

# Safety and Relief Valves

## Product Overview

### Kunkle Valves



Kunkle Valve is a leading supplier of Safety and Relief Valve Products for industrial and commercial applications, such as steam boilers, air, or non-hazardous gases. Kunkle products are available with certification to ASME Section I, Section IV, and Section VIII. In addition, Kunkle Valve offers a range of non-code products. The breadth of the Kunkle Valve product offering is second to none in terms of industrial and commercial safety and relief valve products. Products range in size from 1/4" NPT to 6" flange and are suitable for services ranging from cryogenic to 850°F, at pressures ranging from vacuum to 6,500 psig. BSP threads available on selected models.

## Bronze Safety Valves For Air, Gas and Steam Service

**Models 1 and 2** Compact assembly allows minimum space requirements. Precision lapped, metal-to-metal beveled seat provides premium shutoff. Adjustable blowdown for precise opening, with minimum preopen or simmer, and exact blowdown control. Available in top or side outlet. Nickel plating for use on institutional equipment (Variation 03). Vibration dampener on lift lever (Variation 02).

**Specifications:**

Sizes: 1/2", 3/4" and 1" [15, 18 and 25 mm]  
 Pressure/Temperature Limits: 250 psig [17.2 barg]/406°F [208°C]

**Applications:**

- Air and non-hazardous gas service.
- Air/Gas Compressors - portable or stationary.
- Pressure Vessels - including tanks, receivers, intercoolers, aftercoolers.
- Steam turbines, kettles, other steam-processing equipment.

Request KUKMC-0375-US



## Bronze Relief Valves For Liquid Service

**Models 19, 20 and 200** Extra heavy, rugged construction. Both inlet and outlet connections are cast integral with body to permit easy inspection and servicing without disconnecting piping. Seats lapped for optimum performance. Spherical pivot between disc and spring corrects misalignment and compensates for spring side thrust.

**Specifications:**

Sizes: 1/2" to 3" [15 to 80 mm]  
 Pressure/Temperature Limits: 300 psig [20.7 barg]/406°F [208°C]

**Applications:**

- Overpressure relief and protection of pumps, tanks, lines and hydraulic systems.
- Pressure regulation.
- Continuous bypass relief.

Request KUKMC-0376-US



## Brass Safety Relief Valve For Air and Gas Service

**Model 30** Top-guided disc provides optimum performance.

**Specifications:**

Sizes: 1/4" [7 mm]  
 Pressure/Temperature Limits: 4000 psig [276 barg]/300°F [150°C]

**Applications:**

- Small to medium size, multi-stage, air compressors, intercoolers, aftercoolers, instrument/control air lines and systems.
- Air tanks/receivers and pressurized equipment.

Request KUKMC-0377-US



## Sentinel Relief Valves For Steam Service

**Models 40R and 40RL** All parts are stainless steel. Precision lapped beveled seats for optimum performance. Pivot between spring and disc corrects misalignment and compensates for spring side thrust.

**Specifications:**

Sizes: 1/2" and 3/4" [15 and 18 mm]  
 Pressure/Temperature Limits: 400 psig [27.6 barg]/850°F [455°C]

**Applications:**

- Sentinel (warning) on steam equipment. Intended as audible warning device, not for pressure relief.
- Steam turbines.

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## Iron, Steel, Stainless Steel Relief Valves For Liquid Service



**Models 71S and 171** Extra heavy, rugged construction. Seats lapped for optimum performance. Spherical pivot between disc and spring corrects misalignment and compensates for spring side thrust.

**Specifications:**

Sizes:  $\frac{1}{2}$ " to 2" [15 to 50 mm]

Pressure/Temperature Limits: 400 psig [27.6 barg]/550°F [288°C]

**Applications:**

- Overpressure relief and protection of pumps, tanks, lines and hydraulic systems. Acid, caustic, ammonia and other corrosive liquids requiring iron, steel or stainless steel materials.
- Pressure regulation.
- Bypass relief.
- All 316 stainless steel Models 171S suitable for sanitary/edible corrosive applications.

Request KUKMC-0379-US

## Iron Relief Valves For Liquid Service



**Model 91** Extra heavy, rugged construction with bolted bonnet to permit easy inspection and servicing without removal from system. Quality cast iron body and bonnet with bronze trim (insert and disc). Available with optional stainless steel insert and disc. Spring is steel with aluminum painting for corrosion protection. High lift, wing guided disc offers high relieving capacity. Insert and disc lapped for optimum performance. Pivot between disc and spring corrects misalignment and compensates for side thrust.

**Specifications:**

Sizes:  $1\frac{1}{2}$ " to 6" [40 to 150 mm]

Pressure/Temperature Limits: 400 psig [27.6 barg]/406°F [208°C]

**Applications:**

- Overpressure relief and protection of pumps, tanks, lines and hydraulic systems.
- Pressure regulation.
- Suitable for installations where back pressures to 60 psig [4.14 barg] are present.

Request KUKMC-0380-US

## Iron Relief Valves For Liquid Service



**Models 218 and 228** Extra heavy, rugged construction with bolted bonnet to permit easy inspection and servicing without removal from system. Quality cast iron body and bonnet with bronze trim (insert and disc). Available with optional stainless steel insert and disc. Spring is steel with aluminum painting for corrosion protection. High lift, wing guided disc offers high relieving capacity. Insert and disc lapped for optimum performance. Pivot between disc and spring corrects misalignment and compensates for side thrust.

**Specifications:**

Sizes: 3", 4" and 6" [80, 100 and 150 mm]

Pressure/Temperature Limits: Adjustable 60/200 psig [4.14/13.8 barg]/406°F [208°C]

**Applications:**

- Fire Pump Service, UL and FM approved.
- 218 standard with handwheel for easy adjustment.

Request KUKMC-0380-US

## Stainless Steel Relief Valves For Liquid Service



**Model 140** Compact design requires minimum installation space. Angle lapped seat provides tight shut-off.

**Specifications:**

Sizes:  $\frac{3}{8}$ " and  $\frac{1}{2}$ " [10 and 15 mm]

Pressure/Temperature Limits: 300 psig [20.7 barg]/406°F [208°C]

**Applications:**

- A general utility valve of all stainless steel construction, including spring, for liquid and non-code vapor installations.

Request KUKMC-0381-US

## Safety Valves For Air Gas, Cryogenic Service

**Models 189, 363 and 389** Unique three-piece disc assembly (with Teflon® seat/seal) offers superior “leak-free” performance over the entire pressure/temperature operating range. Control ring offers precise adjustment of blowdown. Heavy duty construction provides long service life. Pivot between disc and spring corrects for all misalignment and compensates for spring side thrust.

### Specifications:

Sizes: 1/2" and 3/4" [15 and 18 mm]

Pressure/Temperature Limits: 2500 psig [172.4 barg]/350°F [177°C]

### Applications:

- Cryogenic “cold” and liquefied gas, oxygen and gas service.
- Multi-stage air and gas compressors, intercoolers and aftercoolers and receivers.
- Thermal expansion relief and/or full rated capacity discharge.
- Air, gas and liquefied gas lines and systems.

Request KUKMC-0382-US



## Iron Vacuum Valves

**Model 215V** High capacity full nozzle design. Bronze nozzle, disc and guide with cast iron housing. Flat bronze valve seats are lapped for optimum performance. Warn ring offers easy adjustability for precise opening and minimum pre-open or simmer and exact blowdown control. Pivot between disc and spring corrects misalignment and compensates for spring side thrust.

### Specifications:

Sizes: 2", 2 1/2" and 3" [50, 65 and 80 mm]

Vacuum Limits 22" Hg [0.759 Kg cm<sup>2</sup>]/406°F [208°C]

### Applications:

- Bulk hauling trailers/equipment.
- Light gauge tanks.
- Protection of high volume vacuum pumps and conveying systems.

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## Iron Safety Valves For Air and Non-Hazardous Gas Service

**Model 337** High capacity full nozzle design. Bronze nozzle, disc and guide with cast iron housing. Flat bronze valve seats are lapped for optimum performance. Warn ring offers easy adjustability for precise opening and minimum pre-open or simmer and exact blow-down control. Pivot between disc and spring corrects misalignment and compensates for spring side thrust. Reversible lift lever for “pull-up” or “pull-down” manual testing. Optional SS trim available.

### Specifications:

Sizes: 2", 2 1/2" and 3" [50, 65 and 80 mm]

Pressure/Temperature Limits: 60 psig [4.14 barg]/406°F [208°C]

### Applications:

- Protection of low-to-medium pressure, high volume blowers, compressors and pneumatic conveying systems.
- Bulk hauling trailers/equipment.
- Light gauge trucks.

Request KUKMC-0383-US



## Blower Relief Valves

**Model 338** is a non-code modulating Relief Valve for air service.

### Specifications:

Sizes: 2" [50 mm]

Pressure/Temperature Limits: 5 to 30 psig [0.69 to 2.06 barg] -30°F to 400°F [-34°C to 204°C]

### Applications:

- Protection of low to medium pressure, high volume blowers.
- Bulk hauling trailers/equipment.

Request KUKMC-0258-US





## Relief Valves For Air/Gas Service



**Models 230, 330, 330S and 333S** Lightweight aluminum construction, resistant to environmental and internal corrosion. Opening pressure is repetitively consistent, relief action is smooth, reseating is positive with minimum pressure drop. The full spring load is never imparted to synthetic disc insert. Seat tightness increases to a maximum as inlet pressure approaches the opening pressure.

**Specifications:**

Sizes: 1/4" to 1/2" [7 to 15 mm]

Pressure/Temperature Limits: 330: 1000 psig [69 barg] minimum,  
6500 psig [448.3 barg] maximum/185°F [85°C]

230: 300 psig [20.7 barg] minimum,  
1500 psig [103.4 barg] maximum/185°F [85°C]

**Applications:**

- Multi-stage high pressure compressors, intercoolers and after-coolers.
- High pressure receivers and storage bottles.
- Thermal expansion relief.
- Breathing air pac recharge compressors.
- Scuba recharge compressors.

Request KUKMC-0384-US

## Steel, Stainless Steel Safety/Relief Valves For Liquid, Air, Gas, Steam Service



**Models 264, 265, 266, and 267** Extra heavy rugged construction. Top guided design offers high capacity with 0.110 in<sup>2</sup> [0.2794 cm<sup>2</sup>] orifice area. Seats lapped to optical flatness. Ball bearing pivot between disc and spring corrects misalignment and compensates for spring side thrust.

**Specifications:**

Sizes: 1/2", 3/4" and 1" [15, 18, and 25 mm]

Pressure/Temperature Limits: 3300 psig [227.6 barg]/750°F [400°C]

**Applications:**

- Protection of pumps, compressors, pressure vessels or systems handling corrosive liquids or vapors at high pressure and/or temperature.
- Sentinel (warning) on steam equipment.

Request KUKMC-0385-US

## Steel Safety Valves For Steam, Air, Non-Hazardous Gas Service



**Models 300 and 600** Heavy duty construction of high quality steel with stainless steel full-nozzle trim. Bolted bonnet design for easy maintenance. Steel yoke incorporates a cover-shield for guiding surfaces and provides for fully exposed spring. Seats lapped to optical flatness. Dual control rings offer easy adjustability for precision opening with minimum pre-open or simmer and exact blowdown control. Heavy duty lift lever assembly.

**Specifications:**

Sizes: 1 1/4" to 6" [32 through 150 mm]

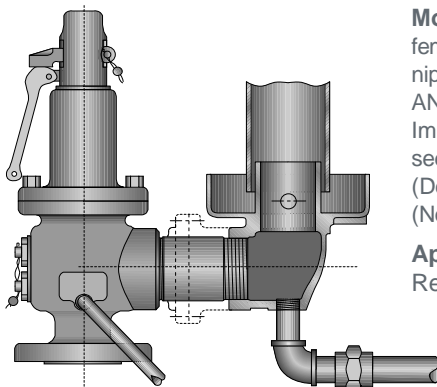
Pressure/Temperature Limits: 1000 psig [69 barg]/750°F [400°C]

**Applications:**

- Steam boilers and generators.
- Pressure reducing stations.
- Air/gas compressors – reciprocating or rotary.
- Pressure Vessels – including tanks, receivers, intercoolers, oil-gas separators, lines.
- Gags available.

Request KUKMC-0387-US

## Drip Pan Elbow



**Model 299** Illustration shows a discharge elbow and drip pan unit attached to a safety valve with female NPT outlet. For safety valves with flanged outlets – 2" to 4" – use companion flange, short nipple and drip pan elbow, all same size as valve outlet. 6" and 8" elbows have integral 125# ANSI B16.1 Flange.

Important - Length of discharge piping must be kept to a minimum. For design considerations see articles: "Steam Flow Through Safety Valve Vent Pipes" by H.E. Brandmaier and M.E. Knebel (Dec. 1975) and "Analysis of Power Plant Safety and Relief Valve Vent Stacks" by G.S. Liao (Nov. 1974) available through ASME Publications.

**Applications:**

Recommended installation on outlet/discharge pipe for safety valves. Used on steam service.

Request KUKMC-0386-US

## Safety Valves For Hot Water Heating Boilers

**Model 537** Extra heavy construction provides long life. Top guided disc assembly incorporates resilient seal in seating area. Working parts are protected from corrosion by discharged liquid by an isolating diaphragm. Pivot between disc assembly and stem corrects for misalignment and compensates for spring side thrust. Heavy duty lift lever.

### Specifications:

Sizes:  $\frac{3}{4}$ " to 2" [18 to 50 mm]

Pressure/Temperature Limits: 160 psig [11 barg]/250°F [121°C]

### Applications:

- Hot water boiler and generators.
- ASME Code Section IV.

Request KUKMC-0388-US



## Brass Safety Valves for Air, Non-hazardous Gas

**Models 541, 542 and 548** Top guided disc – High capacity – Brass construction – Manual lift ring – Canadian registered.

**541** – Brass construction/BUNA-N seat

**542** – Brass construction/Viton® seat

**548** – Brass construction/SS seat (metal seats)

### Specifications:

Sizes:  $\frac{1}{4}$ " and  $\frac{1}{2}$ " [7 and 15 mm]

Pressure/Temperature Limits: 400 psig [27.6 barg]/400°F [204°C]

### Applications:

- Small-to-medium size, single and multi-stage, air compressors, intercoolers, aftercoolers, instrument/control air lines and systems.
- Air tanks/receivers and pressurized equipment.

Request KUKMC-0389-US



## Stainless Steel Safety Valves for Air and Gas Service

**Models 803 and 818** Lightweight aluminum and SS construction, resistant to environmental and internal corrosion.

### Specifications:

Sizes:  $\frac{1}{4}$ " and 2" [7 and 50 mm]

Pressure/Temperature Limits: 803: 6000 psig [413.8 barg]/185°F [85°C] 818: 150 psig [10.3 barg]/300°F [150°C]

### Applications:

- Small to medium size, single and multi-stage, air compressors, intercoolers, aftercoolers, instrument/control air lines and systems.
- Air tanks/receivers and pressurized equipment.

Request KUKMC-0390-US



## Bronze, Steel and Stainless Steel Safety Relief Valves For Air, Gas, Steam, Liquid and Vacuum Service

**Models 910, 911, 912 and 913** Valve housing is heavy duty cast steel, stainless steel or bronze. Standard spring material is stainless steel suitable for temperatures to 550°F [288°C]. High temperature alloy spring good to 800°F [427°C]. Hex on valve nozzle provides for easy installation. Single control ring offers easy adjustability of blowdown. Pivoting disc design offers exceptional seat alignment. Seats lapped to optical flatness. Guide-to-nozzle ratio reduces friction. Models 920, 921 and 927 are certified for ASME Section I - Special Requirements. Models 916, 917, 918 and 919 O-ring soft seated valves are temperature limited by soft seat material. Available for FM Firepump service.

### Specifications:

Sizes:  $\frac{1}{2}$ " to 2" [15 to 50 mm]

Pressure/Temperature Limits: 910: 1400 psig [96.5 barg]/800°F [427°C] steel/stainless steel trim,

911: 1400 psig [96.5 barg]/800°F [427°C] all stainless steel,

912: 300 psig [17.2 barg]/406°F [208°C] bronze/brass trim,

913: 1400 psig [96.5 barg]/425°F [219°C] bronze/SST trim

### Applications:

- Air/gas compressors.
- Liquid Filled Pressure Vessels/Systems – ASME Sec. VIII (UV).
- High Temperature/Pressure Hot Water Boilers – ASME Sec. I (V).
- Pressure Vessels – containing gas, air or steam.
- Process and industrial applications requiring steel/stainless steel construction.
- Optional resilient soft seats available for superior leak free performance.
- Vacuum service.

Request KUKMC-0392-US



## Iron Safety Valves For Steam Heating Boilers



**Model 930** Extra high capacity for industrial, commercial and residential low pressure, steam heating boilers. Cast iron with bronze nozzle, disc and guide. Large seat area/guide area ratio, along with disc pivot design insures top valve performance. Flat bronze valve seats are lapped for optimum performance. Reversible lift lever for “pull-up” or “pull-down” manual testing.

**Specifications:**

Sizes: 2", 2<sup>1</sup>/<sub>2</sub>" and 3" [50, 65 and 80 mm]

Pressure/Temperature Limits: 15 psig [1.03 barg]/250°F [122°C]

**Applications:**

- Low pressure steam heating boilers ASME Code Section IV, 15# set pressure.

Request KUKMC-0391-US

## Bronze Safety Valves For Air Steam, Non-Hazardous Gas



**Series 6000** Valve housing is heavy duty casting. Wide hex on valve body provides clearance for easy installation. Seats lapped to optical flatness. Dual control rings offer easy adjustability for precise opening with minimum pre-open or simmer and exact blowdown control. Ball bearing pivot between disc and spring corrects misalignment and compensates for spring side thrust. Grooved piston type disc reduces sliding area and friction. Heavy duty lift lever assembly. Models 6010, 6030, 6182 and 6130 provided with optional resilient O-ring seat for superior leak-free performance. Models 6021, 6121, 6221, and 6934 offer Teflon® (PFA) disc insert for exceptional leak-free performance (use on steam only). Models 6030, 6130, 6230, and 6935 supplied with stainless steel disc and nozzle for use on severe applications and/or set pressure up to 300 psig [20.7 barg].

**Specifications:**

Sizes: 1/2" to 2<sup>1</sup>/<sub>2</sub>" [15 to 65 mm]

Pressure/Temperature Limits: 300 psig [20.7 barg]/425°F [219°C]

**Applications:**

- Steam boilers and generators.
- Air/gas compressors – reciprocating or rotary – portable or stationary, intercoolers and aftercoolers.
- Pressure Vessels – containing steam, air or non-hazardous gas. Including tanks, receivers, sterilizers and autoclaves.
- Pressure Reducing Valves – protection of the discharge or low pressure side of system.
- Models 6933, 6934 and 6935 are certified for ASME Section IV.
- O-ring disk available with BUNA-N, EPR and Viton®.

Request KUKMC-0394-US

## Iron Safety Valves For Air Steam, Non-Hazardous Gas Service



**Models 6252 and 6254** Heavy duty construction of high quality cast iron with stainless steel semi-nozzle trim. Bolted bonnet design for easy maintenance. Seats lapped to optical flatness. Dual control rings offer easy adjustability for precision opening with minimum pre-open or simmer and exact blowdown control. Heavy duty lift lever assembly.

**Specifications:**

Sizes: 1<sup>1</sup>/<sub>2</sub>" to 6" [40 to 150 mm]

Pressure/Temperature Limits: 250 psig [17.2 barg]/406°F [208°C]

**Applications:**

- Steam boilers and generators.
- Pressure reducing stations.
- Air/gas compressors – reciprocating or rotary.
- Pressure Vessels – including tanks, receivers, intercoolers, oil-gas separators, lines.
- Blower applications.
- Vacuum service.

Request KUKMC-0393-US

## Model Index

Model	Inlet Sizes		NPT	Flange	Air/Gas	Steam	Hot Water	Liquid	Vacuum
	in	[mm]							
1 and 2	1/2, 3/4 - 1	[15, 18 - 25]	☑		☑	☑			
19	1/2 - 3	[15 - 80]	☑	☑				☑	
20	1/2 - 3	[15 - 80]	☑	☑				☑	
200A/200H	1/2 - 2	[15 - 50]	☑	☑				☑	
30	1/4	[7]	☑		☑				
40R	1/2 - 3/4	[15 - 18]	☑			☑			
71S	1/2 - 2	[15 - 50]	☑					☑	
171	1/2 - 2	[15 - 50]	☑					☑	
171S	1/2 - 2	[15 - 50]	☑					☑	
91	1 1/4 - 6	[32 - 150]	☑	☑				☑	
218	3 - 6	[80 - 150]	☑	☑				☑	
228	3 - 6	[80 - 150]	☑	☑				☑	
140	3/8 - 1/2	[10 - 15]	☑					☑	
189	1/2 - 3/4	[15 - 18]	☑		☑				
363	1/2 - 3/4	[15 - 18]	☑		☑				
389	1/2 - 3/4	[15 - 18]	☑		☑				
215V	2, 2 1/2, 3	[50, 65, 80]	☑		☑				☑
337	2, 2 1/2, 3	[50, 65, 80]	☑		☑				
338	2	[50]	☑		☑				
230/330	1/4	[7]	☑		☑				
333	1/4	[7]	☑		☑				
264/265	1/2, 3/4 - 1	[15, 18 - 25]	☑		☑	☑		☑	
266/267	1/2, 3/4 - 1	[15, 18 - 25]	☑		☑	☑		☑	
300/600	1 1/4 - 6	[32 - 150]		☑	☑	☑			
537	3/4 - 2	[18 - 50]	☑				☑		
541, 542	1/4 - 1/2	[7 - 15]	☑		☑				
548	1/4 - 1/2	[7 - 15]	☑		☑				
803, 818	1/4 - 2	[7 - 50]	☑		☑				
910	1/2 - 2	[15 - 50]	☑	☑	☑	☑		☑	☑
911	1/2 - 2	[15 - 50]	☑	☑	☑	☑		☑	☑
912	1/2 - 2	[15 - 50]	☑		☑	☑		☑	☑
913	1/2 - 2	[15 - 50]	☑	☑	☑	☑		☑	☑

Model	Inlet Sizes		NPT	Flange	Air/Gas	Steam	Hot Water	Liquid	Vacuum
	in	[mm]							
916	1/2 - 2	[15 - 50]	☑	☑	☑	☑		☑	☑
917	1/2 - 2	[15 - 50]	☑	☑	☑	☑		☑	☑
918	1/2 - 2	[15 - 50]	☑		☑	☑		☑	☑
919	1/2 - 2	[15 - 50]	☑	☑	☑	☑		☑	☑
920, 921	1/2 - 2	[15 - 50]	☑	☑		☑			
927	1/2 - 2	[15 - 50]	☑	☑		☑			
930	2, 2 1/2, 3	[50, 65, 80]	☑			☑			
6010	1/2 - 2 1/2	[15 - 50]	☑		☑	☑			
6021	1/2 - 2 1/2	[15 - 50]	☑		☑	☑			
6030	1/2 - 2	[15 - 50]	☑		☑	☑			
6182	1/2 - 2	[15 - 50]	☑		☑	☑			
6130	1/2 - 2	[15 - 50]	☑		☑	☑			
6186	1/2 - 2	[15 - 50]	☑		☑	☑			
6283	3/4 - 2	[18 - 50]	☑		☑	☑			
6221	3/4 - 2	[18 - 50]	☑		☑	☑			
6230	3/4 - 2	[18 - 50]	☑		☑	☑			
6933	1/2 - 2	[15 - 50]	☑			☑			
6934	1/2 - 2	[15 - 50]	☑			☑			
6935	1/2 - 2	[15 - 50]	☑			☑			
6252	1 1/2 - 6	[40 - 150]	☑	☑	☑	☑			
6254	1 1/2 - 4	[40 - 100]	☑	☑		☑			

### Notes:

\*Pressure and temperature limits may vary depending upon valve size, material, etc. Please consult appropriate product catalog for specific data.

- As improvements in design are continually being made, specifications are not to be regarded as binding in detail and dimensions/materials are subject to change without notice. Kunkle does not accept liability for damages which result from errors, omissions, misuse or misapplication of any information contained in this brochure.