



Consolidated

Best Under Pressure

NUCLEAR SERVICE VALVE CONDENSED CATALOG



Pressure Relief Valves for the Nuclear Industry



THE DRESSER CONSOLIDATED ALEXANDRIA FACILITY IS DESIGNED TO MEET THE CHALLENGES OF DEMANDING NUCLEAR APPLICATIONS

For more than forty years, Dresser Consolidated has been one of few valve manufacturers with the expertise and qualifications necessary for nuclear applications' tough requirements. Providing thousands of nuclear safety valves in plants around the world, our experience is wide and deep.

Behind our success in this demanding industry is our nuclear valve production and service at our 25,000 square-foot facility in Alexandria, Louisiana. It is designed and certified to produce nuclear valves that deliver the reliability and trusted performance customers expect from Dresser Consolidated.

In addition to full manufacturing capabilities, this ISO 14001:2004 certified facility supports research and development testing as well as a full range of production testing. It is one of the few National Board certified test stands in the United States and holds certifications for air, water and steam valve testing. Plus, the Alexandria plant features a nuclear "clean room" that ensures the integrity and precision crucial to the nuclear valve design and manufacture process.

Manufacturing

The Dresser Consolidated manufacturing facility is outfitted with both electronic and manual manufacturing equipment to give our experienced employees the tools they need to craft exceptional products. The Alexandria plant is outfitted with a full scope of tools on-site to take a valve from its early production phases to final cleaning, painting and quality inspection processes.



Testing

The Alexandria plant is capable of handling aggressive product testing to ensure the durability and quality of Dresser Consolidated nuclear valves. The site includes a Research and Development test facility as well as a Production test facility. In fact, the Alexandria test stand is one of only four facilities in the United States with National Board Certification for air and water applications and one of only three certified for steam.

Clean Room

Large enough to meet projected requirements as well as current customer needs, the “clean room” complex at the Alexandria plant has been built and equipped to meet stringent customer specifications.

The atmosphere is strictly controlled to prevent undesirable elements from entering the environment and potentially compromising the integrity of the valves. Certain chemical elements are permanently prohibited from the clean room area. These include: free halogens; heavy metals such as mercury, lead, or their compounds; hydrocarbons, including oil, grease, and cellulose, and materials of unknown composition. Solvents are neutral and non-reactive, or in accordance with customer specifications. All nuclear valves are handled using strict process controls to ensure plant and equipment safety and security.



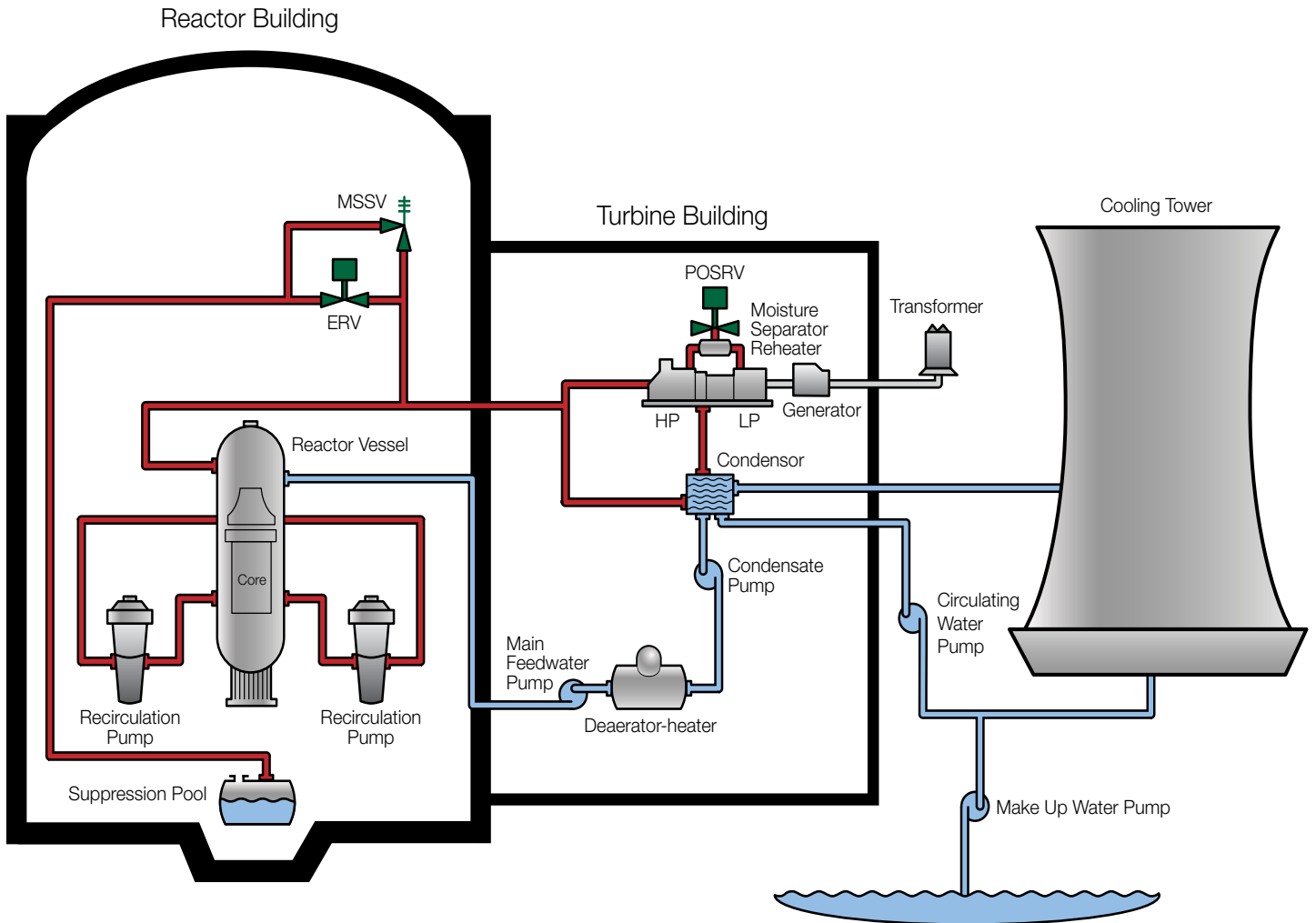


Boiling Water Reactor

This reactor may have many spring-loaded safety valves, pilot operated valves and/or spring-loaded mechanical assist valves, depending on plant design and steam capacity. These valves protect against over pressure of the reactor system in accordance with ASME Code requirements, as well as serving as operating valves. The actual percentage of total generating capacity represented by installed safety valves is determined by the reactor manufacturer and the Atomic Energy Commission by a detailed analysis of possible pressure transients in the system.

As shown in the figure, these valves discharge directly into the suppression pool of the containment vessel. The main steam header has spring, pilot operated or spring-loaded mechanical assist valves. Their main use is to keep the safety valves from opening. Since the steam in the single cycle boiling water reactor is radioactive, any discharge from these relief valves is fed to the reactor suppression pool and discharged under water. Water is subsequently treated, and every trace of radioactivity removed before disposal.

Conventional safety relief valves throughout the plant pumping system are comparable to existing fossil fuel power plants. Forged steel valves of the required pressure class are manufactured to quality levels, including non-destructive testing and third party inspection, in accordance with the Pump and Valve Code requirements for Nuclear Classes 1, 2 and 3 as designated by the design specifications.



MSSV – Main Steam Safety Valve
(3700 Series)

ERV – Electromatic Relief Valve
(1525 VX Series)

POSRV – Pilot Operated Safety Relief Valve
(13900 Series)



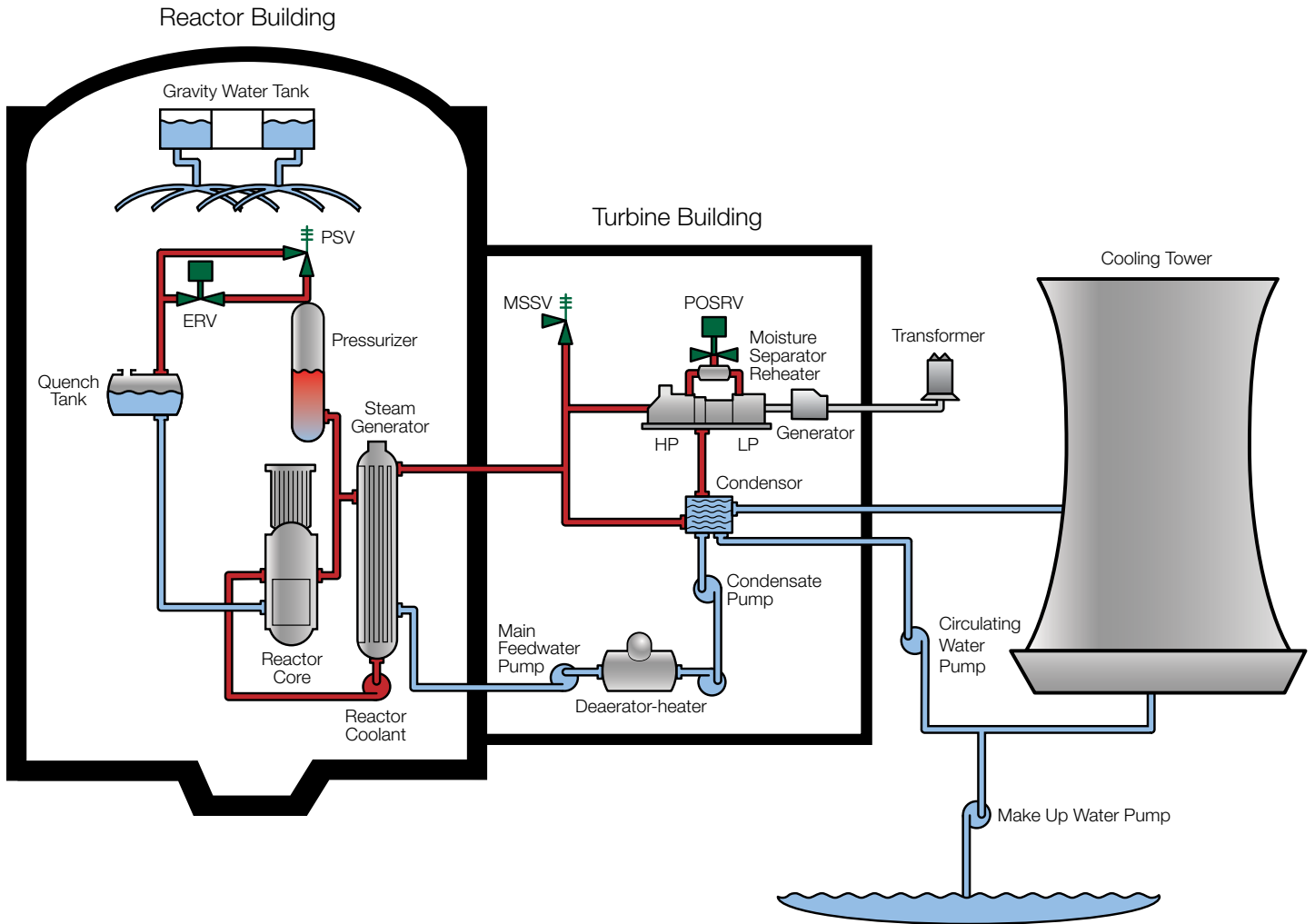
Pressurized Water Reactor

A primary loop is located inside the containment vessel, and a secondary loop sends steam to the turbine. Water in the primary loop is radioactive; steam in the secondary loop is not. The pressurizer in the primary system is equipped with several power actuated relief valves set above operating pressure, in addition to the spring-loaded safety valves required by the ASME Code. The released steam is discharged under water in a quench tank. This water must also be treated for disposal to remove every trace of radioactivity.

The actual percentage of total generating capacity represented by installed safety valves on the Pressurized Water Reactor is determined by the reactor manufacturer and the Atomic Energy Commission by a detailed analysis of possible pressure transients in the system.

Secondary steam valves are selected for full generating capacity of the steam generator. A current problem confronting pressurizer relief valves is that the primary loop contains some boric acid and releases a certain amount of hydrogen. It is extremely difficult to keep a safety relieve valve tight against hydrogen infiltration, as acid has a way of creeping into tiny openings and fouling the seat. Remedies include the thermodisc and low spindle bearing points standard on Consolidated valves.

Forged steel valves of the required pressure class are manufactured to quality levels, including non-destructive testing and third party inspection, in accordance with the Pump and Valve Code requirements for Nuclear Classes 1, 2, and 3 as designated by the design specifications.



MSSV – Main Steam Safety Valve
(3700 Series)

PSV – Pressurizer Safety Valve
(31700 Series)

ERV – Electromatic Relief Valve
(1525 VX Series)

POSRV – Pilot Operated Safety Relief Valve
(13900 Series)



Pressure Relief Valves for Nuclear Service

*Designed for ASME Section III, Class 1, 2 and 3 Valve Specifications
as well as ASME Section VIII Safety Related and Section I for
commercial applications.*

For more than 100 years, Dresser Consolidated has been a leader in dependable, reliable, high performance pressure relief valves. As one of the first companies to adapt valves to the nuclear industry's demands and requirements in the 1960s, Dresser Consolidated delivers a trusted name proven for decades to offer exceptionally dependable products in nuclear applications. Our customers can depend on Dresser Consolidated nuclear service valves for the safety of their communities and their facilities.

We are committed to developing products that meet our customers' needs while upholding the highest industry standards. We carefully listen to our customers and stay informed of the challenges you face. As a result, we are able to design, engineer, and manufacture valves that help address real-world issues. Simultaneously, we work closely with regulatory organizations to ensure our products meet the requirements specified in important codes such as ASME.

Dresser Consolidated nuclear pressure relief valves are in compliance with several ASME sections making them a good choice for a range of applications. Our nuclear service valves meet ASME Section III, Class 1, 2 and 3 valve specifications as well as ASME Section VIII safety related and Section I commercial applications.



Process Control and Documentation

Customer documentation and process control are important core requirements of any successful project, and are particularly crucial for our customers in the Nuclear industry. We take pride in carefully developing and outlining processes based on our extensive experience in the nuclear industry. We capture vital information through comprehensive documentation by collecting data from all aspects of the project and from core team members. Thorough documentation control processes ensures traceability and the smooth and reliable transfer of critical knowledge in a format that can be revisited as often as necessary.

Reliable Customer Support

Experience and expertise are hallmarks of Dresser Consolidated's commitment to our customers and are among the fundamental reasons that customers continue to turn to Dresser Consolidated for their most demanding applications. Our knowledgeable customer support team is available to assist our customers around the globe.

Our industry-leading worldwide network of Green Tag® Centers (GTC) was established as the first network of its kind in 1982. Green Tag Centers remain the gold standard in the industry for reliable customer support that helps protect and optimize your valuable nuclear valve assets. Each GTC is staffed by factory-trained, factory-certified technicians who have completed intensive classroom and hands-on training.

Dresser Consolidated also has a team of well trained technicians in each global region to provide on-time service to our global client base. Any time of the day or night, in any corner of the world, Dresser Consolidated's technicians and network of Green Tag Center service and support facilities will help keep your operations running efficiently and safely.

With a range of styles, models, options and configurations, Dresser Consolidated nuclear safety valves and safety relief valves work in many different process and steam service applications.

- Primary, secondary and auxiliary systems
- Main steam systems for BWR and PWR reactors
- Reactor coolant system for PWR reactors
- Primary plant pressure vessels main steam generators
- Primary vessel service closed loop systems
- Moisture separator reheater systems
- Safety injection systems
- Chemical and volume control systems
- Ventilating systems
- Nitrogen Blanketing System



Dresser Consolidated Nuclear Service Valve Products



Type 3700
Main Steam Safety Valve

The Consolidated **Type 3700** is designed specifically to meet the stringent requirements of ASME Section III, Class 1 and 2. This valve is utilized as the primary pressure relief on main steam systems in BWR and PWR reactors.

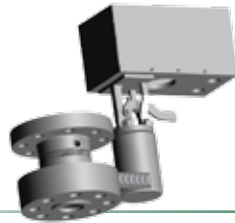
Inlet Sizes:	2 ½" through 10"
Outlet Sizes:	6" through 12"
Orifice Sizes:	3, 4, 6, 7, Q, 8, R, RR, S and T
Set Pressure Range:	50 to 1500 psig
Temperature Range:	Up to 600°F
Materials:	Carbon Steel / Alloy Steel
Reactor Service:	Boiling Water, Pressurized Water
Typical Application:	Primary plant pressure vessels and main steam generators
Certification:	ASME Section III, Class I for BWR and Class 2 for PWR, NV-Stamped



Type 31700
Pressurizer Safety Valve

The Consolidated **Type 31700** is designed to meet ASME Nuclear Code, Section III. This valve provides primary overpressure protection in reactor coolant systems in PWR reactors.

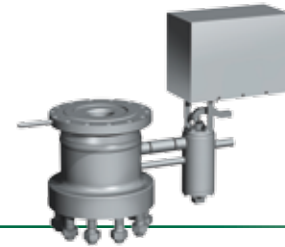
Inlet Sizes:	1 ½" through 6"
Outlet Sizes:	8"
Orifice Sizes:	1, 3, 5, 6, K, L, M, N, and P
Set Pressure Range:	100 to 3000 psig
Temperature Range:	Up to 700°F
Materials:	Stainless Steel
Reactor Service:	Pressurized Water
Typical Application:	Primary vessel service and closed loop systems
Certification:	ASME Section III, Class I, NV-Stamped



Type 31533VX Power Operated Relief Valve

The Consolidated **Type 31533VX** power operated relief valve (PORV) is designed to meet ASME Nuclear Code, Section III, Class 1 in PWR reactors.

Inlet Sizes:	2 1/2"
Outlet Sizes:	4"
Orifice Sizes:	13/16 through 1 5/8"
Set Pressure Range:	300 to 2500 psig
Temperature Range:	Up to 1050°F
Materials:	Stainless Steel
Reactor Service:	Pressurized Water
Typical Application:	Primary vessel service and closed loop systems
Certification:	ASME Section III, N-Stamped



Type 1525VX Electromatic Relief Valve

The Consolidated **Type 1525VX** Electromatic relief valve is designed to meet ASME Nuclear Code, Section III, Class 1 for BWR reactors.

Inlet Sizes:	6"
Outlet Sizes:	8"
Orifice Sizes:	3.860"
Set Pressure Range:	100 to 1500 psig
Temperature Range:	Up to 700°F
Materials:	Carbon Steel
Reactor Service:	Boiling Water
Typical Application:	Primary vessel service and closed loop systems
Certification:	ASME Section III, N-Stamped



Dresser Consolidated Nuclear Service Valve Products



Type 1541-3, 1543-3
Safety Valve

The Consolidated **Type 1541-3 and 1543-3** are designed to meet ASME Nuclear Code, Section III, Class 3, Section VIII safety related and Section I commercial. This spring-loaded safety valve product line is certified for air system protection service within Nuclear power plant processes.

Inlet Sizes:	1/2" through 2 1/2"
Outlet Sizes:	3/4" through 2 1/2"
Orifice Sizes:	D, E, F, G, H and J
Set Pressure Range:	15 to 300 psig
Temperature Range:	Up to 420°F
Materials:	Stainless Steel
Reactor Service:	Air System Protection
Typical Application:	Auxiliary Safety Systems
Certification:	ASME Section III, Class 3, NV-Stamped ASME Section VIII, Safety Related ASME Section I, Commercial



Type 1900
Safety Relief Valve

The Consolidated **Type 1900** is designed to meet ASME Nuclear Code, Section III, Class 3 and Section VIII Safety Related and Commercial. This valve meets numerous application requirements and is an excellent solution for the demanding requirements of nuclear applications.

Inlet Sizes:	1" through 12"
Outlet Sizes:	2" through 16"
Orifice Sizes:	D, E, F, G, H, J, K, L, M, N, P, Q, R, T, U, V and W
Set Pressure Range:	15 to 3000 psig
Temperature Range:	Up to 700°F
Materials:	Carbon Steel, Stainless Steel or Monel
Typical Application:	Various Nuclear and Balance of Plant Applications
Certification:	ASME Section III, Class 3 ASME Section VIII, Safety Related and Commercial



Type 19000 Safety Relief Valve

The Consolidated **Type 19000** is designed to meet ASME Nuclear Code, Section III and Section VIII. This valve meets numerous application requirements and is an excellent solution for the demanding requirements of nuclear applications. It is the best choice for thermal relief services due to the short fixed blowdown.

Inlet Sizes:	½" to 2"
Outlet Sizes:	1"
Orifice Sizes:	.096 through .567"
Set Pressure Range:	15 to 3000 psig
Temperature Range:	Up to 700°F
Materials:	Carbon Steel, Stainless Steel or Monel
Typical Application:	Various Nuclear and Balance of Plant Applications
Certification:	ASME Section III, Class 1, 2 or 3, NV-Stamped ASME Section VIII, Safety Related



Type 13900 Pilot Operated Safety Relief Valve

The Consolidated **Type 13900** pilot operated safety relief valve has been designed for high capacity steam over pressure protection for moisture separator reheater systems.

Inlet Sizes:	16" to 20" flanged
Outlet Sizes:	18" through 24" flanged
Orifice Sizes:	114, 143.1, 176.7 and 201 sq. in.
Set Pressure Range:	50 psig to 300 psig
Temperature Range:	250°F to 550°F
Materials:	Carbon Steel with Stainless Steel trim
Typical Application:	Moisture Separator Reheater Systems
Certification:	ASME Section VIII, PED and SQL



Dresser Consolidated Safety Relief Valve Products



Type 2478
Pressure Relief Valve

The Consolidated **Type 2478** pressure relief valve is a totally enclosed design for safety related applications.

Inlet Sizes:	1/2" through 2 1/2"
Outlet Sizes:	3/4" through 2 1/2"
Orifice Sizes:	D, E, F, G, H and J
Set Pressure Range:	15 to 300 psig
Temperature Range:	-325°F to 406°F
Materials:	Cast need space between bronze and bonnet, brass base and trim and PTFE soft seats
Certification:	Non-Coded



Type 2900
Pilot Operated Safety Relief Valve

The Consolidated **Type 2900** pilot operated safety relief valve combines the best of two products into one, the 1900 safety relief valve and the 3900 POSRV. The 2900 POSRV is designed to replace spring loaded relief valves without having to modify outlet piping.

Inlet Sizes:	1" through 12"
Outlet Sizes:	2" through 16"
Orifice Sizes:	Seventeen sizes – D through W
Set Pressure Range:	15 to 6250 psig
Temperature Range:	-40°F to 505°F
Materials:	Stainless steel pilot with carbon steel main valve and stainless steel trim
Certification:	ASME Section I Code Case 2446 and ASME Section VIII, PED and SQL



Type 3900 Pilot Operated Safety Relief Valve

The Consolidated **Type 3900** 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 in the nuclear industry.

Inlet Sizes:	1" through 10"
Outlet Sizes:	2" through 10"
Orifice Sizes:	Fourteen sizes – D through T
Set Pressure Range:	15 to 6250 psig
Temperature Range:	-40°F to 505°F
Materials:	Stainless steel pilot with carbon steel main valve and stainless steel trim
Certification:	ASME Section VIII, PED and SQL

Type 4900 Pilot Operated Safety Relief Valve

The Consolidated **Type 4900** pilot operated safety relief valve is a tubeless valve designed for overpressure protection of many pressurized systems in the nuclear industry.

Inlet Sizes:	1" to 8" flanged
Outlet Sizes:	2" through 10" flanged
Orifice Sizes:	Fourteen sizes – D through T
Set Pressure Range:	15 psig to 7200 psig
Temperature Range:	-40°F to 505°F
Materials:	Stainless steel pilot with carbon steel main valve and stainless steel trim
Certification:	ASME Section VIII, PED and SQL

About Dresser Consolidated

Dresser Consolidated, headquartered in Houston, Texas, has been an international leader in dependable pressure relief valves and solutions for more than 100 years. A business segment of Dresser, Inc., the company delivers the trusted expertise to provide and service reliable flow safety systems in critical applications around the world. www.dresser.com

About Dresser, Inc.

Dresser Inc. is a global leader in providing highly-engineered infrastructure products for the global energy industry. Leading brand names within the Dresser portfolio include Dresser Wayne® retail fueling systems, Waukesha® natural gas-fired engines, Masoneilan® control valves, Consolidated® pressure relief valves, and ROOTS® blowers and rotary gas meters. The company has manufacturing and customer service facilities strategically located worldwide and a sales presence in more than 150 countries. www.dresser.com.

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