

2900/2900 TM Series

Pilot-Operated Safety Relief Valves

Overview

Consolidated™ 2900/2900 TM Series Pilot-Operated Safety Relief Valves (POSRVs) are a one-of-a-kind valve design combining features and benefits from proven valve technologies in an economical, modular assembly. The 2900 Series is a mix of two safety relief valve (SRV) designs; the base assembly from the Consolidated 1900 Series spring-loaded SRV and the pilots from the 3900 Series POSRV. This combination results in the 2900 Series meeting center-to-face dimensions for API 526 spring-loaded SRVs while providing enhanced benefits of POSRVs, making it a versatile and cost-effective solution.



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: from D through W
Set Pressure Range:	15 psig (1.03 barg) to 6,250 psig (431 barg)
Temperature Range:	-400°F (-240°C) to 800°F (426.6°C) (when properly equipped with a heat exchanger)
Materials:	
• Main Valve (standard)	Carbon steel base and 316 stainless steel internal components
• Pilot Valve (standard)	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 POSRV 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

Features and benefits of the 2900/2900 TM Series include:

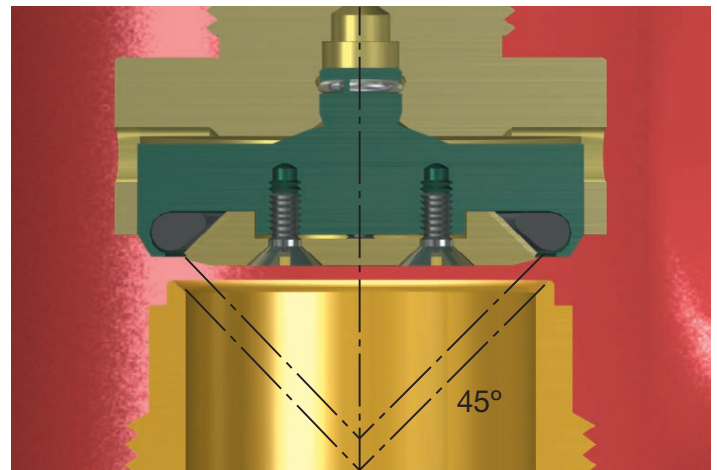
- Triple media certified and engineered for stable performance on air/gas, liquid, and steam media.
- Multi-media certified to meet multiple media (air/gas, liquid, and steam) capacity stamping per ASME B and PVC Code Case 2787.
- Enhanced main valve trim design (patent pending) providing efficient flow and increased capacities in back pressure applications.
- A Pilot Gag prevents the POSRV from opening while equipment is undergoing operational hydrostatic testing.
- Improved seat tightness to 98 percent of set pressure and adjustable blowdown to 2 percent of set pressure allows for higher system pressure 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 then inlet pressure drop exceeds 3 percent.
- The metal seat option uses the same seat design and finish as the 1900 Series SRV for maximum seat tightness.
- Retrofit kits easily and economically convert an existing Consolidated 1900 Series SRV to the 2900/2900 TM Series POSRV design.
- Replacing or upgrading an existing API 526 spring-loaded SRV with the 2900/2900 TM Series valve eliminates costly piping changes.
- Process temperatures that range from -400°F to 800°F (-240°C to 426.6°C) can be met using the heat exchanger option.
- Certified for ASME B and 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".

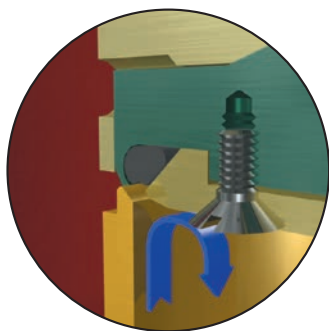
Double Seal



Three Essentials to a Tighter, More Secure Seal

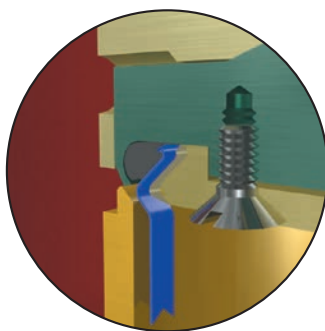
1. Concentric Alignment

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.



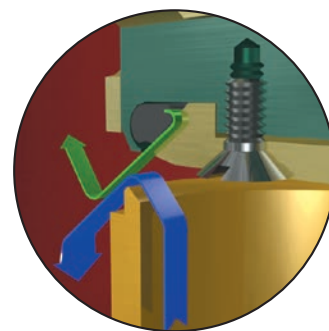
2. Maximum Sealing Force

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 flows through 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 position 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.

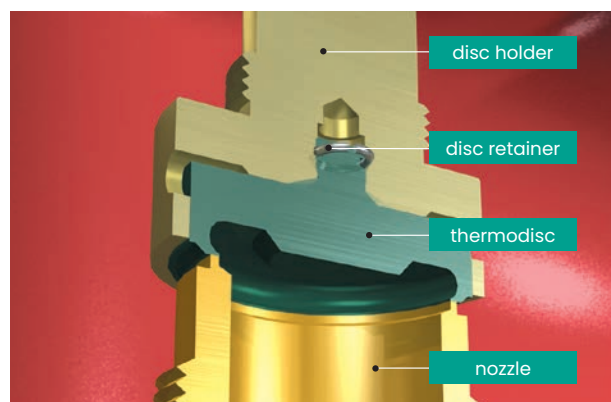
For consistent performance on these medias, specify the "TD" design which utilizes the exclusive thermdisc design.

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

A thermdisc 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 thermdisc 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 POSRV 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 and 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 and 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