

For ASME Section VIII Steam Service on Unfired Pressure Vessels

Job Name _____
 Job Location _____
 Engineer _____
 Approval _____

Contractor _____
 Approval _____
 Contractor's P.O. No. _____
 Representative _____

Series Figure 41

Bronze and Cast Iron Safety Relief Valves

For Steam Service

Sizes: Bronze - 1/2" – 2 1/2" (15 – 65mm)
Cast iron - 1 1/2" – 6" (40 – 150mm)

Figure 41 is a safety relief valve for steam service on unfired pressure vessels and pressure reducing valve stations. Figure 41 safety relief valves are rated up to 250psi and 406°F (208°C) saturated steam and meet ASME code Section VIII.

Features

- 2 piece body design
- Enclosed springs
- 2-ring control provides precise pop action and seat tightness
- Single unit cap and lifting lever

Approvals

Rated in accordance with ASME Section VIII

Pressure – Temperature

Maximum Working Pressure: 250psi (17.2 bar)
 Maximum Working Temperature: 406°F (208°C)

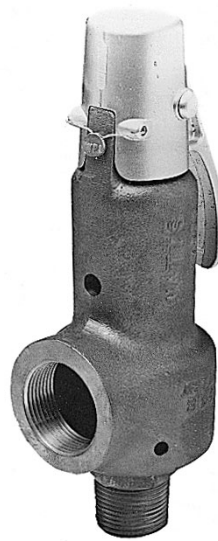


Fig. 41
Bronze safety valves



Fig. 41
Flanged cast iron safety valves

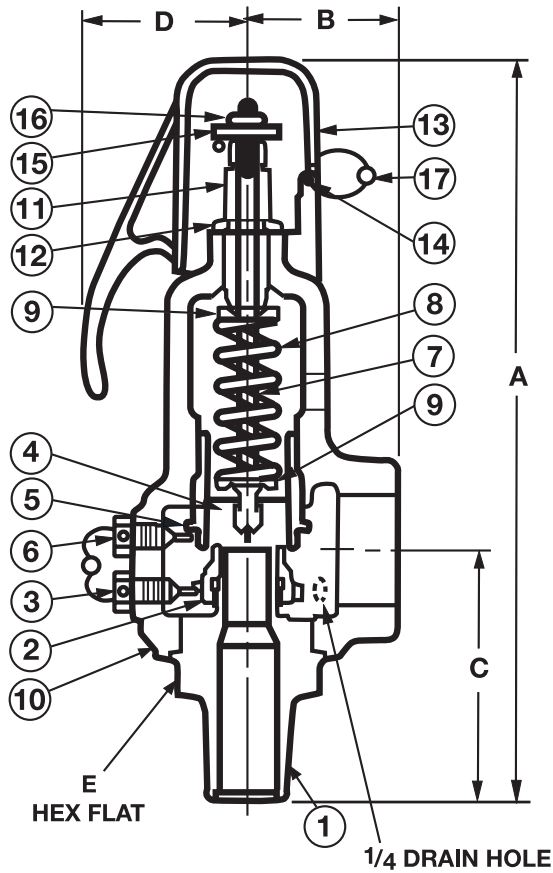


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Dimensions – Weights

Watts Bronze Safety Relief Valves

Figure 41



Materials

Ref. No.	Part Name	Material
1	Base	Bronze
2	Base Ring	Bronze
3	Base Ring Set Screw	Brass
4	Disc	Bronze
5	Guide and Ring	Bronze
6	Guide Ring Set Screw	Brass
7	Spindle	Steel
8	Spring	Plated Steel
9	Spring Washer	Steel
10	Bonnet	Bronze
11	Adjusting Bolt	Brass
12	Adjusting Bolt Locknut	Plated Steel
13	Lifting Cap Zinc	Alloy/Steel
14	Lifting Cap Pin	Plated Steel
15	Spindle Nut	Plated Steel
16	Spindle Nut Locknut	Plated Steel
17	Seal and Wire	Stainless Steel

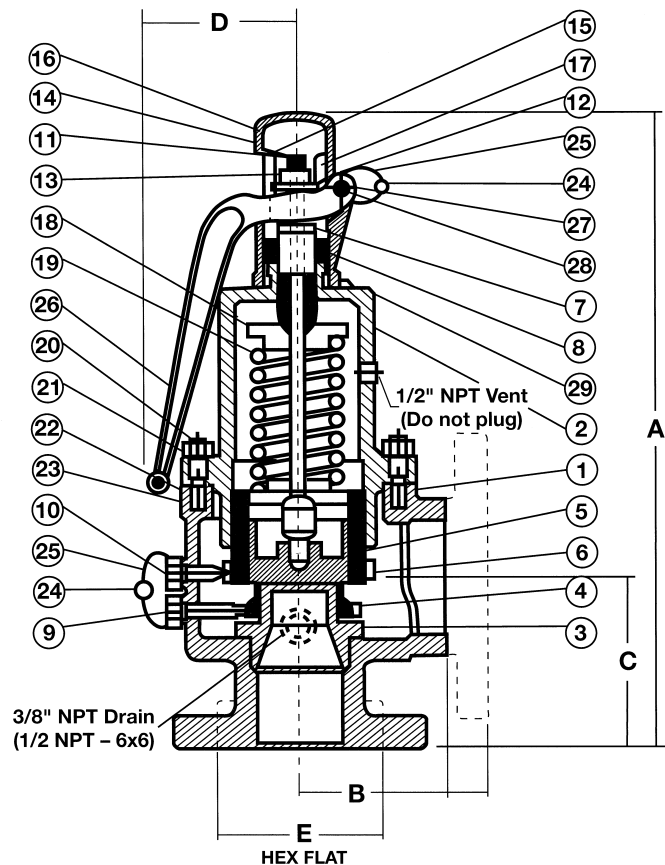
VALVE SIZE		ORIFICE SIZE	DIMENSIONS						WEIGHT					
Inlet x Outlet			A		B		C		D*		E		lb.	kgs.
in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		
1/2 x 3/4	15 x 20	D	6 ⁹ / ₁₆	167	1 ³ / ₈	35	2 ¹ / ₄	57	1 ³ / ₈	35	1 ¹ / ₈	29	2	0.9
3/4 x 3/4	20 x 20	D	6 ⁹ / ₁₆	167	1 ³ / ₈	35	2 ¹ / ₄	57	1 ³ / ₈	35	1 ¹ / ₄	32	2.25	1.0
3/4 x 1	20 x 25	E	7 ¹ / ₈	181	1 ⁵ / ₈	41	2 ⁵ / ₁₆	59	1 ³ / ₈	35	1 ¹ / ₄	32	2.5	1.1
1 x 1	25 x 25	E	7 ¹ / ₈	181	1 ⁵ / ₈	41	2 ⁵ / ₁₆	59	1 ³ / ₈	35	1 ¹ / ₂	38	2.75	1.2
1 x 1 ¹ / ₄	25 x 32	F	9	229	1 ⁷ / ₈	48	2 ¹³ / ₁₆	71	1 ¹³ / ₁₆	46	1 ¹ / ₂	38	4	1.8
1 ¹ / ₄ x 1 ¹ / ₄	32 x 32	F	9	229	1 ⁷ / ₈	48	2 ¹³ / ₁₆	71	1 ¹³ / ₁₆	46	1 ³ / ₄	44	4.25	1.9
1 ¹ / ₄ x 1 ¹ / ₂	32 x 40	G	9 ¹¹ / ₁₆	246	2 ¹ / ₈	54	3	76	1 ¹³ / ₁₆	46	1 ⁷ / ₈	48	7	3.2
1 ¹ / ₂ x 1 ¹ / ₂	40 x 40	G	9 ¹¹ / ₁₆	246	2 ¹ / ₈	54	3	76	1 ¹³ / ₁₆	46	2 ¹ / ₁₆	52	7.25	3.3
1 ¹ / ₂ x 2	40 x 50	H	12 ¹ / ₈	308	2 ⁹ / ₁₆	65	3 ¹ / ₂	89	2 ³ / ₄	70	2 ¹ / ₄	57	13.5	6.1
2 x 2	50 x 50	H	12 ¹ / ₈	308	2 ⁹ / ₁₆	65	3 ¹ / ₂	89	2 ³ / ₄	70	2 ⁹ / ₁₆	65	13.75	6.2
2 x 2 ¹ / ₂	50 x 65	J	13 ³ / ₁₆	338	3 ¹ / ₈	79	3 ³ / ₄	95	2 ³ / ₄	70	2 ³ / ₄	70	17.5	7.9
2 ¹ / ₂ x 2 ¹ / ₂	65 x 65	J	13 ³ / ₁₆	338	3 ¹ / ₈	79	3 ³ / ₄	95	2 ³ / ₄	70	3	76	17.75	8.0

*Add 1/2" to D dimension when lever is pulled out to manually operate the valve.

Dimensions – Weights

Watts Cast Iron Safety Relief Valves

Figure 41



Materials

Ref. No.	Part Name	Material
1	Body	ASTM A126-B (Grey Iron)
2	Bonnet	ASTM A126-B (Grey Iron)
3	Nozzle	ASTM B26 (Bronze)
4	Nozzle Ring	ASTM B584-844 (Bronze)
5	Disc	ASTM B62 (Bronze)
6	Guide Ring	ASTM B584-844 (Bronze)
7	Adjusting Bolt	ASTM B16 (Brass)
8	Adjusting Bolt Locknut	Steel (Zn Plate)
9	Nozzle Ring Set Screw	Brass
10	Guide Ring Set Screw	Brass
11	Spindle	ASTM A108 Grade 1212
12	Spindle Nut	ASTM A108 Grade 1212
13	Spindle Nut Lock nut	Steel AISI (Zn Plate)
14	Lifting Cap	A126-B Cast Iron
15	Lifting Cap Pins	Steel 1020 (Zn Plate)
16	Pivot Post	Steel AISI
17	Post Pin	Steel AISI 1070 (Zn Plate)
18	Spring Washer	Steel AISI 1212
19	Spring	Steel (Zn Plate)
20	Stud	Steel ASTM A193 B7
21	Stud Nut	Steel ASTM A194 2H
22	Name Plate	SST AISI 304
23	Name Plate Screws	SST 18-8
24	Lead Seal	Lead Commercial
25	Seal Wire	SST AISI 304
26	Lifting Lever	A126-B Cast Iron
27	Clevis Pin	Steel (Zn)
28	Cotter Pin	Steel
29	Liftcap Lockscrew	Steel

VALVE SIZE		ORIFICE SIZE	DIMENSIONS								WEIGHT			
Inlet & Outlet (in.)			A		B		C		D		E		lb.	kgs.
in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		
1½-250# x 2½ NPT	40 – 65	J	15	381	¾	83	¼	108	3	76	–	–	24	11
1½ NPT x 2½ NPT	40 – 65	J	14½	368	¾	83	¼	108	3	76	¾	70	20	9
2-250# x 3 NPT	50 – 80	J,K	15¾	400	4	102	⅝	117	¾	89	–	–	42	19
2 NPT x 3 NPT	50 – 80	K	15¾	400	4	102	⅝	117	¾	89	⅝	92	36	16
2½-250# x 3 NPT	65 – 80	K	15¾	400	4	102	¾	121	¾	89	–	–	45	20
2½-250# x 4 NPT	65 – 100	L	23	584	⅝	130	⅝	140	6	152	–	–	105	48
2½ NPT x 4 NPT	65 – 100	L	23	584	⅝	130	⅝	140	6	152	½	114	97	44
3-250# x 3 NPT	80 – 80	K	15¾	400	4	102	5	127	¾	89	–	–	48	22
3-250# x 4 NPT	80 – 100	L,M	23	584	⅝	130	⅝	140	6	152	–	–	107	49
3-NPT# x 4 NPT	80 – 100	M	23⅝	587	⅝	130	5⅝	143	6	152	½	114	99	45
4-250# x 6-125#	100 – 150	N,P	28½	724	¾	184	¾	171	6	152	–	–	212	96
6-250# x 8-125#	150 – 200	Q,R	45⅞	1151	10	254	¾	235	10½	267	–	–	675	306

Capacities

WATTS FIG. 41 ASME SECTION VIII SERIES VALVES SATURATED STEAM CAPACITIES (LBS/HR @ 90% RATING AND 10% OVERPRESSURE)

Orifice Area (in ²)	D 0.1188	E 0.2116	F 0.3318	G 0.5424	H 0.8479	J 1.391	K 1.892	L 2.935	M 3.715	N 4.468	P 6.564	Q 11.365	R 16.475
Set Press. psi													
15	176	313	491	802	1254	2057	2798	4340	5494	6606	9706	16804	24360
20	203	361	566	925	1445	2371	3225	5003	6335	7617	11190	19374	28085
25	229	409	641	1047	1637	2686	3653	5667	7175	8627	12674	21943	31809
30	256	456	716	1170	1829	3000	4081	6330	8015	9637	14158	24513	35534
35	286	509	798	1305	2040	3346	4551	7060	8939	10748	15790	27339	39631
40	315	562	881	1440	2251	3692	5022	7790	9863	11859	17422	30165	43729
45	345	614	963	1575	2461	4038	5492	8520	10787	12970	19055	32992	47826
50	374	667	1046	1709	2672	4384	5963	9250	11711	14081	20687	35818	51923
55	404	720	1128	1844	2883	4730	6433	9980	12636	15193	22320	38645	56020
60	434	772	1211	1979	3094	5076	6904	10710	13560	16304	23952	41471	60117
65	463	825	1293	2114	3305	5422	7374	11440	14484	17415	25585	44297	6U-1-5
70	493	877	1376	2249	3516	5768	7845	12170	15408	18526	27217	47124	68312
75	522	930	1458	2384	3727	6114	8316	12900	16332	19637	28849	49950	72409
80	552	983	1541	2519	3937	6460	8786	13630	17256	20748	30482	52777	76506
85	581	1035	1623	2654	4148	6805	9257	14359	18180	21860	32114	55603	80604
90	611	1088	1706	2789	4359	7151	9727	15089	19105	22971	33747	58429	84701
95	640	1140	1788	2923	4570	7497	10198	15819	20029	24082	35379	61256	88798
100	670	1193	1871	3058	4781	7843	10668	16549	20953	25193	37012	64082	92895
105	699	1246	1953	3193	4992	8189	11139	17279	21877	26304	38644	66909	96992
110	729	1298	2036	3328	5203	8535	11609	18009	22801	27415	40276	69735	101090
115	758	1351	2118	3463	5414	8881	12080	18739	23725	28527	41909	72561	105187
120	788	1404	2201	3598	5624	9227	12550	19469	24649	29638	43541	75388	109284
125	818	1456	2283	3733	5835	9573	13021	20199	25574	30749	45174	78214	113381
130	847	1509	2366	3868	6046	9919	13491	20929	26498	31860	46806	81041	117479
135	877	1561	2448	4003	6257	10265	13962	21659	27422	32971	48438	83867	121576
140	906	1614	2531	4137	6468	10611	14432	22388	28346	34082	50071	86693	1256731
145	936	1667	2614	4272	6679	10957	14903	23118	29270	35194	51703	89520	129770
150	965	1719	2696	4407	6890	11303	15373	23848	30194	36305	53336	92346	133868
155	995	1772	2779	4542	7100	11648	15844	24578	31118	37416	54968	95173	137965
160	1024	1825	2861	4677	7311	11994	16314	25308	32043	38527	56601	97999	142062
165	1054	1877	2944	4812	7522	12340	16785	26038	32967	39638	58233	100825	146159
170	1083	1930	3026	4947	7733	12686	17256	26768	33891	40749	59865	103652	150256
175	1113	1982	3109	5082	7944	13032	17726	27498	34815	41861	61498	106478	154354
180	1143	2035	3191	5217	8155	13378	18197	28228	35739	42972	63130	109305	158451
185	1172	2088	3274	5352	8366	13724	18667	28958	36663	44083	64763	112131	162548
190	1202	2140	3356	5486	8577	14070	19138	29688	37587	45194	66395	114957	166645
195	1231	2193	3439	5621	8787	14416	19608	30418	38512	46305	68028	117784	170743
200	1261	2246	3521	5756	8998	14762	20079	31147	39436	47416	69660	120610	174840
205	1290	2298	3604	5891	9209	15108	20549	31877	40360	48527	71292	123437	178937
210	1320	2351	3686	6026	9420	15454	21020	32607	41284	49639	72925	126263	183034
215	1349	2403	3769	6161	9631	15800	21490	33337	42208	50750	74557	129089	187131
220	1379	2456	3851	6296	9842	16146	21961	34067	43132	51861	76190	131916	191229
225	1408	2509	3934	6431	10053	16492	22431	34797	44057	52972	77822	134742	195326
230	1438	2561	4016	6566	10263	16837	22902	35527	44981	54083	79455	137569	199423
235	1468	2614	4099	6700	10474	17183	23372	36257	45905	55194	81087	140395	203520
240	1497	2667	4181	6835	10685	17529	23843	36987	46829	56306	82719	143221	207618
245	1527	2719	4264	6970	10896	17875	24313	37717	47753	57417	84352	146048	211715
250	1556	2772	4346	7105	11107	18221	24784	38447	48677	58528	85984	148874	215812



Water Safety & Flow Control Products

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