

# 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 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

# 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	$\frac{5}{9} (°F - 32)$	°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

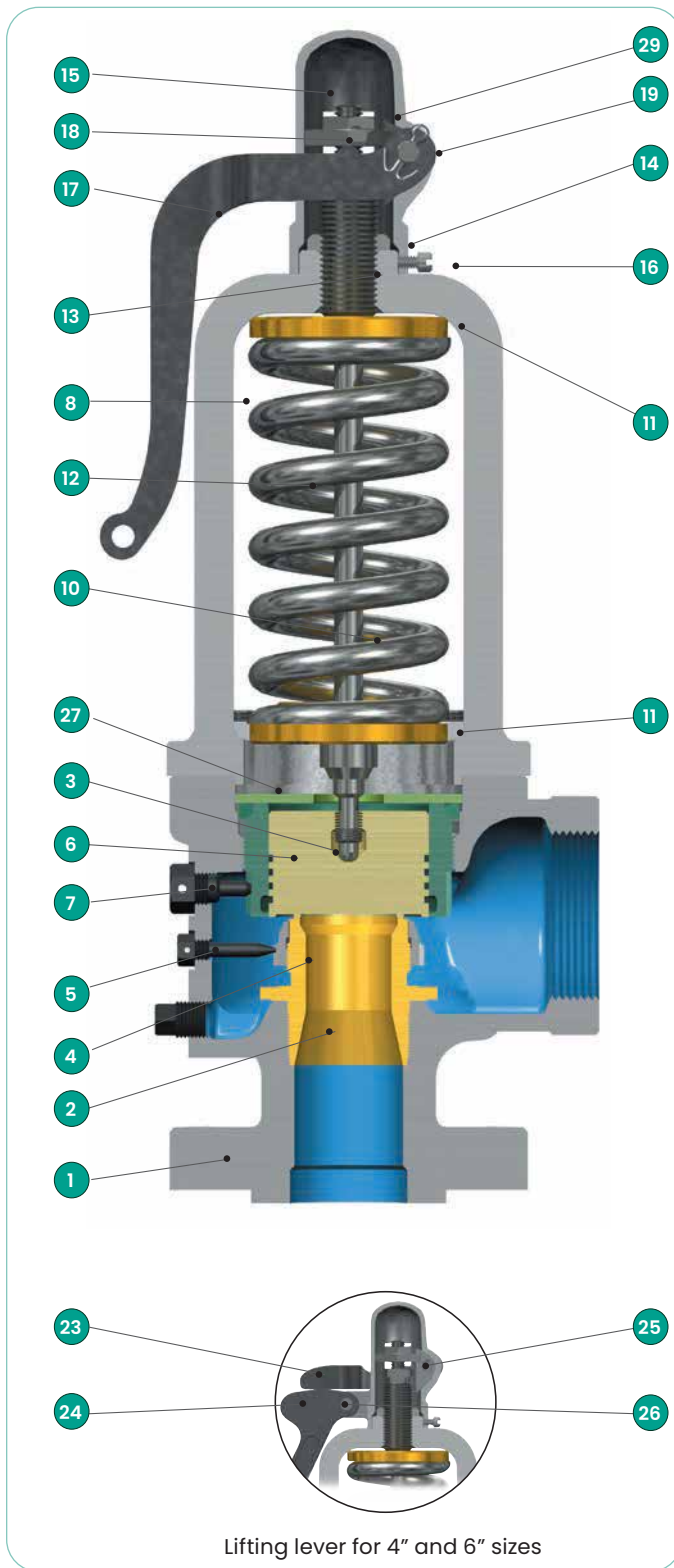
Orifice	Override Inlet Flange	
	in.	mm
H	2.00	50.8
	2.50	63.5
	3.00	76.2
J	2.00	50.8
	2.50	63.5
	3.00	76.2
K	2.50	63.5
	3.00	76.2
	3.50	88.9
	4.00	101.6
L	3.00	76.2
	3.50	88.9
	4.00	101.6
M	3.50	88.9
	4.00	101.6
	4.50	114.3

### 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



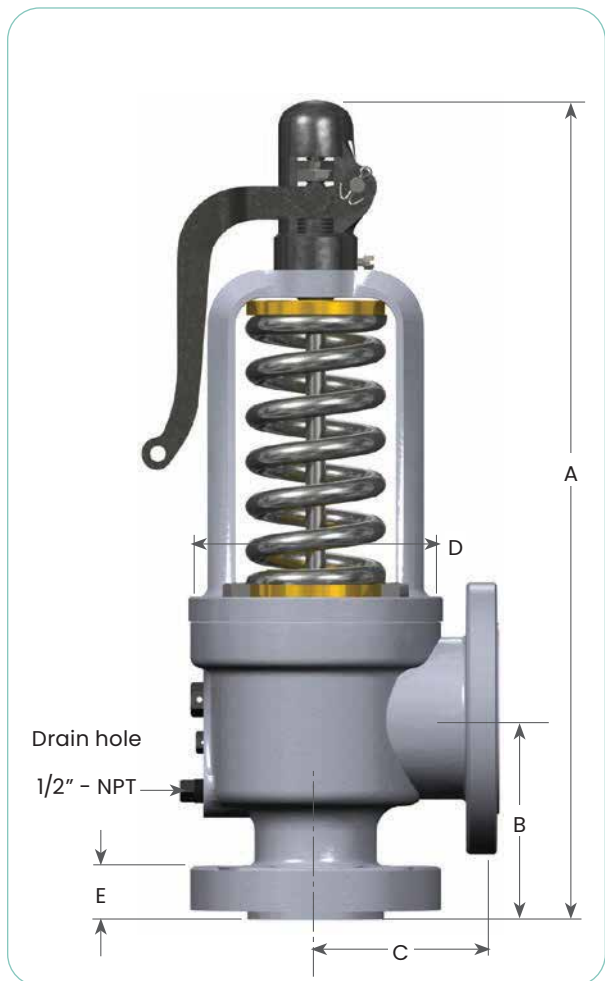
## Parts and Materials

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

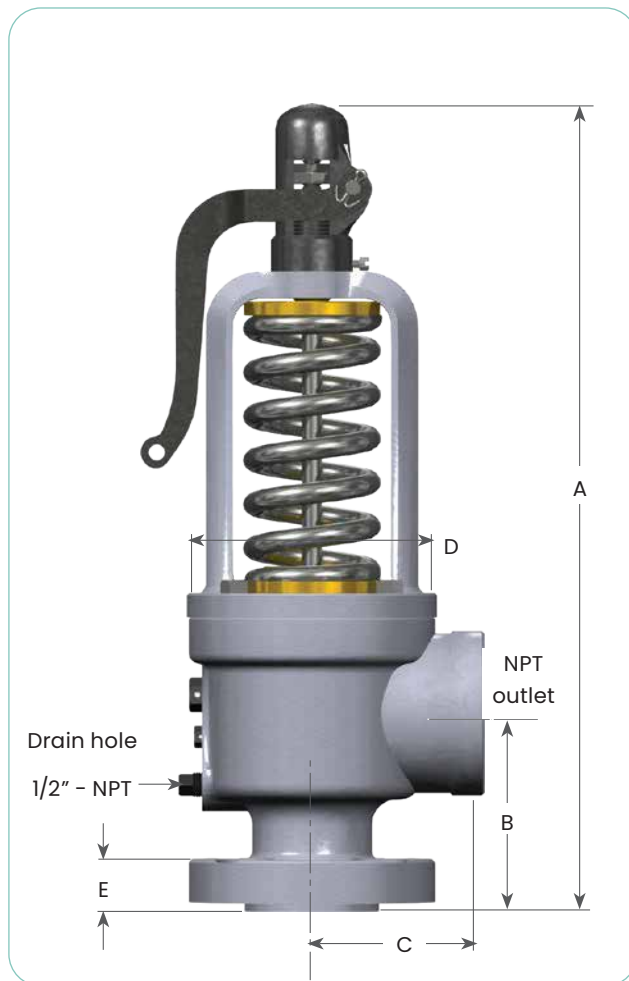
1. Stainless steel materials are available as an alternate for disc and seat bushing; select 1511\_S.
2. Required for 5-26 psig (0.34 - 1.79 barg).

# 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.

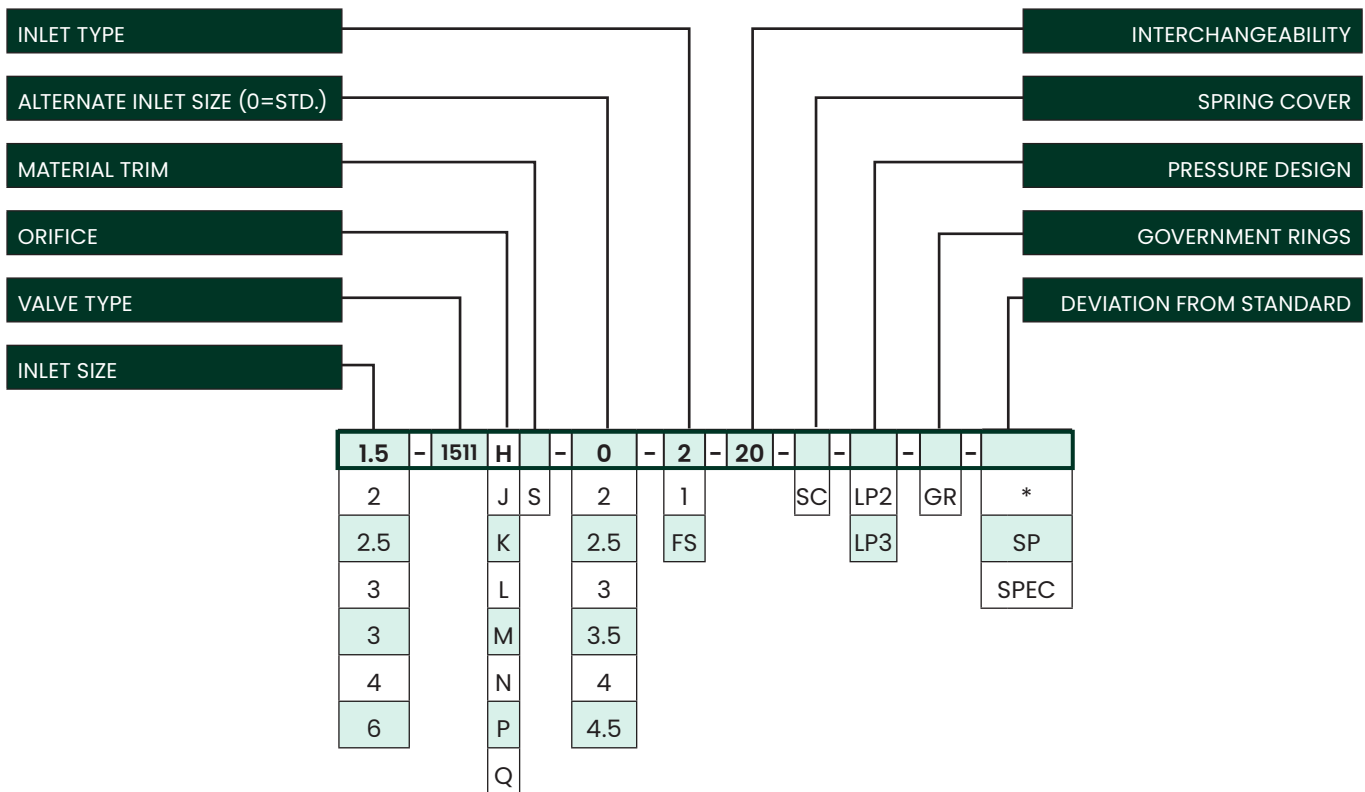








# Valve Configuration Code



## 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	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	

## 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	-



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VALVES ACTUATORS INSTRUMENTATIONS