



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



# Mobile Hydraulics

Innovative Products and System Solutions



ENGINEERING YOUR SUCCESS.



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## Parker Hannifin Corporation

Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of commercial, mobile, industrial and aerospace markets. Parker's products are vital to virtually everything that moves or requires motion control, including the manufacture and processing of raw materials, durable goods, infrastructure development and all forms of transport.

Customers rely on Parker for engineering excellence, world-class manufacturing and outstanding customer service to provide comprehensive application solutions. As the leader in motion and control technologies, Parker partners with its customers to increase their productivity and profitability.

## Parker Hydraulics

Parker serves the critical needs of humanity by providing customers around the world with efficient, intelligent, power-dense hydraulic systems and value-added solutions. Taking the time to understand the needs of its customers empowers employees to develop cutting edge solutions.

Customers expect innovative, high-quality products with short lead times and excellent global service and support. Parker delivers operational excellence while leveraging its total capabilities and minimizing its impact on the environment to promote sustainability. No matter what the need, Parker is a single-source provider of all hydraulics motion and control solutions.

## Global Mobile Systems Engineering

### Motion Control Technology Centers

Strategically located around the world, Parker's uniquely equipped Motion Control and Technology Centers are staffed with application and systems engineers who work with vehicle design teams to develop and refine functional subsystems and complete-vehicle motion and control systems on all types of mobile equipment. Parker engineers design solutions to help customers optimize engine efficiency, extend engine life and meet emission standards. Applications include cooling, steering, braking, implement control, suspension, drive and propel and intelligent and computer-based mobile systems.



### Custom Made Partnerships

Customer partnerships are cultivated and industry leading systems are developed and validated in these locations. These relationships are cultivated by listening closely to customers and repeatedly providing measurable value. Voice of the customer programs, market knowledge and engineering expertise combine



to develop new products that meet evolving customer needs. Parker uses a staged product innovation process, Winnovation, which starts with brainstorming product ideas and continues through product launch. Customers also benefit from Parker's lean thinking and six sigma analysis applied during this process. In the end, Parker solutions provide customers with a competitive advantage.



# Parker Motion Control Technology Centers



## Off-Highway and On-Highway Mobile Markets Served

- Aerial devices
- Agriculture
- Construction
- Defense
- Forestry
- Material handling
- Mining and drilling
- Turf care
- Waste handling
- Transportation





## Mobile Technology Centers

Parker's ultimate competitive advantage in serving customers is its global network of 13,000 distributors that can provide Parker products and services nearly anywhere, anytime. At the core of Parker's hydraulic distribution is a select group of Mobile Technology Centers (MTC). MTCs are Parker distributors who offer a one-stop shop for a wide range of products, engineering

services, computer-aided design, fabrication and assembly. MTCs can assist with mobile equipment design, prototyping and the integration of electronic controls.

Parker's MTCs are chosen because of their commitment to providing exceptional customer service and complete hydraulic systems and solutions. MTCs carry local inventory of Parker products, ensuring customers fast delivery and reduced downtime.



### Training Excellence

Parker's Motion and Control Training Department offers a full range of training equipment and curriculum to support the teaching of hydraulic and electromechanical motion and control technologies. Used by colleges, universities, technical schools and industry around the world, Parker training systems, textbooks, lab manuals, instructor's guides and teaching aids have been educating technology students for decades.

## Value-Added Service & Support

It takes more than innovative products, competitive prices and on-time delivery to satisfy customer needs – it takes a commitment to provide exceptional value. Value is the result of personal interaction and dedicated resources.

Parker value-added services include:

- Design engineering support
- System design and prototyping
- Component selection
- New product development
- Product service centers
- Custom component manufacturing
- Assemblies and kits
- Sub systems
- Global support and service
- Technical training
- Parker Tracking System (PTS) interactive applications

When it comes to hydraulics in the mobile market, Parker's worldwide network of degreed field sales engineers are the best trained in the business and can be a customer's single-point of contact. Parker's vast global resources coupled with its platform and technology experts to satisfy any mobile application.



# Mobile Hydraulic Components

Parker offers the world's most extensive line of hydraulic products for use in all types of mobile equipment. From pumps and valves to motors and motion controllers, all products share a common heritage of advanced technology and are designed to deliver precise and reliable control.

## Accumulators

A complete range of accumulators including piston, bladder and diaphragm type as well as gas bottles, Kleenvent reservoir isolators and other accessories are available. Sturdy construction makes for reliable components that improve hydraulic system efficiency by maintaining pressure, supplementing pump flow and absorbing system shocks.

## Compact Power Systems

Efficient performance in a robust compact design best describes Parker's Oildyne products. These compact power systems deliver power density, are easy to install and allow for flexibility across a wide variety of applications. Locking circuit and manual release availability enable safe, secure operation in

critical situations and harsh environments as well as an extended service life dramatically lowers maintenance requirements and costs. Electro-hydraulic actuators, miniature power units, fluid power systems, piston pumps, cartridge piston pumps and hand pumps are all reliable solutions for design challenges.

## Coolers

Parker offers hydraulic oil and engine coolers with compact, rugged designs built for arduous mobile applications. Its designs benefit OEMs with lighter weight units while maximizing cooling capacity and lower pressure drop. Benefits to end users include low noise operation and low service/maintenance costs over the life of the cooler. Custom combination coolers

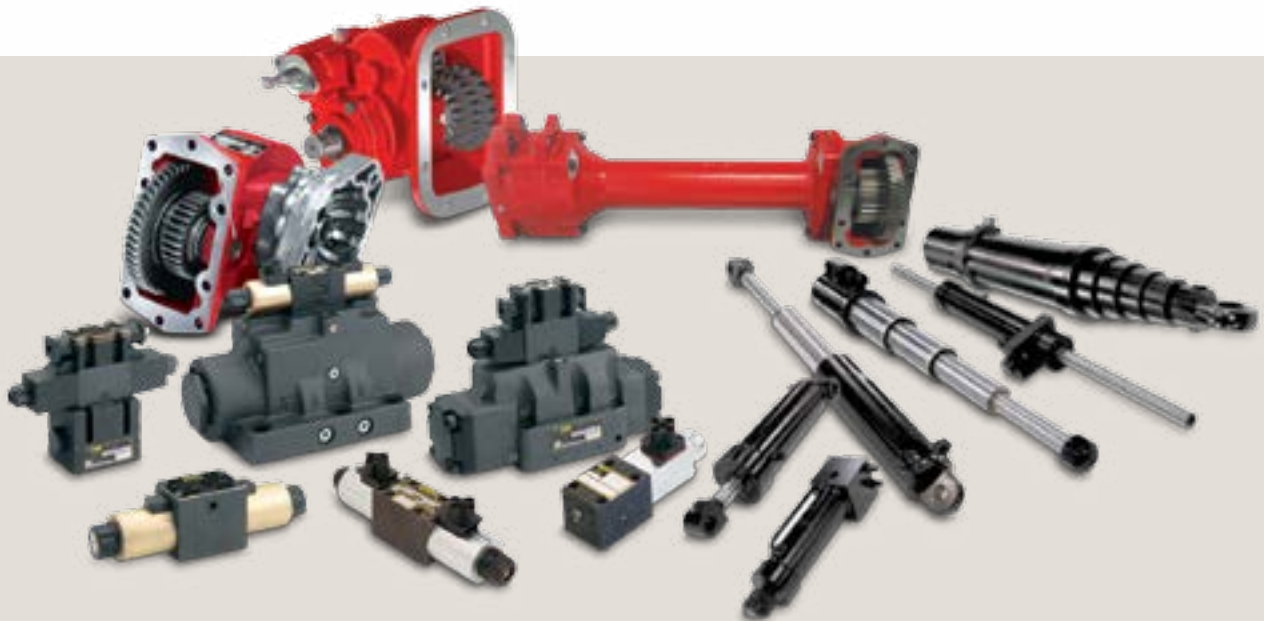
are available for most applications. Design engineers will work to meet unique cooling needs.

## Cylinders

The cylinder product offering provides more power per pound and per dollar over millions of trouble-free cycles. These products have proven to be the most reliable and cost effective cylinders available.

## Filtration, Monitoring and Analysis

Complementing the reliability of hydraulic systems and components are filtration products which provide protection against fluid contaminants. High, medium and low pressure filters are offered, as well as portable filter carts and replacement elements. The comprehensive line of pressure and return line filters enhances machine life and reduces machine maintenance.





## Fluid Connectors

A complete spectrum of fluid connector products for hydraulic, pneumatic and fluid systems is available with products ranging from state-of-the-art fittings, valves and quick couplings, to pressure hose that is available in a wide range of core-tube materials, reinforcement designs and outer covers.

## Hydrostatic Steering Units

A full line of hydrostatic steering units for a wide range of off-road equipment applications is available. These rugged components are designed to withstand system contaminants and engineered to handle higher oil pressure and temperatures than competitive products. A choice of sizes is offered in open-center, closed-center and load-sense configurations.

## Cartridge Valves and Integrated Circuits

Solutions for complex circuits by matching threaded cartridge valves and integrating them into a single manifold is a core competency.

## Motors

A broad range of high and low speed motors deliver excellent performance with high efficiency, true wear compensation and longer service life. Parker's motors provide power ranging up to 15,000 inch-pounds of torque with speeds ranging from ½ RPM (Calzoni) to 13,000 RPM (bent access). A complete range of sizes is offered in gear, gerotor, vane and piston style operating configurations. Fixed and variable displacement motors are available.

## Power Take-Offs (PTOs)

Chelsea® Auxiliary Power Systems products are known for high level performance and reliability. Chelsea® Power Take-offs were first introduced in 1945 and offer the broadest coverage in the industry.

## Pumps

Hydraulic pumps are available in fixed or variable displacement models of piston, vane and gear pumps. Engineered to handle a wide range of applications, they are available with a full complement of electronic and computer controls.

Hydraulic pumps are manufactured with the finest materials under strict quality control resulting in a pump that delivers high efficiency and low maintenance under the toughest operating conditions.

## Rotary Actuators

Recognized for their durability and used wherever reliability is critical to the application, rotary actuation provides performance features to meet all common mobile applications. The product range offers a unique solution for developing high torque from a compact, self-contained, precision machined, drop-in package. Special designs are available.

## Valves and Controls

From simple on/off functions to precise motion control, valves and controls are used on all types of mobile equipment. Inline and bankable control valves, motion controllers, pressure control valves, servo valves and manifold mounted directional and proportional valves are all available.





# Electronic Control Systems

Parker's integrated system solutions increase productivity and reduce energy consumption with a full spectrum of products including control modules, displays, sensors and electromechanical devices. The line includes standard and custom designed components to meet a variety of different customer needs.

Electronic control systems offer many benefits: cost savings in diagnostic capabilities, speed of application development, ease of operation and improved functionality. They are extremely flexible, can support multiple languages and can be branded with custom overlays. System experts can assist customers in writing specifications, selecting components, developing applications and performing system integration.





### Rugged Hardware

Parker hardware is tested for robust operation and compatibility with mobile equipment. A wide range is available, both standard and custom, and designed to interface with mobile communication protocols. Hardware is tested to industry and government standards for operation in severe conditions including vibration, extreme temperatures, mechanical impact or electromagnetic interference.



### Simple Software

Software from Parker enhances manufacturers' ability to quickly develop systems, reducing time and expense. Simple software ensures the ability to design customized applications without having advanced programming skills. A graphical programming interface and diagnostic tools aid users in simple or complex functionality.



### Displays and Panels

Parker has developed many rugged displays, monitors and instrument clusters for the heavy equipment industries; all communicate with other devices using industry standard protocols. Monitors and instrument clusters are highly customizable and are used for operator information display in vehicle cabs. From basic user configurable display panels, up to shaped, cabin pillar or dash clusters for OEMs, Parker's displays and panels meet a variety of design requirements.



### Controllers

A range of robust control modules offer a building-block approach that simplifies component design and installation and reduces development time and expense. Controllers meet industry and government standards for operation in severe conditions that include extremely high or low temperatures, vibrations, mechanical impact and electromagnetic interference. Programmable controllers intended for electro-hydraulic control offer OEMs the ability to optimize their machines for better productivity and efficiency.



### Joysticks and Levers

All Parker joysticks and single axis levers are extremely sturdy and able to withstand aggressive conditions (EMI, vibrations and wide temperature ranges) during outdoor use and installation. The units feature a compact, ergonomic design making them ideal for armrest and panel installations.



### Sensors

A full range of pressure, temperature, proximity, speed, rotary, tilt and specialty sensors are available. Advanced sensors have been introduced to help manufacturers and end users of mobile hydraulic systems improve long term operating performance while reducing overall life cycle costs. These extremely compact and lightweight sensors use proven, reliable technology. They were developed to meet the productivity and profitability needs of the mobile sector, and their features work together to make them suitable for use in many different applications, from construction and forestry, to lift trucks, to buses and commercial vehicles.



# Accumulators

## Piston Accumulators



- Low temperature solutions to -50°F
- Over 50 standard capacities from 5 cu. in. (.075 liters) to 50 gallons (189 liters)
- 2", 3", 4", 6", 7", 8", 9" and 12" nominal bore sizes
- 207, 276 and 350 bar (3000, 4000 and 5000 psi) operating pressures
- Industry proven five-bladed V-O-ring piston seals in five standard seal compounds
- Accumulator and gas bottle configurations
- CRN/CSA, AS1210, DNV, ABS, ASME, CE and other certifications available
- Specials up to 200 gallons and 20,000 psi
- Stainless steel models for water/seawater/chemical service

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## ACP Series Non-Repairable Piston Accumulators



- Piston design
- 40, 50, 80, 100 mm bore sizes
- Standard capacities from 5 cu. in. (.075 liters) to 488 cu. in. (8 liters)
- 276 bar (4000 psi) operating pressure
- Low-cost, non-repairable design
- Multiple port options
- No gas valve option
- Fast delivery

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## Bladder Accumulators



- Standard capacities from 10 cu. in. (.16 liters) to 15 gallons (56 liters)
- Maximum operating pressures up to 455 bar (6600 psi)
- Bladders manufactured in-house
- Six bladder compound to suit a variety of fluids and temperatures
- Bottom and top repairable; medium and high-flow, transfer barriers and gas bottles
- Water/chemical service available
- CRN/CSA, AS1210, DNV, ABS, ASME, CE and other certifications available
- 24-hour emergency bladder kit program

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# Accumulators

## Diaphragm Accumulators



- Standard capacities from 5 cu. in. (.075 liters) to 170 cu. in. (2.8 liters)
- Maximum operating pressures up to 250 bar (3600 psi)
- Compact and lightweight
- Low-cost, non-repairable design
- Quick responding diaphragms of nitrile or hydrin

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## Inline Pulse-Tone™ Shock Suppressors



- Reduces pulsations and shock
- Compact size, inline mounting
- 207 and 345 bar (3000 and 5000 psi) models
- NPT, BSPP, SAE and split flange connections
- Stainless steel model for water/chemical service

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## Accumulator Charging Kit and Mounting Accessories



- Charging and gauging equipment
- Gauge adapters and assemblies
- Unloading valves
- Mounting clamps and base brackets
- U-Bolt mounting hardware
- Accumulator repair tools

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## Hydraulic Oil and Engine Coolers



- Parker coolers offer compact design resulting in lighter weight units with higher cooling capacity and lower pressure drop
- Ruggedly designed for arduous, mobile applications; Low service and maintenance costs
- Optimized fan design and material for low noise operation
- Available with DC Motor (12V/24V) or Hydraulic Motor (displacement from 8.4 cc/rev to 25.2 cc/rev)
- Cooling capacity up to 40 HP (DC Motor) and 215 HP (Hyd Motor)
- Design engineers work with customers to provide custom combination coolers to meet unique cooling needs of most applications

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# Compact Hydraulics

## 108 Series



- AC or DC motor
- 4 pump sizes: up to 2.8 LPM (.75 GPM)
- Single or bidirectional rotation
- Adjustable relief valve(s)
- Locking check valves available on all models
- Variety of hydraulic circuits
- Reservoirs from .45 to 5.6 L (28 cu. in. to 1.5 gallons)
- 241 bar (3500 psi) capability

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## 165 Series



- .8 kW (1 HP), 12 or 24 VDC motor
- Up to 5.4 LPM (1.4 GPM)
- Variety of circuits including reversible locking
- Soft seat load hold check valves
- 241 bar (3500 psi) capability
- Many reservoir choices

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## Compact EHA (Electro-Hydraulic Actuator)



- Compact, power dense, low noise plug and play solution
- Robust, leak free one piece housing design
- Speed range up to 84 mm/sec (3.3 in/sec)
- Force range up to 21.35 kN (4800 lbs)
- Cylinder stroke length of 102, 152 and 203 mm (4", 6" and 8")
- Variety of pump displacements, cylinder rod and bore sizes
- 12 or 24 VDC motor, .18 kW to .56 kW (1/4 to 3/4 hp) for intermittent duty
- Comes pre-flushed, filled & sealed
- Compatible with hostile environments; Can be washed down

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# Cylinders Mobile

## Cylinders



Single or double-acting telescopic cylinders and single or double-acting “rod type” mobile cylinders are available with:

- Bore sizes from 3 – 22"
- Stroke up to 1270 cm (500")
- Operating pressures up to 689 bar (10,000 psi)
- Various materials and coatings including chrome, nitriding, stainless steel and double chrome

- Typical options
  - Load holding valves
  - Flow controls and fuses
  - End of stroke cushions

Single-acting telescopic cylinders are available off the shelf or in production quantities. Design and manufacture of cylinders to customer specifications from one piece to production quantities is also available.

The standard single-acting telescopic cylinders can be used with almost any mounting setup: doghouse, bail, side frame, underbody, inverted mounts or inverted mount design.

### Design Features:

- Longer sleeve overlap for stability
- External packing nuts add strength
- Beveled steel stop rings for superior strength
- High strength tubing has up to 27% greater cross-section area
- Chevron packing and self-adjusting wave springs
- Wide rod bearings and improved, longer life urethane wiper rings
- Steel pin-eye mount
- Cylinder design that allows for easy repacking and repair

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## Standard Build



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The Standard build cylinders offer the benefit of standard tube and rod sizes with custom design options to create a highly engineered, quality cylinder configurable to provide quick delivery. Various mounting options are available. The configurable menu provides same-day assembly drawings and same-day pricing. Bill of materials and manufacturing processes support a reduced lead time.

Seal kits are available for same day delivery for consistent quality and standardization in service needs.

Standard build cylinders are manufactured with Parker Zero Leak sealing technology which offers the following benefits:

- Additional outside diameter lip that prevents contaminants from entering the system by bypassing the O.D. of the wiper body
- Superior BTU rod seal increases the conformity of the seal to the rod; Second lip on the seal improves stability, limiting the rocking motion of the seal to reduce seepage
- Buffer ring acts as a primary seal and pressure spike suppressor; the combination of rod seal and buffer ring results in an exceptionally dry rod for longer life
- Piston includes two wear rings and bronze filled PTFE seal designed for leak-free service life
- 1045/1050 chrome plated, induction hardened, 100K yield rod is more resistant to damage to rod and seal
- 1026 DOM cylinder tube bores are skived and roller burnished to provide precision finishes for extended seal life



# Advanced Cylinder Technologies

## Global Shield™ Coating



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Global Shield™ is an advanced coating technology designed to meet the corrosion, impact, chemical, salt water and acidic resistance requirements of challenging mobile environments, while mitigating the negative environmental impact of current plating technologies.

- Cylinder corrosion resistance up to eight times longer than Engineered Hard Chrome (EHC) or Nitride
- Designed for applications with high-duty cycle and zero tolerance for downtime

- Ideally suited for mining, construction, material handling, renewable energy, power generation, refuse, oil & gas, marine/intermodal, military, heavy-duty trucking and forestry
- Reduces the downtime associated with cylinder and seal repairs and replacements
- Emissions are below OSHA Personal Exposure Limits (PEL) and are fully compliant with the European market's Restriction of Hazardous Substances (RoHS) directive

## Intellinder™ Absolute Position Sensor



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The Intellinder™ Absolute Position Sensor is designed to eliminate the time and costs associated with gun drilling, calibration and field servicing challenges associated with other technologies. This position sensing technology integrates easily into hydraulic cylinders without any exposed external sensors or complex linkages, making it an ideal solution for challenging outdoor environments.

- Design combines highly engineered optics with a proprietary lens that provides excellent resolution, linearity, repeatability, accuracy and hysteresis
- Position-identifying bar codes on the rod are used to communicate absolute position directly and precisely to the controller. Position report occurs at power-on with no need for calibration
- Provides health monitoring which can detect malfunctions disrupting operations; multiple sensors can be mounted, allowing for redundancy in high demand applications
- Performs across a wide range of temperatures and provides long stroke capabilities of 20 feet [6,096mm] or more
- Designed to sustain performance in applications exposed to vibration, dust, gravel, corrosives, chemicals, axial load, side load and immersion
- Plug and play installation

# Advanced Cylinder Technologies

## Lightraulics® Composite Hydraulic Cylinders and Piston Accumulators



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Lightraulics® hydraulic cylinders are made from carbon fiber composites and high performance lightweight alloys. They typically weigh less than 60% of the weight of a comparable steel cylinder. Lightweight composite materials offer revolutionary benefits for machine designers, manufacturers and end users in the oil & gas, military, marine and aerospace markets.

- Carbon fiber has a lot of strength and stiffness relative to its weight, offers superior fatigue life compared to metal components and has a high corrosion and chemical resistance
- Uses a fully composite barrel instead of a metal liner
- Available for bore sizes up to 200 mm (7.9 in) and operating pressures up to 380 bar (5500 psi)
- Piston accumulators in the same design can be realized for volumes up to 13.2 gal (50 liters)
- Custom designs for individual applications are available



# Electronic Control Systems

Parker's Electronic Controls Division provides products and solutions for electrical and electronic systems for mobile vehicles.

The extensive breadth and depth of products and solutions serve a diverse customer base in construction machinery, bus and RV, forestry machines, material handling, agriculture equipment and specialty trucks. The full spectrum consists of control modules, displays, sensors, instrument clusters and joysticks.

Global manufacturing and engineering locations support the complete line of custom-designed products & standard components, making the division very well suited for complete system solutions that meet the needs of mobile OEMs. The scope of the

global engineering and manufacturing resources, give Parker the ability to design and manufacture products for specific high volume OEMs, while continuing to offer an extensive line of standard and catalog products.

Full system solutions and products for the mobile equipment and truck and bus markets include:

- Programmable Controllers
- Displays
- Instrument Clusters
- Operator Input Devices
- Sensors

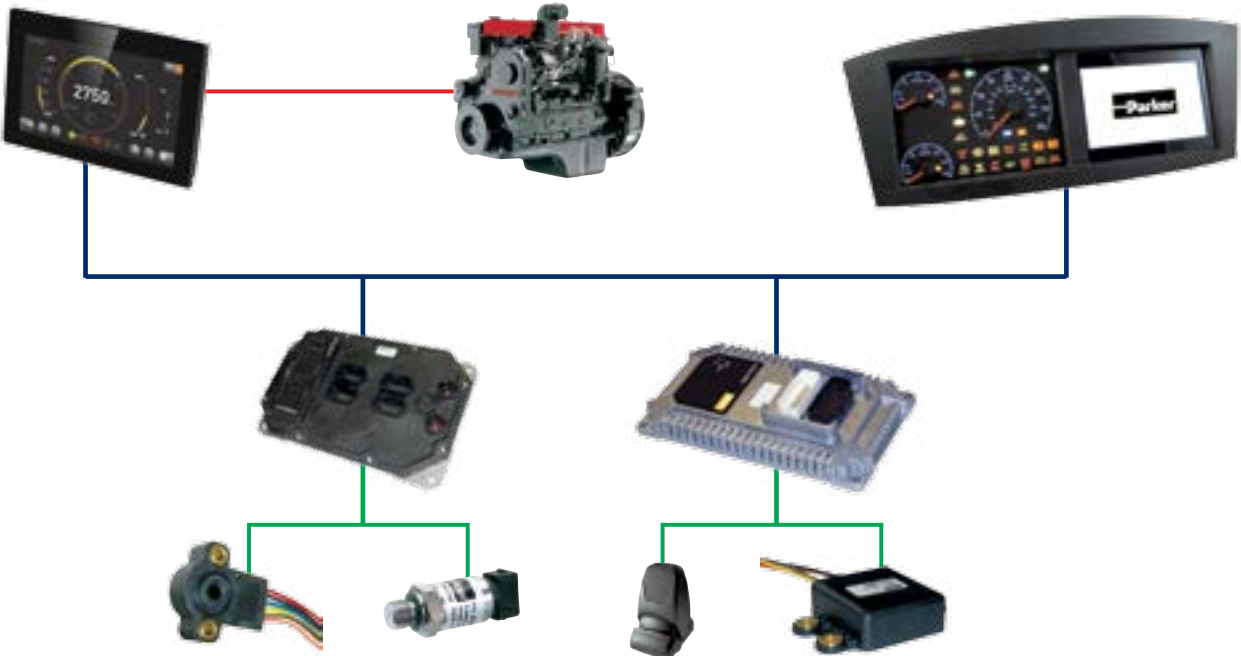


[IQAN Catalog HY33-1800 PDF](#)

[IQAN Catalog HY33-1825 PDF](#)

[IQAN Electronic Controls Made Easy PDF](#)

## ECD control products create systems



# Intelligent



# Product Scope and Depth Allow Full Systems Capabilities



*Illustration shows possible product applications in an agricultural tractor. -image courtesy of Valtra Inc.*

# and Innovative Solutions



# Electronic Control Systems

## Mobile Electronic Control Displays



Display Types	Models
Color TFT master display	IQAN-MD3, IQAN-MD4-5, IQAN-MD4-7, IQAN-MD4-10
Color TFT display	DPS35, DPE70
Instrument cluster, display, panel	DPS4/5, DPS-C, DPS70
Custom	Contact Parker

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## Mobile Electronic Control Modules



Control Module Types	Models
CAN master	IQAN-MC2, IQAN-MC3, IQAN-MC31, CM0711, CM2115, CM3620, CM3626
CAN expansion	IQAN-XA2, IQAN-XS2, IQAN-XT2, IQAN-XC21, CM0410, CM2904
Multiplexing module	VMM0604, VMM1210, VMM1615, VMM2404, VMM3120
Standalone driver	IQAN-TOC2
Custom	Contact Parker

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# Electronic Control Systems

## Mobile Electronic Control Joysticks and Levers



Joysticks and Levers	Models
CAN joystick	IQAN-LC5-C01
Analog joystick	IQAN-LC5-X05, IQAN-LC6-X05
Analog lever	IQAN-LSL
Analog paddle	IQAN-LST
Custom	Contact Parker

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## Mobile Electronic Control Sensors



Sensor Types	Models
Tip, tilt	RM50, ATS50, ATS90, ACC50, ACC100, LS60, UTS
Rotary	RF50, RF55, RS52, RS53, RS60, RS70
Proximity	FP2000, FP3000, FP4000, PS65
Speed	GS50, GS60, GS70, TGSS
Liquid level	LF700, LF750, LF800
Temperature	IQAN-ST-G-B, IQAN-ST-U-D, IQAN-ST-M-B
Pressure	IQAN-SP035, IQAN-SP500, SMP035, SMP500
Custom	Contact Parker

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# Filtration Filters

## Low Pressure



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- Various mounting configurations
- High capacity/high efficiency Microglass media
- Visual and electrical indicators with several connector styles
- Flange options for low profile, easy mounting

Model	Max Flow LPM (GPM)	Max Pressure bar (psi)	Mounting Style
12AT	64 (17)	10.3 (150)	Spin-on
50AT	190 (50)	10.3 (150)	Spin-on
PT	190 (50)	10.3 (150)	Tank top
KLT/KLS	455 (120)	10.3 (150)	Tank top
RF7	1136 (300)	10.3 (150)	Tank top
ILP, RFP	452 (120)	13.8 (200)	Inline, In-tank
BGTS	2400 (640)	10.3 (150)	Return in-tank

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[View KLT/KLS PDF](#)

[View RF7 PDF](#)

[View ILP/RFP PDF](#)

[View BGTS PDF](#)

## Medium Pressure



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- NPT, SAE or flange ports
- High capacity/high efficiency Microglass media
- Cartridge style by-pass valve
- Visual and electrical indicators with several connector styles

Model	Max Flow LPM (GPM)	Max Pressure bar (psi)	Mounting Style
12CS	94 (25)	34.5 (500)	Inline
50CS	220 (60)	34.5 (500)	Inline
GMF2	94 (25)	69 (1000)	Inline
GMF3	302 (80)	69 (1000)	Inline
GMF4	452 (120)	69 (1000)	Inline

[12CS/50CS PDF](#)

[GMF PDF](#)

## High Pressure



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[15P/30P PDF](#)

[50P/50PR PDF](#)

[WPF PDF](#)

- SAE, flange or ISO ports
- High capacity/high efficiency Microglass media
- Visual and electrical indicators with several connector styles
- Manifold mount option (50P and 15P/30P and WPF Series)
- Reverse flow option (50PR Series) for HST circuits

Model	Max Flow LPM (GPM)	Max Pressure bar (psi)	Mounting Style
15P	75 (20)	207 (3000)	Inline, manifold
30P	170 (45)	207 (3000)	Inline, manifold
50P	377 (100)	345 (5000)	Inline, bowl up
50PR	264 (70)	345 (5000)	Inline, reverse flow
WPF1	40 (10)	483 (7000)	Inline
WPF2	100 (26)	483 (7000)	Inline
WPF3	160 (42)	483 (7000)	Inline
WPF4	360 (95)	483 (7000)	Inline
WPF5	520 (137)	483 (7000)	Inline



# Filtration Elements, Systems, Accessories

## Portable/Offline Systems



- Provide flexibility for removing contaminants from hydraulic fluid
- Guardian hand-held purification system with 15 LPM (4 GPM) flow rate
- Choice of five portable purification systems including 18, 37, 75, 113 and 170 LPM (5, 10, 20, 30 and 45 GPM) flow rates
- Choice of two filter carts:
  - 19 LPM (5 GPM) flow; ½ hp electric motor
  - 39 LPM (10 GPM) flow; ¾ hp electric motor
- Par-Gel Elements
  - Water removal elements filter “free” water from mineral-base and synthetic fluids
  - Fits many Parker filters and the Guardian Filtration System

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## Par Fit Elements



- Extensive range of competitively priced quality replacement filter elements for any filter brand
- Over 6500 competitive interchange listings help consolidate vendor base by allowing users to acquire all replacement elements from one source
- Provides proven performance in competitive filter housings

[View Specs](#)

## Reservoir Accessories



- Metallic and non-metallic breathers and filler breathers
- Triceptor™ desiccant breathers
- Spin-on breathers
- Diffusers
- Fluid level/temperature gauges
- Suction strainers

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# Filtration Condition Monitoring Equipment

Effective machinery and oil condition monitoring provide the end user with the ability to predict breakdown and eliminate or reduce the associated cost of failure.

An intimate knowledge of the fluid and mechanical properties of these machines can maximize pre-warning time and result in the most efficient planning of maintenance and resources for asset repair or replacement.

Parker offers one the widest ranges of accurate, reliable and innovative condition monitoring products providing solutions in:

- Detection of abnormal wear/ impending system failure
- Detection of lube degradation/ contamination
- Verification of the oil in use
- Optimization of equipment service intervals
- Improvement of operational safety
- Reduction of risk and maximization of uptime

## LCM – Laser Particle Counter



The LCM laser particle counter is designed for on-line particle counting with programmable automatic operation feature and data storage for continuous monitoring.

- Particle count test cycle in 2 minutes reported in ISO or NAS format

- On-line sampling up to 414 bar (6000 psi)
- RS232 serial port with data storage capacity up to 300 tests
- Integral printer with data graphing and Windows-based software

[View Product PDF](#)

## Par-Test



A complete laboratory fluid sample analysis kit for either water based fluid or petroleum based fluids. Each kit includes a pre-cleaned sample bottle, data sheet and mailing container. Standard tests are:

- Particle count
- Photomicrograph
- Viscosity analysis
- Water analysis
- Neutralization analysis

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## MS200 Moisture Sensor



The MS200 moisture sensor provides real-time continuous water in oil contamination monitoring.

- Simple LEDs provide local Go/No-Go indication

- Panel meter for local or remote display reports 0 – 100% saturation
- Meter scale is color coded for positive/easy identification
- 0 – 10 VDC analog and 120 VAC logic output

[View Specs](#)

## IPD – iCount Particle Detector



The iCount Particle Detector represents the most innovative technology in solid particle detection. The IPD shows real time fluid condition indication in ISO or NAS format to a customer set point.

- Moisture % RH indication (optional)
- Early warning LED or LCD display indicators for low, medium and high contamination levels.

- Cost effective early warning solution which prolongs fluid life and reduces machine downtime
- Hydraulic, phosphate ester and fuel fluid compatible.
- Self-diagnostic software
- Fully PC/PLC integration, RS232 and 0-5 Volt, 4-20mA output.
- 6000 psi (414 bar) maximum operating pressure.

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# Filtration Condition Monitoring Equipment

## ANALEXfdMplus



The ANALEXfdMplus is a highly accurate ferrous debris monitor designed to measure ferrous wear metal particle contamination in an oil sample.

- Portable
- 15 second test time
- Data storage memory
- Touch screen data entry

[View Product PDF](#)

## DIGI Field Kit



The DIGI Field Test Kit gives fast, accurate results for water in oil, total base number, total acid number, insolubles (soot) and comparative viscosity.

- Portable
- TAN and TBN test
- Water in Oil test
- Viscosity go/no-go
- Combustion related debris (soot) test

[View Product PDF](#)

## Low Range DIGI Water Kit



The DIGI Test Cell provides simple, accurate results for water in oil.

- Portable
- Water in oil test
- PPM or %
- Built-in memory
- 10,000 test battery life

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## Heated Viscometer



Make fast on-site maintenance decisions with Parker's Heated Viscometer. Accurate oil viscosity results in minutes.

- Portable
- Digital read-out in Centistokes (cSt)

[View Product PDF](#)

## MHC Bearing Checker



Parker's MHC Bearing Checker is a new, unique hand-held instrument, providing maintenance engineers with an easy-to-operate, simple to use and quick method of analyzing bearing condition and lubrication state.

- Portable
- Magnetic interface
- dB level display
- Digital display of bearing distress level

[View Product PDF](#)

# Fluid Connectors Rubber Hose Products

## Low, Medium and High Pressure

Parker offers the largest selection of hoses plus more fitting sizes and configurations than any other manufacturer. A wide variety of hoses including braided, spiral, specialty and multi-purpose and more than 4500 Parkrimp fittings are available. Parker products have been designed, tested and approved to meet and exceed global standards, including SAE, DIN, ISO, ABS, DNV, USCG among others.

Parker Parkrimp assemblies consist of No-Skive hose and fittings, permanently joined by one of the Parkrimp crimp machines. The teeth in Parker's crimped fittings "bite down" to the hose wire providing a metal-to-metal grip with maximum integrity. Parker's Monoblok™ fittings are manufactured from a single piece of steel as compared to a two-piece fitting. Their lack of brazed or soldered joints provides the maximum in leak protection, eliminating any potential leak paths. Parker Monoblok fittings are available in a wide variety of end configurations and fitting series.

Parker one-piece fittings are designed, manufactured and tested to work with its low, medium and high pressure hoses to help keep equipment up and running.

The right product is available for most applications - including hoses that feature a variety of abrasion-resistant cover choices, flexibility, a wide range of media compatibility and more - characteristics that make Parker the hose supplier of choice.



### Low Pressure

Pneumatic, specialty, air-conditioning and heavy-duty truck/mobile equipment hose makes up the bulk of the low pressure market. In addition to diesel engine and return line hoses, Parker manufactures the Push-lok Plus multipurpose hose line which can be assembled in seconds without the need for clamps or bands using Parker 82 Series fittings or HY Series crimped fittings.

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### Medium Pressure

From ISO 18752 constant working pressure hoses, as well as SAE 100R1 and 100R2, and abrasion resistant one- and two-wire braided hoses, Parker offers high performance hose and fittings for medium pressure needs. Parker's 43 Series fittings provide a broad offering to configurations and connection sizes.

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### High Pressure

The combination of Parker's high pressure, spiral reinforced No-Skive hoses, coupled with Monoblok one-piece fittings, provides the best in leak-free operation. With constant working pressure hoses designed to the ISO 18752 standard and a variety of abrasion resistant covers, inner tube compounds and accessories, there's a Parker high pressure hose for most applications.

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# Fluid Connectors Thermoplastic Products

## Straight and Formed Thermoplastic Hydraulic Products



- Mobile and industrial hydraulic applications
- Thermoplastic hoses up to 10000 psi
- Non-conductive, low temperature and flame resistant hoses
- Rubber/Thermoplastic Hybrid™ hoses with compact O.D. and long, continuous lengths
- High pressure diagnostic and lubrication products
- Preformed and coiled hose
- Metal hose
- Twinline and Multi-line products
- Crimpers, tooling and accessories

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## Fluoropolymer Hose Products



- High temperature/high pressure hydraulic applications
- Cryogenic temperatures
- Corrosive environments and/or media
- Specialty hoses for food/ beverage and pharmaceutical
- Sizes: .250" up to 4" O.D.

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## Ultra High Pressure Products



- Thermoplastic hose, rated up to 55,000 psi, for high pressure hydraulic, oil and gas and water blast applications
- Twin-line options available
- Adapters, fittings and valves
- Umbilicals for subsea applications

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## Fluoropolymer Tubing Products



- Materials PTFE, FEP, PFA, HP PFA, ETFE
- Smoothbore, convoluted, corrugated, coiled and heat shrink
- High temperature, chemical resistant applications
- FDA and USP Class VI compliant
- Custom tubing and profile extrusions
- Sizes: .006" I.D. up to 4" O.D.

## Pneumatic and Transportation Products



- Industrial pneumatics
  - Tubing and coils in polyethylene, nylon, polypropylene, polyurethane and clear vinyl
- Transportation products
  - Airbrake tubing, Airbrake coils, fuel tubing and harnesses

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# Fluid Connectors Brass & Composite Products

[View Division Site](#)

## Manifolds



- Multiple connections
- Composite body
- Lightweight
- Push-to-connect ports

## Hose Barbs



- All brass construction
- SAE straight threads
- Metric threads
- Fluorocarbon O-ring standard
- Compact forged shapes
- Use with hose clamp

## Ball Valves



- Available in brass, carbon steel, stainless steel
- Sizes from 1/8"-3"
- Pressures from 200 – 6,000 psi
- Various handle options
- Full flow available
- NPT, SAE straight threads, ISO 6149 ports, BSPP threads

## 45 Degree Flare Fittings



- Reusable
- Resist vibration
- Resist mechanical pullout
- Easy to assemble and disassemble
- Extrusions and forgings available

## Pipe Fittings



- SAE standards
- Large range of sizes and styles
- Pre-applied sealant available
- Threads made to dryseal standards
- Extrusions and forgings available

## Vibra-Lok



- Excellent vibration resistance
- Fluorocarbon sleeve for higher temperatures
- Used with wide range of tubing
- Simple to assemble
- NPTF threads and SAE straight threads standard
- Optional threads available





# Fluid Connectors Brass & Composite Products

[View Division Site](#)

## Low Pressure Hydraulic Connectors



- Push-to-connect design
- Use with Parflex XDT tubing
- All brass
- 60% weight reduction
- Hydraulic pilot line application – 450 psi
- Reduces assembly time 50%

## Air Brake-NTA Fittings



- Meets D.O.T. FMVSS 571.106 performance
- Meets functional SAE J246 & J1131
- Staked in tube support
- Pre-applied sealant on male threads
- Use with J844 Type A and B nylon tubing
- Nickel plated versions available for Bio-diesel >B20

## PTC- Push-In Air Brake Fittings



- Composite body: strong, light-weight, compact and impact resistant
- Rigid tube support stays in place for ease of proper assembly
- Innovative collet design insures positive grip on tubing
- Composite body can be rotated after assembly to align shaped fittings for proper orientation
- Meets performance requirements of D.O.T. FMVSS 571.106, SAE J1131 and SAE J2494-3
- Reduces assembly variability

## Prestomatic- Push-In Air Brake Fittings



- Staked in stainless steel tube support
- All brass body
- Patented collet
- Superior side load leakage resistance
- Reusable/repairable
- Extended temperature and pressure rating
- Designed for easy assembly
- Impact resistant
- Contamination resistant

# Fluid Connectors Quick Couplings

## General Purpose Quick Couplings



General purpose couplings are used across the spectrum of hydraulic and pneumatic applications. They can also be custom engineered for more demanding applications and design challenges.

- Sizes from 1/8" to 4"
- Brass, steel, stainless steel, plastic
- Pressures to 6000 psi
- Flows up to 200 GPM
- Temp. range from -40° to +400°F

[Quick Coupling PDF](#)

[Snap-tite H, IH & PH Series PDF](#)

## Non-Spill Quick Couplings



Non-spill couplings meet today's requirements for more environmentally and user-safe products. They eliminate excess spillage, reducing hazards in the workplace, as well as contamination to the environment.

- Sizes from 1/4" to 2"
- Steel, stainless steel, plastic
- Pressures to 10,000 psi
- Flows up to 50 GPM
- Temp. range from -40° to +400°F

[59 Series PDF](#)

[FET Series PDF](#)

[FEM/FEC Series PDF](#)

[FEM Series PDF](#)

[Snap-tite 71 Series PDF](#)

[PF Series PDF](#)

[Quick Couplings PDF](#)

## Swivels



The S and PS Series swivels are designed to reduce torque and eliminate hose twist, dramatically increasing the service life of hose and fittings. The full flow design minimizes pressure drop for optimum system performance.

- Sizes from 1/4" to 2"
- Steel, stainless steel
- Pressures to 5000 psi
- Inline and 90° (PS Series); 90° (S Series)
- Standard zinc with clear trivalent, plating, nickel plating

[PS & S Series PDF](#)

[Quick Coupling PDF](#)

# Fluid Connectors Quick Couplings

## Check Valves



Check valves are available in several configurations, so they can be easily adapted to nearly any hydraulic application. Parker check valves offer several unique features that will ensure years of trouble-free operation.

- Standard inline configuration
- Sizes from 1/4" to 2"
- Pressures to 6000 psi
- Crack pressures: 5–200 psi
- Soft seat and stainless steel options

[Quick Coupling Series PDF](#)

## Diagnostic Equipment and Test Port Couplings



Parker's complete line of diagnostic equipment can reduce machine downtime during set-ups, trouble shoot problems and provide critical information for preventative maintenance. Diagnostic nipples provide quick access for testing while diagnostic equipment measures system pressure, flow, RPM and temperature.

Equipment:

- ServiceJunior – measures pressure to 8700 psi
- Serviceman Plus and Service Master Easy - measures and records pressure, temperature, RPM and flow
- Service Master Plus – captures data and has on-board analysis

[Quick Coupling Series PDF](#)

[Serviceman Plus PDF](#)

[Service Master Easy PDF](#)

## Multi-Couplings



Plate mounted couplings allow multiple fluid lines to be connected simultaneously. Lever or handle brings both halves together and holds them in a connected position.

- Single point connection
- Plate mounted stab couplings
- Custom configured and standard options

[Tema Multi-Line PDF](#)

# Fluid Connectors Tube Fittings

## O-Ring Face Seal Fittings



- O-ring seal for leak-free connections up to 9000 psi
- Adaptable to inch and metric tube and hose assemblies
- Flat face design provides zero tube entry and excellent over torque resistance
- Offered with SAE, NPT, ISO 6149, BSPP and metric port ends
- Meets SAE J1453 and ISO 8434-3

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## 37° Flare Fittings



- Metal-to-metal seal for wide temperature range application
- Adaptable to inch and metric tube and hose assemblies
- Offered with SAE, NPT, ISO 6149, BSPP, BSPT and metric port ends
- Meets SAE J514 and ISO 8434-2

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## 24° Flareless Fittings



- Metal-to-metal seal for wide temperature range application
- Suitable for use with inch tube in wall thicknesses from medium to heavy
- Offered with SAE and NPT port ends
- Meets SAE J514

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# Fluid Connectors Tube Fittings

## Metric 24° Flareless Fittings



- Three pressure ranges for optimum compactness
- For use with metric tube and hose assemblies
- Offered with SAE, NPT, ISO 6149, BSPP, BSPT, metric parallel and tapered port ends
- Meets DIN 2353 and ISO 8434-1

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## Pipe Fittings and Adapters



- Metric and BSP conversion adapters
- BSPP 60° cone fittings and adapters
- NPT fittings and adapters
- BSPP 30° flare fittings and adapters
- Metric 30° flare fittings and adapters

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## 4-Bolt Flange Connections



- Forged construction for optimal performance
- Available in kit form with mounting hardware
- Flanges offered with female SAE, NPT, BSPP, socket-weld and butt-weld connections
- Flange adapters offered with O-ring face seal, 37° flare and 24° flareless connections
- Meets SAE J518 and ISO 6162

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# Hydrostatic Transmission

## Gold Cup



The Gold Cup Hydrostatic Transmission pumps are variable displacement piston pumps of an unparalleled rugged design. Rated to 5000 psi continuous pressure and continuous duty, the Gold Cup design has the unique feature of an internal servo/replenish and the ability to utilize system over pressure to directly control the stroking chambers. This affords the fastest and most stable control strategy available.

The controls are completely modular in design and can be configured to meet most system requirements with standard factory options.

All internal wear surfaces are hydrostatically balanced and/or hydraulically linked allowing for a long and serviceable life. The Gold Cup pump also has the ability to run in many open loop applications and

also has digital (flow/pressure) capability for the most difficult of control requirements.

The Gold Cup Series has been designed to operate in a wide range of industries needing closed-loop control, high pressure, high power density such as blast hole drill rigs, shredding, cranes, mining, hydraulic test stands, pulp and paper, military, marine and power generation.

- Quick change valve block – easy to service or replace
- Modular controls – easy to service and change
- Versatile controls – can be located on either side of pump or motor for maximum freedom of design
- Dampened low inertia rocker cam – more stable, quieter and faster than other designs
- Exclusive zero-backlash rotary servo design – lifetime accuracy
- Field adjustable compensator override – easily adjusted without removing from machinery
- Precision barrel bearing, a distinctive Parker Denison Hydraulics feature for over 30 years – permits high speeds, high pressure and provides long life
- Patented ring style replenishing checks – fastest operation with no sliding poppets or parts and low pressure drop
- Hot oil shuttle available – fast, reliable operation
- Auxiliary pump can be changed without disassembling the transmission
- Standard SAE keyed or splined drive shafts are available
- High pressure mechanical shaft seals can be changed without disassembling the transmission. Double lip seals are also available
- One piece stroking vane/cam means no lost motion, zero backlash, better control, and no linkages to wear out
- Stroking vane seals are pressure loaded for longer life
- Standard compensator vent ports allow for a wide variety of controls (see applications manual)
- Rocker cam displacement indicator helps troubleshoot the system
- Modulated servo pressure saves power
- Standard Code 62 SAE split flange connections
- Conforms to SAE mounting standards. These products are qualified to meet Military specifications MIL-P-17869A and MIL-S-901-C Grade A
- Fastest compensator response: Gives maximum of 10% pressure overshoot at rated conditions (guaranteed times under all conditions; faster response times possible depending upon application)

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Frame Size P/M	6	7	8	11	14	24	30
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	98.3 6	118.8 7.25	131.1 8	180.3 11	229.5 14	403.2 24.6	501.5 30.6
Max continuous pressure (bar) (psi)	350 5000	350 5000	350 5000	350 5000	350 5000	350* 5000*	350* 5000*
Max intermittent pressure** (bar) (psi)	420 6000	420 6000	350 5000	420 6000	420 6000	350* 5000*	350* 5000*
Max rated drive speed (RPM)	3000	3000	2700	2400	2400	2100	1800

\*Variable speed. Higher servo pressure may be required.

\*\*10% of operating time, not exceeding 6 successive seconds.



# Hydrostatic Transmissions

## Integrated Hydrostatic Transmissions: HTE, HTJ & HTG



- Field proven durability
- Integrated, efficient design
- High efficiency performance
- Compact design
- No gearbox
- Cooler running
- Less maintenance downtime

### HTE and HTJ

The HTE transmission has a 1" diameter shaft for use on machines with tires up to 24" diameter and gross vehicle weights (GVW) up to 1300 lb. HTJ units use the same motors as the HTE but have 1.25" shafts with heavier bearings for use on vehicle also with up to 24" diameter tires but with GVW up to 1600 lb. Both use time proven 10 cc pumps

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	HTE, HTJ – 10 cc Pump					
Motor Displacement (cc/rev)	130	165	195	228	260	293
Continuous torque (lb-in)	1580	1980	2415	2710	3140	3560
Maximum torque (lb-in)	3115	3845	4675	4555	4870	5180
Output Speed (RPM)*	265	212	177	152	133	118

### HTG

HTG transmissions incorporate the industry standard TG Series motors for use with vehicles using tires of up to 26" in diameter and gross vehicle weights (GVW) of up to 2500 lb. Two pump options are offered.

[View Specs](#)

	HTG					
	14 cc Pump			16 cc Pump		
Motor Displacement (cc/rev)	240	280	310	240	280	310
Continuous torque (lb-in)	3090	3590	4250	2680	3110	3680
Maximum torque (lb-in)	5990	7040	8180	5990	7040	8180
Output Speed (RPM)*	200	171	154	228	195	177

\*At 3600 RPM input to pump

## Hydraguide™ Hydrostatic Steering Unit: HGF



- Compact package size
- Patented pressure dams
- Removable upper column
- Full pressure shaft seal
- Internal relief valve
- Low noise option
- Manual emergency steering

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Frame size HGF	-08	-10	-12	-16	-20	-24
Displacement (cm <sup>3</sup> /rev)	54.1	67.7	81.1	108.2	135.2	162.3
(in <sup>3</sup> /rev)	3.30	4.13	4.95	6.60	8.25	9.9
Max continuous pressure (bar)	124	124	124	124	124	124
(psi)	1800	1800	1800	1800	1800	1800
Flow (LPM)	30	30	30	30	30	30
(GPM)	8	8	8	8	8	8

# Motors Low Speed High Torque

## Nichols



- Single and two-speed styles
- Rugged, compact design
- Unique IGR power element
- Integral selector valve on two-speed styles
- Maximum supply pressure 276 bar (4000 psi)

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[View Product 110A PDF](#)

[View Product 716 PDF](#)

Series 700	072	108	142	176	212	258
Geometric displacement Series (cm <sup>3</sup> /rev)	59	88	116	144	174	211
(in <sup>3</sup> /rev)	3.6	5.4	7.1	8.8	10.6	12.9
Parallel (cm <sup>3</sup> /rev)	118	177	233	288	347	423
(in <sup>3</sup> /rev)	7.2	10.8	14.2	17.6	21.2	25.8
Max cont. differential pressure Series (bar)	170	170	170	170	155	155
(psi)	2500	2500	2500	2500	2250	2250
Parallel (bar)	170	170	170	170	155	138
(psi)	2500	2500	2500	2500	2250	2000
Max operating speed Series (rev/min)	890	843	695	688	580	440
Parallel (rev/min)	782	656	481	419	352	268

Series 110A	036	054	071	088	106	129	164	189	241
Geometric displacement (cm <sup>3</sup> /rev)	59	89	116	144	174	211	269	310	395
(in <sup>3</sup> /rev)	3.6	5.4	7.1	8.8	10.6	12.9	16.4	18.9	24.1
Max continuous pressure (bar)	170	170	170	170	155	155	140	140	120
(psi)	2500	2500	2500	2500	2250	2250	2000	2000	1750
Max operating speed (rev/min)	858	740	684	622	519	437	415	350	279

Series 716	072	108	142	176	212	258
Geometric displacement Series (cm <sup>3</sup> /rev)	59	88	116	144	174	211
(in <sup>3</sup> /rev)	3.6	5.4	7.1	8.8	10.6	12.9
Parallel (cm <sup>3</sup> /rev)	118	177	233	288	347	423
(in <sup>3</sup> /rev)	7.2	10.8	14.2	17.6	21.2	25.8
Max cont. differential pressure Series (bar)	170	170	170	170	155	120
(psi)	2500	2500	2500	2500	2250	1750
Parallel (bar)	170	140	100	85	85	70
(psi)	2500	2000	1500	1250	1250	1000
Max operating speed Series (rev/min)	890	843	695	688	580	440
Parallel (rev/min)	782	656	481	419	352	268





# Motors Fixed Displacement Low Speed High Torque

## Torqmotor™ Small Frame



- High volumetric efficiency
- Long life
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque

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Frame size TC	-0036	-0045	-0050	-0065	-0080	-0100	-0130	-0165	-0195	-0230	-0260	-0295	-0330	-0365	-0390
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	36 2.2	41 2.5	49 3.0	65 4.0	82 5.0	98 6.0	130 8.0	163 10.0	195 11.9	228 13.9	260 15.9	293 17.9	328 20.0	370 22.6	392 24.0
Max cont pressure (bar) (psi)	86 1250	86 1250	86 1250	86 1250	86 1250	86 1250	86 1250	86 1250	86 1250	76 1100	66 950	59 850	52 750	45 650	45 650
Max operating speed (RPM)	902	794	688	517	413	460	429	346	287	246	217	193	173	152	144

Frame size TB	-0036	-0045	-0050	-0065	-0080	-0100	-0130	-0165	-0195	-0230	-0260	-0295	-0330	-0365	-0390
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	36 2.2	41 2.5	49 3.0	65 4.0	82 5.0	98 6.0	130 8.0	163 10.0	195 11.9	228 13.9	260 15.9	293 17.9	328 20.0	370 22.6	392 24.0
Max cont pressure (bar) (psi)	125 1800	125 1800	125 1800	125 1800	125 1800	125 1800	125 1800	125 1800	125 1800	103 1500	100 1450	97 1400	93 1350	86 1250	83 1200
Max operating speed (RPM)	932	805	678	511	409	454	430	343	287	246	216	191	171	151	143

Frame size TE	-0036	-0045	-0050	-0065	-0080	-0100	-0130	-0165	-0195	-0230	-0260	-0295	-0330	-0365	-0390
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	36 2.2	41 2.5	49 3.0	65 4.0	82 5.0	98 6.0	130 8.0	163 10.0	195 11.9	228 13.9	260 15.9	293 17.9	328 20.0	370 22.6	392 24.0
Max cont pressure (bar) (psi)	140 2030	140 2030	140 2030	140 2030	140 2030	140 2030	140 2030	140 2030	140 2030	120 1740	110 1595	100 1450	100 1450	95 1378	85 1233
Max operating speed (RPM)	1141	1024	1020	877	695	582	438	348	292	328	287	256	228	203	191

## Torqmotor™ Medium Frame



- High volumetric efficiency
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque
- High side load capacity
- Long life

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Frame size TJ	-0045	-0050	-0065	-0080	-0100	-0130	-0165	-0195	-0230	-0260	-0295	-0330	-0365	-0390
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	41 2.5	49 3.0	65 4.0	82 5.0	98 6.0	130 8.0	163 10.0	195 11.9	228 13.9	260 15.9	293 17.9	328 20.0	370 22.6	392 24.0
Max cont pressure (bar) (psi)	140 2030	140 2030	140 2030	140 2030	140 2030	140 2030	140 2030	140 2030	120 1740	110 1595	100 1450	100 1450	95 1378	85 1233
Max operating speed (RPM)	1024	1020	877	695	582	438	348	292	328	287	256	228	203	191

# Motors Fixed Displacement Low Speed High Torque

## Torqmotor™ Large Frame



- High volumetric efficiency
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque
- High side load capacity
- Long life

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Frame size TF	-0080	-0100	-0130	-0140	-0170	-0195	-0240	-0280	-0360	-0405	-0475
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	81 4.9	100 6.1	128 7.8	141 8.6	169 10.3	197 12.0	238 14.5	280 17.1	364 22.2	405 24.7	477 29.1
Max cont pressure (bar) (psi)	207 3000	155 2250	138 2000	138 2000	138 2000	138 2000	138 2000	138 2000	130 1880	128 1850	113 1645
Max operating speed (RPM)	693	749	583	530	444	381	394	334	258	231	195

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Frame size TG	-0140	-0170	-0195	-0240	-0280	-0310	-0335	-0405	-0475	-0530	-0625	-0785	-0960
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	141 8.6	169 10.3	195 11.9	238 14.5	280 17.1	310 18.9	337 20.6	405 24.7	477 29.1	528 32.3	623 38.0	786 48.0	959 58.5
Max cont pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	138 2000	138 2000	121 1750	103 1500	69 1000
Max operating speed (RPM)	660	554	477	393	334	303	277	232	237	213	182	143	118

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Frame size TGK	0110	0140	0170	0195	0240	0280	0310	0335	0360	0405	0475	0530	0625	0785	0960
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	110 6.9	141 8.6	169 10.3	195 11.9	238 14.5	280 17.1	310 18.9	337 20.6	360 22.2	405 24.7	477 29.1	528 32.3	623 38.0	786 48.0	959 58.5
Max cont pressure (bar) (psi)	241 3500	241 3500	241 3500	241 3500	241 3500	241 3500	241 3500	241 3500	241 3500	241 3500	241 3500	224 3250	190 2750	152 2200	124 1800
Max operating speed (RPM)	672	660	554	477	393	334	303	277	263	232	237	231	182	143	118

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Frame size TH	-0140	-0170	-0195	-0240	-0280	-0310	-0335	-0405	-0475	-0530	-0625	-0785	-0960
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	141 8.6	169 10.3	195 11.9	238 14.5	280 17.1	310 18.9	337 20.6	405 24.7	477 29.1	528 32.3	623 38.0	786 48.0	959 58.5
Max cont pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	138 2000	138 2000	121 1750	103 1500	69 1000
Max operating speed (RPM)	660	554	477	393	334	303	277	232	237	213	182	143	118

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Frame size TK	-0250	-0315	-0400	-0500	-0630	-0800	-1000
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	250 15.3	315 19.2	400 24.4	500 30.5	630 38.4	800 48.8	1000 61
Max cont pressure (bar) (psi)	241 3500	241 3500	207 3000	207 3000	207 3000	190 2750	172 2500
Max operating speed (RPM)	523	413	373	298	237	276	218

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Frame size TL	-0140	-0170	-0195	-0240	-0280	-0310	-0360
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	140 8.6	169 10.3	195 11.9	238 14.5	280 17.1	310 18.9	364 22.2
Max cont pressure (bar) (psi)	190 2750	190 2750	190 2750	190 2750	190 2750	190 2750	172 2500
Max operating speed (RPM)	613	512	484	399	335	310	255

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# Motors Fixed Displacement Low Speed High Torque

## Torqmotor™ and Brake Motors



DF, DG



BG, BH

- High volumetric efficiency
- Full flow spline cooling
- High pressure shaft seal
- High flow shaft seal cooling
- High starting torque
- High side load capacity
- Long life

### Mechanical Brakes

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Frame size DF	-0080	-0100	-0130	-0140	-0170	-0195	-0240	-0280	-0360	-0405	-0475
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	81 4.9	100 6.1	128 7.8	141 8.6	169 10.3	197 12.0	238 14.5	280 17.1	364 22.2	405 24.7	477 29.1
Max cont pressure (bar) (psi)	207 3000	155 2250	138 2000	138 2000	138 2000	138 2000	138 2000	138 2000	130 1880	128 1850	113 1645
Max operating speed (RPM)	693	749	583	530	444	381	394	334	258	231	195

Max holding torque: 497 N.m. (4,400 in lbs)

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Frame size DG	-0140	-0170	-0195	-0240	-0280	-0310	-0335	-0405	-0475	-0530	-0625	-0785	-0960
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	141 8.6	169 10.3	195 11.9	238 14.5	280 17.1	310 18.9	337 20.6	405 24.7	477 29.1	528 32.3	623 38.0	786 48.0	959 58.5
Max cont pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	138 2000	138 2000	121 1750	103 1500	69 1000
Max operating speed (RPM)	660	554	477	393	334	303	277	232	237	213	182	143	118

Max holding torque: 497 N.m. (4,400 in lbs)

### Spring Applied, Hydraulically Released Brakes

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Frame size BG	-0140	-0170	-0195	-0240	-0280	-0310	-0335	-0405	-0475	-0530	-0625	-0785	-0960
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	141 8.6	169 10.3	195 11.9	238 14.5	280 17.1	310 18.9	337 20.6	405 24.7	477 29.1	528 32.3	623 38.0	786 48.0	959 58.5
Max cont pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	138 2000	138 2000	121 1750	103 1500	69 1000
Max operating speed (RPM)	660	554	477	393	334	303	277	232	237	213	182	143	118

Rated holding capacity: 1350 N.m. (12,000 in lbs)

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Frame size BH	-0140	-0170	-0195	-0240	-0280	-0310	-0335	-0405	-0475	-0530	-0625	-0785	-0960
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	141 8.6	169 10.3	195 11.9	238 14.5	280 17.1	310 18.9	337 20.6	405 24.7	477 29.1	528 32.3	623 38.0	786 48.0	959 58.5
Max cont pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	138 2000	138 2000	121 1750	103 1500	69 1000
Max operating speed (RPM)	660	554	477	393	334	303	277	232	237	213	182	143	118

Rated holding capacity: 1800 N.m. (16,000 in lbs)

# Motors Variable Displacement Axial Piston

## V12



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- Very high operating speeds
- Displacement ratio 5:1
- Pressures to 482 bar (7000 psi)
- Very high power capability
- High starting torque
- Low weight
- High overall efficiency
- Axial or side ports
- Controls available for most needs
- ISO, SAE and cartridge versions

Frame size V12	-60	-80
Displacement: 35° (max): (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	60 3.66	80 4.88
6.5° (min): (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	12 0.73	16 0.98
Max continuous pressure (bar) (psi)	420 6000	420 6000
Max operating speed* (RPM)	5600	5000

\*At reduced displacement

## V14



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- For open or closed circuits
- High starting torque and smooth operation
- Increased shaft speeds and improved support
- Improved sealing
- Faster control response
- Enlarged setting piston
- Tapered roller bearings
- Wide displacement range-5:1
- Small envelope size and high power-to-weight ratio
- Robust motor with long service life and proven reliability

Frame size* V14	-110	-160
Displacement: 35° (max): (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	110 6.71	160 9.76
6.5° (min): (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	22 1.34	32 1.95
Max continuous pressure (bar) (psi)	420 6000	420 6000
Max operating speed** (RPM)	5700	5000

\*Additional frame sizes in preparation.

\*\*At reduced displacement

## T12



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- Designed specifically for track drives
- Very high operating speeds
- Pressures to 482 bar (7000 psi)
- Very high power capability
- High starting torque
- Low weight
- High overall efficiency
- Axial or side ports
- Two-position control
- Cartridge version available

Frame size T12	-60	-80
Displacement: 35° (max): (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	60 3.66	80 4.88
10° (min): (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	18 1.10	24 1.46
Max continuous pressure (bar) (psi)	420 6000	420 6000
Max operating speed* (RPM)	5600	5000

\*At reduced displacement



# Motors Fixed Displacement Bent-Axis Piston

## F11



F11 is the well proven bent-axis, fixed displacement heavy-duty motor/pump series. They can be used in numerous applications in on both open and closed loop circuits.

- Very high motor operating speeds
- Pressures to 420 bar (6000 psi)
- Efficient (low losses)
- Accepts high external shaft loads
- SAE, ISO and Cartridge mount available

- Compact, lightweight motor and pump
- Integral anti-cavitation valves available on certain displacements
- Good resistance to vibrations and temperature shocks
- Proven reliability
- Easy to service with very few moving parts
- Heavy duty roller bearings

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Frame size* F11	-05	-10	-12	-14	-19
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	4.9 0.30	9.8 0.60	12.5 0.76	14.3 0.87	19.0 1.16
Max continuous pressure (bar) (psi)	350 5000	350 5000	350 5000	350 5000	350 5000
Max operating speed** (RPM)	12,800	10,200	9400	9000	8100

\*Use F12 for medium range displacement  
\*\*Functioning as motor

## F12



Series F12 is the high performance bent-axis, fixed displacement heavy-duty motor/pump series. They can be used in numerous applications at unusually high shaft speeds.

- Very high motor operating speeds
- Pressures to 480 bar (7000 psi)
- High starting torque
- Very high power capability
- High overall efficiency
- Compact, lightweight motor and pump

- Laminated piston ring provides low internal leakage and thermal shock resistance
- Accessory valves available
- ISO, SAE and cartridge versions available
- Proven reliability
- Easy to service with very few moving parts
- Super-shockless swing relief valve

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Frame size F12	-30	-40	-60	-80	-90	-110	-125	-150	-250
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	30.0 1.83	40.0 2.44	59.8 3.65	80.4 4.90	93.0 5.7	110.1 6.72	125.0 7.6	150.0 9.15	242.0 14.80
Max continuous pressure (bar) (psi)	420 6000	420 6000	420 6000	420 6000	420 6000	420 6000	420 6000	350 5000	350 5000
Max operating speed (RPM)	6700	6100	5300	4800	4600	4400	4200	3200	2700



# Motors High Speed

## M2



- High starting torque typically 90% of running torque
- Smooth output torque throughout the entire speed range
- Bi-directional operation
- High pressure shaft seal
- Standard SAE mounting
- Long life and quiet operation
- Heavy duty bearings

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Frame size M2	-085	-127	-169	-254	-339	-508
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	13.9 0.85	20.8 1.27	27.7 1.69	41.6 2.54	55.6 3.39	83.2 5.08
Max continuous pressure (bar) (psi)	138 2000	138 2000	138 2000	138 2000	138 2000	69 1000
Max intermittent pressure* (bar) (psi)	166 2400	166 2400	166 2400	166 2400	166 2400	97 1400
Max transient pressure** (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	117 1700
Recommended speeds (RPM)	50-5000	40-4000	36-3600	30-3000	20-2000	15-1500

\*Intermittent conditions are to be less than 10% of each minute.

\*\*Transient conditions are to be less than 1% of every minute.

Minimum speeds based on constant load. Consult factory for speeds outside range.

## M4



- High starting torque typically 90% of running torque
- Smooth output torque throughout the entire speed range
- Bi-directional operation
- High pressure shaft seal
- Standard SAE mounting
- Long life and quiet operation
- Heavy duty bearings

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Frame size M4	-015	-030	-045	-060	-075
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	2.45 0.15	4.91 0.30	7.37 0.45	9.83 0.60	12.29 0.75
Max continuous pressure (bar) (psi)	138 2000	138 2000	138 2000	138 2000	138 2000
Max intermittent pressure* (bar) (psi)	166 2400	166 2400	166 2400	166 2400	166 2400
Max transient pressure** (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000
Recommended speeds (RPM)	75-7500	50-5000	50-5000	36-3600	30-3000

\*Intermittent conditions are to be less than 10% of each minute.

\*\*Transient conditions are to be less than 1% of every minute.

Minimum speeds based on constant load. Consult factory for speeds outside range.

# Motors Calzoni Radial Piston LSHT

## Calzoni Motors

The outstanding performance of this robust product is the result of the original, patented design. Used widely in the mining, off shore drilling, oil field, and marine winch markets; the Calzoni motor is produced in sizes

from 32cc up to 6 gallons per revolution. The efficiency of design allows for a smaller installed product for the same displacement vs the competition. Since there are no internal connecting rods, the

frictional drag is greatly reduced as well as most thrust loading. By creating a static balance on the shaft expected lifetime is extended.

## MR-MRE Series-Fixed Displacement



- 5 piston design
- Wide range of displacement
- Starting torque from 90-95% theoretical
- Total efficiency up to 96%
- Resistance to thermal shocks  $\Delta T=176^{\circ}F$
- Speed feedback accessories optional

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Frame size MR/E*	33	57	73	93	110	125	160	190	200	250	300
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	32.1 2.0	56.4 3.4	72.6 4.4	92.6 5.7	109.0 6.7	124.7 7.6	159.7 9.8	191.6 11.7	199.2 12.2	250.9 15.3	304.4 18.6
Max pressure (bar) (psi)	300 4350	300 4350	300 4350	300 4350	300 4350	300 4350	300 4350	300 4350	300 4350	300 4350	300 4350
Max speed (RPM)	1400	1300	1200	1150	1100	900	900	850	800	800	750

Frame size MR/E*	330*	350	450	500*	600	700	800*	1100	1400*	1600	1800
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	332.4 20.1	349.5 21.3	451.6 27.6	497.9 30.4	607.9 37.1	706.9 43.1	804.2 49.1	1125.8 68.7	1369.5 83.6	1598.4 97.5	1809.6 110.4
Max pressure (bar) (psi)	250 3626	300 4350	300 4350	250 3626	300 4350	300 4350	250 3626	300 4350	250 3626	300 4350	300 4350
Max speed (RPM)	750	640	600	600	520	500	450	330	280	260	250

Frame size MR/E*	2100*	2400	2800	3100*	3600	4500	5400*	6500	7000*	8200
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	2091.2 127.6	2393.1 139.9	2792.0 170.4	3103.7 189.4	3636.8 221.9	4502.7 274.8	5401.2 329.6	6460.5 394.2	6967.2 408.7	8226.4 502
Max pressure (bar) (psi)	250 3626	300 4350	300 4350	250 3626	300 4350	300 4350	250 3626	300 4350	300 4350	250 3626
Max speed (RPM)	250	220	215	215	180	170	160	130	130	130

# Motors Calzoni Radial Piston LSHT

## MRT-MRTE-MRTF Series-Fixed Displacement



- Hydraulically balanced 10 and 14 piston twin row design
- Wide range of displacements
- Starting torque from 91% theoretical
- Total efficiency up to 96%
- Speed feedback accessories optional

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Frame size MRT/E*/F**	7100	7800**	8500*	9000	9900**	10800*	14000	15500**
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	7100.4 433.5	7808.4 476.5	8517.3 519.8	9005.4 549.5	9903.9 604.4	10802.4 659.2	14010 854.9	15276 932.3
Max pressure (bar) (psi)	300 4350	250 3626	250 3626	300 4350	250 3626	250 3626	300 4350	250 3626
Max speed (RPM)	150	130	120	130	120	110	80	75

Frame size MRT/E*/F**	16500*	17000	18000**	19500	20000*	21500**	23000*
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	16542 1009.5	16759 1022.7	18025 1100	19508 1190.5	19788 1207.5	21271 1298	23034 1405.6
Max pressure (bar) (psi)	250 3626	300 4350	250 3626	300 4350	250 3626	250 3626	250 3626
Max speed (RPM)	70	70	65	60	60	55	50

## MRD-MRDE Series-Dual Displacement, MRV-MRVE Series-Variable Displacement



- 5 piston design
- Displacement ratios of 1:2 or 1:3
- Starting torque from 90-95% theoretical
- Total efficiency up to 96%
- Resistance to thermal shocks  $\Delta T=176^{\circ}F$
- Speed feedback accessories optional

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Frame size MRV/E* MRD/E*	300	330*	450 450	500*	700 700	800* 800*	1100 1100	1400* 1400*
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	304.1 18.6	332.4 20.3	451.6 27.6	497.9 30.4	706.9 43.1	804.2 49.1	1125.8 68.7	1369.5 83.6
Max pressure (bar) (psi)	300 4350	250 3626	300 4350	250 3626	300 4350	250 3626	300 4350	250 3626
Max speed (RPM)	1000	1000	850	800	700	650	580	550

Frame size MRV/E* MRD/E*	1800 1800	2100* 2100*	2800 2800	3100* 3100*	4500 4500	5400* 5400*
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	1809.6 110.4	2091.2 127.6	2792.0 170.4	3103.7 189.4	4502.7 274.8	5401.2 329.6
Max pressure (bar) (psi)	300 4350	250 3626	300 4350	250 3626	300 4350	250 3626
Max speed (RPM)	400	370	280	280	250	210





# Motors Vane

## M3-M5 Fixed Displacement



M4



M3

- Low ripple torque
- Low starting torque
- Low noise
- Bi-rotational technology
- Various pilot, threaded port and porting configurations
- External/internal drain option
- Many displacement combinations for double motor

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## M5AF-M5BF Fan Drive Vane Motors



M5BF



M5AF



M5ASF

- Low noise
- Designed for severe duty applications
- High efficiency
- High starting torque
- Low torque ripple
- Long life
- Interchangeable rotating groups
- Cross port check valve on M5BF/1

Series M	3B	4C	4SC	4D	4SD	4E	4SE
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	9.2-37.1 .5-2.3	24.4-80.1 1.4-4.9	24.4-80.1 1.4-4.9	65.1-144.4 3.9-8.8	65.1-144.4 3.9-8.8	158.5-222 9.6-13.6	158.5-222 9.6-13.6
Max pressure* (bar) (psi)	210 3000	175 2535	230 3335	175 2535	230 3335	175 2535	190 2795
Max speed* (RPM)	4000	4000	4000	4000	4000	3600	3600

Frame size M	4DC	4SDC
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	89.5-224.5 5.4-13.7	89.5-224.5 5.4-13.7
Max pressure* (bar) (psi)	175 2535	230 3335
Max speed* (RPM)	4000	4000

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Frame size M	5AF	5B/S	5BF
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	6.3-25 0.3-1.5	12-45 0.7	12-45 2.8
Max pressure* (bar) (psi)	300 4350	320 4650	320 4650
Max speed* (RPM)	6000	6000	6000

\*Intermittent conditions are to be less than 10% of each minute. Minimum speeds based on constant load. Consult factory for speeds outside range.

# Power Take-off Chelsea®

## 252 Series 6-Bolt



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- The 252 Series features the latest PTO technology for automatic transmissions
- The controlled compression interface gasket eliminates the setting of gear backlash
- The lightweight housing design allows for maximum heat dissipation
- Excellent gear contact ratio equals quiet operation
- Integrated cartridge valve - reduced installation time
- Torque up to 120 Lbs.ft - Able to power most application requirements

Series	252*D	252*M	
Standard output shaft size	1" Round w/key		
Intermittent torque rating (lbs. ft)	120	50	
Intermittent torque rating (N.m.)	163	68	
Horsepower rating for intermittent service:			
	at 500 RPM of output shaft (HP)	11	5
	at 1000 RPM of output shaft (HP)	23	10
	at 500 RPM of output shaft (Kw)	9	4
at 1000 RPM of output shaft (Kw)	17	7	
Approximate weight	25 lbs. (11 kg)		

## 236 Series 6-Bolt



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- Powershift
- Patent pending internal self adjusting shaft brake option
- Wide selection of input gears for virtually all currently produced transmissions
- Inspection cove for adjusting backlash
- Helical gears and optional pressure lubrication to extend PTO service life
- Air or electric/air shift unit

Series	236*D	236*K	236*Q	236*U
Standard output shaft size	1¼"	1¼"	1¼"	1¼"
Intermittent torque rating (lbs. ft)	250	250	250	225
Horsepower rating for intermittent Service:				
	at 500 RPM of output shaft	23.8	23.8	23.8
at 1000 RPM of output shaft	47.6	47.6	47.6	42.8

# Power Take-off Chelsea®

## 238 Series 8-Bolt



- “Slip” Fit Idler Pin allows for ease of servicing
- Comes as a KIT PTO; Same input gears as 236 & 442 Series
- “Inspection” cover; Set backlash accurately
- 4 output speed ratios: wide coverage for customer applications
- 12 output options: large coverage for the toughest applications
- 5 mounting options; Flexibility of inventory & applications
- Up to 250 Lbs. ft. of torque; Covers most applications
- Shaft brake option (“BD”) patent # 7159701; Industry setting standard for product pump applications

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Series	238*A, D, K & Q	238*U
Standard output shaft size	1- ¼" Round w/key	
Intermittent torque rating (lbs. ft)	250	225
Intermittent torque rating (N.m.)	339	305
Horsepower rating for intermittent service at 500 RPM of output shaft (HP)	24	21
at 1000 RPM of output shaft (HP)	48	43
at 500 RPM of output shaft (Kw)	18	16
at 1000 RPM of output shaft (Kw)	36	32
Approximate weight	49 lbs. (22 kg)	

## 880 Series 8-Bolt



- Two-gear
- Wide coverage for tough applications
- Speed ratios for high and low speed applications
- Removable shift cover for adjusting backlash
- Dual-pump output for mounting a pump on each end of the PTO

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Series	880*B	880*D	880*G	880*J	880*M	880*P	880*R	880*T
Standard output shaft size	1½" 10 spline with 1410 flange							
Intermittent torque rating (lbs. ft)	500	500	500	500	500	500	400	350
Service: at 500 RPM of output shaft	47	47	47	47	47	47	38	33
at 1000 RPM of output shaft	94	94	94	94	94	94	76	66

# Power Take-off Chelsea®

## 230/231, 270/271 Series 6-Bolt



### 230/231 Series

- Powershift
- Designed for both manual and automatic transmissions
- 231 offers low profile housing for avoiding clearance problems
- Pressure lubrication option available for both units
- Patent pending internal self adjusting shaft brake option
- Air or electric/air shift unit

### 270/271 Series

- Powershift
- Designed for automatic transmissions
- 271 offers low profile housing for avoiding clearance problems
- Pressure lubrication option available for both units
- Patent pending internal self adjusting shaft brake option
- Electric/hydraulic shift unit

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Series	230*A, B, D, K & Q 270* A, B, D w/Pressure Lube	230*A, B, D, K & Q 270* A, B, D w/Standard Lube	231 & 271 All Units w/Pressure Lube	230*U/231*U All Lube Types
Standard output shaft size	1 1/4"	1 1/4"	1 1/4"	1 1/4"
Intermittent torque rating (lbs. ft)	300	250	250	225
Horsepower rating for intermittent Service: at 500 RPM of output shaft at 1000 RPM of output shaft	28.5 57	23.5 47	23.5 47	21.4 42.8

## 280 Series 10-Bolt



- Features single continuous duty torque rating instead of intermittent rating
- Torque capacity ratings have been increased
- Pump clearance issues have been improved with rotatable cast iron flanges
- New positive stop for driveline outputs; Eliminates ability for shaft couplings to damage oil seals
- Wet spline pump flange option provides 7 to 10 times greater shaft life
- Broader coverage of speed ranges expanding from 5 ratios to 9 ratios
- Lower and higher speed now available
- The pressure/lube hose will be included with the new 280 Series; No need to order separately
- Three option positions for the integrated solenoid valve; Remote mounted option provides maximum clearance

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Series	280*B	280*C	280*D	280*G	280*K	280*M	280*P	280*S	280*T
Standard output shaft size	1-1/4" Round w/key								
Intermittent & continuous torque rating (lbs. ft)	300	390	390	360	340	318	290	265	240
Intermittent & continuous torque rating (N.m.)	407	529	529	488	461	431	393	359	325
Horsepower rating for intermittent service at 500 RPM of output shaft (HP)	29	37	37	34	32	30	28	25	23
at 1000 RPM of output shaft (HP)	57	74	74	69	65	61	55	50	46
at 500 RPM of output shaft (Kw)	21	28	28	26	24	23	21	19	17
at 1000 RPM of output shaft (Kw)	43	56	56	51	48	45	41	38	34
Approximate weight	49 lbs. (22 kg)								



# Power Take-off Chelsea®

## 249 Series 6-Bolt (for the Ford TorqueShift™ 6 Automatic Transmission)



- Noise suppression system provides quiet PTO applications for Ford SuperDuty patent pending
- No special installation tools to purchase; Eliminates costs and saves time
- Single hose connection and integrated actuation valve simplify installation and reduce installation time and eliminates leak paths
- Intermittent torque rating of 200 lbs. ft.; 58 horse power @ 1200 Engine RPM
- Two-year warranty; Greater bearing capacity, larger gear width and greater clutch engagement surface provide a robust design
- Pump flows up to 25.1 GPM at 1200 Engine RPM; Standard S.A.E. flanges and shafts allow for a wider variety of flows and pressures
- Simplified ordering: PTO, pump, wiring harness and shift kits available under one part number and package

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PTO Model	% ENG.	Rotation	Shift Type	MAX. Torque Rating	HP @ 1200 ENG.
249FMLLX-B4AD	124%	OPP	ELEC./HYD.	200 Lbs. ft.	58.0 HP

### Direct Mount Pumps - Pump Flows @ 1200 RPM Engine (Theoretical). Can be Ordered with PTO

Pump Number	GPM	Pump Number	GPM	Pump Number	GPM
(16) CGP-P11A016-5GC	2.4 GPM	(61) CGP-P11A061-5GE	9.0 GPM	(09) CGP-P31B094-5AG	14.0 GPM
(26) CGP-P11A026-5GC	3.9 GPM	(71) CGP-P11A071-5GE	10.6 GPM	(11) CGP-P31B107-5AG	16.0 GPM
(32) CGP-P11A032-5GC	4.7 GPM	(82) CGP-P11A082-5GE	12.2 GPM	(15) P16-150A-2D1	18.9 GPM
(37) CGP-P11A037-5GC	5.5 GPM	(87) CGP-P11A087-5GE	12.9 GPM	(18) P16-180A-2D1	22.6 GPM
(42) CGP-P11A042-5GC	6.3 GPM	(08) CGP-P31B081-5AG	12.0 GPM	(20) P16-200A-2D1	25.1 GPM
(55) CGP-P11A055-5GC	8.2 GPM				

## 890 Series 10-Bolt



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- Fits Allison 3000/4000 Series Transmissions
- Moves the PTO mounting flange to the rear of the transmission
- Allows direct mounting of larger pumps
- PTO torque ratings up to 670 lbs.-ft. – able to transmit the maximum torques allowable from the Allison Transmissions
- Wet spline outputs – extends shaft life and eliminates the need to disassemble the PTO/pump to frequently grease the shaft splines
- Electric Overspeed Control (EOC) available to protect driven equipment from overspeeding
- Heavy duty gears, bearings, shafts and housing – tested to withstand the severest applications such as refuse, cranes and fire/rescue
- Electric/hydraulic shift w/new cartridge valve – better transmission/chassis fitment

Series	890*A	890*E	890*F
Standard output shaft size	S.A.E. "C" ("XS") Output		
Intermittent torque rating (lbs. ft)	600	600	600
Intermittent torque rating (N.m.)	813	813	813
Horsepower rating for intermittent service:			
at 500 RPM of output shaft (HP)	57	57	57
at 1000 RPM of output shaft (HP)	114	114	114
at 500 RPM of output shaft (Kw)	43	43	43
at 1000 RPM of output shaft (Kw)	85	85	85
Approximate weight	86 lbs. (39 kg)		

# Power Take-off Chelsea®

## 442 Series 6-Bolt & 489 Series 8-Bolt



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### 442 Series

- Two-gear
- Engineered to work with virtually all existing transmission applications
- Economical workhorse features a cast iron housing
- Tapered cone bearings for high torque rating and long service life
- Slip fit idler pin for easy interchange from one transmission to another
- Easy to set backlash
- Wide range of shift, output options

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### 489 Series

- Two-gear
- 442 Series family, but with an 8-bolt mounting flange
- No adapter plate needed
- Less installation time, less expense and less chance of leakage
- Wide range of shifters options and pump flanges

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Series	442*A 489*A	442*C 489*C	442*F 489*F	442*L 489*L	442*Q 489*Q	442*R 489*R	442*S 489*S	442*U 489*U	442*W 489*W	442*X 489*X
Standard output shaft size	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"
Intermittent torque rating (lbs. ft)	250	250	250	250	225	225	200	195	175	140
Horsepower rating for intermittent Service: at 500 RPM of output shaft at 1000 RPM of output shaft	23.5 47	23.5 47	23.5 47	23.5 47	21.4 42.8	21.4 42.8	19 38	18.6 37.2	16.7 33.3	13.2 26.5

## 870 Series 10- Bolt Powershift



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- Torque capacity up to 670 Lbs. ft. / 908 N.m.
- Compact housing height reduces clearance issues
- Integral actuation valve simplifies plumbing and reduces installation time
- Remote mount valve solves installation interference problems
- Electronic Overspeed Control (E.O.C.) protects driven equipment
- Nine speed ratios
- Nine output options
- Wet Spline pump flange extends PTO and pump shaft life

Series	870*A	870*B	870*C	870*D	870*E	870*F	870*G	870*H	870*J
Standard output shaft size	1½" Spline w/1410 flange								
Intermittent & continuous torque rating (lbs. ft)	670	630	590	550	485	430	380	355	335
Intermittent & continuous torque rating (N.m.)	908	854	800	746	658	583	515	481	454
Horsepower rating for intermittent service at 500 RPM of output shaft (HP)	64	60	56	52	46	41	36	34	32
at 1000 RPM of output shaft (HP)	128	120	112	105	92	82	72	68	64
at 500 RPM of output shaft (Kw)	48	45	42	39	35	31	27	25	24
at 1000 RPM of output shaft (Kw)	95	90	84	78	69	61	54	51	48
Approximate weight	56 lbs. (25 kg)								

# Power Take-off Chelsea®

## 267 Series 10-Bolt



- Approved for use with Allison World Transmissions
- Constant Mesh (non-shiftable) PTO that is ideal for applications requiring continuous power
- Three speed ratios and ten output options
- SuperTorque™ gears available for 20% higher intermittent torque ratings
- No backlash to adjust
- Wet spline output options available

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Series	267*B	267*G	267*S	267*SB	267SG	267*SS
	<b>Super Torque</b>					
Standard output shaft size	1 1/4"					
Intermittent torque rating (lbs. ft)	335	300	250	402	360	265
Intermittent torque rating (N.m.)	454	407	339	545	488	359
Horsepower rating for intermittent service: at 500 RPM of output shaft at 1000 RPM of output shaft at 500 RPM of output shaft at 1000 RPM of output shaft	32	29	24	38	34	25
	64	57	48	77	69	50
	24	21	18	29	26	19
	48	43	36	57	51	38
Approximate weight	35 lbs. (16 kg)					

## 340 Series 6-Bolt



- Single low-speed forward and reverse
- Removable cover plate for adjusting backlash
- Shift options include air and lever
- Variety of input gears to cover most applications
- 6-Bolt mounting pad
- Product features and benefits
- Two-year warranty

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Series	340*F
Standard output shaft size	1 1/4" Round w/key
Intermittent torque rating (lbs. ft)	200
Intermittent torque rating (N.m.)	271
Horsepower rating for intermittent service at 500 RPM of output shaft (HP) at 1000 RPM of output shaft (HP) at 500 RPM of output shaft (Kw) at 1000 RPM of output shaft (Kw)	19
	38
	14
	28
Approximate weight	32 lbs. (15 kg)

# Power Take-off Chelsea®

## 348 Series 8-Bolt



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- Single low-speed forward and reverse
- Removable cover plate for adjusting backlash
- Shift options include air and lever
- Variety of input gears to cover most applications
- 8-Bolt Mounting Pad
- Two-year warranty

Series	340°F
Standard output shaft size	1¼" Round w/key
Intermittent torque rating (lbs. ft)	200
Intermittent torque rating (N.m.)	271
Horsepower rating for intermittent service at 500 RPM of output shaft (HP)	19
at 1000 RPM of output shaft (HP)	38
at 500 RPM of output shaft (Kw)	14
at 1000 RPM of output shaft (Kw)	28
Approximate weight	32 lbs. (15 kg)

## 523 Series Rear Mount



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- Continuous torque rating of 350 N.m. or 260 lbs. ft.
- Rear mount design - requires less mounting space and simplifies installation
- No gear back lash to set; Simplifies installation
- Wet spline outputs extend PTO and pump shaft life: Eliminates the need to disassemble to great the mating pump and PTO shafts
- 3 direct mount pump options
- 5 shift options

Series	523*T	523*V
Standard output shaft size	4-Bolt DIN 5462	
Intermittent & continuous torque rating (lbs. ft)	258	258
Intermittent & continuous torque rating (N.m.)	350	350
Horsepower rating for intermittent & continuous service at 500 RPM of output shaft (HP)	25	25
at 1000 RPM of output shaft (HP)	49	49
at 500 RPM of output shaft (Kw)	18	18
at 1000 RPM of output shaft (Kw)	37	37
Approximate weight	12.0 lbs. (5.4 kg)	



# Pumps Piston

## P1



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- Variable displacement, axial piston pump for open-circuit applications
- Medium pressure, continuous operation at pressures up to 280 bar
- Quiet and efficient control capability
- Low ripple to further reduce noise
- Compact overall package size
- Elastomer seals that eliminate gaskets and external leakage
- High operating efficiency results in lower power consumption and reduced heat generation

Frame size P1	-018	-028	-045	-060	-075	-100	-140
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	18 1.10	28 1.71	45 2.75	60 3.66	75 4.58	100 6.1	140 8.54
Max continuous pressure (bar) (psi)	280 4000	280 4000	280 4000	280 4000	280 4000	280 4000	280 4000
Self priming speed @ 1 bar inlet pressure	3300	3200	2800	2500	2400	2100	2100

## P2



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The P2 Series is a variable displacement piston pump intended for mobile applications, featuring a very compact design, low noise level and low pressure ripple. Stable and quick to respond to system demands, the P2 is designed for cost-effective

installation within the limited space available on modern mobile machines.

- Sealed shaft bearing
- High self-priming speed
- Flexible, reliable, service friendly

Frame size P2	-060	-075	-105	-145
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	60 3.7	75 4.6	105 6.4	145 8.8
Max continuous pressure (bar) (psi)	317 4600	317 4600	317 4600	317 4600
Self priming speed @ 1 bar inlet pressure	2800	2500	2300	2200

## P3



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P3 piston pumps are ideal for mobile applications that require high self-priming speed and operating pressure up to 4600 psi. These high performance pumps are suited for mobile applications where inlet fill characteristics are not ideal; i.e. high

altitudes, long inlet lines, cold weather and high pump drive speeds.

- Sealed shaft bearing
- Compact packaging
- Low noise level
- Easy to install
- Flexible, reliable, service friendly

Frame size P3	-075	-105	-145
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	75 4.6	105 6.4	145 8.8
Max continuous pressure (bar) (psi)	317 4600	317 4600	317 4600
Self priming speed @ 1 bar inlet pressure	3000	2600	2500

# Pumps Piston

## PAVC



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PAVC piston pumps are ideal for many industrial applications with operating pressure up to 3000 psi. These compact pumps feature convenient cartridge style controls and carry a full pressure rating on most water glycol fluids.

- High strength cast-iron housing
- Built-in supercharger
- High speed capability – 3000 RPM (2600 RPM PAVC100)
- Sealed shaft bearing

- Two piece design for ease of service
- Cartridge bronze clad port plate
- Airbleed standard for quick priming
- Hydrodynamic cylinder barrel bearing
- Thru-shaft (PAVC100 only)
- Full pressure rating on water glycol fluids
- Pump case and shaft seal – see inlet pressure only
- Filter and/or cool drain line (100 psi Max)

Frame size PAVC	-33	-38	-65	-100
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	33 2.0	38 2.3	65 4.0	100 6.1
Max continuous pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000
Max self priming speed at 0 psi gauge (RPM)	3000	3000	3000	2600

## PVP



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PVP piston pumps are ideal for medium duty industrial applications with operating pressure up to 3600 psi. These service friendly pumps are quiet and respond quickly to flow demand changes.

- High strength cast-iron housing
- Optional inlet/outlet locations
- Replaceable bronze port plate
- Replaceable piston slipper plate
- Low noise levels
- Fast response times
- Metric pilot, shaft and ports available

Frame size PVP	-16	-23	-33	-41	-48
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	16 1.0	23 1.4	33 2.0	41 2.5	48 2.9
Max continuous pressure (bar) (psi)	248 3600	248 3600	248 3600	248 3600	248 3600
Max self priming speed at 0 psi gauge (RPM)	3000	3000	3000	2800	2400

# Pumps Piston

## Premier



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The open-loop Premier Series Pumps are variable displacement piston pumps with an emphasis on superior design and few maintenance requirements. Low inlet velocity requirements allow the pumps to run faster than competitive models without the added expense of boosting the inlet. Modified pistons that reduce the amount of trapped fluid volume result in improved efficiency.

The series has been designed to operate in a wide range of industries where variable flow, high pressure and/or high speeds are required; such as: presses, construction machinery, injection molding, wood, aircraft, drilling, mining, steel and cranes.

Frame Size P	05/080	07/110	09/140	12/200	16/260
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	80.3 4.9	109.8 6.7	140.9 8.6	200.0 12.2	262.2 16.0
Max continuous pressure (bar) (psi)	414 6000	414 6000	414 6000	414 6000	414 6000
Max intermittent pressure (bar) (psi)	500 7250	500 7250	500 7250	500 7250	500 7250
Max rated drive speed (RPM)	2550	2450	2300	2100	1850

## VP1



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The VP1 is the world's first variable displacement pump for truck applications. It can be close-coupled to a gearbox PTO (power take-off) or to a coupling independent PTO (e.g. an engine PTO) which meets ISO standard 7653-1985.

- Variable, load-sense control
- Low noise level
- High power-to-weight ratio
- Compact and lightweight
- Withstands low temperatures
- Sturdy design
- Highly efficient

Frame size VP1	-45	-75	-95	-130
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	45 2.75	75 4.58	95 5.8	12.8 7.8
Max continuous pressure (bar) (psi)	300 4350	300 4350	400 5800	400 5800
Self priming speed* (RPM)	2400	2100	2200	1900

\*2½" suction line

# Pumps Piston

## F1/F2



F1 fixed displacement piston pumps are widely used on truck applications with operating pressure up to 5000 psi. These lightweight, efficient pumps were designed specifically for truck applications including cargo cranes, hook loaders, forest cranes and concrete mixers.

- Pressures up to 350 bar (5000 psi)
- High power capability
- Twin flow version available
- High self-priming speed
- Easy to install
- Easy to service

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Series F1	25	41	51	61	81	101
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	25.6 1.59	40.9 2.50	51.1 3.11	59.5 3.66	81.6 5.00	102.9 6.29
Max operating pressure (bar) (psi)	350 5000	350 5000	350 5000	350 5000	350 5000	350 5000
Shaft speed (RPM): unloaded at 350 bar <sup>2</sup>	2700 2600	2700 2400	2700 2200	2700 2200	2300 20003	2300 18003
Torque <sup>1</sup> at 350 bar (N.m.) (lb-in)	142 1261	227 2016	284 2522	331 2939	453 4023	572 5079
Input power, continuous (kW) (hp)	31 39	46 57	52 67	61 84	76 102	86 115

1 Theoretical value

2 Valid at an inlet pressure of 1.0 bar (abs.) when operating on mineral oil at a viscosity of 30 mm<sup>2</sup>/s (cSt).

3 Valid with 2½" inlet (suction) line. With 2" suction line: F1-80 – max 1400 RPM. F1-101 – max 1200 RPM.

Series F2	42/42	55/28	53/53	70/35	70/70
Displacement, Port A/Port B (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	43/41 2.62/2.50	55/28 3.36/1.71	54/52 3.30/3.17	69/36 4.27/2.14	68/68 4.15/4.15
Max operating pressure (bar) (psi)	350 5000	350 5000	350 5000	350 5000	300 4350
Max shaft speed, unloaded (RPM)	2550	2550	2550	2550	2550
Max self-priming speed (RPM): Ports A <sup>1,2</sup> and B <sup>1,2</sup> pressurized Port A <sup>2</sup> unloaded, pressure in Port B	1800 2100	1800 2100	1800 2100	1800 2100	1650 2100
Input power, continuous (kW) (hp)	70 118	70 118	88 147	88 147	112 150

1 Valid with 2½" inlet line, q = 120 l/min. With 2" inlet line: max 1400 RPM.

2 Measured at 1.0 bar abs. inlet pressure.



# Pumps Vane

## SDV Single



The SDV Series includes fixed displacement vane pump ideal for low to mid pressure applications. Their compact design and low noise features make them well suited for filter carts, test stands and remote pilot pumps.

- Two compact frame sizes
- Low noise
- 100% tested
- Easy to convert or repair

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Series SDV10	-1	-2	-3	-4	-5	-6	-7
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	3.3 0.2	6.6 0.4	9.8 0.6	13.1 0.8	16.4 1.0	19.5 1.2	22.8 1.4
Max continuous pressure (bar) (psi)	175 2500	175 2500	175 2500	175 2500	175 2500	150 2200	140 2000
Max speed (RPM)	1800	1800	1800	1800	1800	1800	1800

Series SDV20	-6	-7	-8	-9	-11	-12	-13
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	19.5 1.2	22.8 1.4	26.5 1.6	29.7 1.8	36.4 2.2	39.0 2.4	42.4 2.6
Max continuous pressure (bar) (psi)	175 2500	175 2500	175 2500	175 2500	175 2500	150 2200	150 2200
Max speed (RPM)	1800	1800	1800	1800	1800	1800	1800

## SDV Double



The SDV Series includes fixed displacement vane pumps ideal for low to mid-pressure applications. A double pump provides the flexibility of two different displacements within one housing. Compact design and low-noise features make them well suited for filter carts, test

stands, remote pilot pumps and for hi/lo circuits.

- Two compact frame sizes
- Low noise
- 100% tested
- Easy to convert or repair

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Series SDV2010	-7	-8	-9	-11	-12	-13
Displacement* (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	26.1 - 45.6 1.6 - 2.8	29.8 - 49.3 1.8 - 3.0	33.0 - 52.5 2.0 - 3.2	39.7 - 59.2 2.4 - 3.6	42.3 - 61.8 2.6 - 3.8	45.7 - 65.2 2.8 - 4.0
Max continuous pressure (bar) (psi)	175 2500	175 2500	175 2500	175 2500	150 2200	150 2200
Max speed (RPM)	1800	1800	1800	1800	1800	1800

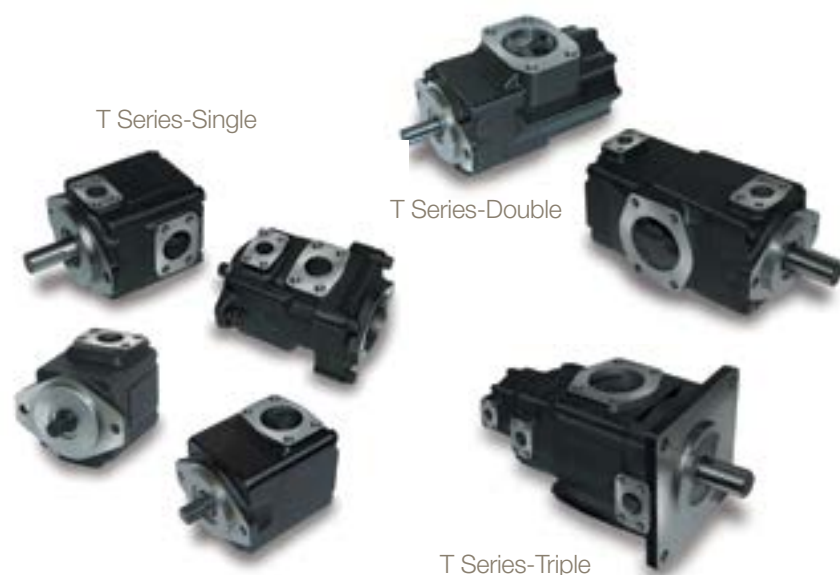
\*Range calculated by adding displacement for SDV20 to range of displacements for SDV10.

Series SDV2020	-7	-8	-9	-11	-12	-13
Displacement* (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	42.3 - 52.5 2.6 - 3.2	46.0 - 56.2 2.8 - 3.4	49.2 - 59.4 3.0 - 3.6	55.9 - 72.8 3.4 - 4.4	58.5 - 75.4 3.6 - 4.6	61.9 - 78.8 3.8 - 4.8
Max continuous pressure (bar) (psi)	175 2500	175 2500	175 2500	175 2500	150 2200	150 2200
Max speed (RPM)	1800	1800	1800	1800	1800	1800

\*Range calculated by adding displacement for SDV20 (shaft end) to range of SDV20 (cover end).

# Pumps Vane

## T Series



The T Series Fixed Displacement Vane Pump is the highest performance pump of its kind. The balanced design and double lip vane technology are key features in providing a contamination resistant and reliable pump.

- Fixed displacement vane
- Silent technology
- Wide range of displacements
- User-friendly – easy conversions and evolutions
- Wide number of shafts available
- Double shaft seal option possible
- Drive train options available (SAE-A/B/C)

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Frame Size T-Single	6CM	6CP	6DM	6EM
Displacement* (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	10.8 - 100 0.66 - 6.1	46 - 100 2.8 - 6.1	47.5 - 158 2.9 - 9.6	132.3 - 227 8.1 - 13.8
Max pressure** (bar) (psi)	275 4000	275 4000	300 3500	240 3500
Max speed** (RPM)	2800	2800	2500	2200

Frame Size T-Double	6CCM	6DCM	6ECM	6EDM
Displacement* (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	21.6 - 200 1.3 - 12.2	58.3 - 258 3.6 - 15.7	143.1 - 327 8.7 - 19.9	179.7 - 385 11.0 - 23.5
Max pressure** (bar) (psi)	275 4000	275 4000	275 4000	275 4000
Max speed (RPM)	2800	2500	2200	2200

Frame Size T-Triple	6DCCM	6EDCM/S
Displacement* (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	69.1 - 358 4.2 - 21.8	190.5 - 485 11.6 - 29.6
Max pressure** (bar) (psi)	275 4000	275 4000
Max speed (RPM)	2500	2200

\*Available range based on various combinations of displacements.  
\*\*Lower for larger displacements; see catalog on CD.

# Pumps Hybrid/Piston/Cartridge

## Variable Piston/Fixed Vane



T6H Series

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The hybrid pump is a combination of fixed displacement vane pump B, C, D cartridges combined with a variable cartridge of PV20 or PV29 piston pump. The cartridges are driven by a common shaft without coupling in between. They have a large common suction port and two or three independent outlet ports: One for the piston, one or two for the vane pump.

- Very compact
- High pressure ratings
- Low noise
- Independent outlets for fixed and variable flow allow simultaneous cycles
- Internal or external drain
- Choice of controls
- Wide range of acceptable fluids

Frame Size T6H	T6H20B	T6H20C	T6H29B	T6H29C	T6H29D	T6H29DB
Displacement* (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	5.7 - 92.9 2.97 - 5.67	10.8 - 142.9 3.28 - 8.72	5.7 - 111.9 4.13 - 6.83	10.8 - 161.9 4.44 - 9.88	47.5 - 219.9 6.68 - 13.42	53.2 - 269.9 7.03 - 16.47
Max pressure** (bar) (psi)	241 3500	241 3500	207 3000	207 3000	207 3000	207 3000
Max speed** (RPM)	2600	2600	2400	2400	2400	2400

\*Piston pump at full displacement

\*\*Lower for larger displacements. See catalog

## Piston Pumps



- Designed for open circuit systems
- Fixed displacement
- Clockwise, counter-clockwise, or bi-directional rotation
- Naturally aspirated to 5000 RPM
- Porting on sides or rear
- Operate efficiently on thin (5 cS) fluid
- Operating temperature: -40° to 300°F

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Frame size H	-156	-206	-259	-311	-346	-417	-519	-692	-865
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	0.156 0.0095	0.206 0.0126	0.259 0.0158	0.311 0.0190	0.346 0.0211	0.417 0.0255	0.519 0.0317	0.692 0.0422	0.865 0.0527
Max continuous pressure (bar) (psi)	241 3500	241 3500	241 3500	241 3500	241 3500	241 3500	241 3500	224 3250	207 3000
Max speed (RPM)	4400	4200	4000	3800	3800	3700	3700	3600	3500

## Cartridge Pumps



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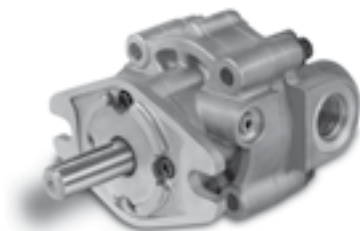
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- Three-piston design
- Fixed displacement determined by internal cam angle
- Uni-directional
- Designed to fit specially machined manifolds

Displacement (cc/rev) (in <sup>3</sup> /rev)	0.1 to 0.33 0.006 to 0.020
Max continuous pressure (bar) (psi)	207 3000
Max speed (RPM)	5000

# Pumps/Motors Gear

## Gerotor Pump and Motor



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- Gerotor design (HSLT- High Speed/Low Torque)
- Aluminum construction for optimum power to weight ratio
- Bi-directional – designed for fan drive and cut off applications
- High-pressure mechanical seals available for series application to 1000 psi back pressure
- Roller bearings for long life and high OHL capacity
- Buna-N Seals are standard for petroleum and glycol based fluids
- MGG-Motor – Shaft speeds to 5000 RPM
- PGG-Pump – Shaft speeds to 3500 RPM
- Up to 17 HP output for motors

Frame size MGG2/PGG2	0010	0016	0020	0025	0030
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	3.572 .218	6.096 .372	7.374 .450	9.505 .580	11.471 .700
Max continuous pressure (bar) (psi)	138 2000	138 2000	138 2000	138 2000	104 1500
MGG2 Max speed at 0 inlet & Max outlet pressure (RPM)	5000	5000	5000	5000	5000
PGG2 Max speed at 0 inlet & Max outlet pressure (RPM)	3500	3500	3500	3500	3000

## P16 Series



- Aluminum flange and cover
- Cast iron gear plate
- Clockwise or counter-clockwise rotation
- Flows to 38 GPM per section
- Journal bearings
- Available with fluorocarbon seals
- Available in tandem and piggy-back configurations
- Integral priority valve available
- Electric clutches available

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Frame size P16	-45	-65	-85	-100	-115	-150	-180	-200
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	14.4 0.88	20.8 1.27	27.3 1.67	32.1 1.96	36.7 2.24	48.1 2.93	57.4 3.51	63.9 3.90
Max continuous pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	152 2200	138 2000
Max speed (RPM)	3600	3600	3400	3300	3100	2800	2500	2200

## 20 Series



- Aluminum or cast iron construction
- Clockwise or counter-clockwise rotation
- Flows to 98 GPM per section
- Journal bearings
- Available with fluorocarbon seals
- Available in tandem and piggy-back configurations
- Available with integral logic valves

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Frame size 20	-150	-200	-250	-300	-350	-400	-450
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	49.5 3.02	66.2 4.04	82.9 5.06	99.1 6.05	115.9 7.07	132.4 8.08	149.1 9.10
Max continuous pressure (bar) (psi)	172 2500	172 2500	172 2500	172 2500	172 2500	172 2500	172 2500
Max speed (RPM)	2500	2500	2500	2500	2500	2500	2500



# Pumps/Motors Gear

## 25 Series



- Aluminum or cast iron construction
- Clockwise or counter-clockwise rotation
- Flows to 208 GPM per section
- Journal bearings
- Available with fluorocarbon seals
- Available in tandem and piggy-back configurations

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Frame size 25	-300	-350	-400	-450	-500	-550	-660	-770	-950
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	99.1 6.05	115.9 7.07	132.4 8.08	149.1 9.10	164.7 10.05	181.22 11.06	219.9 13.42	254.4 15.50	315.0 19.22
Max continuous pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	172 2500	172 2500	172* 2500*	172* 2500*	172* 2500*
Max speed (RPM)	2500	2500	2500	2500	2500	2500	2500	2500	2500

\*Consult factory

## HP7 Series



- Aluminum or cast iron construction
- Clockwise or counter-clockwise rotation
- Flows to 116 GPM per section
- Journal bearings
- Available with fluorocarbon seals
- Available in tandem and piggy-back configurations

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Frame size HP7	-250	-300	-350	-400	-450	-500	-550
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	82.9 5.06	99.1 6.05	115.9 7.07	128.3 7.83	143.4 8.75	159.8 9.75	176.0 10.74
Max continuous pressure (bar) (psi)	276 4000	276 4000	276 4000	276 4000	255 3700	228 3300	207 3000
Max speed (RPM)	2500	2500	2500	2500	2500	2500	2500

## HP8 Series



- Aluminum construction
- Clockwise or counter-clockwise rotation
- Flows to 177 GPM per section
- Journal bearings
- Available with fluorocarbon seals
- Available as tandem pump

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Frame size HP8	-400	-450	-500	-550	-600	-660	-770	-850
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	128.3 7.83	143.4 8.75	159.8 9.75	176.0 10.74	193.0 11.78	213.9 13.05	246.0 15.01	268.3 16.38
Max continuous pressure (bar) (psi)	276 4000	276 4000	276 4000	276 4000	276 4000	248 3600	228 3300	207 3000
Max speed* (RPM)	2500	2500	2500	2500	2500	2500	2500	2500

\*Speeds above 2000 RPM require the suction to be pressurized to 5 psi minimum.

# Pumps/Motors Gear

## PGP 300 Series



- Three-piece cast iron construction
- Low friction bushing design
- Single, multiple, piggyback and thru-drive assemblies
- Heavy duty application
- Long life in severe operating environments
- Integrated or bolt-on valve options available
- Direct clutch mount available
- Can be configured as pump or motor

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Frame size PGP315/PGM315	-05	-06	-07	-08	-10	-11	-12	-13	-15	-16	-17	-18	-20
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	10.2 .620	12.7 .775	15.2 .930	17.8 1.09	20.3 1.24	22.9 1.40	25.9 1.55	27.9 1.71	30.5 1.86	33.0 2.02	35.6 2.17	38.1 2.33	40.6 2.48
Max continuous pressure (bar) (psi)	245 3500	245 3500	245 3500	245 3500	245 3500	245 3500	245 3500	245 3500	225 3300	215 3100	200 2900	190 2700	175 2500
Max speed (RPM)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

Frame size PGP330/PGM330	-05	-07	-10	-12	-15	-17	-20
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	16.1 .985	24.2 1.47	32.3 1.97	40.4 2.46	48.4 2.95	56.5 3.44	64.6 3.94
Max continuous pressure (bar) (psi)	245 3500	245 3500	245 3500	245 3500	245 3500	225 3250	210 3000
Max speed (RPM)	3000	3000	3000	3000	3000	3000	3000

Frame size PGP350/PGM350	-05	-07	-10	-12	-15	-17	-20	-22	-25
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	20.9 1.28	31.3 1.91	41.8 2.55	52.2 3.19	62.7 3.82	73.1 4.46	83.6 5.10	94.0 5.73	104.5 6.38
Max continuous pressure (bar) (psi)	245 3500	245 3500	245 3500	245 3500	245 3500	225 3250	210 3000	190 2750	175 2500
Max speed (RPM)	2400	2400	2400	2400	2400	2400	2400	2400	2400

Frame size PGP365/PGM365	-07	-10	-12	-15	-17	-20	-22	-25
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	44.3 2.70	59.0 3.60	73.8 4.50	88.5 5.40	103.3 6.30	118.0 7.20	132.8 8.10	147.5 9.00
Max continuous pressure (bar) (psi)	245 3500	245 3500	245 3500	245 3500	245 3500	245 3500	225 3250	210 3000
Max speed (RPM)	2400	2400	2400	2400	2400	2400	2400	2400

\*Functioning as motor

# Pumps/Motors Gear

## PGP 500 Series



- Superior performance
- High efficiency
- Low noise operation at high operating pressures
- International mounts and connections
- Integrated valve capabilities
- Common inlet multiple pump configurations
- Can be configured as a pump or motor

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Frame size PGP505/PGM505	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	2 .12	3 .18	4 .24	5 .31	6 .37	7 .43	8 .49	9 .55	10 .61	11 .67	12 .73
Max continuous pressure (bar) (psi)	275 3988	275 3988	275 3988	275 3988	275 3988	275 3988	275 3988	250 3625	250 3625	250 3625	220 3190
Max speed at 0 inlet & max outlet pressure (RPM)	4000	4000	4000	4000	3600	3300	3000	2900	2800	2400	2400

Frame size PGP511/PGM511	-6	-7	-8	-10	-11	-14	-16	-18	-19	-21	-23	-27	-28	-31
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	6 .37	7 .43	8 .49	10 .61	11 .67	14 .85	16 .98	18 1.10	19 1.16	21 1.28	23 1.40	27 1.65	28 1.71	31 1.89
Max continuous pressure (bar) (psi)	275 3988	275 3988	275 3988	275 3988	275 3988	275 3988	275 3988	260 3770	260 3770	235 3408	235 3408	200 2900	190 2705	170 2465
Max speed at 0 inlet & max outlet pressure (RPM)	4000	4000	4000	3600	3600	3300	3000	3000	3000	2800	2800	2400	2300	2300

# Pumps/Motors Gear

## PGP 600 Series



610

- Patented, interlocking body design
- 12 tooth gears, bronze thrust plates
- Tandem, triple and cross-frame pumps available
- Common inlets available for tandem and triple pumps
- Continuous operating pressures up to 275 bar
- Production run-in available to suit OEM application conditions and to provide optimized volumetric efficiencies
- Pressure balanced design for high efficiency
- Reduced system noise levels compared to earlier models and competitor's pumps
- High power through-drive capability
- Wide range of integral valves for power steering, power brakes, fan drives and implement hydraulics
- Load-sense and solenoid-operated unloading valves



620



640



620 Tandem

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Frame Size PGP/PGM610	0070	0100	0140	0160	0180	0210	0230	0260	0280	0320
Displacement (cc/rev) (in <sup>3</sup> /rev)	7 .43	10 .61	14 .85	16 1.04	18 1.10	21 1.28	23 1.40	26 1.59	28 1.71	32 1.95
Continuous pressure (bar) (psi)	275 3989	275 3989	275 3989	275 3989	265 3843	245 3553	235 3408	215 3118	200 2901	175 2538
Intermittent pressure (bar) (psi)	300 4351	300 4351	300 4351	300 4351	290 4206	270 3916	260 3771	240 3480	220 3190	175 2538

Frame Size PGP/PGM620	0190	0230	0260	0290	0330	0370	0410	0440	0500
Displacement (cc/rev) (in <sup>3</sup> /rev)	19 1.16	23 1.40	26 1.59	29 1.77	33 2.01	37 2.26	41 2.50	44 2.68	50 3.05
Continuous pressure (bar) (psi)	275 3989	275 3989	275 3989	275 3989	275 3989	250 3626	220 3191	210 3046	210 3046
Intermittent pressure (bar) (psi)	300 4351	300 4351	300 4351	300 4351	300 4351	275 3989	245 3553	230 3336	210 3046

Frame Size PGP/PGM640	0300	0350	0450	0550	0650	0750	0800
Displacement (cc/rev) (in <sup>3</sup> /rev)	30 1.83	35 2.14	45 2.75	55 3.36	65 3.97	75 4.58	80 4.88
Continuous pressure (bar) (psi)	275 3989	275 3989	275 3989	275 3989	275 3989	235 3408	215 3118
Intermittent pressure (bar) (psi)	300 4351	300 4351	300 4351	300 4351	300 4351	260 3771	240 3481

# Pumps/Motors Gear

## Cast Iron Roller Bearing Pumps and Motors



- Flows to 128 GPM
- Pressures to 3000 psi
- Speeds to 2400 rpm
- Two-speed valves
- Piggybacks
- Winch motors
- Priority Valves
- Unloader Valve

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Frame size PGP020/PGM020	-05	-07	-10	-12	-15	-17	-20
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	16.1 0.99	24.2 1.47	32.3 1.97	40.4 2.46	48.4 2.95	56.5 3.44	64.6 3.94
Max continuous pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	172 2500
Max speed (RPM)	2400	2400	2400	2400	2400	2400	2400

Frame size PGP/PGM/030/031	-05	-07	-10	-12	-15	-17	-20
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	16.1 0.99	24.2 1.47	32.3 1.97	40.4 2.46	48.4 2.95	56.5 3.44	64.6 3.94
Max continuous pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	172 2500
Max speed (RPM)	2400	2400	2400	2400	2400	2400	2400

Frame size PGP/PGM/050/051	-05	-07	-10	-12	-15	-17	-20	-22	-25
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	20.9 1.28	31.3 1.91	41.8 2.55	52.2 3.19	62.7 3.83	73.1 4.46	83.6 5.10	94.0 5.74	104.5 6.38
Max continuous pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	172 2500	172 2500
Max speed (RPM)	2400	2400	2400	2400	2400	2400	2400	2400	2400

Frame size PGP/PGM/075/076	-07	-10	-12	-15	-17	-20	-22	-25	-27	-30
Displacement (cm <sup>3</sup> /rev) (in <sup>3</sup> /rev)	50.4 3.08	67.2 4.10	84.0 5.13	100.8 6.15	117.6 7.18	134.4 8.20	151.2 9.23	168.0 10.25	184.8 11.28	201.6 12.3
Max continuous pressure (bar) (psi)	207 3000	207 3000	207 3000	207 3000	207 3000	172 2500	172 2500	172 2500	138 2000	138 2000
Max speed (RPM)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400



# Rotary Actuators

## HTR Series, LTR Series, M(Mill) Series

The HTR is a rack and pinion rotary actuator in a compact package, providing high power at low rotational speed. The gearing and cylinders are self-contained and protected against contamination within a precision machined housing that can be integrated into the end user's product. Heavy duty bearings support large externally applied shaft loads. Standard and custom rotations are available with a variety of options.

The LTR Series is suitable for low-pressure applications. High strength alloy steel rack and pinion gearing is combined with lightweight aluminum housings to provide an

effective, compact solution over a wide range of rotation and power needs. Three positions of rotation available with a full range of options.

The Mill (M) Series is the non tie rod version of the rack and pinion actuator that provides dependability

features, improved durability and enhanced ease of maintenance. Encompassing a wide range of performance and special features, it offers custom configurations to fit special needs for materials, and performance provisions for power, speed and duty cycle.



HTR Series



LTR Series



M (Mill) Series

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Series	Pressure bar (psi)	Displacement cm <sup>3</sup> /rad (in <sup>3</sup> /rad)	Torque Newton Meter (lb-in)
<b>HTR Series</b>			
.9	207 (3000)	6 (0.36)	102 (900)
1.8	207 (3000)	12 (0.7)	203 (1800)
3.7	207 (3000)	25 (1.5)	418 (3700)
5	207 (3000)	33 (2.0)	565 (5000)
7.5	207 (3000)	51 (3.1)	847 (7500)
10	207 (3000)	65 (4.0)	1130 (10,000)
15	207 (3000)	93 (5.7)	1695 (15,000)
22	138 (2000)	145 (8.8)	1695 (15,000)
30	207 (3000)	186 (11.3)	3390 (30,000)
45	138 (2000)	290 (17.7)	3390 (30,000)
75	207 (3000)	480 (29.3)	8474 (75,000)
150	207 (3000)	960 (58.6)	16,948 (150,000)
300	207 (3000)	1856 (113.3)	33,896 (300,000)
600	207 (3000)	3701 (226.0)	67,791 (600,000)
<b>LTR Series</b>			
101	102 (1500)	7 (0.40)	67 (592)
102	68 (1000)	13 (0.80)	67 (592)
151	102 (1500)	20 (1.20)	200 (1770)
152	102 (1500)	39 (2.41)	399 (3530)
201	102 (1500)	46 (2.81)	479 (4240)
251	102 (1500)	70 (4.30)	728 (6443)
202	102 (1500)	93 (5.67)	957 (8470)
252	102 (1500)	141 (8.59)	1456 (12,885)
321	68 (1000)	187 (11.40)	1289 (11,407)
322	68 (1000)	374 (22.80)	2578 (22,813)
<b>M (Mill) Series</b>			
75	207 (3000)	442 (27)	8474 (75,000)
150	207 (3000)	901 (55)	16,948 (150,000)
300	207 (3000)	1836 (112)	33,896 (300,000)
600	207 (3000)	3669 (224)	67,791 (600,000)
1000	207 (3000)	5800 (354)	113,000 (1,000,000)
50000	207 (3000)	285,523 (17,423)	5,650,000 (50,000,000)

# Rotary Actuators

## HRN Series



The HRN Series provides an additional range of vane actuator technology, allowing more options in optimum torque and pressure. Single and double vane options provide high torque in a compact package for the medium-to-high operating pressure range. The rugged construction assures long life and reliability. The units are precision machined from high grade materials and the compact size offers maximum flexibility in mounting and packaging. Unique cushion options are available for applications where control of high inertia loads is critical.

HRN Series	Pressure bar (psi)	Displacement cm <sup>3</sup> /rad (in <sup>3</sup> /rad)	Torque Newton Meter (lb-in)
10S	69 (1000)	2.12 (0.13)	9.8 (86.7)
10D	69 (1000)	4.14 (0.25)	19.6 (173.5)
15S	69 (1000)	3.61 (0.2)	19.6 (173.5)
15D	69 (1000)	7.00 (0.4)	39.2 (346.9)
20S	69 (1000)	5.09 (0.3)	29.4 (260.2)
20D	69 (1000)	10.19 (0.6)	58.8 (520.4)
30S	69 (1000)	10.82 (0.7)	58.8 (520.4)
30D	69 (1000)	21.65 (1.3)	117.6 (1040.8)
100S	69 (1000)	23.55 (1.4)	123 (1088.6)
100D	69 (1000)	47.11 (2.9)	245 (2168.3)
200S	69 (1000)	46.90 (2.9)	314 (2779.0)
200D	69 (1000)	93.58 (5.7)	627 (5549.2)
400S	69 (1000)	92.31 (5.6)	539 (4770.4)
400D	69 (1000)	184.62 (11.3)	1078 (9540.7)
700S	69 (1000)	165.52 (10.1)	980 (8673.4)
700D	69 (1000)	331.04 (20.2)	1960.1 (17,346.7)

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## Tork-Mor Series



The Tork-Mor Series converts fluid pressure to rotational power using vane actuator technology. Torque output is provided within a limited range of rotation, either 100 degrees on a double vane or 280 degrees on a single vane unit. The compact, cylindrically shaped housing can be easily integrated. Bearing capacity is limited and seal bypass leakage flow compensation is required to hold position. Units can be selected with a variety of options for mounting, shaft configuration, seals, stops and switches.

Tork Mor	Pressure bar (psi)	Displacement cm <sup>3</sup> /rad (in <sup>3</sup> /rad)	Torque Newton Meter (lb-in)
S33	34 (500)	29.48 (1.8)	90 (800)
DS33	34 (500)	58.97 (3.6)	184 (1625)
S42	68 (1000)	60.61 (3.7)	381 (3370)
DS42	68 (1000)	168.71 (10.3)	762 (6740)
S44	51 (750)	106.47 (6.5)	463 (4100)
DS44	34 (500)	298.12 (18.2)	621 (5500)
S46	34 (500)	160.52 (9.8)	458 (4050)
DS46	17 (250)	319.41 (19.5)	424 (3750)
S74	68 (1000)	355.45 (21.7)	2260 (20,000)
DS74	51 (750)	710.89 (43.4)	3344 (29,600)
S77	51 (750)	624.08 (38.1)	2859 (25,300)
DS77	51 (750)	1764.11 (106.6)	3819 (33,800)
S105	68 (1000)	1092.55 (66.7)	6926 (61,300)
DS105	68 (1000)	2186.73 (133.5)	14,010 (124,000)
S108	51 (750)	1746.11 (103.6)	8022 (71,000)
DS108	51 (750)	3490.58 (213.1)	16,383 (145,000)
S1012	34 (500)	2617.52 (159.8)	7943 (70,300)
DS1012	34 (500)	5236.69 (319.7)	16,044 (142,000)

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# Valves Open-Center Directional Control

**MV3, P70CF/P70CP, V10, V20, V20EH, V70/V90, VA/VG20, VA/VG35, VG35EH**



MV3



P70CF/P70CP



V10



V20



V90



VA/VG20



VA/VG35

Parker offers a wide range of open-center directional control valves for mobile markets that also can be used as closed-center, constant-pressure and constant-pressure unloaded valves. Each valve technology offers unique features for improved machine performance and cost.

Parker also provides machine designers with a broad choice of circuitries, spool positioners and port accessories within each valve model. Field-proven differential area and pilot-operated relief valves also are available.

Parker's valve models come with a wide selection of special metering spools designed to optimize machine control and enhance operator comfort. Parker's market experience in machine control will direct you to the right solution.

A full line of pilot controllers with spring packs matched to remote-actuated directional control valves ensures predictable and reliable machine performance. For electrohydraulic operation, all valves are designed to interface with the IQAN electronics package.

BV06, BVB06, BV18, BVCS10   
 Commercial Valve Components   
 Gresen Valve Components   
 P70CF / P70CP  
VG20 / VG35   
 MD04 / MD06   
 F130   
 V20EH   
 VG35EH   
 V90  
MV3   
 MV4   
 MV5   
 MD12   
 V10   
 V20

## Open-Center Technology

Series	Max Input Flow LPM (GPM)	Max Work Port Flow LPM (GPM)	Max Pressure psi	Max Pressure bar	Open Center	Closed Center	Constant Pressure Unloaded	Load Sense
MV3	30 (8)	30 (8)	3000	207	X	X		
BV06-solenoid only	38 (10)	38 (10)	3000	207	X			
V10	57 (15)	57 (15)	3500	240	X	X		
BV18	76 (20)	76 (20)	3500	241	X			
P70CF, P70CP	76 (20)	76 (20)	4600	315	X	X	X	X
MD06-solenoid only	95 (25)	95 (25)	3000	207	X			
V20	95 (25)	95 (25)	3500	240	X	X	X	X
V20EH	95 (25)	95 (25)	3500	240	X	X	X	X
VA20 VG20	170 (45)	170 (45)	2500 3500	172 240	X	X	X	
VA35 VG35	246 (65)	246 (65)	2500 3500	172 240	X	X	X	
VG35EH	246 (65)	246 (65)	4000	275	X	X		
V90	379 (100)	379 (100)	3500	240	X			



# Valves Load-Sense Directional Control

HV08, K170LS, K220LS, L90LS, M402LS, PC25/55, VP120, VP170, VPL



M402LS



PC25/55



HV08



L90LS



VP120



VPL



K220LS



VP170

[PC25 / PC55](#)

[VP170](#)

[L90LS](#)

[M402LS](#)

[VPL Overview](#)

[VPL](#)

[K220LS](#)

[HV08](#)

[K170LS](#)

[M250LS](#)

[VP120 Overview](#)

[VP / VPO](#)

Parker's range of load-sensing control valves includes three models of load-sense only valves, five models of pre-compensated valves, and three models of post-compensated valves. All load-sense control valves offer improved machine control and efficiency. Market demands for improved productivity and reduced horsepower consumption make all of these control valves excellent candidates for mobile equipment.

Pre-compensated valves use traditional technology for load-sense pressure-compensation, and can limit pressure on selected work ports without flow loss. Post-compensated valves share flow

during pump over-demand conditions. All models have a full line of manual, hydraulic pilot and electrohydraulic spool positioners. Additionally, a wide variety of special metering spools are available to maximize machine control or to limit the speed of a function.

A full line of pilot controllers with spring packs matched to remote-actuated directional control valves ensures predictable and reliable machine performance. For electrohydraulic operation, all valves are designed to interface with the IQAN electronics package.

## Load-Sense – Pre & Post Compensated

Series	Max Input Flow LPM (GPM)	Max Work Port Flow LPM (GPM)	Max Pressure psi	Max Pressure bar	Load Sense	Load Sense Post-Pressure Compensated	Load Sense Pre-Pressure Compensated
V20LS	114 (30)	114 (30)	3500	240	X		
VG80LS	454 (120)	379 (100)	3500	240	X		
M402LS	500 (132)	500 (132)	5440	375	X		
PC25 PC55	227 (60) 284 (75)	170 (45) 246 (65)	4000	275		X	
VP120	159 (42)	12 (32)	4650	320		X	
VP170	227 (60)	170 (45)	5000	345		X	
V86	416 (110)	341 (90)	3500	240		X	
VPL	189 (50)	114 (30)	5000	345			X
VP, VPO	379 (100)	208 (55)	4000	275			X
HV08	300 (80)	250 (65)	4600	317			X
L90LS	151 (40)	91 (24)	4600	315			X
K170LS	284 (75)	170 (45)	3800	262			X
K220LS	379 (100)	220 (58)	5000	345			X





# Valves Hydraulic

## Directional Control Valves



- NFPA manifold mounted
- Rugged spools with four control lands; up to 21 spool styles available depending on operator
- Solenoid, lever, cam, air or oil pilot operated
- Soft-shift available on D1 and D3 solenoid operated valves
- Low pressure drop
- Phosphate finish body
- Easy access mounting bolts

Directional Control

	Series	D1SE	D1V	D3V	D31V	D41V	D61V	D81V	D101V	D111V
Maximum flow* (LPM) (GPM)		20	83	150	175	2000	390	622	946	300
		4	22	40	45	528	100	180	250	79
Max operating pressure (bar) (psi)		350	345	345	345	350	207	345	207	350
		5075	5000	5000	5000	5075	3000	5000	3000	5075
Mounting style (NFPA) (CETOP) (NG)		D03	D03	D05	D05H	D10	D08	D08	D10	D07
		3	3	5	5H	10	8	8	10	7
		6	6	10	-	32	25	25	32	16

\*Depending on spool

## Proportional Directional Control Valves



- Standard DIN/ISO/CETOP/NFPA interfaces
- Progressive flow characteristics for improved low flow resolution
- Spring centered spool
- Wide selection of spool options and flow capacity
- Single piece rugged solenoid assembly

D1FW / D\*FW\*ET

## Sandwich Valves



- Mounted between directional control valves and their mounting surface
- Steel bodies and internal hardened steel components for strength and durability

Sandwich Valves

Series	CM	CPOM	FM	PRDM	PRM	RM	SPC
Type	Check	P.O. Check	Flow control	Direct operating pressure reducing	Pressure reducing	Pressure relief	Compensator
Maximum flow LPM (GPM)							
D03 Mounting, Size 2	76 (20)	53 (14)	76 (20)	151 (40)		53 (14)	33 (9)
D05 Mounting, Size 3	113 (30)	76 (20)	113 (30)	303 (80)	64 (17)	76 (20)	85 (22)
D08 Mounting, Size 6	340 (90)	227 (60)	340 (90)		189 (50)	340 (90)	
Max optional pressure: (bar) (psi)	345 5000	345 5000	345 5000	315 4568	345 5000	345 5000	350 5075





# Valves Hydraulic

## Exectrol Directional Control Valves



- One and 2-stage versions
- Shear-type positive seal
- Low leakage (one drop/minute per port)
- Ideal for both hydraulic oil and water soluble fluids
- Standard valves are interflow
- High tolerance to contamination and silting
- Manual overrides standard
- Operating temperature range -40° to +225°F with nitrile o-rings
- One version offers centralized lubricating system
- Self-cleaning and dirt resistant
- Shear-type positive seal

Exectrol

Series	21100	21200	25100	25200	21353	21356
Port size	Subplate	Subplate	Subplate	Subplate	3/8"	3/4"
Maximum flow (LPM) (GPM)	11.3 3	38 10	94 25	169 45	30 8	30 8
Working pressure (bar) (psi)	414 6000	414 6000	414 6000	414 6000	310 4500	310 4500
Operation solenoid air/oil	X	X	X	X	X X	X X
Body material steel aluminum	X	X	X	X	X	X

## Lo-Torq Directional Control Valves



- Shear-type positive seat
- Zero leakage
- High contamination tolerance
- Standard valves are interflow
- Low turning torque
- Side, bottom or subplate mounted
- Panel mounting standard
- Lubricated air, hydraulic oil and water
- Operating temperature -40° to +250°F

Lo-Torq

Series	8000E	8100E	8000C	8100C	8400E	8500
Size, NPT	1/8" - 3/4"	1/8" - 1"	1 1/4" - 1 1/2"	1 1/4" - 1 1/2"	1/8" - 1/4"	1/8" - 1"
Working pressure (bar) (psi)	207 3000	414 6000	207 3000	414 6000	207 3000	207 3000
Body material Steel Aluminum alloy	X	X	X	X	X	X

# Valves Hydraulic

## Pressure Control Valves



Republic, Manatrol

### In-Line Mounted

- Right angle or in-line-style valves
- Pressure ranges between 0.25 and 250 bar (4 and 3600 psi)
- Soft-seat poppets in brass or stainless steel for near zero leaks
- Non-standard and special port styles available on request

### Manifold-Mounted

- Pilot operated, normally closed, quick response and spool-type valves available
- Pressure range of 25 to 350 bar (363 to 5075 psi)
- Subplate or slip-in mounting offered
- 2 or 3 adjustment modes

### Pressure Control



VM



VB



VBY



R, RS



UR\*M, US\*M



PR\*M



VS



S\*M



R5V



R4V



R5P



R5U



R5S



R5R



R5A

Series	620	63x	64x	665
Size NPT	1/4" - 3/4"	1/4" - 3/4"	1/4" - 3/4"	1/4" - 1"
SAE	-4 thru -12	-4 thru -12	-4 thru -12	-4 thru -16
Direct acting				X
Pilot operated				X
Working pressure (bar)	0.3 - 248	0.3 - 248	0.3 - 248	0.3 - 248
(psi)	4 - 3600	4 - 3600	4 - 3600	4 - 3600
Body material				
aluminum	X			X
brass		X		X
stainless steel			X	X
soft seat	X	X	X	X

# Valves Hydraulic

Series/Function	R*M	R*R	RS*M	RS*R	PR*M	S*M	UR*M	US*M	VS	VM	VBV	VB
Relief	X	X	X	X					X	X		
Sequence						X					X	X
Pressure reducer					X							
Unloader							X					
Max operating pressure (bar) (psi)	350 5075	350 5075	350 5075	350 5075	350 5075	350 5075	350 5075	350 5075	350 5075	350 5075	350 5075	350 5075
Maximum flow NG06 LPM (GPM)									25 (7)	25 (7)	40 (11)	25 (7)
NG10 LPM (GPM)	150 (40)	250 (67)	150 (40)	250 (67)	150 (40)	150 (40)	150 (40)	150 (40)		60 (16)	160 (43)	60 (16)
NG25 LPM (GPM)	300 (80)	500 (133.3)	300 (80)	500 (133.3)	350 (80)	350 (80)	350 (80)	350 (80)				
NG32 LPM (GPM)	650 (173)	650 (173)	650 (173)	650 (173)	650 (173)	650 (173)	650 (173)	650 (173)				

Series/Function	R5V	R5R	R5U	R5S	R5A	R5P	R4V
Relief	X						
Sequence				X			X
Pressure reducer		X					
Unloader			X				
Compensator					X	X	
Max operating pressure (bar) (psi)	210, 280, 350 3045, 4060, 5075	210, 280, 350 3045, 4060, 5075	210, 280, 350 3045, 4060, 5075	210, 280, 350 3045, 4060, 5075	280, 350 3045, 4060, 5075	280, 350 3045, 4060, 5075	210, 280, 350 3045, 4060, 5075
Maximum flow (in-line)							
SAE 8 LPM (GPM)							90 (23.7)
SAE 16 LPM (GPM)							300 (79.2)
SAE 12 LPM (GPM)							300 (79.2)
SAE 20 LPM (GPM)							600 (158.5)
Maximum flow (flange)							
SAE 3/4" LPM (GPM)	90 (24)	90 (24)	90 (24)	90 (24)	90 (24)	90 (24)	90 (24)
SAE 1" LPM (GPM)	300 (79)	300 (79)	300 (79)	300 (79)	300 (79)	300 (79)	300 (79)
SAE 1 1/4" LPM (GPM)	600 (159)	600 (159)	600 (159)	600 (159)	600 (159)	600 (159)	600 (159)
SAE 1 1/2" LPM* (GPM)	600 (159)	600 (159)	600 (159)	600 (159)			

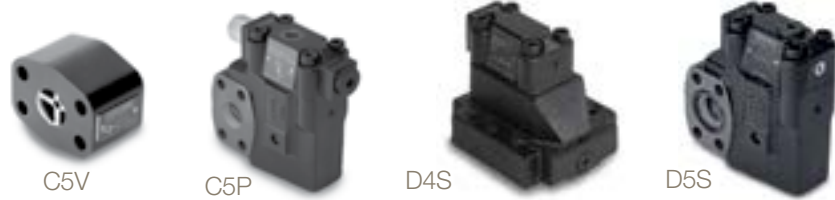
\*3-port body only

# Valves Hydraulic

## Check Valves



- Hydraulic velocity fuse valves
- Low cost check valves
- Restrictor and poppet-style check valves
- Double cylinder locking valves
- Military equivalent versions available
- Versions for high shock and high velocity applications
- Valves mount in a variety of positions
- Pilot operated types



Seal, Flow, Check   Republic, Manatrol   Colorflow

Series	C	VCL	CP	LT, LTF	VLS	440, 450	480, 490	580, 590
Type	Check	Check	P.O. Check	Line Throttle	Velocity Fuse	High Press.	Soft Seat	Swing
Max flow range (LPM) (GPM)	11 - 569 3 - 150	23 - 189 5 - 50	30 - 95 8 - 25		2 - 341 .5 - 90			
Body material								
brass	X						X	
aluminum						X	X	X
steel	X	X	X	X	X	X		
stainless steel	X					X	X	
Port types/sizes:								
NPT	1/8" - 2"	1/4" - 1 1/4"	3/8", 3/4"	1/2", 3/4"	3/8" - 1"	1/8" - 2"	1/8" - 2"	1/8" - 2"
SAE	-4 thru -32			-8 thru -12	-6 thru -24	-4 thru -32	-4 thru -32	-4 thru -32
BSPP	1/8" - 2"							
BSPT	1/8" - 3/4"							
JIC		3/8" - 1 1/4"			3/8" - 1"	1/4" - 2"	1/4" - 2"	1/4" - 2"
Max operating press (bar) (psi)	345 5000	210 3045	210 3045	210 3045	210 3045	345 5000	210 3045	24 350

Series	C5P	C5V	D4S	D5S	J416A, J417A	AVF	
Type	P.O. Check	Check	Check	Check	Mini	Pneu	Hyd
Max flow range (LPM) (GPM)	180 - 600 48 - 159	100 - 700 27 - 185	180 - 585 48 - 155	180 - 585 48 - 155	4 - 110 1 - 29	5 - 60 SCFM	2 - 227 2 - 60
Body material							
brass						X	
aluminum							
steel	X	X	X	X			X
stainless steel					X		
Port types/sizes:							
NPT						1/4" - 3/4"	1/4" - 1"
SAE					-4 thru -16		
BSPP							
BSPT							
JIC					1/4" - 1"		
SAE 61	X	X		X			
SAE 62		X		X			
Subplate			3/8", 3/4", 1 1/2"	3/8", 3/4", 1 1/2"			
Max operating press (bar) (psi)	350 5075	420 6090	350 5075	350 5075	345 5000	136 1973	340 4930



# Valves Hydraulic

## Auxiliary Valves



- Small dimensions
- Easy to install
- Hardened and ground parts
- High stability

QDS6      VV6      PRS6

PLD6 / PLD130      PLC

Series	Valve Type	Max Working Pressure bar (psi)	Max Setting Pressure bar (psi)	Flow Capacity LPM (GPM)
PLC	Direct-Acting pressure relief	241 (3500)	420 (6000)	350 (93)
PLD	Direct-Acting pressure relief	241 (3500)	300 (4350)	40 (11)
PRS6	Pressure reducing	241 (3500)	250 (3625)	30 (8)
QDS6	Sequence, 3-way	241 (3500)	250 (3625)	20 (5.3)
VV6	Shuttle	345 (5000)	250 (3625)	20 (5.3)

## Ball Valves



- Designed for hydraulic, pneumatic and other media
- Fully ported for low pressure drop and maximum, system efficiency
- Polyamide thrust bearing and ball seal compounds
- Low actuation torque and high cycles
- Assortment of port configurations including threaded, manifold mounted, SAE split flange and a unique 4-bolt rotating SAE flange
- Options include locking handles, panel mounting and limit switches

Ball

Series	Function	Pressure bar (psi)	Port Sizes	Material
<b>High Pressure</b>				
BVHP	2-Way	414 (6000)	¼" - 1"	Steel or Stainless Steel
BVAH	2-Way	414 (6000)	1¼" - 4"	Steel or Stainless Steel
BVHH	2-Way	689 (10,000)	½" - 2"	Steel or Stainless Steel
BV3H/BV4H	3 & 4-Way	414 (6000)	¼" - 2"	Steel or Stainless Steel
BVMM	2 & 3-Way	414 (6000)	¼" - 2"	Steel or Stainless Steel
<b>Medium Pressure</b>				
BV3D	3-Way (diverter)	207 (3000)	¼" - 2"	Steel or Stainless Steel
V500CS	2-Way	138 (2000)	¼" - 1"	Steel
V502SS	2-Way	138 (2000)	¼" - 2"	Stainless Steel
<b>Low Pressure</b>				
BVAL	2-Way (suction)	28 (400)	¼" - 4"	Aluminum
V500P	2-Way	41 (600)	¼" - 2"	Brass
V590P	2-Way (right angle)	17 (250)	¼" - ½"	Brass





# Valves Hydraulic

## Mobile Accessories



- Flow controls, flow dividers, pilot operated check valves, relief valves, selector valves and bankable/stackable directional control valves
- Flows to 225 LPM (60 GPM)
- Pressures to 207 bar (3000 psi)
- Cast iron bodies

Mobile Accessories

Series	Function	Pressure Flow	Pressure (SAE Porting)	Pressure (NTPF Porting)
CFD	Priority-type flow control	56 Liters/Min (15 GPM)	207 bar (3000 psi)	138 bar (2000 psi)
CFDA	P.C., Priority-type flow control	56 Liters/Min (15 GPM)	172 bar (2500 psi)	138 bar (2000 psi)
DC	P.C., Priority-type flow control	98 Liters/Min (26 GPM)	241 bar (3500 psi)	138 bar (2000 psi)
PD/PDC	Flow divider/combiner	75 Liters/Min (20 GPM)	172 bar (2500 psi)	138 bar (2000 psi)
LO	Sgl./DbL. pilot operated check	94 Liters/Min (25 GPM)	207 bar (3000 psi)	138 bar (2000 psi)
LOA	Sgl./DbL. pilot operated check	38 Liters/Min (10 GPM)	207 bar (3000 psi)	138 bar (2000 psi)
WJL	Diff. area poppet relief	94 Liters/Min (25 GPM)	207 bar (3000 psi)	138 bar (2000 psi)
RPJL	Pilot operated relief	94 Liters/Min (25 GPM)	345 bar (5000 psi)	138 bar (2000 psi)
RPL	P.O. poppet type relief	225 Liters/Min (60 GPM)	345 bar (5000 psi)	138 bar (2000 psi)
DXV	Ball-type crossover relief	38 Liters/Min (10 GPM)	172 bar (2500 psi)	138 bar (2000 psi)
DWV	Diff. area crossover relief	113 Liters/Min (30 GPM)	345 bar (5000 psi)	138 bar (2000 psi)
HP 20	Hydraulic pilot pressure	75 Liters/Min (20 GPM)	207 bar (3000 psi)	138 bar (2000 psi)
HP 50	Hydraulic pilot pressure	188 Liters/Min (50 GPM)	345 bar (5000 psi)	138 bar (2000 psi)
S-50 S-75 S-100	Manual selector	75 Liters/Min (20 GPM) 113 Liters/Min (30 GPM) 225 Liters/Min (60 GPM)	207 bar (3000 psi)	138 bar (2000 psi)
SM	Manual selector	75 Liters/Min (20 GPM)	207 bar (3000 psi)	138 bar (2000 psi)
HM	Manual selector	38 Liters/Min (10 GPM)	172 bar (2500 psi)	138 bar (2000 psi)
DS12,71,75	Manual double selector valve	94 Liters/Min (25 GPM)	207 bar (3000 psi)	138 bar (2000 psi)
CFQ	Priority-type flow control	113 Liters/Min (30 GPM)	207 bar (3000 psi)	138 bar (2000 psi)

# Valves Hydraulic

## Flow Control Valves



- Pressure and temperature compensated valves available
- Controlled flow in one or both directions
- Simple set screw locks valve settings
- Versions available with Colorflow scales
- Reverse flow checks optional on several valves
- Variety of metering needles
- Versions offered with tamper-proof option

Series	F	PC*K
Type	Flow	PC flow
Max flow (LPM) (GPM)	11 - 569 3 - 150	11 - 95 3 - 25
Body material		
Brass	X	
Steel	X	X
Stainless steel	X	
Port types/sizes		
NPT	1/8" - 2"	1/4" - 3/4"
SAE	-4 thru -32	-6 thru -12
BSPP	1/8" - 2"	
BSPT	1/8" - 3/4"	
Max operating press (bar) (psi)	345 5000	210 3045

Republic, Manatrol

Colorflow

Flow, Check

Series	PC*M	PC*MS	TPC	FG3PKC	N	MVI	MV	D	2F1C
Type	PC flow	PC flow	T & PC flow	T & PC flow	Needle	Cartridge Needle	Metering	Deceleration	PC flow
Max flow (LPM) (GPM)	11 - 189 3 - 50	11 - 189 3 - 50	3.8 - 95 .1 - 25	41.3 11	11 - 265 3 - 70	2 - 95 .5 - 25	4 - 110 .5 - 40	72 - 227 19 - 60	110 29
Body material									
brass					X		X		
steel	X	X	X	X	X	X	X	X	X
stainless steel	X				X				
Port types/sizes									
NPT	1/4" - 1 1/4"		3/8", 3/4"		1/8" - 1 1/4"	1/4" - 3/4"	1/8" - 1"	3/8", 3/4"	
SAE	-6 thru -16				-4 thru -20		-4 thru -16		
BSPP							1/8" - 1"		
BSPT					1/4" - 1/2"		1/4" - 1/2"		
Subplate		1/4" - 1"		3/8"				3/8", 3/4"	3/8", 3/4"
Max operating press (bar) (psi)	210 3045	210 3045	210 3045	210 3045	345 5000	345 5000	345 5000	210 3045	350 5075

## Industrial Accessories and Plug Valves



- Valves isolate the gage from damage and pressure surges
- Pressure snubber offers one-piece construction; no maintenance
- Some valves provide partial snubbing while delivering instant pressure
- Spring-loaded spool on specific valves drains fluid to reservoir
- No power source required for double-acting, hand operated pumps
- Certain valves flange mount in any position

Industrial Accessories, Plug



# Valves Remote Control Systems

## Hydraulic



PCL4



PCL4-N

PCL4

The PCL4 is a hydraulic pilot system for the proportional remote control of directional valves, pumps, motors, etc. It is available with coordinate lever-units, as well as linear units for hand or foot control. The PCL4 is intended primarily for the remote control of hydraulically operated spool actuators and pump regulators in all kinds of mobile and industrial applications.

All connection ports can be obtained with G<sup>1/4</sup>", M14x1.5 or 9/16" UNF connection threads. The coordinate valve is available in a version with all connections in the base plate. Up to 6 linear units can be built together in a block.

System Type	Hydraulic Pilot Pressure
Control pressure range	1 – 69 bar (14–1000 psi)
Control flow	Max 4 LPM (1 GPM)
Individual control characteristics for each direction	X
Selectable start and final pressures	X
Selectable lever force	X
Curves with straight characteristics	X
Curves with two-step characteristics	X
Curves with forced opening (final step)	X
Friction brake for retention in any position	X
Mechanical or electromagnetic end-position detent	X

## Pneumatic



VP04

VP04

The VP04 is a pneumatic pilot valve for the proportional remote control of directional valves, positioning cylinders, etc. Either linear or coordinate-lever versions of the VP04 are available.

All connections are furnished with couplings of the plug-in type. The signal ports can be obtained for 6 mm or 1/4" O.D. hoses. The primary ports and tank ports are available in 6 mm, 8 mm, 1/4" or 5/16" I.D.

Principal applications include the proportional remote control of pneumatic spool-actuators and positioning cylinders in mobile or industrial hydraulic systems.

System Type	Pneumatic Pilot Pressure
Control pressure range	0 – 8 bar (0 – 115 psi)
Control flow	Max 7 NI/s (14.8 cfm)
Control curves with straight characteristics	X
Mechanical end-position detent	X

# Valves Threaded Cartridge

## Threaded Cartridge Valves



Parker offers the broadest line of threaded cartridge valves, specialty valves and integrated packages in the industry. Parker is staffed with experienced cartridge and application engineers to design and specify products to meet customer applications.

### Product Highlights

- Standard cavities sizes from 4–20
- Pressures to 420 bar (6000 psi)
- Flows up to 378 LPM (100 GPM)
- Steel and aluminum line bodies
- RESILON™ D-Ring Seal eliminates need for back-up rings; improves wear, extrusion and spiral failure resistance (Winner's Circle)
- Spherical poppet design assures accurate alignment and reduces leakage rating on many valves
- New crimp design eliminates adhesive between adapter and cage
- Custom manifolds available

- Products hex-chrome free zinc plated
- Adjustment options for pressure & flow controls

### Solenoid Valves

- Optional manual overrides
- SUPER COIL exceeds IP69K specifications
  - Water dunk test qualified
  - Endurance tested
  - Water spray and chemical solvent compatibility
  - 10 standard termination options (and many specials)
  - Many DC and AC voltages available

## Bodies and Cavities

Parker standard	industry standard, -4 through -20 sizes
Counterbalance	single and dual
Cavity plugs	-8, -10, -12, -16 sizes
Special bodies	unique Sterling and Waterman bodies

## Check Valves

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Poppet/ball type	500 (132)	420 (6000)
Pilot operated	150 (40)	420 (6000)
Dual pilot operated	190 (50)	350 (5000)

## Coils and Electronics

Supercoils	IP69K, standard voltages, molded connectors
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## Directional Controls

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Pilot operated spool	400 (105)	420 (6000)

## Flow Controls

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Needle valves	225 (60)	420 (6000)
Pressure compensated	56 (15)	420 (6000)
Pressure compensated priority	150 (40)	420 (6000)
Flow dividers/combiners	320 (85)	420 (6000)

# Valves Threaded Cartridge

## Load Motor Controls

Valve Type	Flow Capacity Liters/Min (GPM)	Max Working Pressure bar (psi)
Standard pilot assisted	350 (90)	350 (5000)
Vented to atmosphere	180 (48)	350 (5000)

## Logic Elements

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Poppet	303 (80)	240 (3500)
Spool	500 (132)	420 (6000)

## Manual Valves

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Poppet	45 (12)	350 (5000)
Spool	17 (5)	350 (5000)

## Pressure Controls

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Direct acting relief	100 (26)	420 (6000)
Pilot operated relief	400 (106)	420 (6000)
Direct acting sequence	47 (12)	420 (6000)
Pilot operated sequence	160 (42)	420 (6000)
Direct acting reducing	56 (13)	420 (6000)
Pilot operated reducing	150 (40)	350 (5000)

## Proportional Valves

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Pressure relieving	95 (25)	350 (5000)
Pressure reducing	30 (8)	210 (3000)
Flow controls	325 (60)	210 (3000)
Directional control	38 (10)	350 (5000)

## Shuttle Valves

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Insert	38 (10)	420 (6000)
Cartridge	50 (13)	420 (6000)
Spool	175 (46)	420 (6000)

## Solenoid Valves

Valve Type	Flow Capacity LPM (GPM)	Max Working Pressure bar (psi)
Spool	285 (75)	350 (5000)
Poppet	113 (30)	350 (5000)



# Valves Integrated Hydraulic Circuits

## Integrated Hydraulic Circuits



Integrated hydraulic circuits (hydraulic manifold blocks) are designed to meet the many demands on mobile hydraulic equipment. Manifold blocks offer the following benefits:

- Minimum number of tubing, hoses and couplings
- Fewer overall components
- Fewer leakage points
- Less space required
- Complete system solution with optimized functions

Additionally, manifold blocks can be flanged to one or more directional valves as well as to pumps, cylinders, motors and filters.

Some cartridge valve products offered include:

- Directional control valves
- Logic elements and flow controls
- Pressure controls
- Proportional valves
- Powershift transmission controls
- Load holding valves
- Check and shuttle valves

Parker offers value-added services such as manifold design using in 3-D CAD and CAM software, application engineering assistance, and assembly and testing capabilities.

Expert application engineers and the latest computer-aided design technology can deliver advanced, custom products to market faster. The solution is only minutes away with Parker's quick design proposals that are created using 3-D CAD.

Once the design is finalized, the process is further streamlined by using electronic communications and approvals. When design specifications meet customer requirements, Parker's CAD-linked prototype machining centers go into motion producing fully functional hydraulic integrated circuits. All prototypes are then fully tested and documented before being released to production. In today's highly competitive market, speed and quality are critical for success.

## Cartpak CETOP-3 Modules



- Standard ISO4401-03, NFPA D03, CETOP3 size bodies designed to accept common -10 size cavity cartridge valves
- Mounted between D1 Series valves and their mounting surface
- Aluminum body for 210 bar (3000 psi) operation; ductile iron body for 350 bar (5000 psi) operation
- Each Cartpak body offers a wide range of hydraulic control functions

- Functions include:
  - Pressure relief
  - Pressure reducing
  - Pressure sequencing
  - Flow control
  - Directional control (two-way, three-way)
  - Proportional flow control
  - Proportional pressure control

# Mobile Hydraulics

## Innovative Products and System Solutions

When it comes to hydraulic components and solutions, no company offers more than Parker. Get a jump on the next solution by contacting Parker today.

### Sales

Call: 1-800-C-PARKER (800-272-7537)

### Distributor Locator

Call: 1-800-C-PARKER

Online: [www.parker.com/distloc](http://www.parker.com/distloc)

### Literature

Call: 1-800-C-PARKER

e-mail: [c-parker@parker.com](mailto:c-parker@parker.com)

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Parker's Mobile Hydraulics Innovative Products and System Solutions Web Interactive can be viewed on-line at [www.parker.com/mobilesolutionsguide](http://www.parker.com/mobilesolutionsguide). In addition to the summary produced for this printed guide, the mobile hydraulics solutions web interactive links to detailed product bulletins in each category and are available for individual or mass download.



[www.parker.com/hydraulicsgroup](http://www.parker.com/hydraulicsgroup)



# Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 1 800 C-Parker (1 800 272 7537)



## Aerospace

### Key Markets

Aftermarket services  
Commercial transports  
Engines  
General & business aviation  
Helicopters  
Launch vehicles  
Military aircraft  
Missiles  
Power generation  
Regional transports  
Unmanned aerial vehicles

### Key Products

Control systems & actuation products  
Engine systems & components  
Fluid conveyance systems & components  
Fluid metering, delivery & atomization devices  
Fuel systems & components  
Fuel tank inerting systems  
Hydraulic systems & components  
Thermal management  
Wheels & brakes



## Climate Control

### Key Markets

Agriculture  
Air conditioning  
Construction machinery  
Food & beverage  
Industrial machinery  
Life sciences  
Oil & gas  
Precision cooling  
Process  
Refrigeration  
Transportation

### Key Products

Accumulators  
Advanced actuators  
CO<sub>2</sub> controls  
Electronic controllers  
Filter driers  
Hand shut-off valves  
Heat exchangers  
Hose & fittings  
Pressure regulating valves  
Refrigerant distributors  
Safety relief valves  
Smart pumps  
Solenoid valves  
Thermostatic expansion valves



## Electromechanical

### Key Markets

Aerospace  
Factory automation  
Life science & medical  
Machine tools  
Packaging machinery  
Paper machinery  
Plastics machinery & converting  
Primary metals  
Semiconductor & electronics  
Textile  
Wire & cable

### Key Products

AC/DC drives & systems  
Electric actuators, gantry robots & slides  
Electrohydraulic actuation systems  
Electromechanical actuation systems  
Human machine interface  
Linear motors  
Stepper motors, servo motors, drives & controls  
Structural extrusions



## Filtration

### Key Markets

Aerospace  
Food & beverage  
Industrial plant & equipment  
Life sciences  
Marine  
Mobile equipment  
Oil & gas  
Power generation & renewable energy  
Process  
Transportation  
Water Purification

### Key Products

Analytical gas generators  
Compressed air filters & driers  
Engine air, coolant, fuel & oil filtration systems  
Fluid condition monitoring systems  
Hydraulic & lubrication filters  
Hydrogen, nitrogen & zero air generators  
Instrumentation filters  
Membrane & fiber filters  
Microfiltration  
Sterile air filtration  
Water desalination & purification filters & systems



## Fluid & Gas Handling

### Key Markets

Aerial lift  
Agriculture  
Bulk chemical handling  
Construction machinery  
Food & beverage  
Fuel & gas delivery  
Industrial machinery  
Life sciences  
Marine  
Mining  
Mobile  
Oil & gas  
Renewable energy  
Transportation

### Key Products

Check valves  
Connectors for low pressure fluid conveyance  
Deep sea umbilicals  
Diagnostic equipment  
Hose couplings  
Industrial hose  
Mooring systems & power cables  
PTFE hose & tubing  
Quick couplings  
Rubber & thermoplastic hose  
Tube fittings & adapters  
Tubing & plastic fittings



## Hydraulics

### Key Markets

Aerial lift  
Agriculture  
Alternative energy  
Construction machinery  
Forestry  
Industrial machinery  
Machine tools  
Marine  
Material handling  
Mining  
Oil & gas  
Power generation  
Refuse vehicles  
Renewable energy  
Truck hydraulics  
Turf equipment

### Key Products

Accumulators  
Cartridge valves  
Electrohydraulic actuators  
Human machine interfaces  
Hybrid drives  
Hydraulic cylinders  
Hydraulic motors & pumps  
Hydraulic systems  
Hydraulic valves & controls  
Hydrostatic steering  
Integrated hydraulic circuits  
Power take-offs  
Power units  
Rotary actuators  
Sensors



## Pneumatics

### Key Markets

Aerospace  
Conveyor & material handling  
Factory automation  
Life science & medical  
Machine tools  
Packaging machinery  
Transportation & automotive

### Key Products

Air preparation  
Brass fittings & valves  
Manifolds  
Pneumatic accessories  
Pneumatic actuators & grippers  
Pneumatic valves & controls  
Quick disconnects  
Rotary actuators  
Rubber & thermoplastic hose & couplings  
Structural extrusions  
Thermoplastic tubing & fittings  
Vacuum generators, cups & sensors



## Process Control

### Key Markets

Alternative fuels  
Biopharmaceuticals  
Chemical & refining  
Food & beverage  
Marine & shipbuilding  
Medical & dental  
Microelectronics  
Nuclear Power  
Offshore oil exploration  
Oil & gas  
Pharmaceuticals  
Power generation  
Pulp & paper  
Steel  
Water/wastewater

### Key Products

Analytical instruments  
Analytical sample conditioning products & systems  
Chemical injection fittings & valves  
Fluoropolymer chemical delivery fittings, valves & pumps  
High purity gas delivery fittings, valves, regulators & digital flow controllers  
Industrial mass flow meters/controllers  
Permanent no-weld tube fittings  
Precision industrial regulators & flow controllers  
Process control double block & bleeds  
Process control fittings, valves, regulators & manifold valves



## Sealing & Shielding

### Key Markets

Aerospace  
Chemical processing  
Consumer  
Fluid power  
General industrial  
Information technology  
Life sciences  
Microelectronics  
Military  
Oil & gas  
Power generation  
Renewable energy  
Telecommunications  
Transportation

### Key Products

Dynamic seals  
Elastomeric o-rings  
Electro-medical instrument design & assembly  
EMI shielding  
Extruded & precision-cut, fabricated elastomeric seals  
High temperature metal seals  
Homogeneous & inserted elastomeric shapes  
Medical device fabrication & assembly  
Metal & plastic retained composite seals  
Shielded optical windows  
Silicone tubing & extrusions  
Thermal management  
Vibration dampening

ENGINEERING YOUR SUCCESS.

# Sales Offices

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Tel: (61) 2 9634 7777

**Austria**, Wiener Neustadt  
Tel: (43) 2622 23501 0

**Belgium**, Nivelles  
Tel: (32) 67 280 900

**Brazil**, Cachoeirinha RS  
Tel: (55) 51 3470 9144

**Canada**, Milton, Ontario  
Tel: (905) 693 3000

**China**, Beijing  
Tel: (86) 10 6561 0520

**China**, Shanghai  
Tel: (86) 21 5031 2525

**Czech Republic and Slovakia**,  
Klecany  
Tel: (420) 284 083 111

**Denmark**, Ballerup  
Tel: (45) 4356 0400

**Finland**, Vantaa  
Tel: (358) 20 753 2500

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