

# KUNKLE SAFETY AND RELIEF PRODUCTS

## DATA SUPPLEMENT

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### CONTENTS

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ASME Codes .....	2-3
Seat Tightness Performance Standards .....	4
Valve Selection Guide .....	5-7
Sizing and Selection.....	8-11
General Information .....	12

All valve dimensions are for reference only.

### ASME CODES

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The ASME (American Society of Mechanical Engineers) boiler and pressure vessel code requirements for overpressure protection as they relate to Kunkle products are as follows:

#### ASME Section I

This code applies to boilers where steam or other vapor is generated at a pressure greater than 15 psig [1.0 barg], high temperature water boilers intended for operation at pressures exceeding 160 psig [11.03 barg] and/or temperatures exceeding 250°F [121°C] and liquid phase thermal fluid heaters.

#### Boiler Pressure Accumulation

No more than 6% above the highest pressure at which any valve is set, or no more than 6% above MAWP.

#### Set Pressure

The set pressure of a one-valve installation cannot be higher than the MAWP. The set pressure of the second or other valves in a multiple valve installation can be up to 3% above the MAWP. The complete range of valve settings for multiple valve installations cannot be greater than 10% of the highest set pressure. For high temperature water boilers, this 10% range may be exceeded.

#### ASME Section IV and XIII - HV

This code applies to steam boilers operating at pressures not greater than 15 psig [1.0 barg] and hot water heating boilers operating at pressures not greater than 160 psig [11.03 barg] and/or temperatures not greater than 250°F [121°C].

#### Steam Boilers

Valve capacity must be selected to prevent the boiler pressure from rising more than 5 psig [0.35 barg] above the MAWP.

#### Hot Water Boilers

Safety valve must be set to relieve at a pressure not greater than the MAWP of the boiler. If more than one safety valve is used, the secondary valve(s) may be set up to 6 psig [0.41 barg] above the MAWP for boilers with MAWPs up to and including 60 psig [4.13 barg], and 5% for boilers with MAWPs greater than 60 psig [4.13 barg]. Capacity must be selected to prevent the pressure from rising more than 10% above the MAWP if one valve is used or 10% above the set pressure of the highest set valve if more than one valve is used.

#### Tanks/Heat Exchangers High Temperature Water-to-Water Heat Exchangers

Valve(s) must be set at a pressure not greater than the MAWP and with sufficient capacity to prevent the pressure from increasing more than 10% above the MAWP.

#### Steam to Hot Water Supply

Valve must be at least 1" [25 mm] diameter with set pressure not greater than MAWP of the tank.

#### High Temperature Water to Steam Heat Exchanger

Valve must be set at a pressure not greater than 15 psig [1.0 barg] and with sufficient capacity to prevent the pressure from rising more than 5 psig [0.35 barg] above the MAWP.

#### ASME Section VIII and XIII - UV

This code applies to unfired pressure vessels with an inside diameter larger than 6 inches [130 mm] and designed for use above 15 psig [1.0 barg]. Valve(s) must prevent the pressure from rising more than 10% or 3 psig [0.21 barg], whichever is greater, above the MAWP. For a single valve installation, the set pressure may not be greater than the MAWP. For multiple valve installations, the first valve cannot be set higher than the MAWP, but the other valves can be set up to 5% above the MAWP. The pressure rise for multiple valve installations can be 16% or 4 psig [0.27 barg], whichever is greater. When the vessel is exposed to an external heat source, such as fire, the pressure rise can be 21% above the MAWP.

#### NOTE

Information stated is for reference only. User should always refer to the current revision of the ASME BPVC.

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### ASME CODE REQUIREMENTS


#### National Board

Kunkle valves are manufactured at facilities that meet the manufacturing requirements of the ASME Sections I (V), IV and XIII (HV) and VIII and XIII (UV) codes for pressure relief valves. Valves that have the relief capacity certified by the National Board of Boiler and Pressure Vessel Inspectors bear the following code symbol stamp on the nameplate and the letters NB. Most Kunkle valves have NB certified capacities.

#### Code Stamps

'V'  applies to all ASME Section I valves

'HV'  applies to all ASME Section IV and XIII-HV valves

'UV'  applies to all ASME Section VIII and XIII-UV valves

#### NOTE

Information stated above is based on latest Code at time of publication.

### POWER BOILER - SECTION I - CODE 'V'

Set Pressure		Set Pressure Tolerance	Minimum Blowdown <sup>2</sup>	Overpressure <sup>1</sup>
psig	[barg]			
15 - 100	[1.03 - 6.90]		2 psig [0.14 barg] min.	
101+	[6.96+]		2%	
15 - 70	[1.03 - 4.83]	±2 psig [±0.14 barg]		
71 - 300	[4.90 - 20.69]	±3 %		
301 - 1000	[20.95 - 68.96]	±10 psig [±0.69 barg]		
1001 and up	[69.03 and up]	±1%		

#### NOTES

- Overpressure would be 2 psig [0.14 barg] for pressures between 15 - 66 psig [1.03 - 4.55 barg]. Pressures above 66 psig [4.55 barg] would have an overpressure of 3%. Valves marked for liquid service have allowable overpressure of 10% or 3 psig (whichever is greater).
- Maximum blowdown is 10% for "Special Application Section I" valves.

### HEATING BOILER - SECTION IV - CODE 'HV'

	Set Pressure		Set Pressure Tolerance	Blowdown	Overpressure
	psig	[barg]			
15 psig Steam	15	[1.0]	±2 psig [±0.14 barg]	2 - 4 psig [0.14 - 0.28 barg]	5 psig [0.34 barg]
Hot Water	15 - 60	[1.0 - 4.14]	±3 psig [±0.21 barg]	N/A	10%
Hot Water	61 - 160	[4.20 - 11.0]	±5%	N/A	10%

### UNFIRED PRESSURE VESSEL - SECTION VIII - CODE 'UV'

Set Pressure		Set Pressure Tolerance	Blowdown	Overpressure
psig	[barg]			
15 - 30	[1.0 - 2.07 barg]	±2 psig [±0.14 barg]	N/A	3 psig [0.21 barg]
31 - 70	[2.14 - 4.83 barg]	±2 psig [±0.14 barg]	N/A	10%
71 and up	[4.90 barg and up]	±3%	N/A	10%

### NON-CODE SET PRESSURE TOLERANCE

Set Pressure, psig [barg]	Set Pressure Tolerance, psig [barg]
Below 15 psig [1.0 barg] to 10 psig [0.69 barg]	+/- 2.0 psig [± 0.14 barg]
Below 10 psig [0.69 barg] to 5.0 psig [0.34 barg]	+/- 1.0 psig [± 0.07 barg]
Below 5.0 psig [0.34 barg]	+/- 0.5 psig [± 0.03 barg]
Below 0.0" Hg [0.0 mb] to 10" Hg [337 mb]	+/- 1.0" Hg [± 33.7 mb]
Below 10" Hg [337 mb] to 20" Hg [674 mb]	+/- 2.0" Hg [± 67.4 mb]
Below 20" Hg [674 mb]	+/- 4.0" Hg [± 134.8 mb]