

# Consolidated™ 1511 Series Safety Valve

Offering proven, high-performance design for low-pressure, steam heating boilers and steam generators, as well as air service applications.



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## Features and Benefits

The Consolidated 1511 Series Safety Valve offers the following key features and benefits:

- Handles a broad range of operating conditions. Pressures up to 250 psig (17.24 barg) and operating temperatures as high as 406°F (207.8°C)
- Available in a variety of sizes. From 1.5 inches (38.1 mm) to 6 inches (152.4 mm) in a complete range of ASME-certified orifice sizes
- Meets industry specifications. ASME Section I (V Designator) and XIII (UV Designator) certified and offered with ASME Class 125 and 250 flat face flanges
- Offers easy assembly and maintenance. Exposed-spring design provides quick, simple assembly and maintenance

## Specifications

<b>Inlet Sizes:</b>	1.5" (38.1 mm) through 6" (152.4 mm) in either flanged or threaded design.
<b>Inlet Ratings:</b>	ASME Class 250, Optional ASME Class 125 or Female Screwed.
<b>Outlet Sizes:</b>	2.5" (63.5 mm) through 4" (101.6 mm) threaded, 6" (152.4 mm) and 8" (203.2 mm) flanged.
<b>Outlet Ratings:</b>	ASME Class 125, Optional ASME Class 125 or Female Screwed.
<b>Orifices Sizes:</b>	Eight sizes: H through Q
<b>Temperature Range:</b>	-20°F (-28.9°C) to 406°F (207.8°C)
<b>Materials:</b>	Cast iron body with brass trim is standard. Stainless steel trim is optional.
<b>Certifications:</b>	ASME B&PVC Section I (V) and XIII (UV)
<b>Blowdown:</b>	4 percent
<b>Back Pressure Limit:</b>	20 percent of Set Pressure

## Applications

- **Steam or Air Service**  
Consolidated 1511 safety valves are designed for use in all steam and air service applications within specified pressure and temperature limits. These valves are not suitable for incompressible fluid service, such as water or oil.
- **Noncorrosive Air or Gas**  
Please contact your Baker Hughes sales representative with questions about noncorrosive compressible fluid service (other than air or steam) for your specific application. Consolidated 1511 valves are not suitable for relieving toxic, flammable, or corrosive media.
- **Marine Use**  
With ASME Section I certification, Consolidated 1500 Series Safety Valves are approved for use by the U.S. Coast Guard, as well as for a variety of other marine applications.
- **Bolting to Steel Flanges**  
Special considerations are required when bolting valves to carbon steel flanges:
  - When the valve is bolted to Class 150 steel flanges, the flange must be flat-faced
  - When the valve is bolted to Class 300 steel flanges, the raised face of the flange may be supplied with a flat face.



### CAUTION

Because the Consolidated 1511 safety valve is not fully enclosed, system media will escape from the following locations during operation:

- **Valve Outlet:** Most of the steam will escape from this main discharge area.
- **Open Yoke:** A small amount of steam will exhaust vertically from the safety valve

Baker Hughes provides a full range of Consolidated pressure safety valve styles, sizes, options and configurations for multiple industries, applications, environments, and media. From spring-actuated to pilot-operated, each pressure safety valve is configured to offer safer process flow control in harsh environments.

## Conversion Table

**All the USCS values are converted to metric values using the following conversion factors:**

USCS Unit	Conversion Factor	Metric Unit
in.	25.4	mm
lb.	0.4535924	kg
in <sup>2</sup>	6.4516	cm <sup>2</sup>
ft <sup>3</sup> /min	0.02831685	m <sup>3</sup> /min
gal/min	3.785412	L/min
lb/hr	0.4535924	kg/hr
psig	0.06894757	barg
ft lb	1.3558181	Nm
°F	$5/9 (°F-32)$	°C

# Scope of Design

## Scope of Design

Inlet Size		Valve Type	Orifice Discharge Area		Connections	
in.	mm		in <sup>2</sup>	cm <sup>2</sup>	Inlet <sup>(1)</sup> ASME STD RF	Outlet ASME STD
1.50	38.1	1511H	.785	5.065	1.50" (38.1 mm) 250 class	2.50" (63.5 mm) NPT(internal)
1.50	38.1	1511J	1.287	8.303	1.50" (38.1 mm) 250 class	2.50" (63.5 mm) NPT(internal)
2.00	50.8	1511K	1.840	11.871	2.00" (50.8 mm) 250 class	3.00" (76.2 mm) NPT(internal)
2.50	63.5	1511L	2.853	18.406	2.50" (63.5 mm) 250 class	4.00" (101.6 mm) NPT (internal)
3.00	76.2	1511M	3.600	23.226	3.00" (76.2 mm) 250 class	4.00" (101.6 mm) NPT(internal)
4.00	101.6	1511N	4.340	28.000	4.00" (101.6 mm) 250 class	6.00" (152.4 mm) 125 class F.F.
4.00	101.6	1511P	6.380	41.161	4.00" (101.6 mm) 250 class	6.00" (152.4 mm) 125 class F.F.
6.00	152.4	1511Q	11.050	71.290	6.00" (152.4 mm) 250 class	8.00" (203.2 mm) 125 class F.F.

1. Inlet connection available with ASME class 125 FF on application.

## Override Inlet Flange Option

### ASME Class 250 Replacement Safety Valves

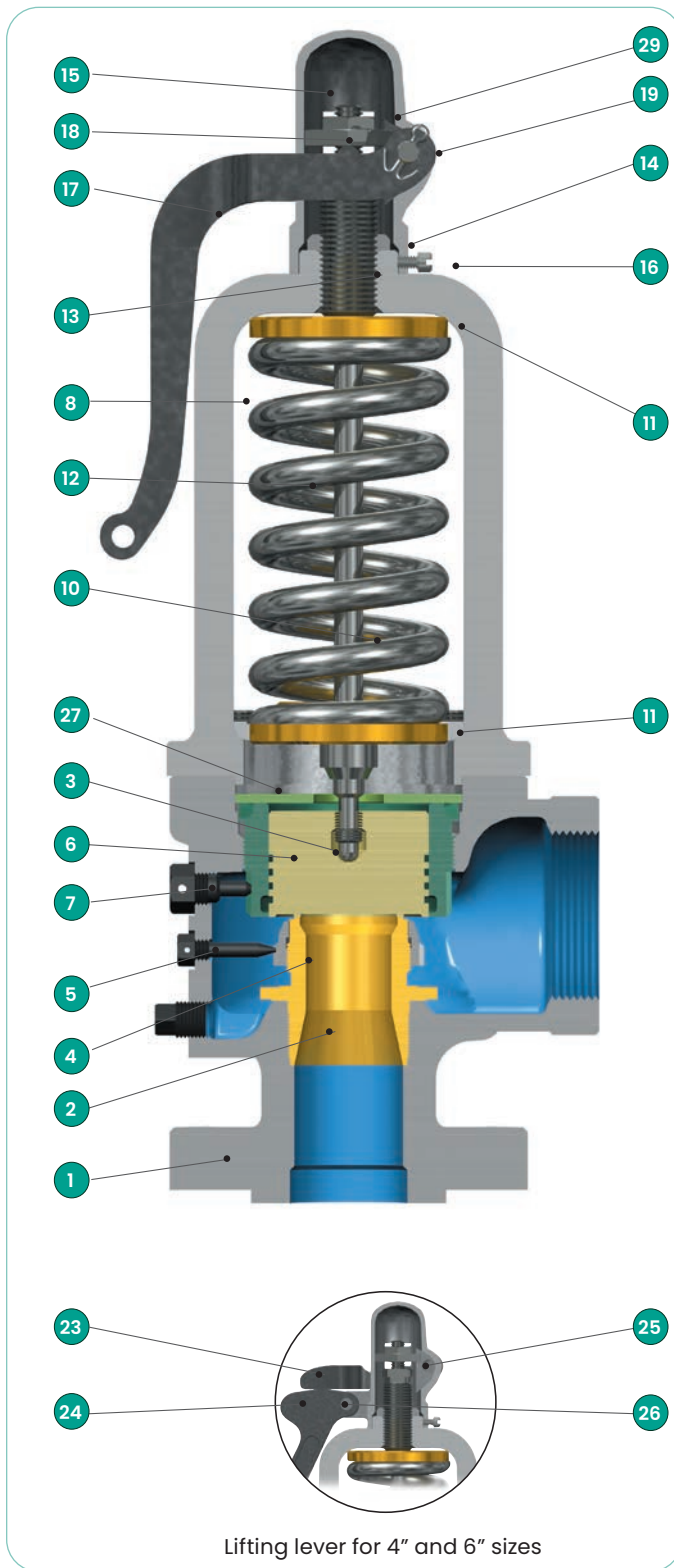
Orifice	Override Inlet Flange	
	in.	mm
H	2.00	50.8
	2.50	63.5
	3.00	76.2
J	2.00	50.8
	2.50	63.5
	3.00	76.2
K	2.50	63.5
	3.00	76.2
	3.50	88.9
	4.00	101.6
L	3.00	76.2
	3.50	88.9
	4.00	101.6
M	3.50	88.9
	4.00	101.6
	4.50	114.3

### Pressure/Temperature Limits

Valve Type	Set Pressure Limit		Temperature Limit	
	psig	barg	°F	°C
1511	250	17.23	406	207.7
1511_S	250	17.23	406	207.7

# Materials

## 1511 Series Safety Valve



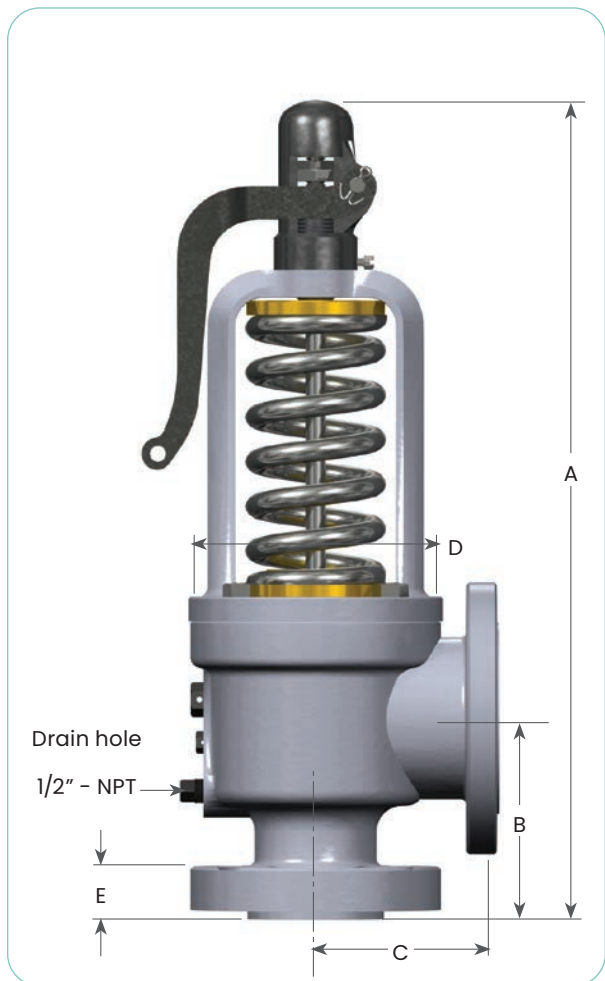
## Parts and Materials

Part No.	Part Name	Material
1	Base	ASTM A126 Class B Iron
2	Seat Bushing	ASTM B283 Alloy C46400 Brass <sup>(1)</sup>
3	Disc (H – M Orifice)	ASTM B124 Alloy C46400 Half Brass <sup>(1)</sup>
	Disc (N – Q Orifice)	ASTM B283 Alloy C46400 Brass <sup>(1)</sup>
4	Lower Adjusting Ring (H – L Orifice)	ASTM B283 Alloy C37700 Brass
	Lower Adjusting Ring (M – Q Orifice)	ASTM B584 C87500 Bronze
5	Lower Adjusting Ring Pin	ASTM B16 Half Hard Brass
6	Upper Adjusting Ring	
	H – L Orifice	ASTM B124 Alloy C37700 Brass
	M – Q Orifice	ASTM B584 C87500 Bronze
7	Upper Adjusting Ring Pin	ASTM B16 Half Hard Brass
8	Yoke	ASTM A126 Class B Iron
9	Yoke Cap Screws (Not Shown)	ASME SA449 Type 1 CS
10	Spindle Assembly (H-M Orifice)	
	Spindle	ASTM A108 Grade 1213 CS
	Spindle Collar	ASTM A276 Type 410 Condition T St. St.
10	Spindle Assembly (N-Q Orifice)	
	Spindle Head	ASTM A108 Grade 1020 CSI
	Spindle Stem	ASTM A108 Grade 1020 CS
	Roll Pin	Carbon Steel
11	Spring Washer (H – L Orifice)	ASTM A108 Grade 1020 CSI
	Spring Washer (M – Q Orifice)	ASTM A108 Grade 1020 CS
12	Spring	Alloy Steel
13	Compression Screw	
	H – N Orifice	ASTM B16 Half Hard Brass
	P – Q Orifice	ASTM B150 Alloy C63000 Bronze
14	Compression Screw Nut	
	H – J Orifice	ASTM A108 Grade 1020 CS
	K – L Orifice	ASTM B16 HALF HARD BRASS
	M – P Orifice	ASTM B371 Alloy C69400 Brass
	Q Orifice	ASTM B584 C87500 Bronze
15	Cap	Malleable Iron
16	Cap Set Screw	ASTM A108 Grade 1020 CS
17	Lever (H – M Orifice)	Malleable Iron
18	Release Nut (H – L Orifice)	ASTM B16 Half Hard Brass
	Release Nut (M – Q Orifice)	ASTM A108 Grade 1020 CS
19	Lever Pin (H – M Orifice)	Carbon Steel
20	Spring Cover	Carbon Steel
21	Spring Cover Bolt	Carbon Steel
22	Cover Nut	Carbon Steel
23	Top Lever (N – Q Orifice)	Malleable Iron
24	Drop Lever (N – Q Orifice)	Malleable Iron
25	Top Lever Pin (N – Q Orifice)	ASTM A108 Grade 1020 CS
26	Drop Lever Pin (N – Q Orifice)	ASTM A108 Grade 1020 CS
27	Floating Washer (H – K Orifice)	Carbon Steel
28	Lift Stop <sup>(2)</sup> (Not Shown)	ASTM A53 Grade B Type E and S Gray Iron (Black Pipe)
29	Locknut (Locks Release Nut)	Carbon Steel

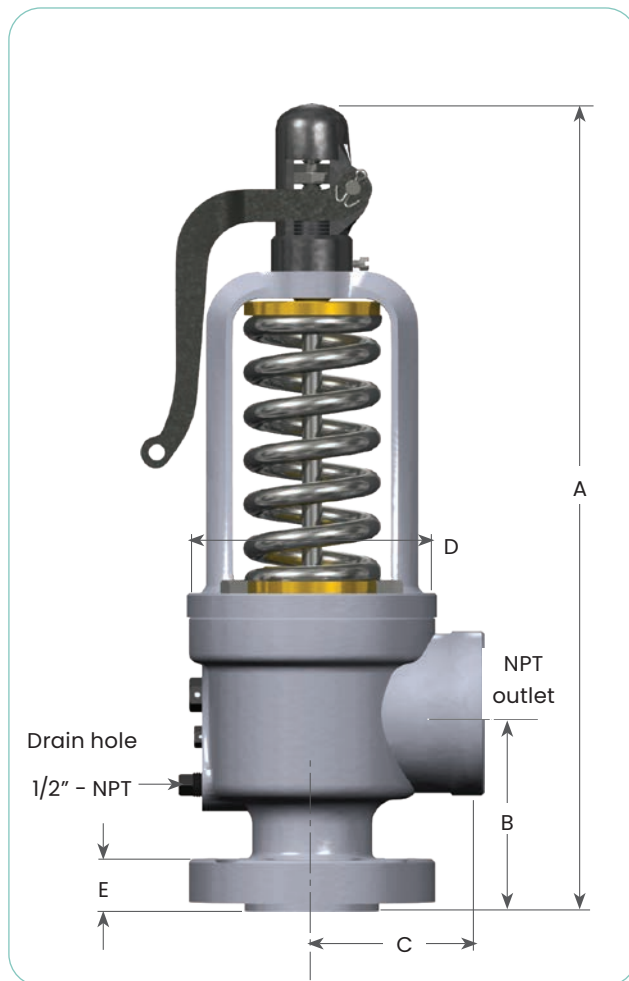
1. Stainless steel materials are available as an alternate for disc and seat bushing; select 1511\_S.
2. Required for 5-26 psig (0.34 - 1.79 barg).

# Dimensions and Weights

4" (101.6 mm) and 6" (152.4 mm) size



1.5" (38.1 mm) to 3" (76.2 mm) size



## Dimensions and Weights

Inlet Size		Valve Type	A <sup>(1), (2)</sup>		B		C		D		E		Dismantling Height		Approximate Weight	
in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb.	kg
1.50	38.1	1511H	14.50	368.3	4.25	108.0	4.00	101.6	5.50	139.7	0.81	20.6	17.38	441.3	30	13.6
1.50	38.1	1511J	14.50	368.3	4.25	108.0	4.00	101.6	5.50	139.7	0.81	20.6	17.38	441.3	36	16.3
2.00	50.8	1511K	18.13	460.4	4.38	111.1	4.25	108.0	6.13	155.6	0.88	22.2	21.63	549.3	57	25.9
2.50	63.5	1511L	19.00	482.6	5.50	139.7	5.25	133.4	7.25	184.2	1.00	25.4	22.63	574.7	79	35.8
3.00	76.2	1511M	22.13	562.0	5.63	142.9	5.50	139.7	7.88	200.0	1.13	28.6	25.88	657.2	88	39.9
4.00	101.6	1511N	24.00	609.6	6.75	171.5	7.25	184.2	8.63	219.1	1.25	31.8	27.50	698.5	142	64.4
4.00	101.6	1511P	25.88	657.2	6.75	171.5	7.25	184.2	10.13	257.2	1.25	31.8	30.00	762.0	172	78.0
6.00	152.4	1511Q	33.75	857.3	9.25	235.0	9.00	228.6	12.88	327.0	1.44	36.5	39.25	997.0	338	153.3

1. When using the EVT™-I or the Hydroset device 15" (381.0 mm), clearance is required.
2. When using the EVT-II, 17" (431.8 mm) clearance is required.  
When using the assisted closing device, an additional 8" (203.2 mm) clearance is required.

# Orifice Capacities

$P = (1.03 \times \text{set pressure}) + 14.7$  or

$P = (2 \text{ psig} + \text{set pressure}) + 14.7$

Not for use on superheated steam. Review pressure/temperature limits on page 4.

$W = 51.5 \times KAP$

$K = .877$

$A = \text{flow area in in}^2$

## ASME, B&PVC, Section I rating - 2010 Edition

lb/hr (kg/hr) saturated steam at 3 percent overpressure or 2 psig (0.14 barg), whichever is greater, 90 percent of actual capacity

Orifice Designation		H		J		K		L		M		N		P		Q	
Orifice Area		in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>
		.785	5.060	1.287	8.300	1.840	11.870	2.853	18.410	3.600	23.230	4.340	28.000	6.380	41.160	11.050	71.290
Set Pressure		Orifice Capacity															
psig	barg	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15	1.03	1123	509	1842	835	2634	1194	4084	1852	5154	2337	6213	2818	9134	4143	15820	7175
20	1.37	1301	590	2133	967	3049	1383	4729	2145	5967	2706	7193	3262	10575	4796	18316	8307
25	1.72	1478	670	2423	1099	3465	1571	5373	2437	6780	3075	8173	3707	12016	5450	20811	9439
30	2.06	1655	750	2714	1231	3880	1759	6017	2729	7593	3444	9154	4152	13456	6103	23306	10571
35	2.41	1833	831	3005	1363	4296	1948	6661	3021	8406	3812	10134	4596	14897	6757	25802	11703
40	2.75	2010	911	3295	1494	4712	2137	7306	3313	9219	4181	11114	5041	16338	7410	28297	12835
45	3.10	2187	992	3586	1626	5127	2325	7950	3606	10032	4550	12094	5485	17779	8064	30793	13967
50	3.44	2364	1072	3877	1758	5543	2514	8594	3898	10845	4919	13074	5930	19219	8717	33288	15099
55	3.79	2542	1153	4167	1890	5958	2702	9239	4190	11658	5287	14054	6374	20660	9371	35783	16230
60	4.13	2719	1233	4458	2022	6374	2891	9883	4482	12471	5656	15034	6819	22101	10024	38279	17363
65	4.48	2896	1313	4749	2154	6789	3079	10527	4774	13284	6025	16014	7263	23542	10678	40774	18494
70	4.82	3077	1395	5045	2288	7213	3271	11184	5072	14113	6401	17014	7717	25011	11344	43320	19649
75	5.17	3260	1478	5344	2423	7641	3465	11848	5374	14950	6781	18023	8175	26495	12017	45890	20815
80	5.51	3442	1561	5644	2560	8069	3660	12512	5675	15788	7161	19033	8633	27979	12691	48460	21981
85	5.86	3625	1644	5943	2695	8497	3854	13175	5976	16625	7540	20042	9090	29463	13364	51030	23146
90	6.20	3807	1726	6242	2831	8925	4048	13839	6277	17462	7920	21052	9549	30947	14037	53601	24313
95	6.55	3990	1809	6542	2967	9353	4242	14502	6577	18300	8300	22061	10006	32431	14710	56171	25478
100	6.89	4173	1892	6841	3103	9781	4436	15166	6879	19137	8680	23071	10464	33915	15383	58741	26644
105	7.23	4355	1975	7141	3239	10209	4630	15830	7180	19974	9060	24080	10922	35399	16056	61311	27810
110	7.58	4538	2058	7440	3374	10637	4824	16493	7481	20812	9440	25090	11380	36883	16729	63882	28976
115	7.92	4720	2140	7739	3510	11065	5018	17157	7782	21649	9819	26099	11838	38367	17402	66452	30142
120	8.27	4903	2223	8039	3646	11493	5213	17820	8083	22486	10199	27109	12296	39851	18076	69022	31307
125	8.61	5086	2306	8338	3782	11921	5407	18484	8384	23324	10579	28118	12754	41335	18749	71592	32473
130	8.96	5268	2389	8637	3917	12349	5601	19148	8685	24161	10959	29128	13212	42819	19422	74163	33639
135	9.30	5451	2472	8937	4053	12777	5795	19811	8986	24999	11339	30137	13669	44303	20095	76733	34805
140	9.65	5633	2555	9236	4189	13205	5989	20475	9287	25836	11719	31147	14128	45787	20768	79303	35971
145	9.99	5816	2638	9535	4325	13633	6183	21139	9588	26673	12098	32156	14585	47271	21441	81873	37136
150	10.34	5998	2720	9835	4461	14061	6377	21802	9889	27511	12478	33166	15043	48755	22114	84444	38303
155	10.68	6181	2803	10134	4596	14489	6572	22466	10190	28348	12858	34175	15501	50239	22788	87014	39468
160	11.03	6364	2886	10433	4732	14917	6766	23129	10491	29185	13238	35185	15959	51723	23461	89584	40634
165	11.37	6546	2969	10733	4868	15345	6960	23793	10792	30023	13618	36194	16417	53207	24134	92154	41800
170	11.72	6729	3052	11032	5004	15773	7154	24457	11093	30860	13997	37204	16875	54691	24807	94725	42966
175	12.06	6911	3134	11332	5140	16201	7348	25120	11394	31698	14377	38213	17333	56175	25480	97295	44132
180	12.41	7094	3217	11631	5275	16629	7542	25784	11695	32535	14757	39223	17791	57659	26153	99865	45298
185	12.75	7277	3300	11930	5411	17057	7736	26447	11996	33372	15137	40232	18248	59143	26826	102435	46463
190	13.10	7459	3383	12230	5547	17485	7931	27111	12297	34210	15517	41242	18707	60627	27499	105006	47629
195	13.44	7642	3466	12529	5683	17913	8125	27775	12598	35047	15897	42251	19164	62112	28173	107576	48795
200	13.78	7824	3548	12828	5818	18341	8319	28438	12899	35884	16276	43261	19622	63596	28846	110146	49961
205	14.13	8007	3631	13128	5954	18769	8513	29102	13200	36722	16656	44270	20080	65080	29519	112716	51127
210	14.47	8190	3714	13427	6090	19197	8707	29766	13501	37559	17036	45280	20538	66564	30192	115287	52293
215	14.82	8372	3797	13726	6226	19625	8901	30429	13802	38396	17416	46289	20996	68048	30866	117857	53459
220	15.16	8555	3880	14026	6362	20053	9095	31093	14103	39234	17796	47299	21454	69532	31539	120427	54624
225	15.51	8737	3963	14325	6497	20481	9290	31756	14404	40071	18175	48308	21912	71016	32212	122997	55790
230	15.85	8920	4046	14625	6633	20909	9484	32420	14705	40909	18556	49318	22370	72500	32885	125568	56956
235	16.20	9103	4129	14924	6769	21337	9678	33084	15006	41746	18935	50327	22827	73984	33558	128138	58122
240	16.54	9285	4211	15223	6905	21765	9872	33747	15307	42583	19315	51337	23286	75468	34231	130708	59288
245	16.89	9468	4294	15523	7041	22193	10066	34411	15608	43421	19695	52346	23743	76952	34904	133278	60453
250	17.23	9650	4377	15822	7176	22621	10260	35074	15909	44258	20075	53356	24201	78436	35577	135849	61620

# Orifice Capacities

Not for use on superheated steam. Review pressure/temperature limits on page 4.

$$W = 51.5 \times KAP$$

$$K = .877$$

$$A = \text{flow area in in}^2$$

$$P = (1.10 \times \text{set pressure}) + 14.7 \text{ or}$$

$$P = (3 \text{ psig} + \text{set pressure}) +$$

## ASME, B&PVC, Section XIII (UV) rating – 2010 Edition

lb/hr (kg/hr) saturated steam at 10 percent overpressure or 3 psig (0.21 barg), whichever is greater, 90 percent of actual capacity

Orifice Designation		H		J		K		L		M		N		P		Q	
Orifice Area		in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>
Set Pressure		.785	5.060	1.287	8.300	1.840	11.870	2.853	18.410	3.600	23.230	4.340	28.000	6.380	41.160	11.050	71.290
Orifice Capacity																	
psig	barg	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15	1.03	1159	525	1900	861	2717	1232	4213	1910	5316	2411	6409	2907	9422	4273	16319	7402
20	1.37	1336	605	2191	993	3133	1421	4857	2203	6129	2780	7389	3351	10863	4927	18815	8534
25	1.72	1513	686	2482	1125	3548	1609	5502	2495	6942	3148	8369	3796	12304	5581	21310	9666
30	2.06	1691	767	2772	1257	3964	1798	6146	2787	7755	3517	9350	4241	13745	6234	23806	10798
35	2.41	1886	855	3092	1402	4421	2005	6855	3109	8650	3923	10428	4730	15329	6953	26550	12042
40	2.75	2081	943	3412	1547	4878	2212	7563	3430	9544	4329	11506	5219	16914	7672	29295	13287
45	3.10	2276	1032	3731	1692	5335	2419	8272	3752	10438	4734	12584	5708	18499	8391	32040	14533
50	3.44	2471	1120	4051	1837	5792	2627	8981	4073	11332	5140	13662	6196	20084	9109	34785	15778
55	3.79	2666	1209	4371	1982	6249	2834	9690	4395	12227	5546	14740	6685	21669	9828	37530	17023
60	4.13	2861	1297	4690	2127	6706	3041	10398	4716	13121	5951	15818	7174	23254	10547	40275	18268
65	4.48	3056	1386	5010	2272	7163	3249	11107	5038	14015	6357	16896	7663	24839	11266	43020	19513
70	4.82	3251	1474	5330	2417	7620	3456	11816	5359	14910	6763	17974	8152	26423	11985	45765	20758
75	5.17	3446	1563	5650	2562	8077	3663	12524	5680	15804	7168	19052	8641	28008	12704	48510	22003
80	5.51	3641	1651	5969	2707	8534	3870	13233	6002	16698	7574	20131	9131	29593	13423	51255	23248
85	5.86	3836	1739	6289	2852	8991	4078	13942	6323	17592	7979	21209	9620	31178	14142	54000	24493
90	6.20	4031	1828	6609	2997	9448	4285	14651	6645	18487	8385	22287	10109	32763	14861	56745	25739
95	6.55	4226	1916	6928	3142	9906	4493	15359	6966	19381	8791	23365	10598	34348	15579	59490	26984
100	6.89	4421	2005	7248	3287	10363	4700	16068	7288	20275	9196	24443	11087	35933	16298	62235	28229
105	7.23	4616	2093	7568	3432	10820	4907	16777	7609	21169	9602	25521	11576	37517	17017	64980	29474
110	7.58	4811	2182	7887	3577	11277	5115	17485	7931	22064	10008	26599	12065	39102	17736	67724	30719
115	7.92	5006	2270	8207	3722	11734	5322	18194	8252	22958	10413	27677	12554	40687	18455	70469	31964
120	8.27	5201	2359	8527	3867	12191	5529	18903	8574	23852	10819	28755	13043	42272	19174	73214	33209
125	8.61	5396	2447	8847	4012	12648	5737	19612	8895	24747	11225	29833	13532	43857	19893	75959	34454
130	8.96	5591	2536	9166	4157	13105	5944	20320	9216	25641	11630	30912	14021	45442	20612	78704	35699
135	9.30	5786	2624	9486	4302	13562	6151	21029	9538	26535	12036	31990	14510	47027	21331	81449	36944
140	9.65	5981	2712	9806	4447	14019	6358	21738	9860	27429	12441	33068	14999	48611	22049	84194	38189
145	9.99	6176	2801	10125	4592	14476	6566	22446	10181	28324	12847	34146	15488	50196	22768	86939	39434
150	10.34	6371	2889	10445	4737	14933	6773	23155	10502	29218	13253	35224	15977	51781	23487	89684	40679
155	10.68	6566	2978	10765	4882	15390	6980	23864	10824	30112	13658	36302	16466	53366	24206	92429	41925
160	11.03	6761	3066	11085	5028	15848	7188	24573	11146	31007	14064	37380	16955	54951	24925	95174	43170
165	11.37	6956	3155	11404	5172	16305	7395	25281	11467	31901	14470	38458	17444	56536	25644	97919	44415
170	11.72	7151	3243	11724	5317	16762	7603	25990	11788	32795	14875	39536	17933	58121	26363	100664	45660
175	12.06	7346	3332	12044	5463	17219	7810	26699	12110	33689	15281	40614	18422	59705	27081	103409	46905
180	12.41	7541	3420	12363	5607	17676	8017	27407	12431	34584	15687	41693	18911	61290	27800	106154	48150
185	12.75	7736	3508	12683	5752	18133	8224	28116	12753	35478	16092	42771	19400	62875	28519	108898	49395
190	13.10	7931	3597	13003	5898	18590	8432	28825	13074	36372	16498	43849	19889	64460	29238	111643	50640
195	13.44	8126	3685	13322	6042	19047	8639	29534	13396	37266	16903	44927	20378	66045	29957	114388	51885
200	13.78	8321	3774	13642	6187	19504	8846	30242	13717	38161	17309	46005	20867	67630	30676	117133	53130
205	14.13	8516	3862	13962	6333	19961	9054	30951	14039	39055	17715	47083	21356	69215	31395	119878	54375
210	14.47	8711	3951	14282	6478	20418	9261	31660	14360	39949	18120	48161	21845	70799	32113	122623	55620
215	14.82	8906	4039	14601	6622	20875	9468	32368	14681	40844	18526	49239	22334	72384	32832	125368	56865
220	15.16	9101	4128	14921	6768	21332	9676	33077	15003	41738	18932	50317	22823	73969	33551	128113	58111
225	15.51	9296	4216	15241	6913	21790	9883	33786	15325	42632	19337	51395	23312	75554	34270	130858	59356
230	15.85	9491	4305	15560	7057	22247	10091	34495	15646	43526	19743	52474	23801	77139	34989	133603	60601
235	16.20	9686	4393	15880	7203	22704	10298	35203	15967	44421	20149	53552	24290	78724	35708	136348	61846
240	16.54	9881	4481	16200	7348	23161	10505	35912	16289	45315	20554	54630	24779	80309	36427	139093	63091
245	16.89	10076	4570	16519	7492	23618	10712	36621	16611	46209	20960	55708	25268	81893	37146	141838	64336
250	17.23	10271	4658	16839	7638	24075	10920	37329	16932	47104	21366	56786	25757	83478	37864	144583	65581



# Orifice Capacities

Not for use on superheated steam. Review pressure/temperature limits on page 4.

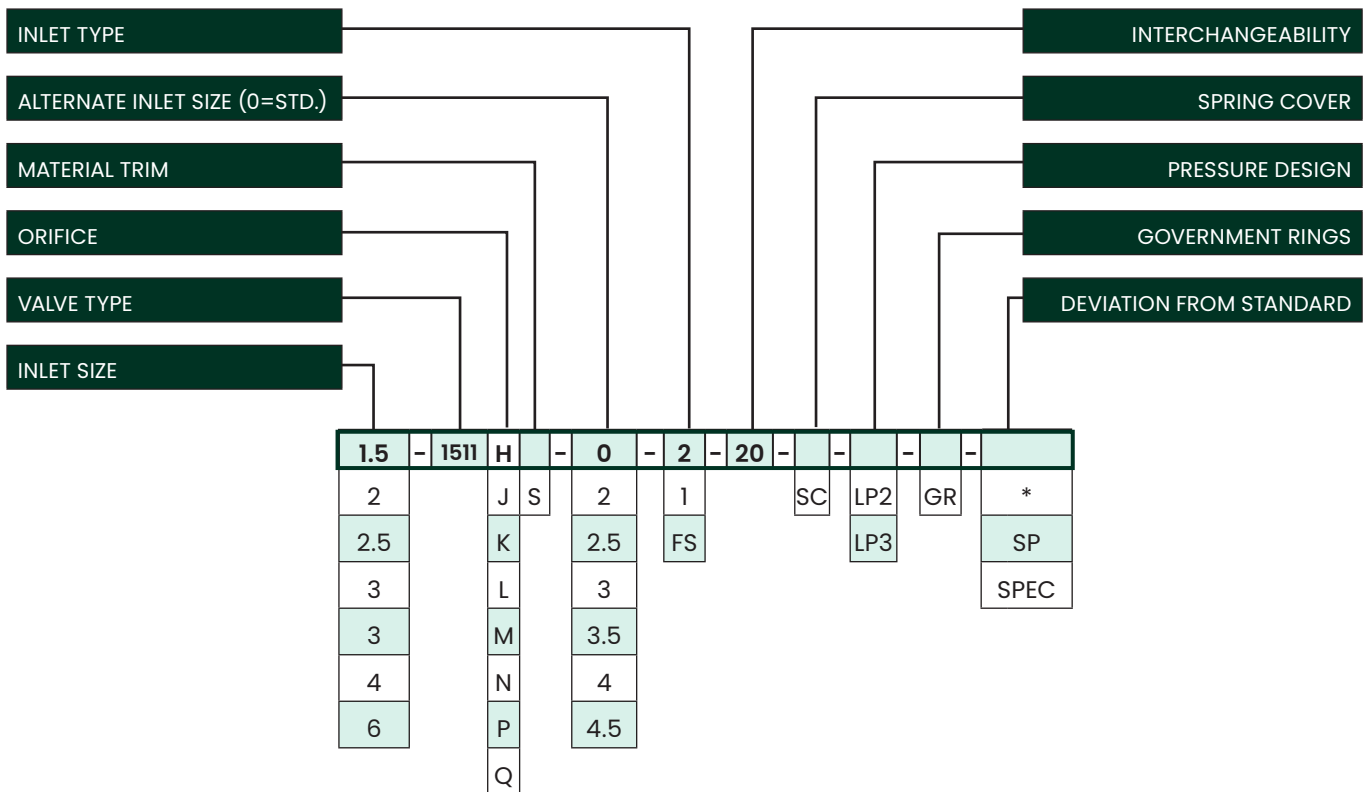
W = 18.3547 x KAP  
 K = .877  
 A = flow area in in<sup>2</sup>  
 P = (1.10 x set pressure) + 14.7 or  
 P = (3 psig + set pressure) + 14.7

## ASME, B and PVC, Section XIII (UV) rating – 2010 Edition

Standard ft<sup>3</sup>/min (m<sup>3</sup>/min) of Air (60°F (15.6°C) at 10 percent overpressure or 3 psig (0.21 barg), whichever is greater

Orifice Designation		H		J		K		L		M		N		P		Q	
Orifice Area		in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>
Set Pressure		.785	5.060	1.287	8.300	1.840	11.870	2.853	18.410	3.600	23.230	4.340	28.000	6.380	41.160	11.050	71.290
		Orifice Capacity															
psig	barg	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min
15	1.03	413	11.69	677	19.17	968	27.41	1501	42.50	1894	53.63	2284	64.68	3358	95.09	5816	164.70
20	1.37	476	13.48	781	22.11	1116	31.60	1731	49.02	2184	61.85	2633	74.56	3871	109.62	6705	189.88
25	1.72	539	15.26	884	25.03	1264	35.79	1960	55.50	2474	70.06	2983	84.47	4385	124.18	7595	215.09
30	2.06	602	17.04	988	27.98	1412	39.98	2190	62.02	2764	78.27	3332	94.36	4898	138.71	8484	240.26
35	2.41	672	19.03	1102	31.20	1575	44.60	2443	69.18	3082	87.28	3716	105.23	5463	154.71	9462	267.96
40	2.75	741	20.98	1216	34.43	1738	49.22	2695	76.32	3401	96.31	4100	116.11	6028	170.71	10441	295.68
45	3.10	811	22.96	1330	37.66	1901	53.83	2948	83.48	3720	105.35	4485	127.01	6593	186.71	11419	323.38
50	3.44	880	24.92	1443	40.86	2064	58.45	3200	90.62	4039	114.38	4869	137.89	7158	202.71	12397	351.08
55	3.79	950	26.90	1557	44.09	2227	63.06	3453	97.78	4357	123.39	5253	148.76	7722	218.68	13376	378.80
60	4.13	1019	28.85	1671	47.32	2390	67.68	3706	104.95	4676	132.42	5637	159.63	8287	234.68	14354	406.50
65	4.48	1089	30.84	1785	50.55	2553	72.30	3958	112.09	4995	141.45	6022	170.54	8852	250.68	15332	434.20
70	4.82	1158	32.79	1899	53.77	2716	76.91	4211	119.25	5313	150.46	6406	181.41	9417	266.68	16310	461.89
75	5.17	1228	34.77	2013	57.00	2878	81.50	4463	126.39	5632	159.49	6790	192.29	9982	282.69	17289	489.62
80	5.51	1297	36.73	2127	60.23	3041	86.12	4716	133.55	5951	168.53	7174	203.16	10547	298.69	18267	517.32
85	5.86	1367	38.71	2241	63.46	3204	90.73	4969	140.72	6270	177.56	7558	214.04	11112	314.69	19245	545.01
90	6.20	1436	40.66	2355	66.69	3367	95.35	5221	147.85	6588	186.57	7943	224.94	11676	330.66	20224	572.74
95	6.55	1506	42.64	2469	69.92	3530	99.96	5474	155.02	6907	195.60	8327	235.82	12241	346.66	21202	600.44
100	6.89	1575	44.60	2583	73.15	3693	104.58	5726	162.16	7226	204.64	8711	246.69	12806	362.66	22180	628.13
105	7.23	1645	46.58	2697	76.37	3856	109.20	5979	169.32	7545	213.67	9095	257.57	13371	378.66	23159	655.86
110	7.58	1714	48.54	2811	79.60	4019	113.81	6232	176.49	7863	222.68	9480	268.47	13936	394.66	24137	683.55
115	7.92	1784	50.52	2925	82.83	4182	118.43	6484	183.62	8182	231.71	9864	279.34	14501	410.66	25115	711.25
120	8.27	1853	52.47	3039	86.06	4345	123.05	6737	190.79	8501	240.74	10248	290.22	15065	426.64	26093	738.95
125	8.61	1923	54.45	3153	89.29	4507	127.63	6989	197.92	8819	249.75	10632	301.09	15630	442.64	27072	766.67
130	8.96	1992	56.41	3267	92.52	4670	132.25	7242	205.09	9138	258.78	11017	312.00	16195	458.64	28050	794.37
135	9.30	2062	58.39	3381	95.74	4833	136.87	7494	212.23	9457	267.82	11401	322.87	16760	474.64	29028	822.07
140	9.65	2131	60.34	3494	98.95	4996	141.48	7747	219.39	9776	276.85	11785	333.75	17325	490.64	30007	849.79
145	9.99	2201	62.33	3608	102.17	5159	146.10	8000	226.56	10094	285.86	12169	344.62	17890	506.64	30985	877.49
150	10.34	2270	64.28	3722	105.40	5322	150.71	8252	233.69	10413	294.89	12554	355.52	18455	522.64	31963	905.19
155	10.68	2340	66.26	3836	108.63	5485	155.33	8505	240.86	10732	303.93	12938	366.40	19019	538.61	32942	932.91
160	11.03	2409	68.22	3950	111.86	5648	159.95	8757	247.99	11050	312.93	13322	377.27	19584	554.61	33920	960.61
165	11.37	2479	70.20	4064	115.09	5811	164.56	9010	255.16	11369	321.97	13706	388.15	20149	570.61	34898	988.31
170	11.72	2548	72.15	4178	118.32	5974	169.18	9263	262.32	11688	331.00	14091	399.05	20714	586.62	35876	1016.00
175	12.06	2618	74.14	4292	121.54	6136	173.77	9515	269.46	12007	340.03	14475	409.93	21279	602.62	36855	1043.73
180	12.41	2687	76.09	4406	124.77	6299	178.38	9768	276.62	12325	349.04	14859	420.80	21844	618.62	37833	1071.43
185	12.75	2757	78.07	4520	128.00	6462	183.00	10020	283.76	12644	358.07	15243	431.68	22408	634.59	38811	1099.12
190	13.10	2826	80.03	4634	131.23	6625	187.62	10273	290.93	12963	367.11	15627	442.55	22973	650.59	39790	1126.85
195	13.44	2896	82.01	4748	134.46	6788	192.23	10525	298.06	13282	376.14	16012	453.45	23538	666.59	40768	1154.54
200	13.78	2965	83.96	4862	137.69	6951	196.85	10778	305.23	13600	385.15	16396	464.33	24103	682.59	41746	1182.24
205	14.13	3035	85.95	4976	140.92	7114	201.46	11031	312.39	13919	394.18	16780	475.20	24668	698.59	42725	1209.97
210	14.47	3104	87.90	5090	144.14	7277	206.08	11283	319.53	14238	403.22	17164	486.08	25233	714.59	43703	1237.66
215	14.82	3174	89.88	5204	147.37	7440	210.70	11536	326.69	14556	412.22	17549	496.98	25798	730.59	44681	1265.36
220	15.16	3243	91.84	5318	150.60	7603	215.31	11788	333.83	14875	421.26	17933	507.86	26362	746.57	45659	1293.06
225	15.51	3313	93.82	5431	153.80	7766	219.93	12041	341.00	15194	430.29	18317	518.73	26927	762.57	46638	1320.78
230	15.85	3382	95.77	5545	157.03	7928	224.52	12294	348.16	15513	439.32	18701	529.61	27492	778.57	47616	1348.48
235	16.20	3452	97.76	5659	160.26	8091	229.13	12546	355.30	15831	448.33	19086	540.51	28057	794.57	48594	1376.18
240	16.54	3521	99.71	5773	163.49	8254	233.75	12799	362.46	16150	457.36	19470	551.39	28622	810.57	49573	1403.90
245	16.89	3591	101.69	5887	166.71	8417	238.36	13051	369.60	16469	466.40	19854	562.26	29187	826.57	50551	1431.60
250	17.23	3660	103.65	6001	169.94	8580	242.98	13304	376.76	16787	475.40	20238	573.14	29751	842.54	51529	1459.30

# Valve Configuration Code



## Standard Valve Connection

Inlet Sizes		Orifice	Area	
in.	mm		in <sup>2</sup>	cm <sup>2</sup>
1.50	38.1	H	0.785	5.065
1.50	38.1	J	1.287	8.303
2.00	50.8	K	1.840	11.871
2.50	63.5	L	2.853	18.406
3.00	76.2	M	3.600	23.226
4.00	101.6	N	4.340	28.000
4.00	101.6	P	6.380	41.161
6.00	152.4	Q	11.050	71.290

## Pressure Design

Designation	Pressure Range
	SET ≥ 125 psig (8.62 barg)
LP2	5 - 26 psig (0.34 - 1.79 barg)
LP3	27 - 124 psig (1.86 - 8.55 barg)

## Inlet Type

Designation	Size	Orifice
2	250# R. F	All
1	125# F. F.	All
FS	Female Screwed (Size 1.5" (38.1 mm), 2" (50.8 mm), 2.5"(63.5 mm))	H-L

## Alternate Inlet Size

Size		Orifice
in.	mm	
2.00	50.8	H
2.50	63.5	
3.00	76.2	
2.00	50.8	J
2.50	63.5	
3.00	76.2	
2.50	63.5	K
3.00	76.2	
3.50	88.9	
4.00	101.6	
3.00	76.2	L
3.50	88.9	
4.00	101.6	
3.50	88.9	M
4.00	101.6	
4.50	114.3	

## Material Trim

Designation	Trim
	Standard
S	Stainless Trim

# Ordering a 1511 Series Safety Valve

Please Specify:	Example
Number of valves	3
Valve inlet	
Size (standard, oversize)	1.5" (38.09 mm) standard 250#
Connection (250#, 125# FNPT)	250#
Type number of valve	1511JS-0-2
Set pressure	100 psig (6.89 barg)
Operating pressure	80 psig (5.52 barg)
Operating, relieving and design temperature	325°F/339°F/400°F (163°C/171°C/204°C)
Built-up back pressure	5 psig (0.34 barg)
Allowable overpressure	3 percent
Orifice size	J
Required capacity	6,500 PPH
Service (air, steam)	Steam
ASME boiler and pressure codes	
Section I - fired pressure vessels	ASME Section I
Section XIII - unfired pressure vessels	
Trim (bronze, stainless)	Stainless
Material substitution (government ring, specify other)	-
Accessories (gag, spring cover, spring coating)	Gag
Certification (for approval, for record)	-
Customer drawings (for approval, for record)	for approval
Note any special needs	-

# Direct Sales Office Locations

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