

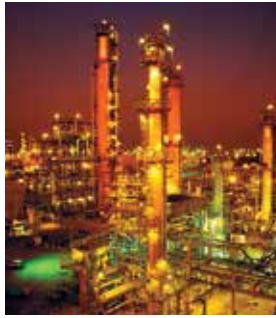
**CURTISS -
WRIGHT**

Valve Group



The First Line of Safety

Farris Engineering



Our Company

Farris Engineering, a business unit of Curtiss-Wright, has been at the forefront in the design and manufacture of spring-loaded and pilot-operated pressure relief valves since the early 1940's. With over 70 years of proven performance, Farris has provided automatic and positive protection against overpressure situations in thousands of industrial plants and facilities. Our reputation as "the First Line of

Safety" is a result of Farris innovations that have evolved into industry standards for pressure relief valve design.

Farris provides products and solutions serving many industries: hydrocarbon processing, refinery, petrochemical, fossil and nuclear power generation, natural gas production and transmission, pharmaceutical, and general processing.

Curtiss-Wright is a worldwide leader in delivering solutions that improve safety, plant flexibility, reliability, and efficiency. The businesses of Curtiss-Wright pioneer highly engineered solutions to deliver profound value to their customers and enable them to transform the way their business is done.

Worldwide

Farris' headquarters is located in Brecksville, Ohio, USA, and supports manufacturing, engineering, design and testing, including an ASME accepted flow test facility. Farris provides the global marketplace with sales and operations

support through our facilities in Canada, the United Kingdom, Brazil, China, and India. All manufacturing facilities are ISO 9000 certified. Products are designed and manufactured to ASME Code Sections I, III and VIII with

capacities certified by the National Board of Boiler and Pressure Vessel Inspectors. Our valves meet API standards and hold PED/ CE, CRN, ATEX, CSQI, CSA B51, GOST-R/RTN certificates as well as many other country, industry and customer specific approved.

Brecksville, OH, USA



Brantford, ON, Canada



São Carlos-SP, Brazil



Corby, UK

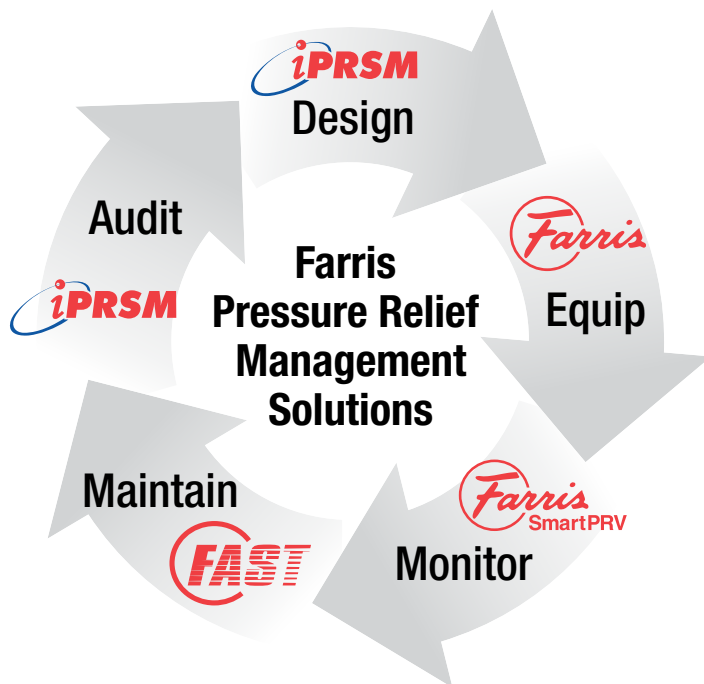


Tianjin, China

Legend

- Manufacturing Facility
- FAST Center
- Representative
- Sales Offices
- MFG Licensee





Value Beyond the Valve

With Farris, a trustworthy valve is only part of our promise. Farris provides customers with total pressure relief management solutions that support a facility's entire lifecycle, transforming the way you ensure plant safety:

Design—Using the power of iPRSM technology and our Farris Engineering Services team, correctly design your pressure relief system to respond to every overpressure scenario.

Equip—Equip your plant with Farris' full line of spring loaded and pilot operated PRV hardware, knowing your plant is protected by over 70 years of manufacturing experience.

Monitor—Monitor your pressure relief valves with the SmartPRV™ and leverage the technology of proven leaders, Farris and Emerson.

Maintain—Localized aftermarket service and repair assistance through the Farris Authorized Service Team – or “FAST” Centers.

Audit—Our Farris Engineering Services team and iPRSM technology will keep your pressure relief systems audited and in compliance.



Farris SmartPRV technology

Monitor

Farris Software Solutions



SizeMaster® Pressure Relief Valve Engineering Sizing & Selection Software

Now you can accurately size and select a pressure relief valve for any combination of process applications with SizeMaster pressure relief valve engineering software. Windows® based (all versions), this program provides unprecedented integration of standard engineering practices to

the task of sizing and selecting pressure relief valves. SizeMaster's scenario matrix allows the user to define as few as one or as many as 64 different sizing scenarios including blocked flow, fire, thermal and tube rupture. Selection of the pressure relief valve is automatically based on the relief area of the worst case scenario. Various Wizards make the most complicated task simple; for instance, the Capacity Wizard allows you to determine accurate vapor generation for vessels of all types.

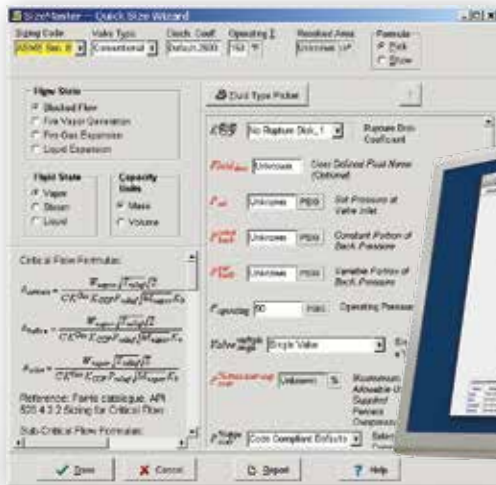
Design

Audit

iPRSM® Pressure Relief System Management Software

iPRSM is a patented, web-enabled software for intelligent pressure relief system management. iPRSM provides cost effective management of pressure relief system documentation and assures compliance with regulatory codes and company standards over your facility's lifecycle. iPRSM delivers features and benefits beyond anything available in industry today:

- Web Enabled / LAN Software Application
- Data Import / Export Capability
- Centralized Document Repository
- Integration to Flash Calculation Engine and Thermophysical Properties System
- Management of Change
- Cause of Overpressure Analysis
- Maintenance Database
- Navigation through P&IDs
- Relief Load Calculations
- Inlet / Outlet Pipe Calculations
- Two-Phase Flow Calculations
- Header / Blow Down Systems
- System Revision Control



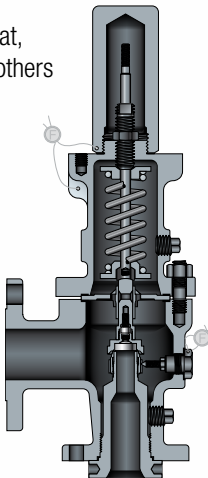
Farris Products

Process Valves



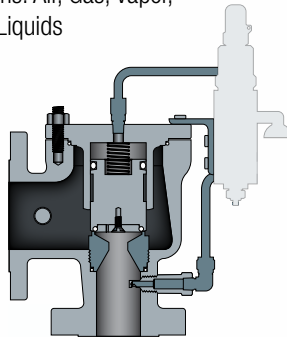
SERIES 2600/2600L

- ASME NB Certified: Air, Steam and Water
- 2600L – Single Trim Design for Multiple Services (Air, Steam, Water and Two-Phase Flow)
- Conforms to API 526
- CE Approved
- Sizes: 1" x 2" to 20" x 24"
- Pressure Range: 15 to 6000 psig, 1.0 to 413 barg
- Temperature Range: -320 to 1500 °F, -195 to 815 °C
- Materials: Carbon Steel, Stainless Steel, Low/High Temp. Alloy Steels, Monel®, Hastelloy C®, Duplex, & NACE Compliant Materials
- Options: Balanced Bellows, O-Ring Seat, Open Bonnet, and others
- Applications: Air, Gas, Vapor, Steam & Liquids



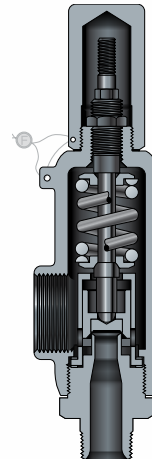
SERIES 3800/3800L

- ASME NB Certified: Air, Steam & Water
- Conforms to API Standard 526
- Full Port Nozzle optional
- CE Approved
- Sizes: 1" x 2" to 12" x 16"
- Pressure Range: 15 to 6170 psig, 1.0 to 425 barg
- Temperature Range: -320 to 500 °F, -195 to 260 °C
- Materials: Carbon Steel, Stainless Steel, Low/High Temp. Alloy Steels, Monel®, Hastelloy C®, Duplex, & NACE Compliant Materials
- Actuation: Snap or Modulating
- Options: Full Port Design Field Test Connections, Reverse Flow Preventer, Remote Depressurizing & Auxiliary Filters, and others
- Applications: Air, Gas, Vapor, Steam & Liquids



SERIES 2700

- ASME NB Certified: Air, Steam & Water
- CE Approved
- Sizes: 1/2" x 1" to 1-1/2" x 2-1/2"
- Pressure Range: 15 to 6500 psig, 1.0 to 448 barg
- Temperature Range: -320 to 750 °F, -195 to 399 °C
- Materials: Carbon Steel, Stainless Steel, Low/High Temp. Alloy Steels, Monel®, Hastelloy C®, Duplex, & NACE Compliant Materials
- Options: O-Ring Seat, Balanced Design, Flanged, Socket Weld, Welding Nipple & Sanitary Connections, and others
- Applications: Air, Gas, Vapor, Steam & Liquids

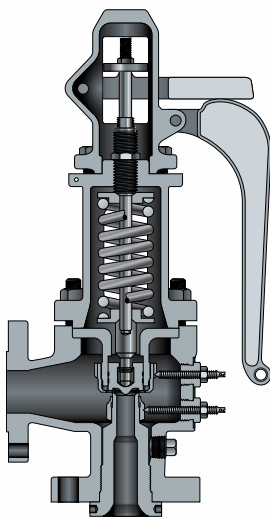


Steam Safety Valves



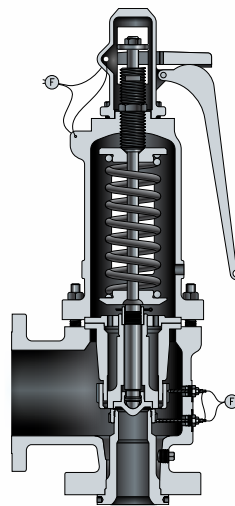
SERIES 4200

- ASME NB Section I & VIII Certified: Air & Steam
- CE Approved
- Sizes: 1-1/4" x 1-1/2" to 6" x 8"
- Pressure Range: 15 to 1000 psig, 1.0 to 68.9 barg
- Temperature Range: -20 to 1000 °F, 538 °C
- Materials: Carbon Steel, Stainless Steel & Chrome-Moly
- Options: Test Gag
- Applications: Steam Service



SERIES 6400

- ASME NB Section I & VIII Certified: Air & Steam
- Sizes: 1" x 2" to 4" x 6"
- Pressure Range: 15 to 1500 psig, 1.0 to 103 barg
- Temperature Range: -20 to 1000 °F, -29 to 538 °C
- Materials: Carbon Steel, Stainless Steel & Chrome-Moly
- Options: Closed Bonnet (6600) & Test Gag
- Applications: Steam Service



Specialty Valves

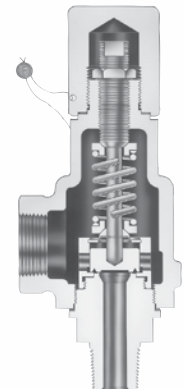


SERIES 1890

- ASME NB Certified: Air, Steam & Water
- Sizes: 1/2" x 1" & 3/4" x 1"
- Pressure Range: 15 psig to 800 psig
- Temperature Range: -20 to +750 °F
- Materials: Stainless Steel Body & Trim, Carbon Steel Bonnet
- Applications: Air, Steam Gas & Water

SERIES 1896M

- ASME NB Certified: Air, Steam & Water
- Sizes: 1/2" x 3/4" & 3/4" x 3/4"
- Pressure Range: 15 psig to 300 psig
- Temperature Range: -320 to +400 °F
- Materials: Brass Body & Trim, Bronze Bonnet
- Applications: Air, Steam Gas & Water



Engineering & Aftermarket Services

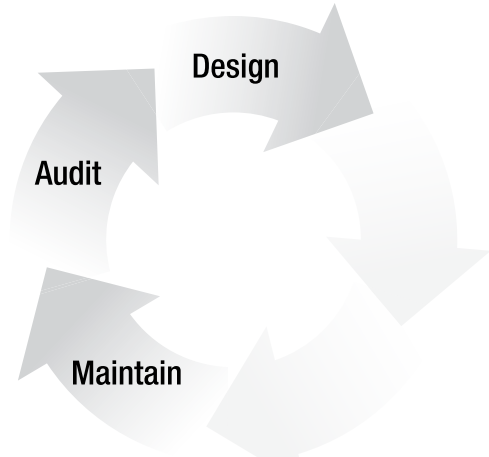
Engineering Services for Pressure Relief Systems

Relief System Design – experts in overpressure scenarios, our staff can design your relief system to optimize process production while minimizing unnecessary equipment costs.

Relief System Audit – our staff provides the most comprehensive relief system audit available in industry today. Services include relief

system validation and recommendations for mitigation of relief system deficiencies. Our staff will help your facility achieve PSM compliance.

Relief System Training – train your team in all aspects of safety system operation, including pressure relief valve design, by bringing our expertise to your facility.



Aftermarket Services for Pressure Relief Valves

The Farris Authorized Service Team – or FAST Centers – provide the aftermarket support facilities need to keep their operations safe. Our network of global FAST Centers provide aftermarket support to keep your pressure relief valves in operation:

- ASME and VR Certified valve repair facilities
- Diagnose and solve pressure relief valve problems with factory trained technicians
- Track and manage PRV maintenance and repair history

- Reduce plant downtime with local service and inventory, inline testing and field service capabilities
- Inventory Exchange – FAST Centers have access to an online inventory exchange allowing them to purchase Farris relief valves from anyone within the FAST network
- Valve Expertise – FAST Centers are all supported by Farris Engineering



Farris Engineering Products and Services

Process Pressure Relief Valves – ASME Code Section VIII

Series 2600	ASME NB Certified for Air, Steam
Series 2600S	ASME NB Certified for Air and Steam
Series 2600L	ASME NB Certified for Air, Steam and Water
Series 3800	ASME NB Certified for Air, Steam and Water
Series 2700	ASME NB Certified for Air, Steam and Water
Series 1890 / 1896M	ASME NB Certified for Air, Steam, & Water

Steam Safety Valves – ASME Code Section I & VIII

Series 4200	ASME NB Certified for Steam
Series 6400/6600	ASME NB Certified for Steam

Nuclear Pressure Relief Valves

Series 4700/4700L	ASME NB Section III, Division 1 Class I, II & III
Series 2700/3700	ASME NB Section III, Division 1 Class I, II & III
Series 2600/2600L	ASME NB Section III, Division 1 Class I, II & III
Series 3800	ASME NB Section III, Division 1 Class I, II & III

Certifications and Approvals:

- ASME V, UV, NV and NPT
- National Board Approval, NB
- ISO 9001-2008
- PED 97/23/EC (European Pressure Equipment Directive)
- ATEX 94/9/EC (European Potentially Explosive Atmospheres)
- CSA B51 (Canadian Registration)
- CSQL (China Safety Quality License)
- Russian GOST-R Certification and RTN Permit
- US Coast Guard
- Nuclear - 10 CFR 50 Appendix B, NCA-4000, NQA-1, N285.0
- First Point Assessment Limited

FAST Centers (Farris Authorized Service Team)

- Worldwide Network of Service Centers with Factory Trained Technicians
- Local Inventory and Support, 24 Hours a Day, 7 Days a Week
- Access to Worldwide Farris Inventory through the Web
- ASME/National Board Approved Assembly, Repair & Test Facilities
- Application, Sizing & Selection Support

SizeMaster™ Mark IV

Pressure Relief Valve Engineering Software for Sizing and Selection

PSM Engineering Services

- Pressure Relief System Design Services
- Pressure Relief System Audit Services
- iPRSM Pressure Relief System Management Software

**CURTISS -
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Facilities: Brecksville, OH, USA; Brantford, Ontario and Edmonton, Alberta, CA; Corby, Northants, UK; São Carlos-SP, Brazil; Tianjin and Beijing, China; Delhi, India

Offices Worldwide: For a listing of our global sales network, visit our website at www.cw-industrial.com.

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