0.86	0.82
41	250	-	1.00	0.97	0.92	0.87	0.82

### Other Temperatures

This steam table is 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.

### Useful Conversions

lbs/h = kg/h x 2.2046

# KUNKLE BAILEY 746 SAFETY RELIEF VALVE

## WATER CAPACITY

### WATER CAPACITY (l/min) at 10% overpressure\* at 20°C

Set pressure (barg)	(BS6759 Pt3)#*						
	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
0.35	105	167	272	420	715	1088	
1.0	170	270	440	680	1157	1761	2722
2.0	240	382	622	962	1637	2490	3849
3.0	294	468	762	1178	2005	3050	4714
4.0	340	540	880	1361	2315	3522	5443
5.0	380	604	984	1521	2588	3937	6086
6.0	416	662	1078	1667	2835	4313	6666
7.0	449	715	1164	1800	3062	4659	7210
8.0	481	764	1245	1924	3273	4980	7698
9.0	510	811	1320	2041	3472	5282	8165
10.0	537	854	1392	2152	3660	5568	8606
12.0	589	936	1525	2357	4009	6099	9428
12.5	601	955	1556	2406	4092	6225	9622
14.0	636	1011	1647	2546	4330	6588	10183
16.0	680	1081	1760	2722	4629	7043	10886
18.0	721	1146	1867	2887	4910	7470	11547
20.0	760	1208	1968	3043	5176	7874	12171
22.0	797	1267	2064	3191	5428	8259	12765
24.0	832	1324	2156	3333	5670	8626	13332
26.0	866	1378	2244	3469	5901	8978	
28.0	899	1430	2329	3600	6124	9317	
30.0	931	1480	2410	3727	6339	9644	
32.0	961	1528	2490	3849	6547	9960	
34.0	991	1575	2566	3967	6748		
36.0	1019	1621	2641	4082			
38.0	1047	1666	2713	4194			
40.0	1074	1709	2783	4303			

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

# The 746 can be sized/certified to ASME VIII - contact factory for details.

### 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).

### Useful Conversions

lgpm = l/min x 0.22

m<sup>3</sup>/min = l/min x 0.001

# KUNKLE BAILEY 746 SAFETY RELIEF VALVE

## HOT WATER CAPACITY

### HOT WATER CAPACITY (kW) for a pressurized (un-vented) system

Set pressure (barg)	(BS6759 Pt1 at 5% overpressure)*						
	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
0.35	227	360	587	907	1543	2547	3628
1.0	235	374	608	941	1600	2434	3762
2.0	309	492	801	1239	2107	3206	4956
3.0	398	633	1031	1594	2711	4124	6375
4.0	498	792	1291	1996	3394	5164	7983
5.0	599	952	1551	2398	4078	6204	9590
6.0	699	1112	1811	2799	4762	7244	11198
7.0	799	1271	2071	3201	5445	8285	12805
8.0	900	1431	2331	3603	6129	9721	14413
9.0	1000	1590	2591	4005	6813	10365	16020
10.0	1100	1750	2851	4407	7496	11405	17628
12.0	1301	2069	3370	5211	8863	13485	20843
12.5	1351	2149	3500	5412	9205	14005	21647
14.0	1501	2388	3890	6015	10231	15565	24058
16.0	1703	2708	4410	6818	11598	17645	27274
18.0	1903	3027	4930	7622	12965	19725	30489
20.0	2104	3346	5450	8426	14332	21805	33704
22.0	2304	3665	5970	9230	15699	23885	36919
24.0	2505	3984	6490	10034	17067	25965	40134
26.0	2706	4304	7010	10837	18434	28045	
28.0	2907	4623	7530	11641	19801	30125	
30.0	3107	4942	8050	12445	21168	32206	
32.0	3308	5261	8569	13249	22536	34286	
34.0	3509	5580	9089	14053	23903		
36.0	3710	5900	9609	14856			
38.0	3910	6219	10129	15660			
40.0	4111	6538	10649	16464			

#### NOTE

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

Pressurized (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 chart capacities above.

# KUNKLE BAILEY 746 SAFETY RELIEF VALVE

## SELECTION GUIDE

Example:		746	1	3	2	2	M
<b>Model</b>							
746	746 safety relief valve						
<b>Type</b>							
1	Conventional						
2	Bellows						
3	Liquid conventional						
4	Liquid bellows						
<b>Size</b>							
1	DN 25 x 40						
2	DN 32 x 50						
3	DN 40 x 65						
4	DN 50 x 80						
5	DN 65 x 100						
6	DN 80 x 125						
7	DN 100 x 150						
<b>Connections</b>							
1	PN 16 RF x PN 16 RF						
2	PN 40 RF x PN 16 RF						
5	ANSI 150 RF x 150 RF						
6	ANSI 300 RF x 150 RF						
<b>Body material</b>							
2	Carbon steel						
3	Stainless steel						
<b>Features</b>							
D	Domed cap						
F	Ferrule						
G	Gag						
M	Open lever						
N	NACE materials						
P	Packed lever						
R	Resilient seat						
H	High pressure						
X	Special details						

## NOTES

- Any special requirements will be indicated by the letter X which will be agreed with the sales office.  
For example, paint specification or spring material.
- Any combination of features can be called up eg. DG, PR, DFRN etc.
- (H) for '746' DN 80 and 100 valves only.