



# Consolidated™ Condensed Catalog

## Pressure Relief Solutions

- Safety Relief Valves
- Safety Valves

**Consolidated**

a Baker Hughes business

An extensive range of safety relief valve and safety valve styles, sizes, options and configurations for multiple applications, environments and media.



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# Consolidated Safety Relief Valves

## In compliance with:

- ASME Section VIII Process Application Standards
- ASME Section I Boiler Application Regulations
- Many other Global and Regional Standards

Safety relief valves often serve as the point-of-protection against potentially dangerous circumstances, so it is important that they be dependable. Consolidated safety relief valves have maintained a reputation for excellence and reliability for more than a century.

The Consolidated product line has demonstrated a number of innovative solutions, too. Safety relief valve innovations from the product line include the *Thermodisc*™ temperature compensating disc and the first modular pilot-operated valve.

## A full range of valves

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

## Meeting evolving needs

Baker Hughes continues to pursue quality and proactive approach through regular collaboration with our customers and by staying actively involved in the development of regulatory compliance standards. We configure, engineer, and manufacture safety relief valves that adhere to industry regulations and global and regional standards while helping meet our customers' evolving needs.

## Applications:

- Chemical and petrochemical
- Refinery
- Power generation
- Economizer (Water)
- Liquid Phase Thermal Fluid Heaters
- Commercial
- MSR – Moisture Steam Re-heater
- Turbine gland steam seal
- Pegging steam/auxiliary steam
- De-aerators
- Feed-water heaters – tube side and shell side
- Pumps – recirculation line protection
- Fuel oil pumps
- Ammonia systems
- Scrubber systems
- Air compressor
- Miscellaneous pumps
- Trim supplied to match the fluid



# Consolidated Safety Relief Valves



## 1900 Series Safety Relief Valve

Inlet Sizes: 1" through 12"

Inlet Ratings: ASME Class 150 through 2500

Outlet Sizes: 2" through 16"

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: D through W

Set Pressure Range: 4 to 6250 psig (0.27 to 431 barg)

Temperature Range: -450°F to 1500°F (-268°C to 815°C)

Materials: Cast carbon steel body with stainless steel trim

ASME B&PVC Section I (Liquid), Section III & VIII

PED

Certifications: China Manufacturing License (CML)

API 520, 521 and 526

NACE

Others available upon request

The highly adaptable 1900 Series safety relief valve meets numerous application requirements.

## Options for 1900 Series Safety Relief Valve

### 1900-30

The 1900-30 Series valve includes the addition of a balanced bellows that is necessary to compensate for the effects of variable back pressure. By isolating the upper structure and allowing the use of less expensive materials, the bellows is also a cost-effective solution in applications where the valve is exposed to highly viscous or corrosive fluids.

### 1900-DA

The 1900-DA Series valve contains an additional O-ring seat seal. This soft seat is the primary seal and it allows the valve to remain leak free at 95 percent of set pressure over 100 psig (6.89 barg). A backup metal seat provides additional safety for fire-relief applications when O-rings can be destroyed by high temperature exposure.

The 1900-DA Series O-ring seat is available for set pressures up to 6250 psig (430.92 barg). Some soft seats offered by other manufacturers are limited to 1500 psig (103.42 barg).

# Consolidated Safety Relief Valves



## 1900-UM Series Safety Relief Valve

Inlet Sizes: 1" through 12"

Inlet Ratings: ASME Class 150 through 2500

Outlet Sizes: 2" through 16"

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: D through W

Set Pressure Range: 4 to 6250 psig (0.27 to 431 barg)

Temperature Range: -450°F to 1500°F (-268°C to 815°C)

Materials: Cast carbon steel body with stainless steel trim

ASME B&PVC Section III and VIII

PED

Certifications: China Manufacturing License (CML)

API 520, 521 and 526

NACE

Others available upon request

The 1900-UM Series valve is capable of flowing liquid, gas or steam with no adjustment required to switch between different media with the same set pressure.

## Options for 1900-UM Series Safety Relief Valve

### 1900-30-UM

The 1900-30-UM Series valve includes the addition of a balanced bellows that is necessary to compensate for the effects of variable back pressure. By isolating the upper structure and allowing the use of less expensive materials, the bellows is also a cost-effective solution in applications where the valve is exposed to highly viscous or corrosive fluids.

### 1900-UM-DA Series Soft Seat

The 1900-UM-DA Series soft seat contains an additional soft seal. This soft seat is the primary seal, and it allows the valve to remain leak free at 95 percent of set pressure over 100 psig (6.89 barg). A backup metal seat provides additional safety for fire-relief applications when soft goods can be destroyed by high temperature exposure. The Consolidated 1900-UM Series soft seat is available for set pressures up to 6250 psig (430.92 barg). Some soft seats offered by other manufacturers are limited to 1500 psig (103.42 barg).



## 19000 Series Safety Relief Valve

Inlet Sizes: 0.5" to 2"

Inlet Ratings: Threaded and ASME Class 150 through 2500"

Outlet Ratings: Threaded and ASME Class 150 to 300

Orifice Sizes: 0.096 sq. in. through 0.567 sq. in.

Set Pressure Range: 5 to 8000 psig (0,34 to 551 barg)

Temperature Range: -425°F to 1100°F (-254°C to 593°C)

Certifications: ASME B&PVC Section III and VIII  
PED  
China Manufacturing License (CML)  
API 520 and 521  
NACE  
Others available upon request

The 19000 Series safety relief valve is ASME and PED certified. It meets and exceeds API seat tightness performance. The 19000 offers enhanced capacity and blowdown performance on many media types. In most cases, it does not require parts changes to accommodate different media.

## Options for 19000 Series Safety Relief Valve

### 19000-MS Standard Design

Metal-to-metal seat construction. Seat tightness compliant with API 527.

### 19000-DA Series O-Ring Seat Option

Soft seat design offers bubble tight seats at up to 97 percent of valve set pressure for valves set at 101 psig (6.96 barg) and above. This option promotes higher, more efficient system operating pressures without significant seat leakage concerns.

# Consolidated Safety Relief Valves



## 1982 Series Safety Relief Valve

Inlet Sizes: 0.5" through 2"

Inlet Ratings: Threaded

Outlet Ratings: Threaded

Orifice Sizes: Four sizes – .121 sq. in. through 1.399 sq. in.

Set Pressure Range: 10 to 500 psig (0,69 to 34,47 barg)

Temperature Range: -20°F to 800°F (-29°C to 427°C)

Materials: Carbon steel bonnet with stainless steel trim

Certifications: ASME B&PVC, Section III  
ASME B&PVC, Section VIII, Division I

The 1982 Series safety relief valve is a preferred choice for OEM and skid manufacturers requiring high-relief capacity from a small valve. The 1982 offers superior seat tightness and blowdown performance for most media applications.

## 2478 Series Relief Valve

Inlet Sizes: 0.5" through 2.5"

Outlet Sizes: 0.75" through 2.5"

Inlet Rating: Threaded

Outlet Rating: Threaded

Orifice Sizes: D, E, F, G, H and J

Set Pressure Range: 15 to 300 psig (1 to 20,68 barg)

Temperature Range: -325°F to 406°F (-198°C to 208°C)

Materials: Cast bronze bonnet, brass base and trim and PTFE soft seats

Certifications: Non-Coded

The 2478 Series pressure relief valve features an enclosed design for non-corrosive, thermal relief and liquid service applications.



# Consolidated Pilot-Operated Safety Relief Valves



## 2900 Series Pilot-Operated Safety Relief Valve

Inlet Sizes: 1" through 12"

Inlet Ratings: ASME Class 150 through 2500

Outlet Sizes: 2" through 16"

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: Seventeen sizes – D through W

Set Pressure Range: 15 to 6250 psig  
(1 to 431 barg)

Temperature Range: -40°F to 505°F (-40°C to 263°C)  
Above 505°F with heat exchanger

Materials: Stainless steel pilot with carbon steel  
main valve and stainless steel trim

ASME B&PVC Section I (Liquid) & Section VIII  
PED

Certifications: China Manufacturing License (CML)  
API 520, 521 and 526  
(Same centerline-to-face as spring loaded valves)  
NACE  
Others available upon request

The 2900 Series pilot-operated safety relief valve combines the advantages of two products into one— the 1900 safety relief valve and the 3900 POSRV. The 2900 POSRV can replace spring-loaded relief valves without requiring modified outlet piping.

## 3900 Series Pilot-Operated Safety Relief Valve

Inlet Sizes: 1" through 12"

Inlet Ratings: ASME Class 150 through 2500

Outlet Sizes: 2" through 16"

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: Fourteen sizes – D through T (Full bores)

Set Pressure Range: Full Bores 15 to 6250 psig  
(1 to 431 barg)

Temperature Range: -40°F to 505°F (-40°C to 263°C)  
Above 505°F with heat exchanger

Materials: Stainless steel pilot with carbon steel  
main valve and stainless steel trim

ASME B&PVC Section VIII  
PED

Certifications: China Manufacturing License (CML)  
API 520, 521 and 526  
NACE  
Others available upon request

The 3900 Series pilot-operated safety relief valve is a non-flowing design available in a modulating or pop-action pilot. The 3900 POSRV is suitable for the overpressure protection of many pressurized systems and vessels in the chemical, petrochemical, paper mill, oil and gas production and transmission industries.

# Consolidated Pilot-Operated Safety Relief Valves



## 4900 Series Pilot-Operated Safety Relief Valve

Inlet Sizes: 1" to 8"

Inlet Ratings: ASME Class 150 through 2500

Outlet Sizes: 2" through 10"

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: Fourteen sizes – D through T

Set Pressure Range: 15 to 7200 psig (1 to 496 barg)

Temperature Range: -40°F to 505°F (-40°C to 263°C)

Materials: Stainless steel pilot with carbon steel main valve and stainless steel trim

Certifications: ASME B&PVC Section VIII  
PED

China Manufacturing License (CML)  
API 520 and 521  
NACE

Others available upon request

The 4900 Series pilot-operated safety relief valve is a tubeless valve for oil and gas production and the offshore industry.

## 13900 Series Pilot-Operated Safety Relief Valve

Inlet Sizes: 16" to 20"

Inlet Ratings: ASME Class 300

Outlet Sizes: 18" through 24"

Outlet Ratings: ASME Class 150

Orifice Sizes: 114, 143.1, 176.7 and 201 sq. in.

Set Pressure Range: 50 to 300 psig (3,44 to 20,68 barg)

Temperature Range: 250°F to 550°F (121°C to 288°C)

Materials: Carbon Steel with Stainless Steel trim

Typical Application: Moisture Separator Reheater Systems

Certifications: ASME B&PVC Section VIII  
PED

China Manufacturing License (CML)  
API 520 and 521

Others available upon request

The 13900 Series pilot-operated safety relief valve is configured for high-capacity steam overpressure protection for moisture separator reheater systems.

# Consolidated Safety Valves

## In compliance with:

- ASME Section I Code for Boiler Applications

Since 1879, Consolidated safety valves have been known for exceptional quality, performance and dependability. Because safety valves play an important role in keeping people and equipment safe, it is important that they be reliable in even the most demanding real-world applications. That's why Baker Hughes works closely with our customers and regulatory organizations to configure, engineer, and manufacture safety valves that can help maintain safer operating conditions in a full range of environments.

## Key valve features

Our comprehensive portfolio of safety valves can help to run operations smoothly and cost effectively, particularly in steam service environments. Consolidated safety valves feature a unique pop-action release that can relieve steam over-pressurization if pressures upstream from the valve reach a set point.

What is more, Consolidated safety valves comply with the ASME Section I code for boiler applications. They are built with many features that meet ASME requirements for steam-compressible fluids. For example, all models feature a lifting lever, required by the code for testing, instead of deadweight or weighted levers. Consolidated safety valves can also withstand set pressures up to 103 percent with a blowdown value of 4 percent, or 96 percent of set pressure drop before the valve re-seats.

## A full range of valves

With a range of styles, models, options and configurations, Consolidated safety valves work in many different boiler applications.

## Applications:

- Economizer (steam/water)
- Drum
- Superheater main steam line
- Power actuated relief valve
- Cold re-heater line
- Hot re-heater line
- Soot blowers in forced flow steam generators
- Organic fluid vapor generators
- High temp hot water generators
- Electric boilers
- Waste heat recovery boilers



# Consolidated Safety Valves



## 1700 Series Maxiflow™ Safety Valve

Inlet Sizes: 1.5" through 8"

Inlet Ratings: ASME Class 600 through 4500 Flanged and BWE

Outlet Sizes: 3" through 10" flanged

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: Eleven sizes – 1 through T

Set Pressure Range: 100 to 5800 psig (6,90 to 400 barg)

Temperature Range: Up to 1200°F (649°C)

Materials: Alloy and carbon steel cast body with stainless steel trim

Certifications: ASME B&PVC Section I and VIII  
PED  
China Manufacturing License (CML)  
Others available upon request

The 1700 Series Maxiflow high-pressure safety valve is a premium product that is installed on a majority of power generating stations worldwide to help protect boilers from overpressure conditions.

## 2700 Series Safety Valve

Inlet Sizes: 1.5" through 6"

Inlet Ratings: ASME Class 600, 900 and 1500

Outlet Sizes: 3" through 8"

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: Seven sizes – 1 through Q

Set Pressure Range: 100 to 1600 psig (6,90 to 110 barg)

Temperature Range: Up to 1050°F (565°C)

Materials: Alloy and carbon steel cast body with stainless steel trim

Certifications: ASME B&PVC Section I and VIII  
PED  
China Manufacturing License (CML)  
Others available upon request

The 2700 Series safety valve is configured to meet the specific requirements of the cogeneration and waste-to-energy markets.



## 1811 Series Safety Valve

Inlet Sizes:	1.25" through 6"
Inlet Ratings:	ASME Class 300 and 600
Outlet Sizes:	1.5" through 8"
Outlet Ratings:	ASME Class 150
Orifice Sizes:	Ten sizes – F through Q
Set Pressure Range:	15 to 725 psig (1 to 50 barg)
Temperature Range:	Up to 1000°F (538°C)
Materials:	Alloy and carbon steel cast body with stainless steel trim
Certifications:	ASME B&PVC Section I and VIII PED China Manufacturing License (CML) Others available upon request

The 1811 Series safety valve is a cost-effective, high-capacity, flanged-steel safety valve for steam service.



## 1511 Series Safety Valve

Inlet Sizes:	1.5" through 6"
Inlet Ratings:	ASME Class 250
Outlet Sizes:	2.5" through 4"
Outlet Ratings:	ASME Class 125
Orifice Sizes:	Eight sizes – H through Q
Set Pressure Range:	15 to 250 psig (1 to 17,24 barg)
Temperature Range:	-20°F to 420°F (-29°C to 215°C)
Materials:	Cast iron body with brass trim
Certifications:	ASME B&PVC Section I and VIII PED China Manufacturing License (CML) Others available upon request

The 1511 Series safety valve is configured for low pressure, steam heating boilers and steam generators as well as air service applications.

# Consolidated Safety Valves



## 1541-3, 1543-3 Series Safety Valve

Inlet Sizes: 0.5" through 2.5"

Outlet Sizes: 0.75" through 2.5"

Inlet Rating: Threaded

Outlet Rating: Threaded

Orifice Sizes: D, E, F, G, H and J

Set Pressure Range: 15 to 350 psig (1 to 24,13 barg)

Temperature Range: -20°F to 420°F (-29°C to 215°C)

Materials: Cast iron bonnet with brass base and trim

Certifications: ASME B&PVC Section I and VIII

The 1541 and 1543 Series safety valves are configured for steam and other compressible fluids. Compression media is limited to non-toxic, non-flammable, non-corrosive service. These valves are most commonly used in pharmaceutical and process plants.



## 1900/P Series Safety Valve

Inlet Sizes: 1" through 8"

Inlet Ratings: ASME Class 150 through 2500

Outlet Sizes: 2" through 10"

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: D through T

Set Pressure Range: 5 to 6000 psig (0,34 to 414 barg)

Temperature Range: -20°F to 850°F (-29°C to 454°C)

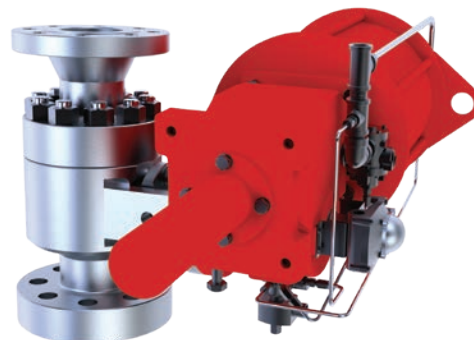
Certifications: ASME B&PVC, Section I (Steam Service)

API 520 and 527

Others available upon request

The 1900/P Series safety valve is designed to meet Economizer and Organic fluid applications.

# Consolidated Electromatic Ball Valve System



## 2900-40 Series Pilot-Operated Safety Valve

Inlet Sizes: 1" through 12"

Inlet Ratings: ASME Class 150 through 2500

Outlet Sizes: 2" through 16"

Outlet Ratings: ASME Class 150 and 300

Orifice Sizes: D through W

Set Pressure Range: 15 to 5800 psig (1 to 400 barg)

Temperature Range: -40°F to 505°F (-40°C to 263°C)  
Above 505°F with heat exchanger

Materials: Carbon steel base and 316 stainless steel  
internal components; pilot valve 316 stainless steel

ASME B&PVC Section I

Certified for steam and water per ASME  
B&PVC Code Case 2446

Certifications: China Manufacturing License (CML)

API 520 and 521

Others available upon request

The 2900-40 Series pilot-operated safety valve offers exceptional performance and meets demanding ASME Section I Economizer and Boiler Applications.

## 3500-5 Series EBV Electromatic™ Ball Valve System

Inlet Sizes: 1.5" / 2" / 2.5" / 3" / 4"

Inlet Ratings: ASME Class 1500, 2500, 3100 and 4500

Outlet Sizes: 3" / 4" / 6"

Outlet Ratings: ASME Class 300 and 900

Bore sizes: 0.875" / 1" / 1.75" / 2" / 2.5" / 3"  
(Reduced bore sizes available without ASME V stamp.)

Set Pressure Range: 50 to 6000 psig  
(3,45 to 414 barg)

Temperature Range: up to 1150°F (621°C)

Materials: Alloy steel body with Colmonoy® coated  
inconel alloy ball and seat assembly

Certifications: ASME B & PVC Section I 'V' code stamp on  
once through boilers (full bore only) and  
non-code section I

The 3500-5 EBV Series offers automatic or manual overpressure protection for steam boiler systems, and can also be used to assist start-up and shut-down venting. The new enhanced design includes a superior coating and manufacturing process that enhances leak free performance, and improves reliability and increases valve life.

## Direct Sales Office Locations

### Australia

Brisbane  
Phone: +61-7-3001-4319

Perth  
Phone: +61-8-6595-7018

Melbourne  
Phone: +61-3-8807-6002

### Brazil

Phone: +55-19-2104-6900

### China

Phone: +86-10-5738-8888

### France

Courbevoie  
Phone: +33-1-4904-9000

### India

Mumbai  
Phone: +91-22-8354790

New Delhi

Phone: +91-11-2-6164175

### Italy

Phone: +39-081-7892-111

### Japan

Tokyo  
Phone: +81-03-6871-9008

### Korea

Phone: +82-2-2274-0748

### Malaysia

Phone: +60-3-2161-03228

### Mexico

Phone: +52-55-3640-5060

### Russia

Veliky Novgorod  
Phone: +7-8162-55-7898

Moscow

Phone: +7-495-585-1276

### Saudi Arabia

Phone: +966-3-341-0278

### Singapore

Phone: +65-6861-6100

### South Africa

Phone: +27-11-452-1550

### South & Central America and the Caribbean

Phone: +55-12-2134-1201

### Spain

Phone: +34-935-877-605

### United Arab Emirates

Phone: +971-4-8991-777

### United Kingdom

Phone: +44-7919-382-156

### United States

Houston, Texas

Phone: +1-713-966-3600

Find the nearest local Channel Partner in your area:

[valves.bakerhughes.com/contact-us](http://valves.bakerhughes.com/contact-us)

## Tech Field Support & Warranty:

Phone: +1-866-827-5378

[valvesupport@bakerhughes.com](mailto:valvesupport@bakerhughes.com)

[valves.bakerhughes.com](http://valves.bakerhughes.com)

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