Power Generation Interactive Resource Guide

The most comprehensive line of aftermarket component and system solutions in the world.

February 2013

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker

ENGINEERING YOUR SUCCESS.

A Legacy Since 1940

Parker is proven in the power industry like no other supplier. Our years of strategic acquisition have created a vast array of trusted, reliable legacy products that improve system life, increase safety, eliminate downtime, reduce operation and maintenance costs, boost efficiency, and accurately meet standards for emissions compliance.

A-Filter Arlon • Abex • Advanced Products • Airtek • AquaPro • Atlas Cylinder • Autoclave Engineer • Balston • Bayside Motion • Berea Rubber Products • Calzoni • Climax • Commercial Filter • Computer Technology • Daedal • Dayco Industrial • Denison International • domnick hunter • Ermeto • Fairey Arlon • Farr • Filtran Aftermarkets Products • Finite Filter • Finn Filter • Gold Ring • Greer • Gresen Hydraulics • Hanil Hydraulics • Hargraves Technology • Hiross • Hy-Temp • Invensys Watts Fluid Air • Kittiwake Group • Legris SA • Lucifer • Maidenstone • Manapak • Mantrol • Maxam Pneumatics • Meads Fluids Dynamics • Metal Bellows • Miller Fluid Power • Mitos Technologies • Olaer Group • Origa Group • Parflex • Page International • PGI International • Pioneer Quick Coupling • Pneutronics Ltd. • Polyflex • Porter Instrument • Pradifa Jager K.G. • Procal • Racor Industries • Rectus AG • Republic Valves • Resistoflex • RM Dynex • Rosaen Filter • Ross Controls • Schraeder Bellows • Schwarz Group • Sealcraft Division • Sempress • Sinclair Collins • Skinner Valve • Snap-tite • SSD Drives • Sterling Hydraulics • Stratoflex • Synthetic Rubber Products • Tell Tale Filters • Texas Thermowell • Texloc Holdings • Titan Industries • Trilogy Motors • Twin Filter • UCC International • UHP Components • United Air Products • Velcon Filters • Veriflo • Whatman's Industrial Filtration • Wilkerson • Zander

PARKER AND POWER

Advanced Motion and Control Products and Systems that Improve your Reliability, Performance, and Profitability.

Parker is the world's leading diversified **original equipment manufacturer** of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of markets, including power generation. As a collaborative partner, we work one-on-one with you to help create cleaner, more efficient energy. Whether for **nuclear**, **coal-fired**, **gas turbine**, and **combined cycle plants**...or **biomass**, **hydroelectric**, **waste-to-energy**, **geothermal**, **wind**, and **solar**...our solutions reduce costs and optimize performance. Faster and more efficiently.

What Parker Offers You

As the world's motion control expert, you can rely on our understanding of your business. Parker provides:

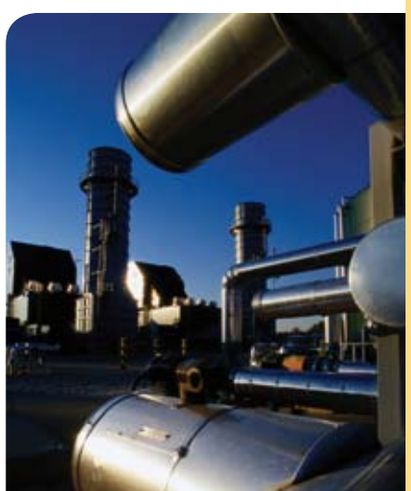
- Decades of power generation innovation
- Proven reliability worldwide
- OEM component and system solutions that meet stringent safety standards
- New, evolving technologies
- Customized system design
- Local distributor support
- Corporate procurement solutions

The bottom line? Our thousands of standardized and custom engineered solutions improve system life, increase safety, eliminate downtime, reduce operation and maintenance costs, boost efficiency, and meet emissions standards in new and old plants alike.

Expertise in key power areas translates into faster development, improved life, reduced risk, and greater value for you.

PH LISTED NYSE.

We are a public company traded on the New York Stock Exchange with annual sales in the billions of dollars.



Our Power Expertise

Parker has solutions for every power plant system, as well as balance of plant (BOP).

- Boiler Systems
- Circulating Water Systems
- Conveyor Systems
- Combustion
- Condensate and Feed water Systems
- Flue Gas Systems
- Fuel Handling
- Gas Turbine
- Generator Systems
- HRSG
- I&C
- Nuclear Reactor
- Plant Electrical
- Steam Turbine

Globally Connected

No matter where you produce, Parker is there. By working with us, you have access to an integrated network of hundreds of global manufacturing plants, 13,000 distributors and maintenance/repair outlets, and over 1,500 ParkerStores.

With approximately 60,000 employees in almost 50 countries, Parker is everywhere you need us to be.

Quality Focused

Our national and international certifications verify that our systems and solutions offer the highest possible quality for the most efficient performance.

ASME · FM APPROVED · ATEX · N · B31.1/B31.3 · PED · CE · TÜVRheinland · CSA/CRN · DIN · UL

A Partnership Approach

Whether you're involved in **new construction, planned outages, or plant upgrades** for an aging fleet, involving us early on can frequently speed the process and reduce costs. As a collaborative partner, we work one-on-one with you to create and deliver:

- **Custom engineered** original equipment and aftermarket solutions utilizing our complete range of proven products
- **Technology advances** that are smaller, lighter, safer, sustainable, more energy efficient, and highly reliable

PARKER AND POWER

A Dedicated Team of Power Experts to Provide the Best Turnkey, Technical Solutions.

As one of the leading **original equipment manufacturers** of engineered products, subsystems, and systems, Parker's capabilities in power are impressive – particularly when you realize they come to you as **one easy-to-work-with team**. Consisting of Parker experts who have worked in power for decades, including a North American network of **dedicated power distributors** with strong power engineering and fabrication capability, the Parker Power Team was formed to both **simplify and speed** working with us to your advantage.

The Power of Parker

Parker means solutions. We offer you a systems capability that leverages the power of Parker across the broadest range of applications in power plants for the best technical solutions. Plus our dedicated power distributors, located all over the world, can provide the additional benefit of "one-stop shopping," saving time and simplifying both your job and your day.

Parker
DISTRIBUTOR
Power Generation Specialist

How Our Distributors Help

- Vendor Managed Inventory
- Inventory Sharing
- Kitting and Pre-Assemblies
- Local ParkerStores
- Repair and Rebuild Services
- System Engineering
- Custom HPUs / Manifold Blocks
- In-House Fabrication (Pump, Compressor, Lube Oil / Flushing Skids)
- Field Service

Complete Systems Engineering Support

Parker's ability to design, prototype, and manufacture can shorten the design cycle, improving production efficiency and simplifying processes. Our team of dedicated power experts can be brought in to provide valuable, early-on collaboration for streamlined development. Not only can their knowledge of our many engineered solutions help solve existing problems – it can also help you develop new systems for added efficiency and productivity.

Fewer Suppliers

Working with Parker simplifies things. As a multiple technology provider, we can save you time and money by providing or negotiating national purchasing agreements, offering fleet standardization on key components, and helping to integrate a faster, more efficient supply chain. All of which can reduce the need for multiple suppliers and make single source supply for your company a reality.

Sustainability Initiatives

Parker can help you meet the need for low-emission, high-performance energy. Our advanced technologies can:

- Improve emissions performance
- Minimize waste
- Meet environmental regulations
- Monitor air and water quality
- Extend operating life
- Help create greater fuel efficiency

Profitability

Our active customer partnerships result in cost-effective solutions that optimize value. We offer a full complement of services that reduce outages and operational costs.

Aftermarket Service Programs

We know how important maintenance, repair, and service are. That's why we have focused service programs tailored to the needs of the aftermarket world. Working together, we can **control stock room inventories** with **integrated procurement options**. Improve maintenance cycles. Even help with **obsolete equipment**. Plus evolving development across all technology platforms guarantees you **new technology upgrades that deliver increased efficiency and longevity for your fleet**.

From instrumentation valves, fittings, tubing, and manifolds to flow control systems, our instrumentation solutions solve problems in new ways for increased accuracy, improved productivity, and less risk. Plus many of our products comply with Pressure Equipment Directive (PED) quality standards, ASME B31.1 Power Piping Code, as well as enabling compliance with newly enacted fugitive emissions standards.

Flow Control

Mass Flow Meters

- Porter 100/200/3200 Series – Analog Controllers
- Porter 500 Series – Digital Controllers
- Porter 3600 MFM Series – Digital Controllers

PTFE Flow Meters

- Veriflo FM-4 Series

Variable Area Flow Meters

- **Metal Tube Rotameters**
  - Porter P710 Series
  - Porter P750 Series
  - Porter P800 Series
- **Purge Meters**
  - Porter P100 Series – Metal Tube Purge Meter
- **Instrumentation (IPA) Flow Controllers**
  - Veriflo LC223S Series – Gas or Liquid Flow Controllers
  - Veriflo SC423XL Series – Gas Flow Controllers

Mass Flow Controllers

- Porter 200/2200/3200 Series – Analog Intra-Flow Controllers
- Porter 600 Series – Digital Controllers
- Porter 3600 Series – Digital Severe Duty Controllers

Instrumentation (IPA) Valves

- Veriflo FS190 Series – Excess Flow Shut-off Valves
- Veriflo NV17 Series – High Pressure Instrumentation Diaphragm Valves
- Veriflo NV70 Series – High Flow Instrumentation Diaphragm Valves
- Veriflo VR7 Series – Pressure Relief Valves

Porter 3600 Series Digital Mass Flow Meters and Controllers

Parker's Porter brand of Mass Flow Meters/ Controllers is specifically designed for severe duty industrial applications, handling a wide variety of gases. Both feature digital control electronics which enhance accuracy and repeatability.

Features & Benefits

- Certified for a wide variety of industry classifications, including hazardous environments
- Industry standard TURCK electrical connectors
- Multi-gas capability
- Modbus, Profibus, and DeviceNet communication

Applications

- Continuous on-stream analyzers
- Chemical (gas) flow measurement
- Corrosive/non-corrosive gas
- Cooling and circulating water
- Heat measurement of steam and saturated steam

Porter 800 Series Metal Tube Flow Rotameters

Parker offers a broad range of metal tube type flow meters that are applicable for monitoring lube oil and coolant flows. With an industry standard installation height, as well as stainless steel construction of all wetted surfaces, these flow meters are compact and highly accurate.

Features & Benefits

- 250 mm face-to-face installation height, an industry standard
- Corrosion-resistant 316L stainless steel construction standard
- Ease of installation and interchange with other flow meters
- Options of 4-20mA output, HART communication, alarm contacts, intrinsically safe

Applications

- Liquid, gas, steam, or dry gas seal flow measurement in piping up to 6" in diameter
- Chemical injection feed systems
- Process water flow measurement
- Compressor air flow monitoring
- Slurries – lime, fly ash, and coal powder
- Flow measurements on fuel line
- DI water systems (boiler, feed water and steam generators)

Veriflo NV70 Series High Flow Instrumentation Valves

For high flow applications that demand positive shut-off, either via pneumatic or manual actuation, these high cycle valves are an economical choice. Corrosion-resistant bodies and high fatigue strength diaphragm material ensure contaminate-free flows.

Features & Benefits

- Internally threadless design prevents contamination of fluid stream
- Metal-to-metal seal to atmosphere
- Elgiloy® diaphragm for exceptional corrosion resistance

Applications

- Continuous emissions monitoring (CEMS)
- High-purity flow control
- Hydrogen delivery
- Analyzer sampling

Mass Flow Control Valves
- Porter 001/002/003 Series

Metering Valves
- Porter HR Series – Valve Cartridges
- Porter HRCV Series – High Resolution Metering Valves

PFA/PTFE Valves
- Partek Ball Valves
- Partek Check Valves
- Partek Diaphragm Valves (Manual)
- Partek Needle Valves
- Partek Relief Valves
- Partek Sampling Valves
- Partek StopCock Valves

Thermoplastic Valves
- Partek PVC/CPVC True Union Ball Valves

Ultra-High Purity (UHP) Valves
- Veriflo F9 Series – UHP Check Valves

PFA Tube Fittings
- Partek Parflare Series
- Partek ParGrip Series
- Partek PFA Schedule 40 Tube Fittings

Thermoplastic Fittings
- Partek PVC Schedule 40 Fittings
- Partek PVC/CPVC Schedule 80 Fittings

Ultra-High Purity (UHP) Fittings
- Veriflo UltraSeal™ Series – UHP Fittings

Partek PFA Fluoropolymer Tube Fittings

Our full line of Fluoropolymer Tube Fittings enables the simplified creation of a corrosion-/contamination-resistant plumbing system. Containment of corrosive liquids and gases, as well as complete transmission of emission byproducts, is possible with Parker's line of Parflare, ParGrip, Parbond, and Schedule 40 pipe connections.

Features & Benefits
- Parflare flared tube connections minimize dead volume in unswept areas
- ParGrip tube connections can be assembled without any special tools
- Parbond weldable tube connections eliminate leaks
- Schedule 40 pipe connections simplify assembly
- Virgin fluoropolymer material for the ultimate in purity and corrosion resistance

Applications
- Plumbing systems requiring the utmost in corrosion resistance
- Exhaust stream flow paths for continuous emission monitoring systems (CEMS)
- Chemical injection lines for emission reduction

Partek PVC/CPVC Schedule 40 & 80 Fittings

An economical and long-lasting alternative to more exotic metal alloys, Parker Partek's PVC and CPVC thermoplastic pipe products are excellent in applications where corrosion resistance is required, but stainless steel piping will not work. PVC and CPVC piping products are available in a broad range of styles.

Features & Benefits
- Schedule 80 PVC and CPVC products, and Schedule 40 PVC products
- Corrosion resistance
- Ease of installation
- Light-weight, maintenance-free, long-lasting

Applications
- Liquid acid and alkali transport
- Chemical injection systems
- Emission reduction – FGD/SCR
- Wastewater treatment/process water filtration

Changeover Systems
- Veriflo COSE Changeover System – Continuous Gas Delivery

Instrumentation Cylinder Connections (Stainless Steel Compressed Gas Fittings)
- Veriflo CGA Connections
- Veriflo DISS Connections (Ultra High Integrity)

ChangeOver System (COSE)

For dependable, efficient gas and fluid management, Parker's ChangeOver System (COSE) is the solution. The compact, turnkey module maintains continuous gas delivery from multiple sources, eliminating costly downtime. Specialty gas costs are also reduced by maximizing gas consumption.

Features & Benefits
- Depleted gas cylinders can be changed out without disrupting gas flow
- Remote monitoring of cylinder banks using optional pressure switches reduces need for visual inspection by the operator
- Fully enclosed to protect internal components
- Removable side panels for field maintenance

Applications
- Continuous on-stream analyzers
- Continuous feed of bottle gases for CEMS
- Back-up system for compressors, generators, and other plant air sources

Pressure Control

Regulators

- **Back-Pressure Regulators**
  - Veriflo ABP1/ABP3 Series
  - Veriflo BPR50 Series – High Pressure
- **Dual Stage Regulators**
  - Veriflo 735 Series
  - Veriflo IR6000 Series
  - Veriflo IR6000W Series (High Pressure)
- **High Flow Regulators**
  - Veriflo HF 1200 Series
  - Veriflo HFR 9000 Series
  - Veriflo HFT 1200 Series
- **High Pressure Regulators**
  - Veriflo APR 66 Series (Pressure Reducing)
  - Veriflo HPR 800 Series
  - Veriflo XPR Series (Pressure Reducing)
- **Negative Pressure Regulators**
  - Veriflo NPR4100 Series
  - Veriflo NPR959 Series
- **Precision Instrument Regulators**
  - Porter 8310 Series
  - Porter 8311 Series
- **PTFE Pressure Regulators**
  - Veriflo BR-01 & BR-08 Series – PTFE Back-Pressure
  - Veriflo PR-01 & PR-08 Series – PTFE Pressure

Dual Stage Pressure Regulators – IR6000 and 735 Series

The IR6000 line of dual stage gas pressure regulators is for general purpose industrial applications, while the 735 Series features tied diaphragms, ensuring positive shut-off. These dual stage regulators from Veriflo dramatically reduce downstream pressure changes as the supply pressure fluctuates.

Features & Benefits

- 316L stainless steel
- 735 Series features tied diaphragms, ensuring positive shut-off of flow in case of a seat leak
- Elimination of threads in the wetted area for a cleaner flow path
- Metal-to-metal, body-to-diaphragm sealing for high leak integrity
- Up/down stops prevent diaphragm damage
- Welded option available for nuclear

Applications

- Steam atomizing/steam pressure
- Chemical feed systems
- Water treatment and DI water systems
- Fugitive emissions
- Calibration (gas cylinders)

- **Single Stage Regulators**
  - Veriflo IR4000 Series
  - Veriflo IR4000W Series (High Pressure)
  - Veriflo IR4200 Series
- **Vaporizing Regulators**
  - Veriflo AVR3 Series – Steam Heated Vaporizing (Pressure Reducing)
  - Veriflo AVR4 Series – Electrically Heated Vaporizing (Pressure Reducing)

Single Stage Pressure Regulators – IR4000/IR4200 Series

Parker Veriflo's single stage pressure regulators meet a wide variety of industrial gas pressure regulations. With a broad range of flow rates, body constructions, porting options, and seal materials, we can build a regulator to meet your system requirements.

Features & Benefits

- 316L stainless steel
- Hastelloy® C-22 diaphragms standard
- Close tolerances and tight alignment reduce hysteresis effect, enhancing pressure control
- Threadless design for clean, contamination-free flow path
- Metal-to-metal, diaphragm-to-body sealing for leak-free performance
- PEEK, Vespel®, and PCTFE seat materials
- Welded option available for nuclear

Applications

- Continuous emission monitoring (CEMS)
- Compressed air/gas
- Seal gas
- Boiler layup/nitrogen systems
- Calibration – gas cylinders
- Analyzer sample systems
- Instrument calibration

Click on specific products or headlines for more information.

Process Control

Compression Fittings

- A-LOK® Series – Double Ferrule Instrumentation Tube Fittings (up to 15,000 psi)
- CPI™ Series – Single Ferrule Instrumentation Tube Fittings

Click here to get a grip on pressure, vibration, and corrosion.

- MPI™ Series – Medium Pressure Tube Fittings (up to 15,000 psi)
- Phastite® Series – Permanent Ferrule-less Fittings (non-welded; up to 20,000 psi)

A-LOK® Tube Fittings

A-LOK® Double Ferrule Fittings bring the Parker edge to the power generation industry. Positive, reliable connections with Parker A-LOK Fittings have been qualified by exhaustive tests and more than four decades of manufacturing experience, making A-LOK the industry standard for instrumentation grade tubing. Documented heat code traceability on readily available stainless steel A-LOK Fittings for nuclear and other critical applications.

Features & Benefits

- Industry standard for instrumentation grade double ferrule tube connections
- Silver-coated threads reduce galling
- Back ferrule with Suparcase® resists inter-granular corrosion for superior sealing, longer shelf life
- For use with a wide variety of tubing materials and tube wall thicknesses

Applications

- Plant instrumentation control racks
- Continuous emissions monitoring (CEMS)
- Steam blowdown lines
- Transmitter connections

CPI™ Tube Fittings

Designed for leak-free tube connections in process, power, and instrumentation applications, Parker CPI™ Single Ferrule Fittings are manufactured to the highest quality standards and are available in a broad range of sizes, materials, and configurations. Documented heat code traceability on readily available stainless steel CPI Fittings for nuclear and other critical applications.

Features & Benefits

- Simple three-piece design; excellent for thermal cycling and heavy vibration applications
- Single ferrule system with Suparcase® reduces tube shear in high vibration environments
- Molybdenum disulfide coated nuts prevent galling and provide thread lubrication
- For use with a wide variety of tubing materials and tube wall thicknesses

Applications

- Instrumentation tubing connections
- Demanding applications where thermal cycling and/or vibration are present
- Steam blowdown lines
- Transmitter connections

MPI™ Tube Fittings

Parker's MPI™ Fittings have been engineered to provide secure, tight, leak-resistant connections for power gen applications requiring operating pressures from 6,000 to 15,000 psi and temperatures up to 1,150°F (621°C). Proven double ferrule construction and consistent high levels of reliability result in less media loss and reduced maintenance.

Features & Benefits

- Reduce installation and rework time by 50% as compared to cone and thread connections
- Designed with thick-wall tubing for added strength
- Longer thread area for vibration resistance
- Molybdenum disulfide coated nuts prevent galling
- Supplied complete and ready to install with standard hand tools

Applications

- Supercritical coal plant boiler water control
- Heavy wall tubing connections
- Alternative to traditional cone and thread connections
- High pressure/high temperature water and steam applications
- Transmitter/gauge/relief valve connections

Phastite® Tube Fittings (Non-Welded)

Revolutionary Phastite® tube connections from Parker provide an integrated alternative to welded connections and traditional high pressure fittings. Simply insert your cleaned and prepped tubing, then compress the integral collars to their stops. It's as simple as that. Assembly time required for heavy wall tubing is reduced, while costly welding and inspection are eliminated.

Features & Benefits

- Permanent, tamper-proof assemblies
- No loose parts – integral ferrules
- No threads, eliminating vibration-induced leaks
- Dramatic reduction in assembly time as compared to welded connections
- No heat-induced brittleness or corrosion reduction

Applications

- Heavy wall tubing connections
- Alternative to traditional cone and thread and welded connections
- High-pressure/high temperature steam applications
- Transmitter/gauge/relief valve connections
- Boiler water sampling lines

Click on specific products or headlines for more information.

B Series Ball Valves

Manual, pneumatic, and electric actuated Parker B Series Ball Valves are designed to provide positive, leak-tight shut-off and control of fluids utilized in process and instrumentation applications. The two-way valves provide quick, 1/4-turn on/off control of media, while the three-way valves may be used as diverting or selecting valves. A broad selection of valve body, seat, and seal materials combine to deliver a wide range of temperatures and pressures.

ANSI B31.1 COMPLIANT

Features & Benefits

- Two-way, three-way, or spring-loaded three-way selector designs
- Broadest temperature/pressure ranges: -65°F (18°C) to +450°F (232°C); up to 6,000 psi (414 bar)
- Lower inventory requirements by 60% through use of "one valve fits all"
- Widest variety of seats, seals, and port connections

Applications

- Instrumentation lines subjected to ambient temperatures – permits the use of one valve in various applications, eliminating potential misapplication
- Sample transport lines
- High-pressure/temperature steam lines
- Hydraulic control circuits, lube oil skids, pneumatic systems, etc.
- Control valves (steam turbine)
- Water injection

Pipe Fittings

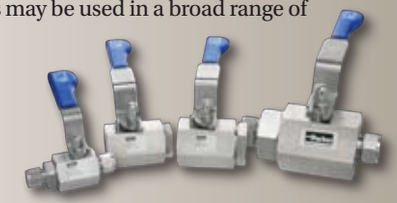
- High Pressure 10k Pipe Fittings (10,000 psi)

Instrumentation Valves

- **Ball & Plug Valves**
  - B Series – **ANSI B31.1 COMPLIANT** General Purpose Ball Valves
  - HB4 Series – High Pressure Ball Valves
  - Hi-Pro Series – **ANSI B31.1 COMPLIANT** High Pressure Ball Valves (20,000 psi)
  - MB Series – One-Piece Miniature Ball Valves
  - MBP Series – Medium Pressure Ball Valves
  - PR Series – 316 Stainless Steel Rotary Plug Valves
  - SB/SWB Series – Three-Piece Swing-out Ball Valves
  - SB/SWB8 Series – Three-Piece Swing-out Ball Valves (with PEEK seats & Grafoil seals)

Hi-Pro Ball Valves – ANSI B31.1 COMPLIANT

These high performance ball valves are of two-piece construction, reducing the number of potential leak paths, and offering up to 10,000 psig working pressure capability. Integral compression ends also help to eliminate leak-prone NPT threads. With various seat and seal materials available, these ball valves may be used in a broad range of difficult industrial applications.



Features & Benefits

- PEEK and PTFE standard ball seat materials for bubble tight shut-off
- 316 stainless steel
- Two-piece construction results in leak path reduction
- Integral compression end connections available, eliminating leak-prone NPT threads
- Meet the requirements of ANSI B16.34
- 4:1 standard working pressure safety factor
- Bidirectional flow path

Applications

- High pressure hydraulics
- Steam transport lines
- High pressure gas
- Hydraulic control circuits, lube oil circuits, pneumatic systems, etc.

SB/SWB8 Series Three-piece Swing-out Ball Valves

With a center section that can swing out to replace seats, seals and the ball without major disruption to the piping system, our SB and SWB8 Ball Valves now offer PEEK seats and Grafoil® seals for higher temperature and pressure ratings for process and instrumentation applications. The free-floating ball design allows the valve to continue to seal even after the seats begin to wear. Plus an ISO-type actuator mounting design offers the option of electric and pneumatic actuation.

Features & Benefits

- PEEK seats and packing improve the temperature range over that of the standard valve
- Grafoil® seals expand material compatibility options for the SWB8 valve
- Free-floating ball design for excellent seat wear and compensation
- Micro-finished ball provides reliable, positive seal
- Straight through flow design for minimum pressure drop
- ISO-type actuator mounting design offers electric and pneumatic actuation options

Applications

- Electrohydraulic control (EHC)
- Generators
- Welded piping systems
- Process lines/high flow applications
- High pressure/temperature steam lines
- Hydraulic control circuits and lube oil circuits

Instrumentation Valves continued

- **Check Valves**
  - C Series – General Purpose Check Valves
  - CB/CBF Series – Dual Fuel Check Valves
  - CF Series – Check/Filter Valves
  - CO Series – High Performance O-ring Poppet Check Valves
  - LC Series – Lift Check Valves
  - MPC Series – Medium Pressure Check Valves

Diaphragm Valves

- Nova Series – Economical general purpose valve
- NV55 Series – High flow valve

Manifold Valves & Systems

- CCIMS – Close Coupled & Remote Mount Manifold System
- H Series – **ANSI B31.1 COMPLIANT** Three- and Five-Valve Manifolds
- H Series – Two-Valve Manifolds
- Hi-Check Series – Non-Return Valves

CB/CBF Check Valves

Specifically designed to withstand the high temperatures and aggressive media of dual fuel turbines used in power generation, chemical processing, and oil and gas production, Parker CB Series Check Valves can significantly reduce or eliminate costly turbine shutdowns and maintenance caused by premature seat and seal failures. The unidirectional valve reduces the chance of coke deposit buildup when installed in fuel oil, purge air, or water lines connected to the combustion chamber.

Features & Benefits

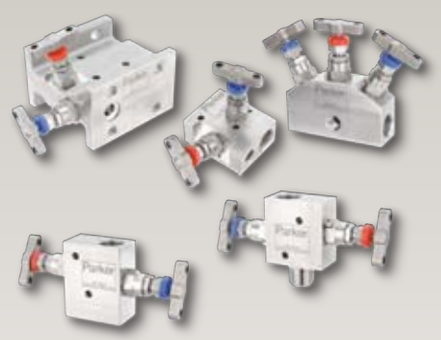
- High temperature sealing materials, including Teflon® coating
- Excellent, bubble-tight shut-off results in fewer stuck poppets and chattering valves
- No micro leakage to accelerate deposit formation and catastrophic failure
- Valve seats and seals withstand operating conditions in excess of 500°F (260°C)

Applications

- Liquid fuel lines
- Combustion turbine water feed lines for purge or NO_x reduction (water injection)
- Combustion turbine air purge lines
- Any fluid system exposed to high temperatures and process media coking

H Series Manifolds – ANSI B31.1 COMPLIANT

Whether for pressure, flow or temperature measurements, Parker's line of stainless and carbon steel manifold products offer innovative threadless connections and proven valve designs for demanding industrial applications. From the most basic two-valve manifold block, to multiple valve distribution manifolds, Parker offers a model to fit your instrumentation needs.



Features & Benefits

- 316 stainless steel
- 2, 3, 5, and multiple valve manifold designs in stainless steel and carbon steel
- Optional PT-Free™ threadless connection, for the elimination of NPT threads
- ASME Class 2500
- Graphite packed for high temperature service
- Patented Tru-Lok® safety bonnet locking device

Applications

- Differential pressure transmitter mounting
- Pressure gauge mounting
- Steam blowdown lines
- Process instrumentation

Manifold Valves & Systems
continued

- Monoflange Series – **ANSI B31.1 COMPLIANT** Double Block & Bleed Manifolds – FEMF Series for Ultra-low Class A Emissions
- Pro-Bloc® Series – Double Block & Bleed Flanged Valves & Manifolds
- R-Max Series – Stream Switching System

Metering Valves

- HR Series – Shut-off Capability
- N Series – General Purpose and High Flow Valve

Needle Valves

- H Series – **ANSI B31.1 COMPLIANT** Needle Valves
- Hi-Pro Series – **ANSI B31.1 COMPLIANT** High Pressure Needle Valves
- NV/HNV Series – Globe Style Bar Stock Needle Valves
- U Series – **ANSI B31.1 COMPLIANT** Union Bonnet Needle Valves
- V Series – Integral Bonnet Valves (5,000 psi)

Double Block and Bleed Monoflange Manifolds – ANSI B31.1 COMPLIANT

Parker now offers a full range of double block and bleed flanged products with fugitive emission options. These products meet Class 'A' or Class 'B' levels of the ISO 15848 standard for fugitive emissions. They also meet ANSI/ASME B16-34, B1.20.1, and B16.5 codes, as well as BS6755 PART 2/API 607 for fire safety.

The Monoflange manifold range is designed to replace conventional, multiple-valve installations that currently interface with pressure measuring systems. By combining primary and secondary valves into one compact manifold, the number of leak paths is significantly reduced and the system mass is lowered, offsetting the stresses from loading and vibration. This not only improves installation and operational safety factors, it lowers installation cost.

Features & Benefits

- Up to 60% reduction in leak paths through integral valve mounting for improved safety
- Less susceptibility to vibration
- Installation and component costs reduced by up to 80%
- Weight reduced by up to 85%
- One-piece, grain flow controlled, forged body for strength
- Incorporates standard "H" Series needle valve technology
- State-of-the-art outside screw and yoke (OS&Y) design
- Meets ISO 15848, Class A standard for fugitive emission requirements
- ANSI B16.5, 150 to 2,500 flange class

Applications

- Differential pressure transmitter mounting
- Pressure gauge mounting
- Steam blowdown lines
- Process instrumentation

H Series Needle Valves – ANSI B31.1 COMPLIANT

Specifically designed and tested for ANSI B31.1 compliance, these H Series Valves can be used for a wide variety of flow controls. The non-rotating stem tip and metal-to-metal sealing provide confidence with bubble-tight shut-off.

Features & Benefits

- Tru-Lok® safety bonnet locking device prevents accidental stem removal
- Graphite packing for high temperature service
- Blowout-proof stem

Applications

- Instrument lines
- Steam lines
- Transmitter lines
- Flow control

U-Series Union Bonnet Needle Valves

Our Union Bonnet Valves have been specifically engineered to meet the severe service requirements of BEP power applications. With sizes through 1", these U-Series Needle Valves are pressure-rated at up to 6,000 psi (414 bar), and temperature-rated from -65°F to 1200°F (-54°C to 649°C) with Grafoil® packing and a high temperature option.

ANSI B31.1 COMPLIANT

Features & Benefits

- Provide a high integrity seal under severe service
- Packing below power threads protects and isolates thread lubricants from the media
- Stem tip options prevent wire draw in high pressure steam applications
- 316 stainless steal

Applications

- Steam blowdown lines
- High pressure/high temperature applications
- Severe duty needle valve applications
- Flow control
- Boiler water sampling systems

Click on specific products or headlines for more information.

Hand Valves

All Parker Hand Valves are **ANSI B31.1 COMPLIANT**

- FB Series – Bellows Valves (6,000 psi) – **ANSI B31.1 COMPLIANT**
- GV/HGV Series – Multi-Port Gauge Valves
- MPN – Medium Pressure Needle Valves – **ANSI B31.1 COMPLIANT**
- PV/HRPV Series – Rising Stem Plug Valves – **ANSI B31.1 COMPLIANT**
- SN6 Series – Integral Bonnet Valves (6,000 psi) – **ANSI B31.1 COMPLIANT**
- VG/HVG Series – Single Port Gauge Valves (with vent) – **ANSI B31.1 COMPLIANT**
- YV Series – Outside Screw & Yoke Globe Pattern Needle Valves – **ANSI B31.1 COMPLIANT**

Purge Valves

- BV Series – Bleed/Purge Valves
- PG Series – Bleed, Purge or Drain Valves

Relief Valves

- HRPV Series – **PED-APPROVED** Relief Valves
- LPRA Series – Medium Pressure Relief Valves
- MPR Series – Relief Valves
- RH4 Series – High Pressure Relief Valves
- RL4 Series – Relief Valves

Tubing (Fractional/Metric)

- 316/316L Stainless Steel Instrumentation Tubing

Instrumentation Filters

- F Series – Inline Type Filters
- FT Series – Tee Type Filters
- MPF Series – Sintered Stainless Steel Filters

Did you know? Parker offers standard and custom tubing in several materials, including **316/316L, 304/304L, 6Mo, 321, SAF 2507, 625, 825,** and **Hastelloy C276**. Contact your local Parker Power Gen Distributor Specialist to learn more.

Snap-Trap® Tube Clamp Systems

Choosing the best possible components for a given application or environment can greatly control corrosion, not to mention the hazards and costs associated with it. Parker's Snap-Trap® is an innovative clamp designed to help customers defend against corrosion while radically simplifying the installation and maintenance of instrumentation tubing. Minimal contact points make Snap-Trap clamps a much better solution for avoiding crevice corrosion between the tubing and support system. When paired with Parker 6Mo Tubing and Fittings (both very resilient to uniform and pitting corrosion), you'll realize far greater confidence in your long-term corrosion control efforts.

Snap-Trap's unique one-piece design allows quick and easy fitting to cable trays, brackets, and angle iron alike. The clamp will fit slotted cable trays with various dimensions and can be mounted to any other design of trays with the aid of brackets.

Features & Benefits

- Salt spray tested with Parker 6Mo Tubing per ASTM B-117/ISO 9227
- Erected without using traditional tools – no slippage of spanners on nut or bolt hexagons
- Available in 5 sizes covering both imperial and metric tubing
- Significant reduction in installation time (less than two minutes)
- No bolts to be fastened to the ladder, tray, etc.; no additional spare parts to be ordered
- Designed by an offshore contractor, with over one million installed worldwide
- Complies fully to NORSOK standard Z-CR-010
- Brackets, cable trays, keys, and accessories available

Applications

- Water treatment systems
- Gauge clusters
- Hydrogen cooling (generators)
- Instrument air lines and panels

316/316L and 6Mo Stainless Steel Instrumentation Tubing

For stainless steel tubing in harsh process control environments, the safety, integrity, and reliability of the tubing are critical. By partnering with only the best tubing suppliers, Parker is able to offer quality-assured domestic (P1) and non-domestic (P2) 316/316L stainless steel tubing that meets Parker performance standards.

Exotic materials

Our welded or seamless instrumentation tubing is available in 316/316L stainless steel, as well as a range of the most commonly used exotic alloys. These include 304/304L, 6Mo, 321, SAF 2507, 625, 825, and Hastelloy C276. This assures corrosion-free performance in specific applications, including media, pressure, temperature, and environment.

Features & Benefits

- Controlled and consistent quality to provide easy welding
- Plugged ends provide protection during transit and from environmental contamination
- Strictly controlled ovality, concentricity, and close tolerances
- Meets ASME, ISO 9001, QS-9000, PED 97/23/EC, JIS, TUV, and LRQA requirements for tubing

Applications

- Instrument lines for pressure, flow, and temperature monitoring
- Sample transport lines for chemical injection or process measurement
- Fuel, gas, or steam transport lines
- Hydraulic control circuits, lube oil circuits, pneumatic systems, etc.
- Feed water tubes/condenser tubes/ baler tubes

Click on specific products or headlines for more information.

AIR QUALITY CONTROL Solutions

Spec the Best. Spec Parker.

Carbon. Mercury. SO_x. NO_x. CO_2. Soot. Organic chemicals. Metals. Tightening regulations regarding these and other air pollutants are making gas and coal compliance more challenging than ever. As companies look for new ways to meet mandates Parker is there, offering game-changing innovations that provide accurate, reliable, and cost-effective solutions.

Emissions Monitoring and Analysis Expertise

For more than 25 years, coal-, oil-, and gas-fired power plants have formed the largest installed user base for Parker CEM systems. Throughout this period, there has been increasing environmental scrutiny and resulting process upgrades, including the adoption of after-treatments such as sophisticated Flue Gas Desulfurization (FGD) and Selective Catalytic Reduction (SCR) systems. Parker technology has evolved with the industry, offering increasingly sophisticated monitoring and analysis solutions that help ensure a cleaner environment.

Click here for Key Global Regulations.

Procal 1000 Analyzer Control Unit and Software

The brains of an advanced, continuous emissions monitoring software control and reporting system. Configured to collect data from Procal's advanced range of emissions analyzers as well as complementary devices, enabling the system to display gas concentrations in a normalized basis or in mass units if required. Can be located up to 1,200 meters from the CEMS.

Features & Benefits

- Reports that meet the requirements of most national environmental authorities
- Data from up to 16 channels per instrument can be presented on one individual panel
- Measurement values in digital and analog form
- Normalization system diagnostic alarm with access to specific detailed displays
- Analyzer connection status and analyzer-specific status panel screens for each instrument

Applications

- Selective catalytic reduction monitoring
- Flue gas desulfurization monitoring
- Continuous emissions monitoring (CEMS)
- Combustion control

Procal 2000 In-Situ Infrared (IR) CEMS/FGD Analyzer

This Infrared (IR) Duct or Stack-mounted Analyzer uses the reflective beam principle to directly measure process gas as it enters a sample cell. It provides an online analysis solution of up to six gas-phase emissions components. Patented, sintered metal technology eliminates the need for gas filtering or sample conditioning as required by higher maintenance extractive systems. Plus Procal 2000 allows for rapid upgrades of measuring range, presentation, and reporting formats to help ensure compliance.

Features & Benefits

- Integral auto verification unit initiates a zero-check on the system by filling the sample probe with clean, dry instrument air; similarly, it performs a span-check by filling the sample probe with certified span gas
- Wet or dry options; Oxygen or CO_2 measurement normalization options
- ATEX/IEC options for hazardous areas
- Legislative compliance: CEM - U.S. EPA 40 CFR parts 60 & 75 / AMS - Europe QAL 3 of EN 14181

Applications

- Selective catalytic reduction monitoring (SCR)
- Flue gas desulfurization monitoring (FGD)
- Continuous emissions monitoring (CEMS)
- Combustion control (CFB)
- Biomass plant emissions monitoring

KEY GLOBAL REGULATIONS

In the U.S.:

Mercury and Air Toxics Standards (MATS)

- Finalized in 2011
- Sets the first emissions limits on mercury and other toxic air pollutants
- Applies to coal- and oil-fired power plants
- Requires 1,100 coal-fired power plants to prevent 90% of mercury in burned coal from being emitted by 2015
- Will also curtail lead, arsenic, hydrogen chloride, hydrogen fluoride, and dioxins/furans
- Currently, power plants are the dominant emitters of mercury (50%), acid gases (<75%), and many toxic metals (20-60%)
- Approximately 40% of current plants do not have advanced pollution control equipment

In Europe:

The Large Combustion Plant (LCP) Directive

- Coal-fired plants that produce sulphur dioxide, nitrogen oxide, and carbon dioxide in large volumes had to fit pollution reduction technologies such as FGD by the start of 2008 or else operate for 20,000 more hours or until the end of 2015 and then close
- In 2016, the LCP Directive will be superceded by the Industrial Emissions Directive (IED), which gives coal, gas, and oil fired power stations until June 2020 to comply with the next phase of EU pollution regulations
- New plants, both gas and coal, are required to use the best available pollution control technologies at time of construction, updatable through a legislative review process

Procal 5000 Ultraviolet (UV) Emissions Analyzer

Continuous emissions monitoring analyzer for in-situ analysis of gas-phase emission components. Uses absorption spectroscopy to store and analyze the full UV spectrum and calculate gas emission concentrations. Patented, sintered metal technology eliminates gas filtering or sample conditioning.

Features & Benefits

- Multi-component gas analysis; typically measures up to 6 components
- No operator intervention during routine use
- Automatic signal verification and recalibration of oxygen or CO_2 measurement normalization
- Reduced maintenance and cost; simple installation
- Legislative compliance: CEM - US EPA 40 CFR parts 60 & 75 / AMS - Europe QAL 3 of EN 14181

Applications

- Selective catalytic reduction monitoring
- Flue gas desulfurization monitoring
- Continuous emissions monitoring (CEMS)
- Combustion control
- Incineration emissions monitoring (waste to energy plants)

Procal 6000 Infrared (IR) Radioactive Gas Monitoring for Nuclear Power Generation

Procal 6000 is an infrared (IR), duct-mounted multi-component gas analysis emissions analyzer designed to provide in-duct analysis of up to six gas-phase emission components. Consisting of a duct-mounted analyzer, an Auto Verification Unit, and a Control Unit, Procal 6000 is suitable for stack testing/analysis of corrosive, toxic, and in particular, potentially radioactive gas-phase samples. Under such conditions, its simplicity and reliability compare favorably to the high maintenance requirements and potential contamination issues of extractive systems.

Features & Benefits

- Measures up to six components
- Provides direct, in-situ measurements, eliminating the need for high cost, high maintenance sample handling systems
- Eliminates the need for sample modification
- Automatic signal verification and recalibration removes operator intervention during routine use
- Flange-mounted analyzer reduces installation cost
- Low maintenance and zero consumables reduces cost of ownership

Applications

- Stack testing
- Analysis of corrosive, toxic, and in particular, potentially radioactive gas-phase samples

COVER
TABLE OF CONTENTS
AUTOMATION
CLIMATE & INDUSTRIAL CONTROLS
FILTRATION
FLUID & AIR CONNECTORS, HOSE & PIPING
GAS TURBINE
HYDRAULICS
INSTRUMENT-ATION
SEALING
AIR QUALITY CONTROL
BIOGAS
CONDITION-BASED MONITORING & DIAGNOSTICS
ENERGY STORAGE
NUCLEAR
DISTRIBUTOR SPECIALISTS

AIR QUALITY CONTROL Solutions

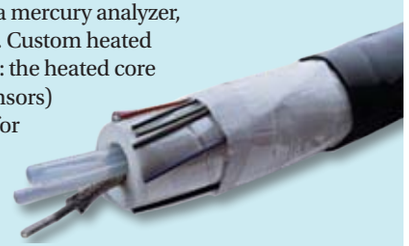
Power plant instrumentation equipment must operate reliably to monitor critical processes, determine emissions, and maintain control of the power plant. To do this, tubing requires heat trace and insulation capabilities. Parker pre-insulated tubing is the most reliable, consistent, and cost-effective way to accomplish the following:

- Process accuracy and emissions compliance
- Winterization/freeze protection
- Temperature maintenance
- Personnel protection from hot piping/tubes
- Keeping gas streams above their dew point

Our heated lines for your gas stack sampling systems offer a temperature maintenance range of up to 4,000°F (2,040°C). Each element within the umbilical is helically cabled, allowing for complete heat control through its length, providing precise feedback to the operator and ensuring system accuracy.

Multitube® CEMS and Analyzer Umbilicals

Used to extract stack gas from a probe located at the top of a smoke stack. The umbilical transports the gas by vacuuming it down to a mercury analyzer, where the mercury content of the stack gas can be verified. Custom heated CEMS umbilicals typically consist of two separate sections: the heated core (sample transport tubes, heating element, temperature sensors) and the non-heated probe support bundle section (tubes for calibration/air purge, electric wires, temperature sensor and wires, thermocouple cables for the probe). To reduce installation time and cost, Parker offers Multitube® bundles made to customer design requirements with all components included.



Features & Benefits

- Withstand temperatures up to 1,500°F (815°C)
- Accurately maintain stack gas temperatures while transporting flue gas samples
- Unique cabling design for ease of handling and routing
- Single or multiple tubes, cabled or parallel configurations, up to 30 elements

Applications

- Environmental stack gas analyzer lines and probe control
- Continuous emissions monitoring (CEMS) sampling analyzers (SO_x, NO_x, and mercury)
- Analyzer lines that need to be heated to measure gas streams above their dew point

CH/CL Series Constant Watt Electric Heat Trace Tubing Bundles

Temptrace™ electric heat trace tubing bundles utilize a constant wattage heating cable to protect against corrosion, freezing, and personnel injury. High Temperature (CH Series) and Low Temperature (CL Series) provide even heat distribution and precise temperature control. Parker tubing bundles save space within cabled trays and reduce overall installation costs.

Features & Benefits

- CH Series High Temperature: Process temperature maintenance up to 400°F (204°C)
- CL Series Low Temperature: Process temperature maintenance up to 250°F (121.1°C)
- Non-hygroscopic fiberglass thermal insulation for minimum heat loss
- Flexible black UV and flame-resistant PVC jacket
- Process tubes 1/4" to 1/2" O.D.; single or dual tube designs

Applications

- Process analyzer and analyzer lines
- Impulse and instrument lines
- Stack gas sampling lines
- Water lines (water shelter) – freeze protection
- Transmitters (flow, pressure, and level)

SH/SL Series Self-Regulating Electric Heat Trace Tubing Bundles

Bundles feature insulated and heated tube construction with self-regulating cables for maximum performance in an extreme range of temperatures. Although both series offer freeze protection, SH is engineered for high temperature maintenance up to 250°F (121°C), while SL is ideally suited for low temperature maintenance up to 150°F (65°C).

Features & Benefits

- SH Series withstands steam blowdown
- Non-hygroscopic, inorganic fiberglass insulation for minimum heat loss
- Flexible black UV and flame-resistant PVC jacket
- Standard Parflex Temptrace™ meets NEC Personnel Protection Code 427.12

Applications

- Water injection and cooling system protection
- Water freeze protection for pipes, valves, and tubes
- Temperature maintenance of gas samples, liquids, and other process materials
- HRSG (heat recovery steam generator)
- Steam blowdown

Temptube Steam Bundles

Designed to provide an economical and highly efficient method of conveying steam or other hot materials through the power plant, Parker Temptube Bundles are pre-insulated to provide winterization and protect against freeze and personnel injury. Intended to replace hard piping and on-site installations.

Features & Benefits

- Patented non-hygroscopic insulation for minimum heat loss
- Outer jacket surface temperature maintained at 140°F (60°C)
- Flexible black UV and flame-resistant PVC jacket

Applications

- Steam supply, condensate return, cooling water, lubrication, and liquid nitrogen lines
- Transfer heat from tracer/steam line to process line
- Turbine inlets
- Impulse lines
- Water injection
- Flow measurement in cooling modules
- Instrument line freeze protection

BIOGAS Solutions

Between municipal solid waste (MSW), agricultural waste, and forestry waste, there is an abundance of biomass waste around the world. This makes biogas – which originates from biomass – a leading energy source for renewable power production. In fact, according to EIA, biomass was the world's fourth largest source of energy in 2011.

The technologies used in harnessing this abundant power resource include gasification and direct firing. Parker's portfolio of proven heat transfer technologies is ideal for these production processes, which involve feed preheating, steam generation, steam condensing, and gas cooling. Parker's extensive expertise includes the following:

- Filters
- Cooling and chilling packages
- Condensate drains
- Gas drying and dehydration packages, utilizing TSA and PSA technology
- Removal systems for siloxanes, H_2S, NH_3, HHC from biogas/landfill gas
- Fuel, associated gas, and natural gas purification systems
- High pressure compressed gas filters

Parker Siloxane Removal System

A dual-bed regenerative skid that is placed into a fuel gas stream prior to turbine usage of methane from landfill gas. The skid efficiently separates the siloxane from the gas in order to protect the turbine from harmful damage created when the gas is burned. Utilizing a blower, chiller, and pre- and post-filters, the system removes additional contaminants as well, reducing turbine maintenance costs and improving profitability.

Features & Benefits

- The only regenerative system proven to consistently meet or exceed OEM specifications for fuel gas siloxane content
- Provides efficient particulate and aerosol filtration, VOC reduction, and dehydration
- Fully adjustable cycle to handle a wide range of gas qualities and adjust to changing gas conditions
- Operates on as little as 0.2 to 0.6 cents per kWh
- Individually designed for each application

Applications

- Siloxane removal in gas applications
- Treatment of landfill gas

Did you know?

Cooling biogas to a low dew point can increase cogeneration systems' energy output by as much as 5% and significantly reduce operating costs. Using Parker components such as WFB Coolers, SFB Separators and ICE Water Chillers, Parker can custom engineer complete packaged dehumidification systems to meet the specific needs of our clients worldwide. Contact your local Parker Power Gen Distributor Specialist.

Click on specific products or headlines for more information.

Biogas Filters

- Parker Hiross Raw Biogas Filters (ATEX)
- Parker S4 – Biogas Filters

Biogas Industrial Process Water Chillers

- Parker Hiross HyperChill – Bioenergy Chillers
- Parker Hiross HyperFilter – Bioenergy Low Pressure Filters

Need an Expert?

Click here to locate a Parker Power Generation Specialist near you.

Parker Hiross Raw Biogas Filters

Our low-pressure Raw Biogas Filters increase process safety and efficiency by protecting the tube bundle coolers from dirt and particle contamination. Used as a post-filter, they remove particles from the gas stream, protecting the downstream gas engine. Filters are available in sizes to handle gas flows up to 50,000 Nm3/h.

Features & Benefits

- ATEX approved
- Comply with PED, GOST, ASME, and SQL pressure vessel codes
- Water separation filters available

Applications

- Landfill gas conditioning
- Feed preheating
- Steam generation
- Steam condensing
- Gas cooling

Parker Hiross Hyperchill Bioenergy Chillers

Designed to cool and dehumidify aggressive bio, landfill and sewage gases, Parker Bioenergy Chillers offer high efficiency, excellent reliability, and flawless performance under many different operating conditions. Their closed water temperature operation provides high working limits and low running costs. Many options make them highly adjustable.

Features & Benefits

- Special protective treatment on condensers and copper piping for reliable operation, even in aggressive ambient environments
- Pump and tank reside inside the chiller for a compact footprint and easy installation
- Electronic controllers; remote monitoring available
- Large internal tank and pump, low head pressure 21.7 psi (1.5 bar)
- Scroll compressors and large condensers for high efficiency

Applications

- Provides chilled water for heat exchangers in gas cooling

Biogas Heat Exchangers/ Aftercoolers

- Parker Hiross Hypercool Bioenergy

Aftercoolers

- Parker Hiross WFB Series – Shell & Tube Coolers

Biogas Demister Separator (Centrifugal Separator)

- Parker Hiross HyperSep Bioenergy

Biogas/Landfill/Digester Dryers

- Parker Hiross W Series – Biomethane Dryers

Biogas Condensate Float Drains

- Parker Hiross Hyperdrain Bioenergy

Biomass Treatment Systems

- Parker Siloxane Removal Systems (H2S, NH3 or HHC)

Parker Hiross Hypercool Bioenergy Heat Exchangers/Aftercoolers

Hypercool Aftercoolers can be installed immediately downstream of compressors or blowers to remove up to 80% of the condensate, protecting the entire compressed air system or production process. Cost-effectively remove water vapor and cool compressed air to safe, usable levels. ADT coolers can be used when cooling water is not available, limiting plant complexity and preparing air for further filtration and drying.

Features & Benefits

- High efficiency heat exchanger for a low gas outlet temperature
- Robust construction and compact design with stainless steel ribbed tubes
- Significant energy and capital investment savings
- Reduced maintenance and improved product quality

Applications

- Cooling warm, saturated landfill air, or biogases
- Compressed air cooling and dehumidification
- Cooling air before an adsorption dryer
- Turbine bearing lube systems
- Boiler feed systems (boiler blowdown)
- FGD systems

Parker Hiross W Series Biomethane Dryer

Grid injection of treated biogas (biomethane) requires compliance with various country-specific criteria, including dehumidification. Parker's adsorption dryers ensure reliable gas dehumidification, achieving pressure dew points of -94° to -130°F (-70° to -90°C). The twin tower design facilitates continuous operation, providing optimum energy balance and maximum safety.

Features & Benefits

- ATEX-compliant components
- Low differential pressure
- Able to use external flash gas sources
- Adsorption drying agents used to capture moisture
- Twin tower process enables 24/7 operation; one tower used for drying, while the other is regenerating

Applications

- Biomethane production plants (dehumidification before grid injection)
- Dehumidification of associated gas
- IGCC plants (integrated gasification combined cycle)
- Combined heat and power (CHP) systems

Parker Hiross HyperSep Bioenergy Separators

HyperSep Bioenergy Separators from Parker Hiross remove rust, oil, and other impurities, significantly improving the performance of filters. Compact and easy to install, HyperSep units are available with a wide range of threaded and flanged air connections. They require no external power source and work automatically without any required maintenance. All threaded models feature a unique HiroShield surface protection treatment applied both inside and outside to further reduce downtime.

Features & Benefits

- Removable demister for very easy maintenance
- Stainless steel separator with 99% efficiency across the entire flow range
- Surfaces in contact with the media are made of stainless steel

Applications

- Removal of water content from gases entering gas turbines

A Legacy of Innovative Solutions for Nuclear Power

Parker has been the source of innovative solutions for the nuclear power industry since the 1960s. In fact, Parker components and subsystems have been used in more than 50% of all nuclear power plants in the world over the past 40 years. Leading power generation companies have depended on us to deliver solutions of exceptional quality and durability – solutions designed to reduce costs and advance performance.

Our globally available, safety-related certified products for nuclear power include the following:

Electrohydraulic Servovalves

Hose Assemblies

Hydraulic Accumulators

- Bladder Accumulators/Pulsation Dampeners/Suction Stabilizers
- Piston Accumulators

Also ASME U Stamp and CRN certified.

Hydraulic Fittings

Also CRN certified.

Hydraulic Pumps/Motors/PU

Hydraulic Valves

- Flow Control Valves
- Colorflow® Valves
- Republic/Manatrol Valves
- Servo/Proportional Valves

Industrial Cylinders/Actuators

Also ASME U Stamp and CRN certified.

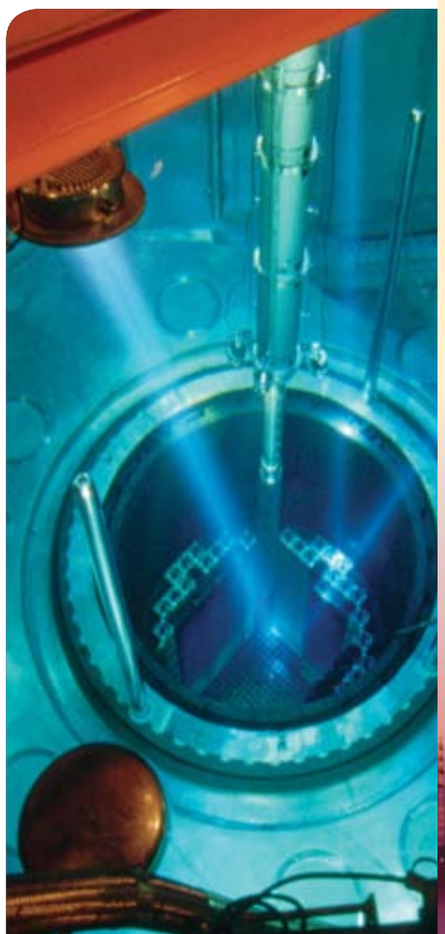
Instrumentation Fittings and Tubing

Also ASME, RCC-M, and CRN certified.

Instrumentation Valves and Manifolds

Also ASME N Stamp, RCC-M, and CRN certified.

NPP Filters



Our Installed Base

Where is Parker in nuclear today? Everywhere – as listed below:

Alabama Power
American Electric Power
Areva Np Inc.
Arkansas Nuclear One
Bruce Power LP
Brunswick Nuclear Plant
BW Nuclear
Con Edison
Constellation Nuclear
Diablo Canyon Nuclear
Detroit Edison
Dominion Generation
Dominion Nuclear
Duke Energy Corp.
Duke Power Co.
EDF
EDF Cnpe De Cat
Entergy Corp.
Entergy Nuclear Operation
Entergy Operations Inc.
Exelon Corp.
Exelon Generation
Exelon Nuclear
Farley Nuclear Plant
First Conax Nuclear Inc.
First Energy Corp.
Florida Power Light
GE Global Nuclear Fuel
GE Nuclear Energy
Georgia Power
Helian Industrial Machiner Qingdao, Prc (China)
Hydro Quebec
Kernkraftwerk
Korea Hydro Nuclear Power
Ling Ao
Nebraska Public Power District
Nine Mile Point Nuclear Station
Ontario Hydro
Ontario Power Gen
Palisades Nuclear Plant
Par Nuclear Inc.
Pennsylvania Power Light
Perry Nuclear Power Plant
Point Beach Nuclear Plant
PPL Susquehanna
Progress Energy
Progress Energy Crystal River
Qingshan
RE Ginna Nuclear Power Plant
SCE Songs
SCK Bruxelles
Sequoyah Nuclear Plant
Slovenske Elektrane Mochovce
Sogedec
Southern Cal Edison
Southern Nuclear Co.
STP Nuclear Operating
Taiwan Power
Texas Utilities
TVA Browns Ferry
TVA Sequoyah Nuclear Plant
TVA Watts Bar Nuclear
UKAEA Government
Union Electric Company
Westinghouse Electric
Wolf Creek Nuclear
Xinhua Powerstation Shanghai Prc.

O-rings/Seals

- E0740/E0962/E0803/V0747/V0884/VM835 O-rings

Pneumatic Cylinders

Also ASME U Stamp and CRN certified.

Quick Closing Valve Actuators

Also ASME U Stamp and CRN certified.

Quick Couplers

- CPI™/A-LOK® Series Instrumentation Couplings
- 60 Series General Purpose Couplings
- Snap-tite™ H Series General Purpose Poppet Couplings

Also CRN certified.

Solenoid Valves

E0740 EPDM High Radiation O-rings

Parker has been the premier supplier of O-rings for U.S. power plants for over 30 years. Key among our offerings is the E0740 EPDM O-ring, specially formulated for compression set resistance at intensities of 10^6 rads and above. Typically used for storage containers, high/low temperature cooling connections, and steam turbine and boiler applications in temperatures that range from -70°F to 250°F (-57°C to 121°C), the E0740 High Radiation O-ring provides the following benefits:

- Available in standard sizes for quick delivery
- Custom spliced O-rings for extremely large I.D.s
- Test data with popular gearbox lubricants
- Long-term CSR data
- Adhesives for holding large seals in place
- NUPIC certification for nuclear power plant use
- Several unique recipes specifically for power plant applications

U.S. Nuclear Installed Base:

- Calvert Cliffs
- Ginna
- Nine Mile Point
- Monticello
- Point Beach
- Savannah River
- Tennessee Valley

Greer Bladder Accumulators

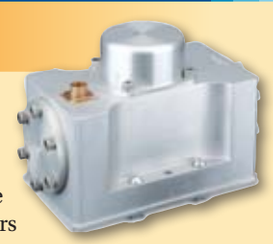
Available in bottom repairable, top repairable, medium flow, high flow, transfer barrier, and gas bottle styles, the Parker Bladder Style Accumulator is the industry's original, and still the best. For years this style of accumulator has served nuclear markets, providing a proven design for many hydraulic system applications. Parker bladder products maintain the highest quality because of our in-house bladder molding operations. All Greer bladders are engineered and manufactured in our own facility to our own high quality standards. For nuclear applications, Greer Bladder Accumulators offer the following:

- Operating pressures to 6,600 psi
- 10 different capacities from 10 cubic inches to 15 gallons
- Nine different configurations
- ASME/U-Stamp certification standard, one gallon and up
- Water/chemical service available, with stainless steel ports
- Five bladder compounds to suit a variety of fluids and temperatures
- CE marking available

Nuclear Applications

- Valve actuation systems
- HYD lube oil systems
- Boric acid injection skids

Parker Jet-Pipe® (ABEX) EHSVs



Parker Electrohydraulic Servovalves (EHSVs) produce fewer unscheduled trips due to their highly reliable Jet-Pipe® first-stage and second-stage spool design. This basic fail-to-center design has been continuously developed and refined over the last 40 years. The result is an exceptionally stable and erosion-tolerant EHSV that offers the longest expected life in the industry.

Another benefit? Parker Jet-Pipe® technology is far less prone to contamination, a key advantage in power generation "dirty" environments. The unique jet construction enables most designs to receive and pass particles as large as 500 microns without malfunction. Plus Parker EHSVs offer 75% pressure recovery and neutral fail-safe capability.

This total value servovalve also offers the following:

- Excellent low temperature performance
- Low sensitivity to first-stage erosion
- Enlarged product portfolio targeting the global power generation market
- Global dedicated power generation distributors, situated to provide local support
- Competitively priced for a highly reliable, value conscious solution

Nuclear Applications

- Steam turbine control valves
- Boiler feed water control

Quality-Assured Stainless Steel Instrument Tubing

Want to reduce the risk of leakage in your hydraulic and instrumentation systems? Consider Parker seamless, stainless steel, straight length tubing. Our domestic and non-domestic tubing is characterized by the ovality, concentricity, and hardness limits required for superior performance. Plus Parker tubing offers the high surface smoothness and close dimensional tolerances needed to ensure a leak-free environment when connected with couplings or to Parker fittings. This quality-assured tubing with its superior O.D. finish offers:

- Easy welding, due to controlled and consistent quality
- Plugged ends that provide protection during transit and from inside contamination
- Superior performance in a wide variety of system applications, temperatures, and pressures due to strictly controlled ovality, concentricity, and close tolerances
- Meets ASME, ISO 9001, QS-9000, PED 97/23/EC, JIS, TUV, and LRQA requirements for tubing
- Parker "branded" on tubing, assuring installers that it has been qualified by Parker Hannifin

COVER
TABLE OF CONTENTS
AUTOMATION
CLIMATE & INDUSTRIAL CONTROLS
FILTRATION
FLUID & AIR CONNECTORS, HOSE & PIPING
GAS TURBINE
HYDRAULICS
INSTRUMENT-ATION
SEALING
AIR QUALITY CONTROL
BIOGAS
CONDITION-BASED MONITORING & DIAGNOSTICS
ENERGY STORAGE
NUCLEAR
DISTRIBUTOR SPECIALISTS

Parker Hannifin Corporation
6035 Parkland Blvd.
Cleveland, OH 44124
phone 800 272 7537
fax 216 896 4410
www.parkerpowergen.com