KUNKLE BAILEY 707 SAFETY RELIEF VALVE

A safety relief valve that encompasses a top guided design, combining an unobstructed seat bore with high lift capability

FEATURES

- Choice of resilient or metal trims.
- Choice of threaded or flanged connections.
- Test levers available for inline safety checking.
- Alternative sealed dome for service conditions requiring a pressure tight seal on the discharge side (eg. liquid service with enclosed discharge).

GENERAL APPLICATION

The 707 is certified to BS EN 4126 Part 1 (BS6759 pt 1:2:3) and is suitable for duty on air/gas, steam/hot water (above 212°F (100°C)) and process liquid.

TECHNICAL DATA

Material:	Bronze
Sizes:	½" to 2" (DN 15 to 50)
Connections:	Threaded or flanged
Pressure range:	4.4 to 348 psig (0.3 to 24 barg)
Temperature range:	-4° to 435°F (-20° to 224°C)

KUNKLE BAILEY 707 SAFETY RELIEF VALVE

SPECIFICATIONS

Materials

Body - Bronze from -4° to 435°F (-20° to 224°C)
Trim - SS/EPDM from -4° to 203°F (-20° to 95°C)
- SS/Aflas from -4° to 392°F (-20° to 200°C)
- SS from -4° to 435°F (-20° to 224°C)

SIZE RANGE

Size, in (DN)	Orifice mm²	Min pressure (barg)	Max pressure (barg)
½ (15)	126	0.3	24.0
¾ (20)	364	0.3	24.0
1 (25)	481	0.3	24.0
1¼ (32)	791	0.3	24.0
1½ (40)	1240	0.3	24.0
2 (50)	1943	0.3	24.0

PERFORMANCE

	Kdr	Over pressure	Blow down
Steam	0.173	10%	15%*
Hot water ◊	0.173	10%	15%*
Air/gas	0.173	10%	15%*
Liquid	0.149	10%	20%*❖

* or 0.3 barg min ◊ above 100°C
❖ or 0.6 barg min

Maximum back pressure

Barg 5.5
Constant 80%
Built-up 10%
Variable 0%
(Total % must not exceed barg shown)

Connections

Screwed female in x screwed female out
Screwed male in x screwed female out
Flanged in x flanged out

Cap options

Open lever
Screw-on pressure tight dome

Approvals

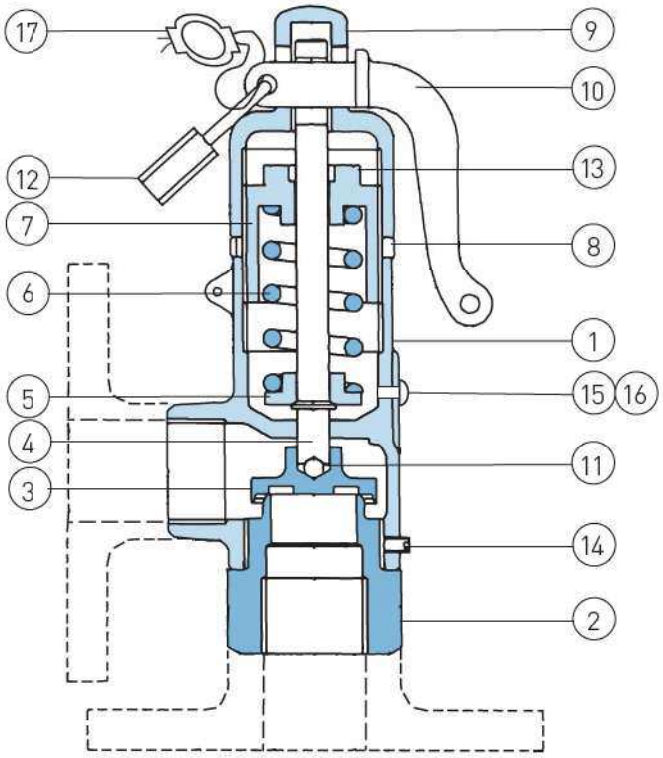
BS EN ISO 4126 Part 1 (SAFED)
Pressure Equipment Directive (PED)
ISO 9001:2008
Water Regulation Advisory Scheme (WRAS)

KUNKLE BAILEY 707 SAFETY RELIEF VALVE

PARTS AND MATERIALS/DIMENSIONS

MATERIALS

Item	Part	Material
1	Body	Bronze
2	Seat	Bronze
3*	Disc assembly	Stainless steel/EPDM/Aflas
4	Spindle	Stainless steel
5	Spring cap	Stainless steel
6*	Spring	Chrome alloy
7	Adjusting screw	Bronze
8	Locking ring	Bronze
9	Dome	Bronze
10	Lever	Bronze
11*	Ball	Stainless steel
12	Padlock	Brass
13	Bush	PTFE
14	Pinning screw	Steel
15	Nameplate	Aluminum
16	Nameplate screw	Steel
17	Lead and wire seal	Lead and stainless steel



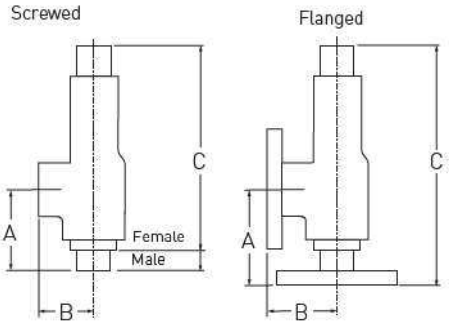
NOTES

* Recommended spares

Recommended inspection every 12 months

DIMENSIONS

Valve type	Valve size DN	Inlet	Outlet	A mm	B mm	C Dome mm	C Lever mm	Weight (kg)
*	15	½"	½"	59	29	130	152	0.5
	20	¾"	¾"	65	37	159	181	1.6
	25	1"	1"	78	40	185	208	2.0
	32	1¼"	1¼"	89	48	205	237	3.5
	40	1½"	1½"	95	56	245	277	5.0
	50	2"	2"	109	71	298	333	7.0
**	15	½"	½"	40	29	111	133	0.6
	20	¾"	¾"	46	37	140	162	1.0
	25	1"	1"	56	40	163	186	1.5
	32	1¼"	1¼"	67	48	183	215	3.0
	40	1½"	1½"	67	56	216	249	4.5
	50	2"	2"	79	71	268	303	6.0
***	20	¾"	¾"	70	62	164	187	2.0
	25	1"	1"	71	73	179	202	3.0
	32	1¼"	1¼"	90	81	206	239	4.5
	40	1½"	1½"	94	89	243	276	6.0
	50	2"	2"	110	108	298	333	9.0



NOTES

* Male x Female

** Female x Female

*** Flanged x Flanged

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

	BS EN ISO 4126 Pt 1 (BS6759 Pt 1:2:3)					
Set pressure (barg)	**DN 15**	**DN 20**	**DN 25**	**DN 32**	**DN 40**	**DN 50**
0.35	3.93	11.4	15.0	24.7	38.7	60.6
1.0	8.28	23.9	31.6	52.0	81.5	128
2.0	13.6	39.1	51.7	85.0	133	209
3.0	18.3	52.8	69.8	115	180	282
4.0	22.9	66.3	87.6	144	226	354
5.0	27.6	79.7	105	173	272	426
6.0	32.3	93.2	123	203	317	497
7.0	36.9	107	141	232	363	569
8.0	41.6	120	159	261	409	641
9.0	46.2	134	177	290	455	713
10.0	50.9	147	194	320	501	785
12.0	60.2	174	230	378	593	929
12.5	66.6	181	239	393	616	965
14.0	69.5	201	265	437	684	1072
16.0	78.9	228	301	495	776	1216
18.0	88.2	255	337	554	868	1360
20.0	97.5	282	372	612	960	1504
22.0	107	309	408	671	1051	1647
24.0	116	336	443	729	1143	1791

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

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
Nm^3/h = l/sec x 3.60
SCFM = l/sec x 2.12

SATURATED STEAM CAPACITY (kg/h)

	BS EN ISO 4126 pt 1 (BS6759 pt 1:2:3 at 10% Overpressure*)					
Set pressure (barg)	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
0.35	9.68	28.0	37.0	60.8	95.3	149
1.0	22.6	65.2	86.2	142	222	348
2.0	35.9	104	137	225	353	553
3.0	47.8	138	182	300	470	737
4.0	59.3	171	226	372	583	914
5.0	76.6	221	292	481	753	1181
6.0	89.0	257	340	559	876	1372
7.0	99.9	289	381	627	983	1540
8.0	112	324	428	705	1104	1731
9.0	123	355	469	771	1208	1893
10.0	135	390	515	848	1329	2082
12.0	157	454	600	987	1548	2425
12.5	167	482	637	1048	1642	2573
14.0	182	524	693	1140	1787	2799
16.0	201	606	801	1318	2066	3237
18.0	243	702	928	1527	2393	3750
20.0	256	739	977	1606	2518	3946
22.0	284	822	1086	1786	2799	4386
24.0	308	889	1174	1931	3027	4743

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

FSH - SUPERHEAT STEAM CORRECTION

Set pressure	Saturated steam	Total steam temperature in degrees centigrade					
(barg)	temp. °C	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

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

	(BS6759 Pt3)					
Set pressure (barg)	**DN 15**	**DN 20**	**DN 25**	**DN 32**	**DN 40**	**DN 50**
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	110	182	285	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	62.5	181	239	392	615	964
16.0	66.8	193	255	420	658	1031
18.0	70.9	205	271	445	698	1093
20.0	74.7	216	285	469	735	1152
22.0	78.4	226	299	492	771	1208
24.0	81.9	236	312	514	806	1262

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

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^3/min = l/min x 0.001

HOT WATER CAPACITY (KW) FOR A PRESSURIZED (UN-VENTED) SYSTEM

	(BS6759 Pt1 at 10% overpressure)*					
Set pressure (barg)	**DN 15**	**DN 20**	**DN 25**	**DN 32**	**DN 40**	**DN 50**
0.35	6.88	19.9	26.3	43.2	67.7	106
1.0	14.0	40.5	53.5	88.0	138	216
2.0	22.9	66.3	87.5	144	226	354
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	70.4	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	118	340	449	739	1158	1815
16.0	133	386	510	838	1314	2059
18.0	149	431	570	937	1469	2302
20.0	165	477	630	1036	1624	2545
22.0	181	522	690	1135	1780	2788
24.0	197	568	751	1234	1935	3032

NOTE

* Minimum overpressure = 0.07 barg at set pressure less than 0.7 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 707 SAFETY RELIEF VALVE

SPRING SELECTION

DN 15 SPRING RANGE

Part no	Barg	Psig	Color 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 - 15.9	120 - 230	White/blue
C3235	15.9 - 19.3	230 - 280	Red/orange
C3236	19.3 - 24.1	280 - 350	Yellow/blue

DN 20 SPRING RANGE

Part no	Barg	Psig	Color 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 - 13.8	150 - 200	Green/white
C3237	13.8 - 20.7	200 - 300	Red/orange
C3238	20.7 - 24.1	300 - 350	Yellow/blue

DN 25 SPRING RANGE

Part no	Barg	Psig	Color 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
C2183	4.1 - 5.5	60 - 80	Purple
C2184	5.5 - 8.3	80 - 120	Green/white
C2185	8.3 - 12.5	120 - 180	Green/blue
C3239	12.5 - 19.3	180 - 280	Red/orange
C3240	19.3 - 24.1	280 - 350	Yellow/blue

DN 32 SPRING RANGE

Part no	Barg	Psig	Color 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
C3241	12.5 - 19.3	180 - 280	Red/orange
C3242	19.3 - 24.1	280 - 350	Yellow/blue

DN 40 SPRING RANGE

Part no	Barg	Psig	Color 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
C3243	12.5 - 15.9	180 - 230	Red/green
C3244	15.9 - 19.3	230 - 280	Red/orange
C3245	19.3 - 24.1	280 - 350	Yellow/blue

DN 50 SPRING RANGE

Part no	Barg	Psig	Color 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
C0724	12.5 - 17.2	180 - 250	Red/yellow
C3246	17.2 - 24.1	250 - 350	Yellow/blue

The valves are fitted with a suitable spring. Every valve is tested thoroughly for efficient operation before leaving the factory. Ensure the set pressure is within the range of the existing spring. If not, select and fit the correct spring from these tables. All our springs are low stressed and painted to minimize corrosion. Springs listed above comply with the requirements of BS EN ISO 4126: Part 7 and BS6759: Part 1.

SELECTION GUIDE

Example:		707	3	3	M	L
Model						
707	707 safety relief valve					
Size						
1	DN 15 (for screwed only)					
2	DN 20					
3	DN 25					
4	DN 32					
5	DN 40					
6	DN 50					
Connections						
1	Scrd M x F (BSP parallel)					
2	Scrd F x F (BSP parallel)					
3	Scrd M x F (NPT)					
4	Scrd F x F (NPT)					
5	Flgd PN 25 FF x 25 FF					
6	Flgd ANSI 150 FF x 150 FF					
7	Flgd BS10 'H' FF x 'H' FF					
Materials body/trim						
M	Bronze/SS					
E	Bronze/SS/EPDM					
V	Bronze/SS/Aflas					
Cap						
L	Marine lever					
D	Dome					