Fluid Systems Innovation
Fuel and Inerting Systems | Electronic Controls | Pneumatics | Water and Waste

Parker Aerospace
ENGINEERING YOUR SUCCESS.
Our Vision:

The premier global leader providing fluid management and electronic control systems for aerospace markets.

TECHNOLOGY
Develop innovative systems solutions and expanded core capabilities through investment in technology and resources by capitalizing on our electronics and software expertise.

OPERATIONS
Achieve superior program execution through advanced business processes and our people.

GROWTH
Expand our partnerships with our customers by leveraging our consolidated intellectual property to provide innovative solutions and unmatched performance.

Saved time, reduced waste, gained efficiency, expanded output, increased profitability.

That’s what we mean by engineering your success at the Parker Aerospace Fluid Systems Division. As the premier global leader providing fluid management and electronic control systems for the aerospace market, we offer both systems and components for fuel, inerting, pneumatics, and water and waste applications. Routinely going above and beyond to provide you with the kind of premier customer service that you expect and deserve.

As your partner, we make it our business to improve your productivity and profitability wherever possible. From design and development, through integration, manufacture, certification, and lifetime support, we work hard to add value to both the process and the product by exceeding expectations and performance goals for aerospace and related markets.

A key division of Parker Aerospace, and part of the Parker Hannifin family, the Parker Fluid Systems Division has the talent, resources, and infrastructure needed to help you succeed through innovative technology, meaningful partnership, and premier customer service.
The Parker Fluid Systems Division engineers your success with the following product lines:

- Fuel systems and subsystems
- Engine pneumatics
- Smart pumps
- Fuel tank inerting systems
- Water subsystems and products
- Fuel measurement and management
- Airframe pneumatics
- Electronic controls
- Lightning protection equipment
Fuel systems and subsystems

As a world leader in fuel systems, we combine our expertise in fuel system equipment with the advanced pump technology and fuel measurement and management capabilities enabling us to offer our customers the time and money savings of total fuel system integration. We provide a single point of contact, as well as a singular fuel system solution that includes:

- Fuel tank pressure and vent control
- Fuel tank inerting
- Fuel level and flow control
- Fuel transfer
- Fuel pumping
- Engine feed
- Fuel measurement and management
- Refueling and defueling
- Aerial refueling
- And more

Fueling innovation:

Our dual role on the Airbus A350 XWB

Xtra responsibility on this Xtra widebody airliner — that’s the role of the Parker Fluid Systems Division on the A350 XWB, and it’s one we’re proud to fill.

As the first supplier to be awarded both the fuel equipment and the fuel tank inerting systems on a major program, our contributions to this long-range, widebody family are significant. They include the fluid mechanical equipment, the fuel measurement and management system, engine feed and transfer fuel pumps, and the fuel tank inerting system.

As a key partner in the A350 XWB program, we teamed with Airbus from an early stage in the development process.

We also are providing a wide range of light-weight, high-performance equipment and Lightning-Safe® components for its all-new composite wing design.

Current fuel system programs

Agusta A109/119, AB139
Airbus A350 XWB, A400M
BAE Bradley Fighting Vehicle
Bell OH-58, UH-1
Bell/Boeing V-22
Boeing C-17 ER, F-15, F/A-18 E/F
Bombardier CSeries, Global Express XRS, Q400, Learjet 45 and 85
Cessna 208, 535; Citation CJ4, Mustang, Sovereign, XLS
COMAC ARJ21, C919
Embraer ERJ 135/145, 170/190, Legacy 450/500
General Dynamics MIA1 and MIA2 Abrams
Hawker Beechcraft
Lockheed Martin F-16, F-22, F-35
Northrop Grumman Global Hawk
Raytheon Tactical Tomahawk
Sikorsky HH-92, MH-60, UH-60
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Putting performance to the test

Our extensive on-site testing capabilities duplicate actual operating conditions. By providing a thorough evaluation of fuel system and component performance under temperature, vibration, and altitude extremes, we engineer products that withstand the harshest environments, reduce development cycle time, and ensure reliability at entry into service.

Full-scale wing testing
Executed at high or low temperatures using a wide range of fuels and varying altitude conditions, our full-scale wing testing covers:
- Refuel/defuel
- Venting
- Icing
- Pitch and roll

Dynamic vibration testing
With test facilities that provide control to 3200 Hz and capabilities that include random and sinusoidal vibration and shock, we can duplicate critical high- or low-temperature vibration environments for systems and components that include electromechanical, electronic, pneumatic, and/or hydraulic actuators.

Partnering: Helping the C919 get off the ground

Seeing opportunity in a growing market, we established an early partnership with the Commercial Aircraft Company of China (COMAC), which has resulted in our selection as the fuel and fuel tank inerting systems provider for the C919. With total system responsibility, the Parker Aerospace team is working onsite with COMAC engineers to help define, develop, integrate, build, test, certify, and provide lifetime support for the C919.

The fuel system equipment will handle multiple functions and includes engine feed, auxiliary power unit feed, refuel and defuel, venting, scavenge, fuel quantity gauging, and integrated modular avionics fuel gauging and management software.

The fuel tank inerting system includes the conditioned air supply and electronic control, as well as nitrogen-enriched air generation and distribution, reducing the flammability of fuel vapors in the aircraft’s fuel tanks and increasing aircraft safety.

The end result? Strong global relationships and a very satisfied customer.
Fuel tank inerting systems

As the premier world leader in fuel tank inerting systems, Parker’s Fluid Systems Division has turned nearly 50 years of inerting technology leadership into an unequalled inerting system pedigree. No other aerospace company can offer either the depth or breadth of our proven inerting and fuel system experience. Our unmatched expertise in the design, manufacture, integration, and support of fuel systems enables us to bring fuel tank inerting systems to market quickly and cost effectively. By approaching fuel tank inerting from a fuel system perspective, we have developed extensive analytical and test capabilities that allow us to provide an integrated solution. It’s the kind of expertise that makes us a low-risk, high-value partner.

Partnering:
Parker technology transforms Boeing

All new Boeing 737, 747, and 777 airliners will include fuel tank inerting technology produced by Parker’s Fluid Systems Division. Our proprietary inerting technology uses the existing conditioned engine bleed air to separate out the oxygen and produce nitrogen-enriched, non-flammable air for delivery to the fuel tanks. Our fuel tank inerting equipment is accompanied by Parker people who are placed onsite to support the integration of our inerting technology into all newly produced members of the Boeing 737, 747, and 777 families.

Fueling innovation:
Our advanced and comprehensive inerting technology

Parker’s leadership in fuel inerting development is reflected by our broad and comprehensive portfolio of advanced technology.

Inerting technology capabilities

| Aircraft fuel tank inerting systems |
| Fuel tank inerting system with thermal stability |
| Fire prevention and/or suppression systems |
| Climb and dive valves |
| Explosion suppression systems |
| Gas separation apparatus |
| Three-flow architecture |
| Process for drying air |
| Modular OBIGGS |
| OBIGGS optimization by pressure scheduling |
| OBIGGS cooling systems |
| Method for monitoring inert gas distribution |
| OBIGGS turbocharging |
| Modulated warming flow |

Palletized air separation modules
SPEEDING THE PROCESS:

Delivering the best system at the lowest possible price

As a value-added partner, we’ve developed processes that ensure our fuel inerting systems come to market faster and more affordably. These include:

- A Stage-Gate™ lean process procedure that offers the benefits of single-piece flow and statistical process control
- A total life-cycle tool that reduces both time and risk in program development
- Global outsourcing, saving you money through our worldwide network of subcontractors

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Analytical tools that enable optimized system solutions

At the Parker Fluid Systems Division, we employ a wide array of analytical tools integrating fuel system knowledge and experience to make sure our fuel tank inerting systems perform up to standard. These tools include computational fluid dynamics (CFD), SYSIL, a computation analysis program, and our proprietary tank modeler tool to predict in-tank oxygen concentration. Together, they allow us to properly size the systems while streamlining the distribution of nitrogen-enriched air. The end result is a system that can provide the required flow based on demand without the need for storage tanks, saving weight and space for better bottom-line performance.

Our fuel tank inerting capability discriminators include:

- 45 years of fuel and fuel tank inerting experience
- Multiple-fiber knowledge and experience with actual test data, analysis, and flight certification
- Experience with nitrogen-enriched air distribution test and analysis
- Safety technology to prevent fuel ingress back to high-temperature air source
- Integration of fuel gauging systems and inerting systems

Simulation aids integration — Parker’s fuel tank inerting systems integration lab (SIL) simulates a complete range of aircraft operation conditions while monitoring oxygen concentrations of the system, confirming our analytical models.

Current fuel tank inerting system programs

- Airbus A320, A330, A340, A350 XWB, A400M
- Boeing 737, 747, 777, C-17, Orion P8A
- Bombardier CSeries
- COMAC C919
- Lockheed Martin C-5, F-16, F-22, F-35
- Sukhoi Superjet 100

The right rig — Parker’s NEA distribution test rig monitors oxygen concentration and nitrogen-enriched air distribution on a full-scale test rig, validating our analytical tools.

Lifetime Support

Our cost-per-hour programs, dispatchability requirements, and fixed maintenance pricing actually guarantee performance.
Airframe pneumatics

Our broad portfolio of airframe pneumatic components and subsystems is the ideal place to start for any commercial, military, or regional application. The industry experience and pedigree we offer, combined with our continuous research and development programs, keep our products leading the way while offering our customers low cost of ownership. Our product range includes:

- Anti-ice control and de-icing systems
- Compartment and precooler temperature control
- APU load control valves
- Butterfly, coaxial, and check valves
- Bleed air pressure control
- Air turbine starter control valves
- Temperature control valves and temperature sensors
- Low-pressure regulators
- Motor-operated shutoff valves
- Pneumatic-operated shutoff valves
- Nacelle cooling/ventilation shutoff valves

Global sourcing of motor-operated pneumatic valves

Innovation isn’t always born of new technology: sometimes it comes from new thinking. Take our motor-operated pneumatic valves for Kawasaki Heavy Industries’ XP-1 program. We were able to lower production costs and raise customer satisfaction by taking the manufacture of the motors for these valves to our assembly and test facility in Guaymas, Mexico. Here, cellular manufacturing and material pull systems combine with a skilled and willing workforce to provide excellent quality at a competitive cost. Guaymas is just one of the many worldwide locations we can draw upon to procure the value our customers want and deserve.

Fueling innovation:

Partnering:

Improving pressure regulating valves on the Boeing 747-8

You don’t build a super-efficient airliner like the new Boeing Intercontinental without sweating the details — or, to be more specific, the wing anti-ice valves. These valves contribute to Boeing’s overall goal of lower life-cycle costs for the 747-8 Intercontinental and help us to achieve our goal of 100% customer satisfaction, 100% of the time.
Advanced analysis that advances your performance

Our in-depth finite element analysis (FEA) capabilities not only set us apart, they move you ahead by simulating component performance in a way that can significantly reduce development time and program risk.

**Structural analysis**
The computation of deformations, internal forces, and stresses to predict the behavior of structures in the following areas:
- Static
- Modal
- Dynamic
- Fatigue

**Current pneumatic subsystems programs**
- Bell/Augusta BA609
- Bell/Boeing V-22
- Boeing 737, 747-8, 767, F/A-18 E/F
- Bombardier Learjet 60
- Cessna C208 Caravan; Citation CJ4, Mustang, Sovereign, XLS, X
- Hawker Beechcraft King Air
- KHI PX/CX
- Lockheed Martin F-16
- P180
- Sikorsky S-92 Helibus

**SPEEDING THE PROCESS:**
Developing products for unmet customer needs

We call it Winovation. You might call it listening to the customer. But whatever you call it, this proprietary business process has been designed to drive the development and commercialization of new products that fulfill unmet customer needs — and it’s working beautifully. Based on the principles of Stage-Gate™, Winovation shepherds new ideas through five distinct stages — concept, feasibility, development, qualification/pre-production, and launch — allowing Parker Aerospace to provide its customers with only the most commercially viable new ideas.

Parker Aerospace customers receive several levels of global customer support, ranging from a far-reaching network of distributors to geographically strategic service centers providing technical assistance 24/7.
Engine pneumatics

Today’s aerospace markets demand high-performing yet cost-effective pneumatic engine controls. Which is why the Parker Fluid Systems Division offers such a wide range of options designed to operate in the extreme environments of today’s high-performance engines. Our pneumatic subsystem expertise complements our fuel subsystems and fluid conveyance abilities in the engine environment. Our subsystems and components are well proven and reliable, offering you the advantages of seamlessly integrated and optimized solutions. Parker Aerospace engine control subsystems and components are available for virtually any specification or application, employing advanced designs, materials, and actuation technologies.

Partnering on the Trent XWB: Innovative thinking early on

Great programs demand great ideas — and that means teaming, early and often. Take the Rolls-Royce Trent XWB engine, slated for the Airbus A350 XWB family of aircraft. By working collaboratively at the initial concept phase, we’ve been able to integrate design innovations that will result in lower costs and longer service life.

Our demonstrated ability as effective team members through early engagement has had its own rewards. Rolls-Royce has selected Parker Aerospace as a partner on the program, asking us to provide the pneumatics suite, the hydraulic EBU system, heat management valves, and the lubrication and oil scavenge pump for the new engine. Not only that: we’ve been selected as the Rolls-Royce Gas Turbine supplier of the year, proving that a focus on customer satisfaction gains recognition in more ways than one.

Pneumatic subsystems

- Anti-icing subsystems
- Compressor control subsystems
- Starter air subsystems
- Turbine case cooling subsystems

Fueling innovation:

Turning up the heat on the Trent 1000

The three-shaft, Rolls-Royce Trent 1000 engine that is used on the Boeing 787 Dreamliner features Parker Fluid Systems Division pneumatic valves with a new capability: higher heat resistance. Thermal mapping of the valves very early in the design stage resulted in the development of higher-temperature pneumatic valves for use in higher-temperature applications. This in turn produced longer valve life and lower cost of ownership.

Advanced and early thermal analysis of new designs is only one example of how Parker reduces your risk while offering equally impressive and predictable levels of reliability in the harsh operating environments of today’s jet engines.
**Current engine pneumatic programs**

- EuroProp International TP400-D6 (Airbus A400M)
- GE CF34-8/10 (COMAC ARJ21, Embraer 170/190, Bombardier CRJ700/900), GE90 (Boeing 777), F404/F414 (F/A-18 E/F)
- IAE V2500 (Airbus A320)
- Pratt & Whitney PW2000/F117, PW4000, PW6000
- Rolls-Royce Trent 1000 (Boeing 787), Trent 500 (Airbus A340), Trent XWB (Airbus A350 XWB)

**Predicting fluid flow to reduce risk and manage cost**

Our continued investment in the latest technologies, processes, tools, and test equipment continues to pay off for our customers. This is particularly true of our computational flow dynamics tool. It enables Fluid Systems Division engineers to simulate fluid flow through valves to predict system performance. Results are then validated using our own dedicated test rigs and hardware. The end result? Better optimized system performance for our customers.

**SPEEDING THE PROCESS:**

**Fast-tracking product development**

Every company has its own trade secrets. One of ours happens to be a proprietary development process that can cut weeks off the delivery date. By initiating product design using 3D tools right from the start, we’re able to bring products from specification through testing and validation much faster. In fact, we are on track to cut development time on some programs by as much as 20%.

**Predicting performance — Computational flow dynamics testing simulates fluid flow and predicts performance.**

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An extensive performance database combines with our watchful eye to flag early or unusual problems in the field, which we then proactively address with our customers.
Water subsystems and products

Our potable water and lavatory subsystems and components range from immediately available off-the-shelf products to highly engineered solutions, offering customers the greatest flexibility in meeting their needs. Based on more than 100 million flight hours, these innovative products provide durability, light weight, easy maintenance, and simple operation. They include:

**POTABLE WATER**
- Heated and non-heated fill valves and overfill nipples
- Liquid level indicators and indicator panels
- Pressure relief valves
- Pumps
- Tanks
- Quick-disconnect couplings

**LAVATORY**
- Drain valves
- Rinse/fill check valves
- Supply hoses
- Leak check tools
- Nut plate adapters
- Anti-siphon, vacuum-breaking check valves
- Composite tubing

**Fueling innovation:**
Making a material difference on the G650

A leader in the use of titanium for valves, as well as potable water and waste tanks, Parker Aerospace put its material expertise to good use for the new Gulfstream flagship, the G650. Our hybrid design for the aircraft’s potable water and waste system used both titanium and stainless steel to help meet the aircraft’s cost and performance objectives. Our unique skill set in the casting, welding, machining, and passivation of titanium combine with our innovative design capabilities to shorten lead times while simultaneously reducing risk and cost.

**Partnering:**
Parker and the Bombardier CRJ1000

The Parker Fluid Systems Division is helping Bombardier’s new CRJ1000 get off to a flying start in support of launch customers British Air and My Way Airlines. Parker is supplying the design and manufacturing of the regional jet’s lavatory subsystem.

The business is predicated on the past success of our aft lavatory drain subsystems for the CRJ700 and 900 aircraft, which offered a proven, fast-tracked solution with high levels of maintainability and serviceability. Not to mention unmatched aftermarket support.
SPEEDING THE PROCESS:

Continuous improvement

At Parker Aerospace, continuous improvement is an integral part of our culture. We are driven to provide superior customer satisfaction by constantly evaluating what we do and how we do it. Our continuous improvement process allows us to:

• Re-evaluate and re-examine our core competencies
• Solicit and act upon customer input
• Identify areas where unmet customer needs exist
• Enhance and refine our capabilities to meet customer needs better, faster, and at a total lower cost for the life of a program

All with the superior quality and on-time delivery we’re known for!

Taking technology on the road

Parker Aerospace is taking its technology pedigree on the road by sponsoring technology forums at customer locations around the globe. Engineering leaders from all Parker Aerospace advanced technology disciplines host these intensive events with the goal of advancing the state of the art through meaningful information exchange. By going on the road with our latest aerospace innovations, we can work side by side with our customers to see how we might meet their future technology needs.

Current potable water and lavatory programs

Airbus A318, A319, A320-100/200, A330, A340-300/500/600, A380, A400M
Boeing 737-600/700/800/900, 747-400, 767, 777, 787, C-17
Bombardier CRJ700/900/1000, Global Express XRS, Challenger 605
Gulfstream G650
IAI/Gulfstream G250

Parker’s Customer Support Operation is highly proactive, taking the initiative to identify and prevent problems at an early stage, before they occur. As a result, more frequent field engineering contact with customers has yielded measurably greater customer satisfaction.

Smart production — In the production cell, a skilled Parker Aerospace technician assembles and tests a state-of-the-art smart potable water pump.

Boeing 787 potable water pump

Tech talk — Parker showcases its engineering expertise in sponsoring technology forums at customer locations.
Smart pumps

Parker Aerospace offers a wealth of intelligent technology pumps for wide-ranging applications. These include:

- Fuel boost and transfer pumps
- Hydraulic brake actuation pumps
- Potable water pumps
- Recirculation pumps
- APU pumps

“Smartening” up the mission

Parker smart pumps do more than add value. They add real intelligence to both military and commercial aircraft.

These brushless, electric, DC motor-driven pumps with sensorless or sensor-based electronic controls can:

- Adjust flow and pressure in response to system demand for optimum efficiency
- Simplify system complexity, reduce weight and power consumption, enhance safety, and improve system reliability
- Interface with system control devices to monitor component health and reduce maintenance
- Accommodate power input — reduces in-rush/start current versus load required, and adapt load variation from the system

Current smart pump programs

Airbus A380, A350 XWB
Boeing 787
Bombardier Learjet 85
Embraer MSJ/MLJ
Ground vehicles
Lockheed Martin F-35
Northrop Grumman
Global Hawk
UAVs and UCAVs

The Parker Motor Design Center

The Parker Motor Design Center (PMDC) is focused on advancing the science of motor technology to the benefit of our customers. The center allows customers to leverage low costs, proven manufacturing capabilities, and rapid prototyping to produce a working motor in as little as six weeks.

The motors developed here are being used in smart pumps, which are replacing engine-driven fuel pumps in many applications. PMDC engineers have developed a proprietary design tool used to create the best motor configuration by:

- Optimizing magnetic FEA
- System simulation
- Establishing the best motor geometry
- Simulating thermal performance

In command of controllers

The electronics experts at Parker have developed an advanced model-based architecture for controller and circuit design that uses a proven technology base of components and processes. By combining the new with the proven, our engineers can speed up controller development time and lower nonrecurring controller costs.

In addition, our electronics capability includes high levels of expertise in the following areas:

- Controller design (analog and digital, 28V to 610V)
- Software development and coding
- Hardware and software architecture
- EMI filter design
- System modeling and synthesis
- Parts management and obsolescence control
- Test and qualification management
Lightning protection equipment

Parker’s array of Lightning-Safe® products has been designed to meet and exceed the stringent lightning safety requirements of the aircraft industry. Our technology is grounded on decades of proven on-wing time and includes:

- Fuel caps and mating adapters
- Anti-siphon adapters and fuel strainers
- Flame arrestors
- Sump drain valves
- Positive/negative pressure relief valves
- Gravity fillers
- Lightning isolation/static dissipation fuel tubes

**Partnering:**
Getting a charge out of new composite aircraft

The increasing use of composite materials in aircraft design is bringing new business to Parker Aerospace for the HondaJet, thanks to our lightning protection expertise. Our equipment will work to dissipate the static charge caused by lightning strikes and other electrical upset conditions.

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Testing to protect

Parker’s Fluid Systems Division has unique and specialized on-site testing facilities to ensure the safety and superior performance of all its products. These include the following:

**Flame arrestor testing**
- Testing per AC 25-975
- Flame arrestor/flame holding
  - Vaporized hexane or jet fuel testing
  - Heated air/fuel mixtures up to 400° F
  - Air and mixture flows over 10 scfm
  - Air flows up to 200 scfm
  - Data acquisition software that monitors and collects data requirements

**FAA fire tests**
- Fire proof (2,000° F for 15 minutes)
- Fire resistant (2,000° F for 5 minutes)
- Testing in accordance with AS1055B, AS4273, AC20-135, AIR 1377
- Testing of oil tanks, filler caps and necks, hoses, sight gauges, and many others

**Lightning test services**
- In-house, direct-effects lightning test facility
  - MIL-STD-1757A
  - FAA AC-20-53A, RTCA DO-160D, Sect. 23 ARP 5412
- Up to 200 kiloamperes oscillatory current waveform (components A, Ah, and D)
- Up to 3,000 amperes unipolar current waveform (component B)
- Photographic and explosive mixture ignition detection
- Over 2,500 mf at 5,000 volts
- Over 60 mf at 45,000 volts

**Shining a light** — Parker’s in-house lightning test validates the performance of Lightning-Safe® products.
Integrated system solutions for fluid measurement and management

Parker’s Fluid Systems Division is a world leader in the design and manufacture of aerospace fuel measurement and management systems and equipment. We offer a total fuel system to our customers, providing a single point of contact as well as a singular fuel system solution.

Our systems and components can be found on fixed- and rotary-winged commercial, commuter, business, and military aircraft — reducing weight and saving fuel as they minimize costs and maximize efficiency for the world’s largest commercial airliners and the smallest microjet aircraft.

Advanced system design
Parker’s Fluid Systems Division leads the industry for the most comprehensive system design, development, and testing. Our advanced systems utilize the following:
- Fault-tolerant architectures
- Extensive automatic fault detection and isolation
- On-board attitude-error correction
- Sophisticated microprocessors
- ASICs
- Solid-state displays
- In-house-manufactured active and passive densitometers

As a result of these advanced capabilities, we remain at the forefront of safety, satisfying all applicable FAA requirements, including those set by FAR 25,981.

Adaptive technologies
The systematic reuse of existing technologies is a key goal of ours to reduce costs.

By drawing on what has worked well in the past, and incorporating application-specific refinements, we are able to speed the transformation of new projects from idea to reality, saving you both time and money.

Customized innovation
Many customers need custom systems to meet the exact specifications of their applications. We are uniquely suited to take on these challenges. Our innovative thinking and leadership have led to fluid systems that set new standards for maturity at entry into service, as well as safety, reliability, accuracy, and maintainability — qualities that lead to lower cost of ownership for you and higher dispatch reliability for your customers.

Current fluid measurement and management system programs

- Airbus long-range aircraft
- Boeing twin-aisle and military transports
- Bombardier business and transport jets
- Cessna very light jets
- COMAC regional and transport jets
- Embraer regional, E-class, business-class, and light jets
- Gulfstream business jets
- IAI business jets
- Lockheed Martin/Boeing fighters
- Lockheed Martin fighters and transports
- Sikorsky helicopters

PzPLS: our piezoelectric point-level sensor

Prior to this Parker Aerospace innovation, point-level sensing in fuel tanks utilized float switches — prone to mechanical failure — or thermal-based sensors, which had a history of false triggering during descent when cool air entered the fuel tank.

Our piezoelectric point-level sensor eliminates both problems through the innovative application of sound. By using sound waves to determine fuel presence or absence, PzPLS is immune to false triggering. Its solid-state technology has no moving parts, eliminating the potential for jamming or wear. Made of plastic, the PzPLS weighs less than current technologies.
Parker’s Fluid Systems Division supplies a diverse range of the highest-performance electronic controllers for the aerospace market. This line of products continues to be a rapidly growing segment of our overall business.

Our aerospace controller products include the following:

- Flight control actuation systems (flaps, horizontal stabilizer, rudder)
- Landing gear systems (actuation, steering)
- Fuel pumps and valves (boost, transfer)
- Munitions and missiles (fin actuation, thrust vector control)
- Utility control systems (fuel tank inerting, fire suppression, aerial refueling, manual fuel control)

These controllers are designed using modern architecture and meet hardware and software requirements of RTCA DO-254 level A and DO-178 level A, respectively.

**Architecture**

Controller architectures include the following:

- Redundant channel, fail-safe design
- Control and monitoring within each channel
- FPGA/CPLD or DSP control logic technology
- System monitoring
- PID control loop
- System performance tuning

**Motor drive capabilities**

These controllers encompass a wide range of motor drive capabilities, including:

- 12V DC to 270V DC input supply voltage
- 115V AC input supply voltage
- Sensor or sensorless motor commutation

We drive a wide array of motor types:

- 1 hp, 28V DC, 30 amp, four-quadrant modulation
- 2 hp, 28V DC, 60 amp, four-quadrant modulation
- 14 hp, 270V DC, 40 amp, four-quadrant modulation

**Low cost**

Coupling our aerospace and industrial controller experience allows us to be the low-cost supplier of high-performance, high-integrity electronic control products for all applications.
Harness design and manufacture, and build-to-print services

Wire harnesses and cables

Parker’s Fluid Systems Division provides engineering design and manufacturing services for a wide variety of custom-built aerospace wire harnesses and cables. We have over 40 years of experience in harness manufacture and provide high-integrity harness assemblies for OEM customers as well as retrofit programs.

With manufacturing facilities in Hauppauge, New York, and Guaymas, Mexico, we specialize in harnesses designed to provide continuous, reliable service in harsh airframe, fuel tank, nacelle, and engine environments. Our harness capabilities include:

- A full range of MIL and commercial connector styles: ARINC, MIL-C-3899, MIL-C-26482, MIL-C-83723, micro miniature, D subminiature, coaxial, and others
- A variety of wire terminations including multi-pin connector inserts, ferrules/terminal lugs, and more
- Automatic laser wire marking, stripping, and cutting
- A variety of protective outer coverings including heat shrinkable sleeving, directly and indirectly applied metallic or non-metallic braiding, and shielding
- Fully automated testing using multiple automated test stations for point-to-point continuity, dielectric strength, and insulation resistance

Build to print

The Parker Fluid Systems Division also provides build-to-print (BTP) services for harnesses and electronics.

Build-to-print services for electronics include printed circuit boards (PCBs) and complete electronic boxes. Electronics BTP can be structured in several ways:

- Customer-supplied drawings and parts kits
- Parker-procured parts kits to supplier drawings
- Customer or Parker end-item testing, including acceptance tests, environmental stress screening, and more

Our manufacturing BTP capabilities include Kanban pull systems, electronic work cells, and PCB assembly.

We also provide automated in-circuit testing, environmental stress screening, reliability enhancement testing, and more.
When it comes to MRO, Parker continues to be at the forefront of customer support innovation through Parker Aerospace Customer Support Operations (CSO). CSO offers a full spectrum of services and support and will work in partnership with you to develop comprehensive programs tailored to fit your specific maintenance and aftermarket needs.

Staffed by a global network of highly trained and dedicated professionals, CSO delivers customer support and logistic services such as 24/7 AOG and technical support. Additionally, we offer value-added services such as repairs, inventory management, rotable exchanges, warranty administration, and technical publications.

**Local in more locales**
Parker Aerospace customer service centers and business offices are strategically located in Europe, North America, Latin America, the Middle East, and Asia Pacific to serve you in your time zone.

**Best-of-the-best** — Our highly skilled repair technicians restore Fluid Systems Division equipment to new product performance and reliability standards.

**PHconnect**
Parker’s Customer Support Operation offers registered MRO users access to our secure and personalized website. You can view your parts and order data, and access technical publications, component maintenance manuals, and service bulletins 24 hours a day, seven days a week. Visit us at www.phconnect.com.
Parker Fluid Systems Division facilities

Irvine, California
Elyria, Ohio
Hauppauge, New York
Naples, Florida
Tolleson, Arizona
Guaymas, Mexico