

2900/2900 TM Series Generation II

Pilot-Operated Safety Relief Valves

Overview

Consolidated™ 2900/2900 TM Series Pilot-Operated Safety Relief Valves (POSRVs) have 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. The 2900 Series valve is a blend of Consolidated type 1900 safety relief valve and Consolidated 3900 Series POSRV.

Specifications

| | |
|----------------------|---|
| Inlet Sizes: | 1" (25 mm) through 12" (305 mm) |
| Inlet Ratings: | ASME Class 150 through 2500 EN 1092-1 PN 10 through PN 400 |
| Outlet Sizes: | 2" (50 mm) through 16" (406 mm) |
| Outlet Ratings: | ASME Class 150 and 300 EN 1092-1 PN 10 through PN 40 |
| 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 (648.9°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.



Optimize Service

Increase operational uptime and system throughput by replacing API 526 spring-loaded SRVs with our cost-effective, full nozzle pilot-operated SRV to improve the system's relieving performance.



Improve Reliability

Prevent adverse inlet line loss conditions with remote sensing and multi-media trim, providing stable performance and reliable protection on any media while reducing the damaging effects of rapid cycling.



Increase Efficiency

Ensure consistent opening and relieving cycles with a 2900 Series modulating pilot that opens proportionally to your overpressure demand, relieving only the required capacity, reducing product loss and ensuring stable overpressure protection.



Reduce Emissions

The zero leak pilot provides seat tightness up to 100% of set pressure and main valve seat tightness up to 98% of set pressure, preventing product loss.

Features and Benefits

Additional features and benefits of the 2900/2900 TM Series include:

- Triple media certified and engineered for stable performance on air/gas, liquid, and steam media
- Multi-media certified to meet multiple media (air/gas, liquid, and steam) capacity stamping per ASME B & PVC Code Case 2787
- Enhanced main valve trim design (patent pending) providing efficient flow and increased capacities in back pressure applications
- 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 2900/2900 TM Series valve allows higher system pressures that can increase the yield of the process.
- Pop action and modulating pilots allow for application versatility.
- Remote actuation and sensing can eliminate problems caused when the 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 2900/2900 TM Series POSRV design.
- Replacing and/or upgrading existing API 526 spring-loaded safety relief valves with the 2900/2900 TM Series valve eliminates costly piping changes.
- Process temperatures that range from -400°F to 850°F (-240°C to 454°C) can be met using the heat exchanger option.
- Certified for ASME B & PVC, Section I Liquid economizers and thermal fluid heaters.

Conventional Type Main Valve - Double Seal Soft Seat

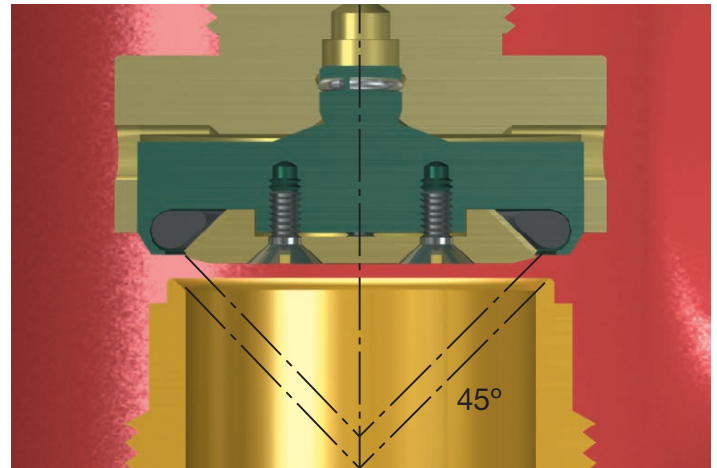
The double seal design incorporates the merits of both a soft seat and a metal seat design valve. The 45° metal seat provides the load bearing surface to transmit piston pressure force, while the slotted O-ring retainer allows the O-ring to be pressurized and accomplish the primary sealing function.

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.

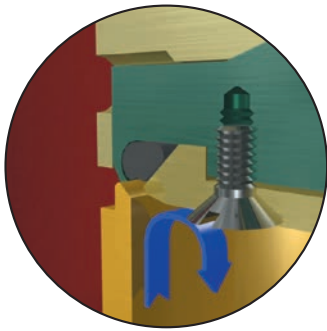
Double Seal



Three Essentials to a Tighter, More Secure Seal

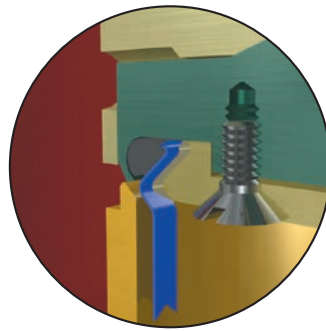
1. Concentric Alignment

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.



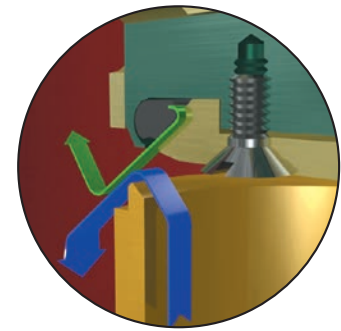
2. Maximum Sealing Force

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.



2900/2900 TM Series Steam Trim (TD) Valves

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

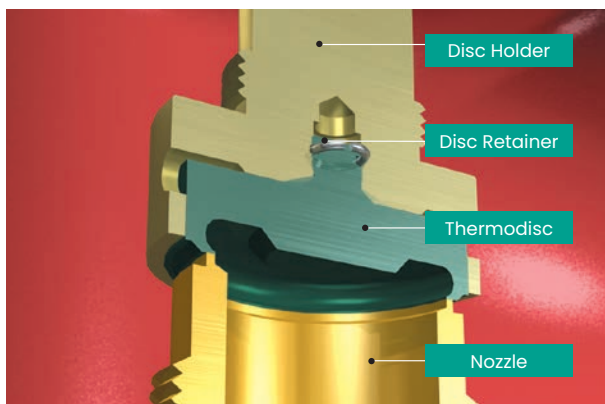
For consistent performance on these medias, specify the "TD" design which utilizes the exclusive **Thermodisc™** design.

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



2900/2900 TM Flanged Series Valves

The Consolidated 2900/2900 TM Series Pilot-Operated Safety Relief Valve is supplied with the same non-flowing pilot valve used on the 3900/3900 TM 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 XIII (UV Designator) (Gas, Liquid & Steam Service) | American Society of Mechanical Engineers | Standard |
| ASME Code Case 2787 - Triple Capacity Stamping | 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 |
| EN 1092-1 | CEN (European Committee for Standardization) | 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 |