

Consolidated™ 2900 MPV Series

Pilot-Operated Safety Relief Valve

Overview

The 2900 Series Pilot-Operated Safety Relief Valve is a world leader in pressure relief valve technology. The 2900 Series valve is a blend of Consolidated type 1900 safety relief valve and Consolidated 3900 Series Pilot-Operated Safety Relief Valve. These Baker Hughes products have a proven track record of performance, versatility and ease of maintenance.

Specifications

Inlet Sizes:	1" (25 mm) through 12" (305 mm)
Inlet Ratings:	ASME Class 150 through 2500
Outlet Sizes:	2" (50 mm) through 16" (406 mm)
Outlet Ratings:	ASME Class 150 and 300
Orifice Sizes:	Seventeen sizes: D through W
Set Pressure Range:	15 psig (1.03 barg) to 6,250 psig (431 barg)
Temperature Range:	-400°F (-240°C) to 1200°F (649°C) (when properly equipped with a heat exchanger)
Materials:	
• Main Valve (Std.)	Carbon steel base and 316 stainless steel internal components
• Pilot Valve (Std.)	316 stainless steel base and internal components

Notes: - Optional materials available.
- Centerline to face dimensions match that of API 526 spring loaded valves for easy replacement.

Features and Benefits

The Consolidated pilot valve has a unique design that combines top features and capabilities within an economical, modular assembly. This is based on the successful design of an optimized safety "device" that offers versatility of application, yet provides cost-effective standardization. Additional features and benefits of the 2900 Series include:

- Closed bonnet for spring protection.
- A Pilot Gag prevents the pilot-operated relief valve from opening while equipment is undergoing operational hydrostatic testing.



- Through its improved seat tightness to 98 percent of set pressure, and adjustable blowdown to 2 percent of set pressure, the 2900 Series valve allows higher system pressures that can increase the yield of the process.
- Pop action and modulating pilots allow for application versatility.
- Pilot seat design allows for self-cleaning operation and is tolerant to icing and dirty conditions.
- Remote actuation and sensing can eliminate problems caused when then inlet pressure drop exceeds 3 percent.
- The metal seat option incorporates proven technology from the 1900 series safety relief valve seat design.
- Retrofit kits easily and economically convert an existing Consolidated 1900 Series SRV to the 2900 Series POSRV design.
- Replacing and/or upgrading existing API 526 spring-loaded safety relief valves with the 2900 Series valve eliminates costly piping changes.
- Process temperatures that range from -400°F to 1200°F (-240°C to 649°C) can be met using the heat exchanger option.
- The Dirty Service option ensures operation in dirty, precipitating and viscous fluids.
- Certified for ASME B&PVC, Section I Liquid economizers and thermal fluid heaters.

Conventional Type Main Valve - Double Seal Soft Seat

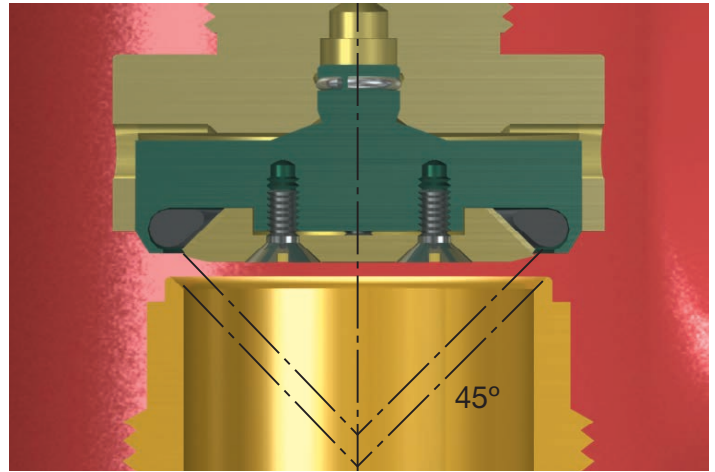
The double seal design incorporates the merits of both a soft seat and a metal seat design valve. The 45° metal seat provides the load bearing surface to transmit piston pressure force, while the slotted O-ring retainer allows the O-ring to be pressurized and accomplish the primary sealing function.

Consolidated's O-ring seat seal valves are bubble tight at 98 percent. They provide positive closure for continuous, troublefree service and complete valve tightness after numerous "pops".

How the Double Seal Works

Two unique features distinguish the Consolidated O-ring seat seal safety valve from other designs. These are the 45° metal-to-metal load-bearing seats and the slotted O-ring retainer.

Double Seal



Three Essentials to a Tighter, More Secure Seal

1. Concentric Alignment

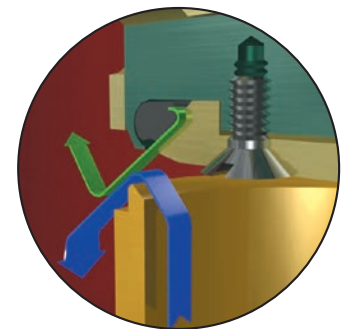
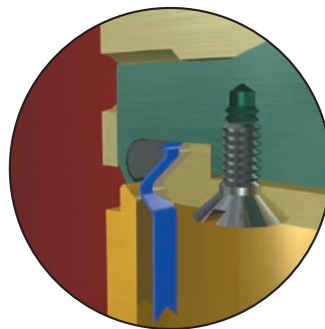
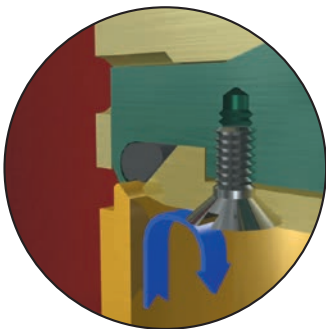
The nozzle bore and O-ring retainer are both machined to an angle of 45°. This ensures that as the valve disc opens and closes, the O-ring is aligned concentrically against the lip of the nozzle. Close tolerance between the nozzle and the body, or the body and the disc guide and disc holder, also help to ensure a tight seal when the valve is closed. Accurate alignment, coupled with the load-bearing function of the O-ring retainer, virtually eliminates O-ring abrasion from valve action.

2. Maximum Sealing Force

On the back side of the O-ring retainer there are two small slots. When the valve is closed, process media enters between the machined seat of the nozzle and the O-ring retainer and proceeds up the slots behind the O-ring. This pressure forces the O-ring against the lip of the nozzle and the curved recess of the disc holder. As the pressure within the valve rises to set point, the O-ring is pressed tightly against the nozzle to maintain maximum sealing force until break-away pressure is reached.

3. O-ring Retention

When the valve opens, the pressure behind the O-ring escapes from the same two slots on the O-ring retainer. This prevents the O-ring from being ejected. Additionally, the O-ring encapsulating retainer prevents the O-ring from being pulled from its setting by the high-velocity, low-pressure discharge inside the upper valve body.



2900 Series Steam Trim (TD) Valves

The Consolidated 2900 Series Valve Steam Trim (TD) option is specifically designed for steam service and organic heat transfer media.

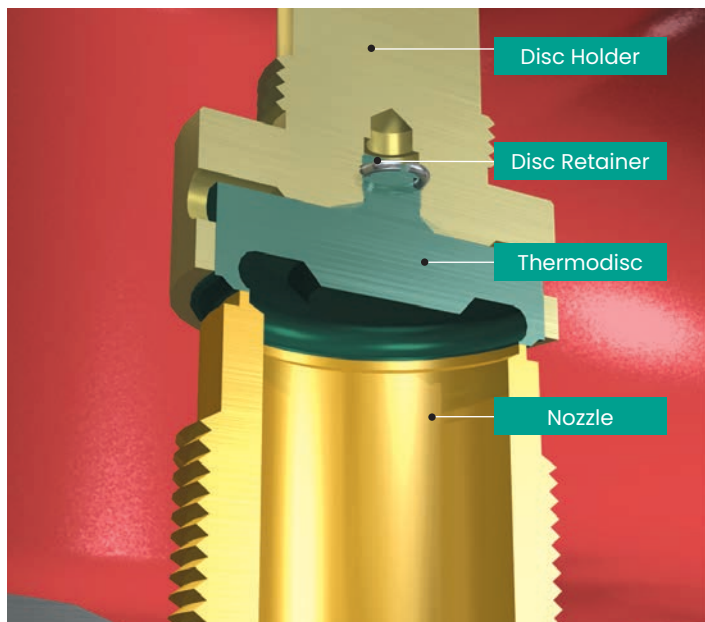
For consistent performance on these medias, specify the "TD" design which utilizes the exclusive *Thermodisc*™ design.

Designed for use on high-temperature fluids, Thermodisc has more than half a century of field-proven performance.

A Thermodisc is required for steam service.

The martensitic stainless steel disc construction allows for high strength and toughness. As the set point of the valve is approached, the pressure sealing effect of the Thermodisc helps to tighten the seat, as does the rapid thermal equalization that occurs due to the thin sealing section.

Steam Trim Valve Internals



2900 Flanged Series Valves

The Consolidated 2900 Series Pilot-Operated Safety Relief Valve is supplied with the same non-flowing pilot valve used on the 3900 Series POSRV.

This single-pilot design is suitable for both incompressible and compressible applications and performs equally well on gas, liquid and steam services.

The set pressure will not require adjustment if the service condition changes. A metal seat on the main valve is standard, and an O-ring option is available. Both pop action and modulating action pilots are available.

Standards and Regulation Compliance

Standard/Regulation	Authority	Applicability
ISO 9001	International Organization for Standardization (ISO)	Standard
ISO 14001	International Organization for Standardization (ISO)	Standard
ASME B and PVC, Section I (Liquid Service)	American Society of Mechanical Engineers	As Required
ASME B and PVC, Section VIII (Gas, Liquid & Steam Service)	American Society of Mechanical Engineers	Standard
ASME B16.34	American Society of Mechanical Engineers	Standard
ASME B16.5	American Society of Mechanical Engineers	Standard
API 520, 521, 527	American Petroleum Institute	Standard
CRN	Canada	As Required
NACE MR0175	Nace International Institute	As Required
NACE MR0103	Nace International Institute	As Required
PED 2014/68/EU	European Union	As Required
ISO 4126-4	International Organization for Standardization (ISO)	As Required
Indian Boiler Regulations (IBR)	India Boiler Act - Section 28 & 29	As Required
Customs Union Technical Regulation (CU TR)	Customs Union	As Required
AQSIQ - China Manufacturing License	State Council of the People's Republic of China	As Required
Australian Standards	Council of Standards Australia	As Required
NORSOK	Norwegian Petroleum Industry	As Required
49 CFR 192.199	U.S. Department of Transportation (D.O.T.)	Standard
Korean High Pressure Gas Safety Control Act	Korea	Standard

