With Parker's pedigree and technology

Over 300 aircraft models in service today fly with equipment from Parker’s Nichols Airborne Division

Smart pumps, lubrication pumps, motor-driven pumps, turbine pneumatic systems

Hundreds of millions of hours on wing

More support over more miles

Advanced proprietary gerotor, impeller, and motor technology

Cost-competitive solutions
products, and temperature control systems

Lean manufacturing/continuous improvement

Exceptional quality control

Experienced technical leadership

Rapid prototyping
Smart pumps

With intelligent technology

The advantages

- Capable of adjusting flow and pressure in response to system demand for optimum efficiency
- Simplify system complexity, reduce weight and power consumption, enhance safety, and increase system life
- Interface with system control devices to monitor component health
- Accommodate power input – reduces in-rush start current versus load required
**The technology**
- Sensorless motor commutation to eliminate parts and increase reliability
- Lightweight active power factor correction (PFC)
- Flexible software routines to eliminate costly hardware redesigns, support safety-critical applications, and facilitate the programming of current, velocity, and pressure with greater precision
- 12V to 600V capabilities
- Canned rotor design to isolate windings from fluid path for water applications
- High-energy magnets to provide lighter weight, higher efficiency

**The engineering**
- Multi-disciplined engineering teams combine proven processes and technology with innovative thinking to minimize complexities and risk, lowering cost and speeding time to market
- Proprietary impeller design tool optimizes pump performance
- Proprietary pump builder software and use of DesignSpace software for finite element analysis
- Fluid network modeling analysis capability
- Advanced engineering tools, such as computational fluid dynamics, combine with stress analysis and flow performance studies to increase efficiency and total quality from the start of a project

**The testing**
- Computerized motor dynamometer testing
- State-of-the-art power quality analyzer
- Computerized environmental chambers
- High-altitude, live-fuel single-pass testing capabilities
- High-voltage, high-amperage digital power supplies
- Wireless data acquisition system
- Programmable control endurance test stand
- Chillers for coolant pump testing to -20°F

Fuel boost and transfer pumps for next-generation UCAV

Large commercial transport fuel boost pump

Fuel boost pump for UAV

Hydraulic brake actuation pump for UAV

Fuel boost and transfer pumps for next-generation fighter jet

DesignSpace is a registered trademark of ANSYS, Inc.
Lubrication pumps
With proprietary gerotor technology

The advantages
- Light weight and cost effective, with excellent contamination resistance
- Robust single-shaft design provides greater reliability
- Longer life due to low relative velocity between gerotor elements
- Custom porting for high-speed filling and low inlet-pressure applications
- Incorporates other oil system components into the pump package, including filters, relief and regulating valves, chip collectors, and debris monitors
- Reduced cycle time through lean manufacturing and demand flow production pull system

The technology
- Advanced positive displacement technology
- Advanced design tools
- Systems design capability

The products
- Fuel boost pumps
- Fuel transfer pumps
- Hydraulic brake actuation pumps
- High-pressure engine feed fuel pumps
- Potable water pumps
- Recirculation pumps
- Galley cooling pumps
- Electronic coolant pumps
- APU pumps

The applications
- F-35
- Global Hawk
- A380
- Boeing 787
- Commercial transports
- X-45C
- UAVs
- UCAVs
- Fighter jets
- John Deere

GE T700
main engine lubrication and scavenger pump

Bell 206 helicopter transmission pump
The engineering and testing

- Proprietary design tools optimize pump performance
- Proprietary pump builder software facilitates efficiency, provides CAD designs for multiple flow gerotor stacks in seconds
- Engine lubrication system modeling analysis capability
- Complete portfolio of analytical design tools, including portable Windows NT-based 3D CAD solid modeling system for anything from gerotor sizing to complete offsite pump design
- Advanced engineering tools like moving boundary computational fluid dynamics combine with stress analysis and flow performance studies to increase efficiency and total quality from the start of a project
- Rapid prototyping of complex parts significantly reduces development time and program risk
- Qualification test capabilities, as well as a network of certified test laboratories
Anytown, USA August 2006

Motor-driven fuel pumps

With motor-driven innovation for customer-driven performance

The products
- Main engine lubrication and scavenge pumps
- Helicopter transmission lubrication and scavenge pumps
- AMAD gearbox lubrication, scavenge, and pressurization pumps
- Generator lubrication pumps

The applications
Aircraft/Engines
- F135
- F119
- T800/CTS800 - LHTEC
- AE2100
- Trent 500
- AE3007
- T700
- CF34
- TFE731
- Airbus commercial transports
- Embraer regional jets
- Bombardier regional jets
- Cessna business jets
- Boeing helicopters
- Agusta helicopters
- Bell helicopters

Marine/Industrial
- LM2500/6000
- MT30 Marine Trent
- Industrial Trent

The advantages
AC induction motors
- Long life with extended dry run capability
- Constant frequency or wild frequency capability
- Broad range of fluids regardless of viscosity, vapor pressure, or dielectric properties
- Spat-mounted and in-tank-mounted designs

Brush-type DC motors
- Family of pumps with great versatility applied across all aviation markets
- Advanced wet-motor technology uses fuel for cooling and lubrication. Eliminates shaft seals. Extends life, minimizes downtime, and reduces operating and inventory costs
- In-tank or in-line designs
- Excellent cost effectiveness, high operating efficiency
- Significant downtime savings with in-tank cartridge design

Boeing F/A-18 E/F fuel transfer pump
Embraer ERJ-145 fuel boost pump
Cessna Citation Sovereign fuel boost pump
The technology
- High-energy magnets for lighter weight and higher efficiency
- Pumping elements include centrifugal (radial or mixed flow), priming (liquid ring, spur gears, or gerotor), or duplex (with both centrifugal and priming abilities)
- Integrated radio noise filters (DC pumps)
- AC and DC cartridge canister configurations for ease of service
- Precision gear metering pumps
- SPAR88-compliant designs
- Available in flows from 100 to 250,000 pph
- Power interface from 28 VDC to 230 VAC
- Fixed and variable frequency AC
- Unique thermal protection schemes

The engineering
- Multi-disciplined engineering teams combine proven processes and technology with innovative thinking to minimize complexities and risk, lowering cost and speeding time to market
- Proprietary impeller design tool optimizes pump performance
- Proprietary pump builder software and use of DesignSpace® software for finite element analysis facilitate efficiency
- Fluid network modeling analysis capability
- Advanced engineering tools, like computational fluid dynamics, combine with stress analysis and flow performance studies to increase efficiency and total quality from the start of a project
- Rapid prototyping and testing of complex parts significantly reduces development time and program risk

The testing
- Computerized motor dynamometer testing
- Computerized environmental chambers
- High-altitude, live-fuel, single-pass testing capabilities
- High-voltage, high-amperage power supplies
- Wireless data acquisition system
- Qualification test capabilities, as well as a network of certified test laboratories
- Programmable control endurance test stand
Pneumatic products

With high performance for turbine engine aircraft

The advantages

- Integration of new technology and proven designs
- Minimum development time and risk
- Centralized or distributed control
- System/subsystem or component solutions
- Modular design of components allows customers to optimize cost, pressure drop, actuation method, and response time

The products

- Fuel boost pumps
- Fuel transfer pumps
- APU pumps
- Trim-tank pumps

The applications

- Airbus commercial transports
- Embraer regional jets
- Military fighters
- Military transports
- Cessna business jets
- Raytheon business jets
- Commuters
- Boeing helicopters
- Sikorsky helicopters
- Bell helicopters
- Tiltrotor aircraft
The technology

- Pneumatic, analog, and digital electronic control of position, flow, pressure, and temperature
- Software processes for safety-critical applications
- Butterfly and poppet valves
- Linear and rotary motion
- Pneumatic, AC, or DC actuation
- RTD, thermistor, or pneumatic temperature sensing
- Communication bus interface
- Built-in test (BIT)
- High temperature capability
- 1"-4" diameter valves

The engineering

- Multi-disciplined engineering teams combine proven processes and technology with innovative thinking to minimize complexities and risk, lowering cost, and speeding time to market
- Use of DesignSpace® software for finite element analysis
- Complex system simulation and mock-ups
- Rapid prototyping of complex parts significantly reduces development time and program risk

The testing

- Computerized environmental chambers
- Qualification test capabilities, as well as a network of certified test labs
- Programmable control endurance test stand
Lifetime customer support

With our stand-alone group dedicated to keeping you airborne

The products
- Anti-icing and rain removal systems
- Compartment temperature control systems
- Pre-cooler temperature control systems
- Pressure regulation systems
- In-flow control systems
- APU load control systems
- Flow mixing valves

The applications
- Citation business jets
- Bell 206
- BA 609 Tiltrotor
- Apache helicopter
- Sikorsky S92
- Global Hawk
- X-47 UCAV
- Lockheed C-130
- V-22 Tiltrotor
- Skjold class fast patrol boat
- AR121

The advantages
- People and resources dedicated solely to the aftermarket support of Parker products
- FAA/IAA approved repair stations
- 24/7 AOG service
- Worldwide service through the Parker Aerospace Customer Support organization and our network of independent distributors
- Strategically located repair centers
- Repair to original specs
- Cost-effective repairs
- Quick turn-around time
- Proven reliability
- Special reworks and salvages
- Extended warranties

What we offer around the world
- Field service engineering
- Reliability trend analysis
- Technical publications
- Spares, repairs, and overhauls
- Rotable exchange units
- Customized support agreements
- Training
What we offer online

PHconnect, Parker's secure and personalized e-business web site is available for:

- Spares pricing and lead time
- Requests for quotes
- Order placement
- Credit card payment
- Shipment status
- Viewing invoices
- Open invoice and aging information
- Printing duplicate invoices
- Open order status

To request your PHconnect account, please contact your customer service administrator by faxing us at (949) 809-8390, or e-mail your request to: csc@parker.com.
Anything possible

Benefit from the power of Parker

Working with Nichols Airborne Division gives you access to all of Parker, which is a powerful advantage.

As the world leader in motion control technologies, our market-smart professionals can work with you to investigate problems and customize products for real world solutions.

From phone or on-site service to application-specific prototype development, our people will work cross-divisionally to create total systems solutions that lessen your engineering burden, reduce total costs, and improve operating efficiency.

The development of new approaches and the constant upgrading of existing lines is not only key to our success; it is critical to yours.

To find out more about the power of Parker, contact us at (440) 284-6300 or (978) 784-1200.