Truck Hydraulics
Innovative Products and System Solutions
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© Copyright 2014, Parker Hannifin Corporation. All rights reserved.
The Parker Hannifin Corporation is the most dynamic hydraulics motion and control components and solutions provider in the truck industry. Parker hydraulics technology and components, including Chelsea product offerings, makes Parker the leading choice to fill your heavy-duty truck needs. With our qualified factory support and network of distribution, being your single source supplier for components, kits and solutions has never been easier. Our truck hydraulics, market-focused staff is ready to assist you with application expertise, innovative designs and state-of-the-art manufacturing and engineering technology. Total systems capability makes Parker Hannifin today’s complete supplier. Our customers can reduce their number of vendors without compromising quality, and buying from a single source saves both time and money.

Parker Hannifin Corporation

A global Fortune 300 company with customers in 49 countries, Parker Hannifin is the world’s leading supplier of hydraulic, pneumatic, and electro-mechanical systems and components. Customers rely on Parker for engineering excellence, world-class manufacturing and outstanding customer service to provide comprehensive application solutions that are second to none.

The Parker Brand Promise

Parker is the global leader in motion and control technologies, partnering with its customers to increase their productivity and profitability.

Dedication to the truck industry

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Truck Hydraulics

Fluid Power/Truck Focus
Although Parker serves many industries including Aerospace, Construction, Agriculture, Mining, Automotive, Refrigeration, etc., we are exclusively concentrated on controlling fluid motion and pressure. We have created a market-focused hydraulics truck team to focus solely on the needs of the customers in various vocational truck markets.

Total Systems From the Ground Up
Parker will assist you to determine your component(s) and/or systems requirements and help design a solution. We have the ability to capture exact system details through our high levels of data acquisition. Parker’s staff of highly qualified engineers – application engineers, research and development teams, and system solution specialists, assures you that nobody knows truck hydraulic applications and products better than Parker. Parker’s extensive breadth of product line allows for unlimited solution possibilities. Our worldwide network manufacturing and distribution facilities ensures quick deliver of your engineered solution, from components to kits to entire system solutions.

Manufacturing
Parker continues to invest in our world class ISO 9001 certified manufacturing facilities. Our factories are equipped with the most modern technology to meet the demands of both quality and delivery. Our manufacturing is backed by a highly qualified engineering staff, working with today’s latest tools and technology. This investment ensures that we maintain control of the manufacturing process and components, as well as the ability to look forward to new design ideas and solutions. Our truck hydraulic components are core to our business and investments. We do not outsource our components and solutions – we manufacture them.
Parker’s Value Proposition

Parker is the leading hydraulics supplier worldwide. We have a powerful reputation, unparalleled breadth of products, and world-class customer service. However, Parker’s greatest distinguishing benefits can be found in its Value Proposition. Parker believes that it takes more than our great products, competitive prices, and on-time delivery to satisfy customer demands. It takes a commitment to provide exceptional value.

At Parker, value is not a commodity. It is the result of personal relationships built around the customer’s use of Parker’s extensive resources. Our customer services include:

- Truck Analysis and Troubleshooting
- Design-Engineering Support
- System Design
- Components Selection
- New Product Development
- Custom-Component Manufacturing
- Assemblies and Kits
- Sub-System Configuration
- Global Support and Service
- ISO Certification
Value Added Programs

Premier Customer Service
Parker’s Premier Customer Service leads the industry in response. In addition to assured product quality, Parker provides engineering assistance, consolidated shipments, on-time delivery, extensive product information, and customer training. Our employees are empowered to do whatever it takes to meet or exceed customer expectations.

Field Sales Team
Parker’s highly trained truck hydraulics field sales force provides knowledgeable assistance to your product and system requirements, working hand in hand with your local Parker distributor. These experts are strategically located throughout the world.

Kitting
In those instances where you require multiple components and sub-assemblies for a specific application, Parker offers the added benefit of a Kitting Service. Within a kit, everything you need is delivered in one convenient package, ready for installation.

Training
Parker is recognized as the industry leader in the development and presentation of technical training for hydraulic and pneumatic technology. We offer complete and comprehensive texts, along with hands-on classroom opportunities to our employees, distributors, and customers. This includes web based training, On site training, and classroom training at various Parker locations. Our focus is on a practical approach to training, stressing active participation to increase students’ confidence and understanding of motion control technology.
Accumulators - Piston, Bladder and Diaphragm

Parker’s comprehensive range of CE approved piston accumulators maintains high pressure for safe braking and manoeuvring. Ride control and load/boom damping systems enhance productivity and improve the operator’s environment, while greater system efficiency and reduced pump sizes give longer life with lower whole-life costs.

A Series

- Standard capacities from 0.08 to 8 litres
- Up to 275 bar operating pressures
- 40, 50, 80 and 100 mm bore diameters
- Rechargeable or sealed-for-life designs
- High strength crimped construction

ACP Series

- Standard capacities from 0.08 to 8 litres
- Up to 275 bar operating pressures
- 40, 50, 80 and 100 mm bore diameters
- Rechargeable or sealed-for-life designs
- High strength crimped construction

Bladder Accumulators EHV from 330 to 690 bar

- Standard capacities from 0.2 to 57 litres
- From 330 to 690 bar
- Operating temperature: -20 °C + 80 °C
- Shell material options include alloyed steel, stainless steel, aluminium, titanium and composites
- Various bladder materials available which are compatible with a range of fluids and temperatures
- CE approved (Meet conformity assessment according to the PED)

Diaphragm Accumulators ELM from 140 to 350 bar

- 11 standard capacities from 0.075 to 3.5 Litres
- From 140 to 350 bar
- -20 °C / +80 °C for standard nitrile elastomers for models 0.075 ≥ 1.4 Litres
- -10 °C / +80 °C for standard nitrile elastomers for models ≥ 2 Litres
- -35 °C / +80 °C for hydrin elastomers
- Materials: carbon steel or stainless steel, nitrile or hydrin diaphragm (for other constructions: contact Parker)
- Meet conformity assessment according to the PED
  (For information about SELO and SELO + CE availability: contact Parker)

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
Actuators / Cylinders / Coolers

Parker offers single- or double-acting single stage and telescopic mobile cylinders. Custom cylinders can be built in batch sizes from one piece to hundreds. We work with our customers to develop specifications in a wide range of sizes, pressures and mounting styles. New Intellinder absolute position sensing is ideally suited for double rod steering cylinders, and is available with two or more sensors for multiple redundancy in safety-critical applications.

Multi-stage, Double-acting Telescopic with Mechanical Plunger and Load Holding Valve

Multi-stage, Single-acting Telescopic

Single Stage Cylinder

Intellinder

Coolers

LDC – DC motor

• 12V or 24V DC motor
• Maximal cooling capacity 30 kW
• Can be fitted with Smart DC Drive
• Compact and light weight
• Quiet fan and motor
• Low pressure drop
• High cooling capacity
• Service-friendly, easy to retrofit
• For Truck cranes
• Body builders
• Mining Applications
Compact Hydraulics

Hand Pump Series 700
With Built-in 4-way Valve

- Pressures up to 175 bar
- 8.2 cm³/stroke
- Operating Range: -40 to +70 °C (Depending on Fluid Used)
- Very Compact Size
- Excellent Backup Power Supply
- Up to 61 cm Handle Available

Series 108

- AC or DC motor
- 4 pump sizes – up to 3 l/min
- Single or bidirectional rotation
- Fixed relief valve
- Locking check valves available on all models
- Variety of hydraulic circuits
- Reservoirs from 0.45 to 5.5 litres
- 241 bar rating

Series 165

- 0.75 kW, 12 VDC electric motor
- 3 pump sizes (0.52, 0.82 and 1.06 cm³/rev)
- Variety of circuits
- Many reservoir choices
- Up to 240 bar operating pressure
- Soft seat load hold check valves
- Vertical or horizontal mounting

Series 550

- Numerous motors to 1.5 kW
- 6 pump sizes – flows from 1 to 11.4 l/min
- Externally adjustable relief valve
- Variety of reservoirs
- Operating pressure to 210 bar
- NG6 pad or standard P and T ports

Compact EHA

- Compact, free-standing actuator for high power density applications
- Provides a complete actuation system for space critical industrial, mobile and remote use
- Eliminates need for separate pump, tank, hoses, valves and actuator
- Max. force, extension - 21.3kN
- Max. force, retraction - 16.0kN
- Max. speed - 84mm/s (no load)
- Standard stroke lengths - 102 mm, 152 mm, 203 mm
- Mounting pin diameters - 6.4 mm, 9.5 mm, 12.7 mm
- Motor Options - 12V DC, 245W or 560W; 24V DC, 245W or 560W
Filtration and Condition Monitoring Solutions

Total Product Offering

For Parker Filtration, our commitment to re-think, re-engineer and realign ourselves to fulfil the needs of our customers and their customers, is best demonstrated by our Total ‘Global’ Product Offering. In addition to the products highlighted here, a comprehensive catalogue is available.

- Various mounting configurations
- High capacity/high efficiency quantumfiber™ media and environmentally friendly media options
- Visual and electrical indicators with several connector styles
- Tank mounted and in-tank models
- Condition Monitoring solutions for total health management

<table>
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<tr>
<th>Low Pressure</th>
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<tbody>
<tr>
<td>Suction Return</td>
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<td>TTF Series</td>
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<td>PT Series</td>
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<td>Tank Topper</td>
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<tr>
<th>Medium Pressure</th>
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<td>GMF iprotect</td>
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<tr>
<td>EPF iprotect Series</td>
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Condition Monitoring

Parker’s range of condition monitoring monitors, detectors and analysers are designed and manufactured to the highest standard to ensure reliability and accuracy. From laser operated icountOS oil samplers, icountPD particle detectors to Parker Kittiwake’s range of proven products such as the MHC Bearing Checker ideal for maintenance analysis of bearing condition and lubrication state; Parker offers on-line and on-site solutions for condition monitoring of critical plant and machinery.
Fuel Filtration and Separation

Racor Spin On Series

- Water separation to SAE J1488/J1839 and ISO 4020 6.5, and particle filtration to ISO TR13353
- Compact spin-on filter/water separator with electric heater and transparent bowl
- Filter elements with Aquabloc element and multiple ports
- The optional integral hand pump and water level sensor allow the filter to be adapted for the particular application in trucks and buses

Racor Turbine Series

- High performance prefilter/water separator for applications where there are large amounts of water in the fuel
- Element with original Aquabloc filter medium
- Newly designed bowls made of transparent plastic or injection moulded aluminium
- Optional electric heating and water level sensor

Crankcase Ventilation Filter (CCV)

- This compact, patented system removes the crankcase blow-by from the oil before it is returned to the intake manifold, thereby protecting the turbocharger and intercooler from oil deposits.
- Engines equipped in this way meet the requirements of Euro Tier 4 and 5

Engine Air Filter Systems

- Pamic series – two or three stage air filter with pre-separator or moisture separator for use in extreme conditions
- Eco series – air filters that are lightweight and easy to install
- Dynacell series – space-saving multi-stage air filter for use in challenging conditions

Transmission, Rear Axle and Cabin Air Filters

- High filter performance and service life from multilayer filter material
- A good filtration ratio with a specially designed “blocking layer” suitable for high burst pressures
- Fresh air filter for truck cabs to remove fine contaminants such as dust, pollen and asphaltenes from the air

Truck TyreSaver 1 - Filling Tyres with Nitrogen

- Nitrogen truck tyre inflation system with a capacity of 10, 20, 30 and 40 nm3/h, 95% purity and 10 bar pressure
- Switches off automatically when no nitrogen is needed
- Compact design with high performance membrane
- Lower fuel consumption and and longer tyre service life
Thermoplastic Hoses and Tubes

**Polyflex/Parflex**

Thermoplastic Hoses for Use in Hydraulic and Industrial Applications

For pressures up to 2500 bar. Single and multiple hoses.

Applications: low pressure to high pressure hydraulics, pneumatics and surface polishing. PTFE hoses. Industrial gases, aggressive media and chemicals.

Construction: thermoplastic hoses with synthetic fibre/steel wire reinforcement.

Size range: from 5/64” to 1 1/4”.

Temperature range: -57 °C to +250 °C.

**Preforming**

Thanks to preforming technology, Parker can custom shape hoses and thermoplastic tubes for a variety of applications such as air brakes, fuel lines and hydraulic lines with low and high pressure supply.

Benefits:

- Preformed thermoplastic products cost less than the tube or hose/tube combination being replaced. The main difference is the smaller number of clamps needed for an identical layout.
- Products preformed by Parker may well include more expensive parts than the comparable product, but the extra cost is more than offset by the time saved during handling and installation.
- The smaller number of fittings reduces the risk of leaks
- Ideal where space is tight
- Easy installation in confined spaces
- Weight reduction

**Polyflex products for the transportation market**

- Clutch hose with very low volumetric expansion
- Customised Power Steering hose
- Small bore cabin tilt hoses (DN2.9 up to DN6)
- SCR solutions (electrically heated or coolant lines)
- Hoses for Alternative Fuels (CNG/LPG) BUL4460-CNG/BUL 4460-LPG-UK
- PTFE hoses for hot environment applications

**CNG Hose**

Hose for Mobile Applications in Vehicles

Parflex CNG Hose is specially developed for the conveyance of compressed natural gas. It is constructed of an electrically conductive nylon core designed to dissipate static build up and a fiber reinforcement for maximum pressure and flexibility. In addition, the polyurethane jacket provides abrasion resistance and protection from outdoor elements including ultraviolet light.

- Approved according to CSA ECE R110
- High flexibility, compact construction
- Strong polyurethane cover for high wear and tear resistance
- Working pressure 34.5 MPa
- Also available as twinline or multiline hose
- Customized preforming available (see Bulletin 5200-Preformed)
- Electrically conductive
**Fittings**

**UPTC push-to-connect system**

- For tubes and hoses
- Based on DIN 24° system and SAE O-Lok®
- 100% assured assembly
- 100% leak free
- Can be disassembled with standard tools
- Applications: steering hydraulics, hydraulic cab tilt systems, transmission oil cooling, etc.

**EO-PSR, EO-2, EO2-FORM and EO-3**

**EO-PSR**

- Metallic sealed connection
- ISO 8434 cutting ring system

**EO-2**

- Soft seals
- ISO 8434 cutting ring connection

**EO2-FORM**

- ISO 8434 soft seal
- Pipe forming
- Pipe AD 6 - 42 mm
- Steel, stainless steel, brass
- NBR, FKM
- PN to 800 bar

**EO-3**

- With visual assembly status recognition
- For tube and hose applications

**SensoControl®**

Test Terminals

A wide range of EMA test points and adapters for quick, clean and easy adaptation of sensors and measuring instruments to hydraulic systems
SensoControl®
SensoControl® - test equipment for maintenance and construction

Service Junior

Simple digital gauge for pressure measurements. Scanning rate 10 ms
- Back-lit display
- Numerical display of pressure spikes (MIN/MAX)
- Ideal for service engineers

Serviceman Plus

Simple, robust and flexible
- “Plug & play” using automatic sensor recognition, simply plug in and measure
- Innovative memory concept with nano USB stick
- USB interface to PC for convenient analysis and documentation of the measurement via the SensoWin software
- Robust design with oil-resistant rubber protection for use in extreme conditions
- Large back-lit display for quick and secure reading
- Simple and clear user prompts

The Parker ServiceMaster PLUS

High-performance high-end device:
- Interfaces: analogue, CAN, LAN and USB
- Display of measured values: numerical, bar graph, pointer and curve graph
- Measurement and display of more than 50 channels
- Remote maintenance via LAN, regardless of location
- Up to 4 million measured values per measurement
- Ideal for construction

Pressure Sensors, Pressure and Temperature
Sensors, Pressure Switches

Combined pressure/temperature sensors for use in maintenance and diagnostics, and pressure sensors and pressure switches in a sturdy steel housing for long-term mobile use.
Pneumatic Fittings

Prestomatic 2  Push-In Fittings
Connector for air brakes

Material: brass.
Size range: tube outer diameter from 6 mm to 16 mm
Threads: from M10x1.0 to M22x1.5, NPT, BSPT.
Working pressure: up to 20 bar
Working temperature: -40 °C to +100 °C

Prestomatic 3  Push-In Fittings
Connector for air brakes

Material: technical polymer
Size range: tube outer diameter from 8 mm to 16 mm
Threads: from M10x1 to M22x1.5
Working pressure: up to 17 bar
Working temperature: -40°C to +100°C

Air Brake, Adapters and Accessories
Range of prestomatic accessories with metric threads

Material: brass
Range: bulkhead unions, elbows, tees, run tees, test points, tilt drain valves
Threads: metric
Working pressure: up to 17 bar
Working temperature: -40°C to +100°C

LF 3000 Push-In Fittings
Complete range for pneumatic in cab applications

Material: technical polymer
Size range: from 3 mm to 16 mm
Threads: metric BSPP, BSPT, NPT
Working pressure: up to 20 bar
Working temperature: -20°C to +80°C

LF 3400 Cartridges
Low pressure cartridges

Material: technical polymer
Size range: 6mm and 8mm
Working temperature: -40°C to +100°C
Vacuum: 755 mm Hg (99% vacuum)
Pneumatic Fittings

**Manifolds**
Customised products for connection of pneumatic lines between the truck cab and chassis

Customised products
Polymer body with integrated fittings
Polymer manifolds

**Blowgun Kits**

Material: Body: technical polymer
- Nozzle: aluminium or nickel plated brass
- Tubes: Polyamide
Working pressure: up to 10 bar
Working temperature: air: -15°C to +50°C / dry air: -20°C to +80°C
Rubber Hoses

SAE 100R5 Air Brake/Refrigerant and 2TE Hydraulic Hoses

Parker’s airbrake and refrigerant hoses are the optimum solution for air brake systems, diesel engine cooling systems as well as air conditioning applications. Parker is offering for this hose types a special range of fittings (Series 26) as a No-Skive system. Some of the available hose types include high performance of fire resistance construction.

The hose constructions are dependent on working pressure and contain different layers of textile or steel wires and synthetic rubber material for tube and cover.

Working pressure: up to 207 bar.
Temperature range: -50 °C to +150 °C
Dimensions: size -4 to -32

441 Compact No-Skive
High Pressure SAE 100 R16 Hose – ideal for Power Steering

Parker’s upgraded 441 hose provides 2-wire braided performance with only 1 high quality wire braid and is now approved for a working temperature of up to 125 °C. The Hi-Pac construction of the hose braid allows the technical characteristics of an SAE 100 R16 hose to be met, but offers higher flexibility and therefore improved ease of installation in machines or equipment.

The 441 hose is ideal for many industrial and mobile applications, with typical usage seen on agricultural machines or in power steering circuits.

Synthetic rubber tube; one braid of high tensile steel wire reinforcement; oil, weather and abrasion resistant black synthetic rubber cover.

Temperature range: -40 to +125 °C
Exceptions: air max. +70 °C, water max. +85 °C

CARBOBLUE N/L 10 – 20

CARBOBLUE N/L 10 - 20 is an automotive hose for trucks, specially designed for additive that reduces the amount of polluted substances released into the environment. These objectives are included in the European parameters EURO IV and EURO V.

Tube: Black, smooth, antistatic R<1M Ω/m and sulphur free EPDM rubber compound nitrosamine-free with peroxide curing. Composed of 32 % urea aqueous (AUS 32/AIR1-AdBlue).
Reinforcement: Synthetic textile fabrics.
Cover: Black, smooth, antistatic R<1M Ω/m, EPDM rubber compound nitrosamine free, ageing, heat and weather resistant.
Rubber Hoses

ARCTIC EDGE

Recommended for air, oil, gasoline, diesel, biodiesel and ethanol to be used in refrigerated applications and cold weather conditions. Arctic Edge keeps high flexibility and kink resistance also at extreme low temperatures (-57°C). Embedded copper wires assure conductive propriety to the hose for safe use in agriculture, construction and general industry. The longitudinal blue stripe on the cover allows an easy hose identification. Do not use for fuel dispensing.

Tube: Black NBR rubber compound.

Reinforcement: Multiple textile plies with static wire

Cover: Black, smooth CR rubber compound resistant to oil and weathering

EZ-Form MP

A multipurpose hose suitable for diesel, biodiesel, ethanol and gasoline in oil suction/return lines, on board fuel connector lines, drain lines on buses, cranes, mobile off-road equipment. Extremely handy and lightweight it reduces installation times, eliminates special design, tooling and fabrication cost. With a superior kink resistance and an outstanding flexibility could be routed with minimal force though confined spaces where pre-shaped and formed hose are normally required. Do not use for fuel dispensing or drag across sharp edges or very abrasive surfaces.

Tube: Black CR, antistatic rubber compound.

Reinforcement: Multiple textile plies with wire helix

Cover: Black, Greek corrugated CR rubber compound resistant to oil and weathering

EZ-Form GS

Designed to handle air, coolant and water in on-road and off-road applications. Extremely flexible and lightweight provides full suction capability and a path to conduct static electrical charge to the ground. The unique Greek cover corrugations provides minimum force-to-bend, superior kink resistance, and maximum flexibility for ease of handling. Used where formed hose might normally be required saving time and costs thanks to easy and quick assembly.

E-Z Form GS assure equal performances to SAE J20R2-D1.

Tube: Black EPDM, antistatic rubber compound.

Reinforcement: Multiple textile plies with wire helix

Cover: Black EPDM rubber compound resistant to weathering, abrasion, heat and ozone. Greek corrugated finish
Rubber Hoses

AIR BRAKE DIN 74310
Air Brake System Hose

Based on the special EPDM rubber compound, used for both tube and cover, the product features are low permeability to air and an excellent flexibility even in case of low temperatures. The premium rubber compounds gives resistance to high temperatures, weathering, abrasion and oil traces. Based on this product features, AIR BRAKE DIN 74310 is widely used in automotive and air brake systems.

Tube: Black, smooth EPDM nitrosamine-free rubber compound.
Reinforcement: Stress-resistant, synthetic textile yarns.
Cover: Black, abrasion, ageing and weather-resistant, smooth EPDM nitrosamine free rubber compound.

RADIOR DIN 6
Cooling System Hose

RADIOR DIN 6 is designed for a constant working pressure of 6 bar. Also the increased temperature range from -40 °C up to +125 °C makes this hose to the preferred product for cooling systems of automotive engines, stationary engines and for refrigerant systems.

Tube: Black, smooth, heat resistant EPDM rubber compound.
Reinforcement: Synthetic textile fabrics yarns. Up to ID 25 mm. in aramid plies as requested by DIN 74311. Cover: Black, smooth, wrapped finish, heat, ageing and weather-resistant EPDM rubber compound.
Motors - Fixed Displacement

### Vane

**Fan – M5**

- Heavy duty bearing
- High performance motor
- Integrated valves possible (anti cavitation check, proportional pressure relief valve, ...)
- Low noise motor
- Bi-rotational technology
- High starting torque
- High side load capacity
- Balanced performance in both directions of rotation

<table>
<thead>
<tr>
<th>Frame size M5AF</th>
<th>0006</th>
<th>0010</th>
<th>0012</th>
<th>0016</th>
<th>0018</th>
<th>0023</th>
<th>025</th>
<th>M5BF</th>
<th>0012</th>
<th>0018</th>
<th>0023</th>
<th>0028</th>
<th>0036</th>
<th>0045</th>
</tr>
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<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>6.3</td>
<td>10.0</td>
<td>12.5</td>
<td>16.0</td>
<td>18.0</td>
<td>23.0</td>
<td>25.0</td>
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<td>18.0</td>
<td>23.0</td>
<td>28.0</td>
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<td>260</td>
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</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>5000</td>
<td>5000</td>
<td>3800</td>
<td>3800</td>
<td>3300</td>
<td>3000</td>
<td>3000</td>
<td>4000</td>
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<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>2500</td>
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<tr>
<td>Max output torque (Nm)</td>
<td>26.1</td>
<td>43.7</td>
<td>55.7</td>
<td>79.4</td>
<td>81.2</td>
<td>-</td>
<td>-</td>
<td>50.6</td>
<td>81.2</td>
<td>117.1</td>
<td>132.1</td>
<td>172.8</td>
<td>-</td>
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<td>Output power (kW)</td>
<td>5.5</td>
<td>9.2</td>
<td>11.7</td>
<td>15.2</td>
<td>17.0</td>
<td>-</td>
<td>-</td>
<td>10.6</td>
<td>17.0</td>
<td>24.5</td>
<td>27.7</td>
<td>36.2</td>
<td>-</td>
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</tr>
<tr>
<td>Weight (kg)</td>
<td>15.0</td>
<td>15.5</td>
<td>15.0</td>
<td>15.0</td>
<td>15.5</td>
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1) Max shaft speed at max pressure

<table>
<thead>
<tr>
<th>Frame size M5ASF</th>
<th>006</th>
<th>010</th>
<th>012</th>
<th>016</th>
<th>018</th>
<th>023</th>
<th>025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>6.3</td>
<td>10.0</td>
<td>12.5</td>
<td>16.0</td>
<td>18.0</td>
<td>23.0</td>
<td>25.0</td>
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<tr>
<td>Max cont pressure (bar)</td>
<td>280</td>
<td>280</td>
<td>280</td>
<td>280</td>
<td>280</td>
<td>280</td>
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<td>Max operating speed (rpm)</td>
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<td>5000</td>
<td>3800</td>
<td>3800</td>
<td>3300</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td>Max output torque (Nm)</td>
<td>26.1</td>
<td>43.7</td>
<td>55.7</td>
<td>72.4</td>
<td>81.2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Output power (kW)</td>
<td>5.5</td>
<td>9.2</td>
<td>11.7</td>
<td>15.2</td>
<td>17.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>12.2</td>
<td>12.2</td>
<td>12.2</td>
<td>12.2</td>
<td>12.2</td>
<td>12.2</td>
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</tbody>
</table>

2) Output at 2000 rpm, 24 cSt & M5B® at 320 bar, 045 at 280 bar, M5AF at 300 bar

### Gerotor

**TE**

- High volumetric efficiency
- Long life
- Full flow spline cooling
- High pressure shaft seal
- High shaft seal cooling
- High starting torque
- High side load capacity
- Balanced performance in both directions of rotation

<table>
<thead>
<tr>
<th>Frame size TE</th>
<th>0036</th>
<th>0045</th>
<th>0050</th>
<th>0065</th>
<th>0080</th>
<th>0100</th>
<th>0130</th>
<th>0165</th>
<th>0195</th>
<th>0230</th>
<th>0260</th>
<th>0295</th>
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</thead>
<tbody>
<tr>
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<td>41</td>
<td>49</td>
<td>65</td>
<td>82</td>
<td>98</td>
<td>130</td>
<td>163</td>
<td>195</td>
<td>228</td>
<td>260</td>
<td>293</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
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<td>140</td>
<td>120</td>
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<td>100</td>
<td>-</td>
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<tr>
<td>Max operating speed (rpm)</td>
<td>1141</td>
<td>1024</td>
<td>1020</td>
<td>877</td>
<td>695</td>
<td>582</td>
<td>438</td>
<td>348</td>
<td>287</td>
<td>260</td>
<td>256</td>
<td>-</td>
</tr>
<tr>
<td>Max output torque (Nm)</td>
<td>55</td>
<td>71</td>
<td>90</td>
<td>125</td>
<td>160</td>
<td>190</td>
<td>255</td>
<td>310</td>
<td>390</td>
<td>400</td>
<td>428</td>
<td>-</td>
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<td>Weight, code L and H (kg)</td>
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<td>6.8</td>
<td>6.9</td>
<td>7.0</td>
<td>7.1</td>
<td>7.2</td>
<td>7.6</td>
<td>8.1</td>
<td>8.3</td>
<td>8.6</td>
<td>8.8</td>
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<table>
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<th>0390</th>
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<td>Displacement (cm³/rev)</td>
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<td>370</td>
<td>392</td>
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<tr>
<td>Max cont pressure (bar)</td>
<td>100</td>
<td>95</td>
<td>85</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>228</td>
<td>203</td>
<td>191</td>
</tr>
<tr>
<td>Max cont output torque (Nm)</td>
<td>443</td>
<td>467</td>
<td>445</td>
</tr>
<tr>
<td>Weight, code L and H (kg)</td>
<td>9.1</td>
<td>9.4</td>
<td>9.6</td>
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</tbody>
</table>

**TG**

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

<table>
<thead>
<tr>
<th>Frame size TG</th>
<th>0140</th>
<th>0170</th>
<th>0195</th>
<th>0240</th>
<th>0280</th>
<th>0310</th>
<th>0335</th>
<th>0405</th>
<th>0475</th>
<th>0530</th>
<th>0625</th>
<th>0785</th>
<th>0960</th>
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</thead>
<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>141</td>
<td>169</td>
<td>195</td>
<td>238</td>
<td>280</td>
<td>310</td>
<td>337</td>
<td>405</td>
<td>477</td>
<td>528</td>
<td>623</td>
<td>786</td>
<td>959</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>207</td>
<td>207</td>
<td>207</td>
<td>207</td>
<td>207</td>
<td>207</td>
<td>172</td>
<td>138</td>
<td>138</td>
<td>121</td>
<td>103</td>
<td>69</td>
<td>-</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>660</td>
<td>554</td>
<td>477</td>
<td>393</td>
<td>334</td>
<td>303</td>
<td>277</td>
<td>237</td>
<td>217</td>
<td>182</td>
<td>143</td>
<td>118</td>
<td>-</td>
</tr>
<tr>
<td>Max cont output torque (Nm)</td>
<td>390</td>
<td>475</td>
<td>555</td>
<td>675</td>
<td>795</td>
<td>924</td>
<td>965</td>
<td>940</td>
<td>885</td>
<td>980</td>
<td>985</td>
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<td>775</td>
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<tr>
<td>Weight code H and V (kg)</td>
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<td>14.8</td>
<td>15.1</td>
<td>15.5</td>
<td>16.0</td>
<td>16.3</td>
<td>16.9</td>
<td>17.5</td>
<td>18.3</td>
<td>19.0</td>
<td>20.5</td>
<td>22.2</td>
<td>-</td>
</tr>
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</table>
Motors - Fixed Displacement

Gerotor

- High volumetric efficiency
- Flow through internal spline and shaft seal cooling
- High pressure shaft seal / no drainline
- High starting torque
- High side load capacity
- Long life

### Frame size TK

<table>
<thead>
<tr>
<th>Frame size TK</th>
<th>0250</th>
<th>0315</th>
<th>0400</th>
<th>0500</th>
<th>0630</th>
<th>0800</th>
<th>1000</th>
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<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>250</td>
<td>315</td>
<td>400</td>
<td>500</td>
<td>630</td>
<td>800</td>
<td>1000</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>241</td>
<td>241</td>
<td>207</td>
<td>207</td>
<td>207</td>
<td>190</td>
<td>172</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>523</td>
<td>413</td>
<td>373</td>
<td>298</td>
<td>237</td>
<td>276</td>
<td>218</td>
</tr>
<tr>
<td>Max cont output torque (Nm)</td>
<td>814</td>
<td>1029</td>
<td>1153</td>
<td>1439</td>
<td>1617</td>
<td>1916</td>
<td>2143</td>
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<tr>
<td>Weight (kg)</td>
<td>30.8</td>
<td>31.4</td>
<td>32.3</td>
<td>33.2</td>
<td>34.5</td>
<td>36.0</td>
<td>37.9</td>
</tr>
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</table>

Axial Piston

F1

- Pressures up to 350 bar
- Positive synchronization with timing gear
- Shaft end and mounting flange meet the ISO standard for all sizes
- Very low weight
- High overall efficiency withstand high acceleration

### Frame size F1

<table>
<thead>
<tr>
<th>Frame size F1</th>
<th>25-M</th>
<th>41-M</th>
<th>51-M</th>
<th>61-M</th>
<th>81-M</th>
<th>101-M</th>
<th>121-M</th>
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</thead>
<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>25.6</td>
<td>40.9</td>
<td>51.1</td>
<td>59.5</td>
<td>81.6</td>
<td>102.9</td>
<td>118.5</td>
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<tr>
<td>Max cont pressure (bar)</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>3000</td>
<td>2700</td>
<td>2400</td>
<td>2200</td>
<td>2000</td>
<td>1800</td>
<td>1700</td>
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<tr>
<td>Output torque at 200 bar (Nm)</td>
<td>81</td>
<td>130</td>
<td>162</td>
<td>189</td>
<td>259</td>
<td>327</td>
<td>376</td>
</tr>
<tr>
<td>Output power (kW)</td>
<td>20</td>
<td>27</td>
<td>31</td>
<td>34</td>
<td>41</td>
<td>48</td>
<td>51</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
</tr>
</tbody>
</table>

F11

- Very high operating speeds and fast accelerations
- Anti cavitation valve available
- Pressures up to 420 bar
- High overall efficiency (low losses)
- Accept high external shaft loads
- Good resistance to vibrations and temperature shocks
- Proven reliability
- Easy to service
- CETOP, ISO and SAE versions available

### Frame size F11

<table>
<thead>
<tr>
<th>Frame size F11</th>
<th>05</th>
<th>06</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>19</th>
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<tr>
<td>Displacement (cm³/rev)</td>
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<tr>
<td>Max cont pressure (bar)</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
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<td>10200</td>
<td>10200</td>
<td>9400</td>
<td>9000</td>
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<tr>
<td>Output torque at 100 bar (Nm)</td>
<td>7.8</td>
<td>9.5</td>
<td>15.6</td>
<td>19.8</td>
<td>22.7</td>
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<tr>
<td>Weight (kg)</td>
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<td>7.5</td>
<td>7.5</td>
<td>8.2</td>
<td>8.3</td>
<td>11</td>
</tr>
</tbody>
</table>

F12

- Very high operating speeds and fast accelerations
- Accessory valves available
- ISO, SAE and cartridge versions available
- Proven reliability
- Easy to service
- Super-shockless swing relief valve

### Frame size F12

<table>
<thead>
<tr>
<th>Frame size F12</th>
<th>30</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>90</th>
<th>110</th>
<th>125</th>
<th>150</th>
<th>250</th>
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<tr>
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<td>30.0</td>
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<td>80.4</td>
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<td>420</td>
<td>420</td>
<td>420</td>
<td>350</td>
<td>420</td>
<td>420</td>
<td>350</td>
<td>350</td>
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<td>Max operating speed (rpm)</td>
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<td>4400</td>
<td>4200</td>
<td>3200</td>
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<td>Output torque at 100 bar (Nm)</td>
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<td>63.5</td>
<td>94.9</td>
<td>128</td>
<td>148</td>
<td>175</td>
<td>198</td>
<td>238</td>
<td>384</td>
</tr>
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<td>Weight (kg)</td>
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<td>21</td>
<td>26</td>
<td>28</td>
<td>36</td>
<td>36</td>
<td>70</td>
<td>77</td>
</tr>
</tbody>
</table>
**Pneumatic**

**Truck Valves**

Highly versatile range of poppet to inline air-control panels for on and/or off-road vehicles assisting air suspension stability.

- Reduced frictionless seal technology
- Low pressure drop loss in actuation
- Robust die cast, plastic and anodized material
- Push button or toggle technology
- Normally open/normally closed operation
- Mono or bi-stable position operation

Load distribution legislations in various countries utilize solenoid or vacuum, including hand-lever valves, to manually or automatically operate rugged, light and heavy freight operation.

- Wide operating temperature -40 °C to +70 °C
- Environmental conditions IP67
- Electric conditions between 12-24 VDC
- Stable seal performance technology
- Wide range of body sizes 1/8-3/4 (3 mm-19 mm)
- Easily accessible adjustments

**Truck Air Prep**

Provides moisture-free and dry compressed air to the equipment and applications which require continuous and uninterrupted regulated operation.

- One-piece filter cartridge for fast maintenance
- Robust metal shell for extra safety
- Key lock metal bonnet
- Ideal for low and high flow applications
- Space saving package for optimal performance
- Precise regulation with balanced poppet
- Multi-porting options

Low operating noise, with the ability to withstand vibration while operating in extreme conditions.

- Flexible design suitable for retrofitting systems
- Compact and light weight housing material
- Electric or pneumatic drains
- Solid control piston for extended life
- Removable, non-rising knob for panel mounting
- Dual or three-unit combinations
Power Take-Off
Mechanical 6 & 8 Bolt Power Take-Offs

442

- 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 and output options

<table>
<thead>
<tr>
<th>Series 442</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>F</th>
<th>H</th>
<th>L</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>U</th>
<th>W</th>
<th>X</th>
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<tbody>
<tr>
<td>Standard Output Shaft Size</td>
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<td>1¼”</td>
<td>1¼”</td>
<td>1¼”</td>
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<td>1¼”</td>
<td>1¼”</td>
<td>1¼”</td>
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<tr>
<td>Intermittent Torque Rating (Nm)</td>
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<td>339</td>
<td>339</td>
<td>339</td>
<td>339</td>
<td>305</td>
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<td>264</td>
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<td>237</td>
<td>190</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service: at 500 rpm of Output Shaft</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
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<td>16</td>
<td>16</td>
<td>14</td>
<td>14</td>
<td>12</td>
<td>10</td>
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</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
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<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
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<td>32</td>
<td>28</td>
<td>28</td>
<td>25</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

489

- 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 shifter options and pump flanges

<table>
<thead>
<tr>
<th>Series 489</th>
<th>A</th>
<th>C</th>
<th>F</th>
<th>H</th>
<th>L</th>
<th>Q</th>
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<th>S</th>
<th>U</th>
<th>W</th>
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<tbody>
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<td>Standard Output Shaft Size</td>
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<td>1¾”</td>
<td>1¾”</td>
<td>1¾”</td>
<td>1¾”</td>
<td>1¾”</td>
<td>1¾”</td>
<td>1¾”</td>
<td>1¾”</td>
<td>1¾”</td>
<td>1¾”</td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
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<td>339</td>
<td>339</td>
<td>339</td>
<td>339</td>
<td>305</td>
<td>305</td>
<td>271</td>
<td>264</td>
<td>237</td>
<td>190</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service: at 500 rpm of Output Shaft</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>16</td>
<td>16</td>
<td>14</td>
<td>14</td>
<td>12</td>
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<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>32</td>
<td>32</td>
<td>28</td>
<td>28</td>
<td>25</td>
<td>20</td>
</tr>
</tbody>
</table>

823

- Robust design for high torque applications
- Lever shift standard
- Inspection cover for adjusting backlash
- Popular pump mounts available

<table>
<thead>
<tr>
<th>Series 823</th>
<th>B</th>
<th>D</th>
<th>G</th>
<th>J</th>
<th>M</th>
<th>R</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1½” 10T spline with 1410 flange</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
<td>678</td>
<td>678</td>
<td>678</td>
<td>678</td>
<td>678</td>
<td>542</td>
<td>475</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service: at 500 rpm of Output Shaft</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>57</td>
<td>50</td>
</tr>
</tbody>
</table>

880

- 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

<table>
<thead>
<tr>
<th>Series 880</th>
<th>B</th>
<th>D</th>
<th>G</th>
<th>J</th>
<th>M</th>
<th>Q</th>
<th>R</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1½” 10T spline with 1410 flange</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
<td>678</td>
<td>678</td>
<td>678</td>
<td>678</td>
<td>678</td>
<td>610</td>
<td>542</td>
<td>475</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service: at 500 rpm of Output Shaft</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>32</td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>64</td>
<td>57</td>
<td>50</td>
</tr>
</tbody>
</table>
Power Take-Off

Power Shift 6 & 8 Bolt Power Take-Off’s

236

- Optional Internal Self-Adjusting Shaft Brake
- Wide selection of input gears for virtually all currently produced transmissions
- Helical gears and optional pressure lubrication to extend PTO service life
- Inspection cover for adjusting backlash

<table>
<thead>
<tr>
<th>Series 236</th>
<th>D, K &amp; Q</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1¼&quot;</td>
<td>1¼&quot;</td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
<td>339</td>
<td>305</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service:</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>at 500 rpm of Output Shaft</td>
<td>36</td>
<td>32</td>
</tr>
</tbody>
</table>

270/271

- Designed for automatic transmissions
- Electric-over-hydraulic shifting
- 271 offers low profile housing for avoiding clearance problems
- Pressure lubrication available for both units

<table>
<thead>
<tr>
<th>Series 270/271</th>
<th>270th A, B, D &amp; K</th>
<th>270th A, B, D &amp; K</th>
<th>271th A, B, D &amp; K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1¼&quot;</td>
<td>1¼&quot;</td>
<td>1¼&quot;</td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
<td>407</td>
<td>339</td>
<td>339</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service:</td>
<td>21</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>at 500 rpm of Output Shaft</td>
<td>43</td>
<td>36</td>
<td>36</td>
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</tbody>
</table>

852

- Designed for Heavy Duty applications
- Three speed ratios to choose from
- Pump flanges to fit most popular hydraulic pumps
- Pressure Lubrication standard

<table>
<thead>
<tr>
<th>Series 852</th>
<th>B</th>
<th>G</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1½&quot; 10T spline with 1410 flange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
<td>678</td>
<td>678</td>
<td>678</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service:</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>at 500 rpm of Output Shaft</td>
<td>71</td>
<td>71</td>
<td>71</td>
</tr>
</tbody>
</table>

885

- Designed for Heavy Duty applications such as pneumatic blowers
- Rugged cast iron housing
- Four speed ratios to choose from
- Pressure Lubrication available

<table>
<thead>
<tr>
<th>Series 885</th>
<th>B</th>
<th>G</th>
<th>J</th>
<th>M</th>
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<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1½&quot; 10T spline with 1410 flange</td>
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<td></td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
<td>678</td>
<td>678</td>
<td>678</td>
<td>678</td>
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<tr>
<td>Power Rating for Intermittent Service:</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
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<tr>
<td>at 500 rpm of Output Shaft</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>71</td>
</tr>
</tbody>
</table>
Power Take-Off

Power Shift 10 Bolt Power Take-Off’s

280

- It will feature a single continuous duty torque rating. No more 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. Plus a remote mounted option provides maximum clearance

<table>
<thead>
<tr>
<th>Series 280</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>G</th>
<th>K</th>
<th>M</th>
<th>P</th>
<th>S</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1-1/4” Round w/key</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
<td>407</td>
<td>529</td>
<td>529</td>
<td>488</td>
<td>461</td>
<td>431</td>
<td>393</td>
<td>359</td>
<td>325</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service: at 500 rpm of Output Shaft</td>
<td>29</td>
<td>37</td>
<td>37</td>
<td>34</td>
<td>32</td>
<td>30</td>
<td>28</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>43</td>
<td>58</td>
<td>56</td>
<td>51</td>
<td>48</td>
<td>45</td>
<td>41</td>
<td>38</td>
<td>34</td>
</tr>
</tbody>
</table>

* SuperTorque™

870

- Integral actuation valve simplifies plumbing and reduces installation time
- Compact housing height reduces clearance issues
- Remote mount valve solves installation interference problems
- Electronic Overspeed Control (E.O.C.) protects driven equipment
- Wet Spline pump flange extends P.T.O. and pump shaft life

<table>
<thead>
<tr>
<th>Series 870</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1¾” Spline with 1410 flange</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Torque Rating (Nm)</td>
<td>908</td>
<td>854</td>
<td>800</td>
<td>746</td>
<td>683</td>
<td>653</td>
<td>583</td>
<td>481</td>
<td>454</td>
</tr>
<tr>
<td>Power Rating for Continuous Service: at 500 rpm of Output Shaft</td>
<td>48</td>
<td>45</td>
<td>42</td>
<td>39</td>
<td>35</td>
<td>31</td>
<td>27</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>95</td>
<td>90</td>
<td>84</td>
<td>78</td>
<td>69</td>
<td>61</td>
<td>54</td>
<td>51</td>
<td>48</td>
</tr>
</tbody>
</table>

890/892

- Moves the P.T.O. mounting flange to the rear of the transmission allowing larger pumps and in some cases it will eliminate the need for a drive shaft
- Wet Spline outputs extends shaft life and eliminates the need to disassemble to frequently grease the splines
- Require less space than current P.T.O.s. Will help clear frame rails etc.
- Torque ratings up to 670 Lbs. ft. allows the use of higher flow and pressure pumps

<table>
<thead>
<tr>
<th>Series 890/892</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1½” 14T spline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Torque Rating (Nm)</td>
<td>908</td>
<td>854</td>
<td>800</td>
<td>746</td>
<td>658</td>
<td>583</td>
</tr>
<tr>
<td>Power Rating for Continuous Service: at 500 rpm of Output Shaft</td>
<td>48</td>
<td>45</td>
<td>42</td>
<td>39</td>
<td>35</td>
<td>31</td>
</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>95</td>
<td>90</td>
<td>84</td>
<td>78</td>
<td>69</td>
<td>61</td>
</tr>
</tbody>
</table>
Power Take-Off

Constant Mesh 10 Bolt Power Take-Off’s

- Constant Mesh (non-shiftable) PTO ideal for applications requiring continuous power
- Wet Spline Output options available
- Three speed ratios and ten output options
- SuperTorque™ gears available for 20% higher intermittent torque ratings
- No backlash to adjust

<table>
<thead>
<tr>
<th>Series 267</th>
<th>B</th>
<th>G</th>
<th>S</th>
<th>SB*</th>
<th>SG*</th>
<th>SS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1 ¼”</td>
<td>1 ¼”</td>
<td>1 ¼”</td>
<td>1 ¼”</td>
<td>1 ¼”</td>
<td>1 ¼”</td>
</tr>
<tr>
<td>Intermittent Torque Rating (Nm)</td>
<td>454</td>
<td>407</td>
<td>339</td>
<td>545</td>
<td>488</td>
<td>359</td>
</tr>
<tr>
<td>Power Rating for Intermittent Service: at 500 rpm of Output Shaft</td>
<td>24</td>
<td>21</td>
<td>18</td>
<td>29</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>48</td>
<td>43</td>
<td>36</td>
<td>57</td>
<td>51</td>
<td>38</td>
</tr>
</tbody>
</table>

Series 560V

- Wet Spline for Extended P.T.O. and Pump Shaft Life
- Single Continuous Duty Torque Rating
- Torque Rating of 335 Lbs. ft. (454 N.m.)
- Flow rates 3.4 to 31.7 GPM (12.9 119.9 LPM) at 1200 R.P.M.
- Pressure Ratings up to 3500 PSI (240 Bars)
- 12 or 24 Volt Electric Over Hydraulic Actuation
- Pressure and Suction Ports Rotatable for Best Clearance
- Weight 71 Lbs. No Pump Bracket Required
- Quiet Operation
- Patent Pending

<table>
<thead>
<tr>
<th>Series 560V</th>
<th>03</th>
<th>05</th>
<th>06</th>
<th>09</th>
<th>10</th>
<th>12</th>
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<th>17</th>
<th>20</th>
<th>22</th>
<th>25</th>
<th>28</th>
<th>31</th>
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</thead>
<tbody>
<tr>
<td>Displacement ml/rec</td>
<td>10.8</td>
<td>17.2</td>
<td>21.3</td>
<td>26.4</td>
<td>34.1</td>
<td>37.1</td>
<td>46.0</td>
<td>58.3</td>
<td>63.8</td>
<td>70.3</td>
<td>79.3</td>
<td>88.8</td>
<td>100.0</td>
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<tr>
<td>Intermittent Pressure (Bars)</td>
<td>275</td>
<td>275</td>
<td>275</td>
<td>275</td>
<td>275</td>
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<td>275</td>
<td>275</td>
<td>275</td>
<td>275</td>
<td>275</td>
<td>275</td>
<td>210</td>
</tr>
<tr>
<td>Continuous Pressure (Bars)</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>160</td>
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<tr>
<td>Maximum RPM</td>
<td>2800</td>
<td>2800</td>
<td>2800</td>
<td>2800</td>
<td>2800</td>
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<td>2800</td>
<td>2800</td>
<td>2800</td>
<td>2500</td>
</tr>
</tbody>
</table>

Series 897/899

- Moves the P.T.O. mounting flange to the rear of the transmission allowing larger pumps and in some cases it will eliminate the need for a drive shaft
- Require less space than current P.T.O.s. Will help clear frame rails etc.
- Torque ratings up to 908 N.m. allows the use of higher flow and pressure pumps
- Wet Spline outputs extends shaft life and eliminates the need to disassemble to frequently grease the splines

<table>
<thead>
<tr>
<th>Series 897/899</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1 ¼” 14T Spline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Continuous Torque Rating (Nm)</td>
<td>908</td>
<td>854</td>
<td>800</td>
<td>746</td>
<td>658</td>
<td>583</td>
<td>583</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Rating for Continuous Service: at 500 rpm of Output Shaft</td>
<td>48</td>
<td>45</td>
<td>42</td>
<td>39</td>
<td>35</td>
<td>31</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>95</td>
<td>90</td>
<td>84</td>
<td>78</td>
<td>69</td>
<td>61</td>
<td>61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Series 877

- Torque capacity up to 908 N.m.
- Compact housing height reduces clearance issues
- Wet Spline pump flange extends P.T.O. and pump shaft life

<table>
<thead>
<tr>
<th>Series 877</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
<td>1 ½” Spline with 1410 flange</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Torque Rating (Nm)</td>
<td>908</td>
<td>854</td>
<td>800</td>
<td>746</td>
<td>658</td>
<td>583</td>
<td>515</td>
<td>481</td>
<td>454</td>
</tr>
<tr>
<td>Power Rating for Continuous Service: at 500 rpm of Output Shaft</td>
<td>48</td>
<td>45</td>
<td>42</td>
<td>39</td>
<td>35</td>
<td>31</td>
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<td>25</td>
<td>24</td>
</tr>
<tr>
<td>at 1000 rpm of Output Shaft (kW)</td>
<td>95</td>
<td>90</td>
<td>84</td>
<td>78</td>
<td>69</td>
<td>61</td>
<td>54</td>
<td>51</td>
<td>48</td>
</tr>
</tbody>
</table>
Power Take-Off

Split Shaft Power Take-Offs

912
• Three 8-Bolt openings that allow you to operate a variety of auxiliary equipment
• Wide variety of 6-Bolt, 8-Bolt, PowerShift and Reversible PTO's fit the 912 Series
• Air and Lever shift available

<table>
<thead>
<tr>
<th>Series 912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
</tr>
<tr>
<td>2 ¾” 10T Spline</td>
</tr>
<tr>
<td>Max Thru Torque Capacity w/Diesel Engine:</td>
</tr>
<tr>
<td>Automatic Transmission</td>
</tr>
<tr>
<td>13 000 lbs ft 17 625 Nm</td>
</tr>
<tr>
<td>Manual Transmission</td>
</tr>
<tr>
<td>12 000 lbs ft 16 270 Nm</td>
</tr>
<tr>
<td>Max Thru Torque Capacity w/Gas Engine:</td>
</tr>
<tr>
<td>Automatic Transmission</td>
</tr>
<tr>
<td>16 000 lbs ft 21 693 Nm</td>
</tr>
<tr>
<td>Manual Transmission</td>
</tr>
<tr>
<td>15 000 lbs ft 20 337 Nm</td>
</tr>
</tbody>
</table>

941
• Smaller version of the 912 Series with three 6-bolt openings
• Designed for Class 3, 4, 5 and 6 trucks with automatic transmissions and no P.T.O. opening or trucks requiring additional P.T.O. openings
• Special Park Brake Applications available
• Several 6-Bolt and Reversible P.T.O.s will fit on the 941 Series

<table>
<thead>
<tr>
<th>Series 941</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
</tr>
<tr>
<td>1 ½” 12T Spline</td>
</tr>
<tr>
<td>Max Thru Torque Capacity w/Diesel Engine:</td>
</tr>
<tr>
<td>Automatic Transmission</td>
</tr>
<tr>
<td>3100 lbs ft 4203 Nm</td>
</tr>
<tr>
<td>Manual Transmission</td>
</tr>
<tr>
<td>2900 lbs ft 3932 Nm</td>
</tr>
<tr>
<td>Max Thru Torque Capacity w/Gas Engine:</td>
</tr>
<tr>
<td>Automatic Transmission</td>
</tr>
<tr>
<td>4200 lbs ft 5694 Nm</td>
</tr>
<tr>
<td>Manual Transmission</td>
</tr>
<tr>
<td>3900 lbs ft 5288 Nm</td>
</tr>
</tbody>
</table>

Rear Mount Power Take-Offs

511
• Rear mount design - requires less mounting space and simplifies installation
• Wet Spline outputs - Extend PTO and Pump Shaft Life. Eliminates the need to disassemble to grease the mating Pump and P.T.O. shafts
• Four direct mount pump options
• Four Shift Options
• No gear back lash to set - simplifying installation

<table>
<thead>
<tr>
<th>Series 511</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
</tr>
<tr>
<td>4-Bolt DIN 5462</td>
</tr>
<tr>
<td>Continuous Torque Rating (Nm)</td>
</tr>
<tr>
<td>Power rating for Continuous Service At 500 rpm of the Output Shaft (kW)</td>
</tr>
<tr>
<td>At 1000 rpm of the Output Shaft (kW)</td>
</tr>
</tbody>
</table>

523
• Rear mount design - requires less mounting space and simplifies installation
• Wet Spline outputs - Extend PTO and Pump Shaft Life. Eliminates the need to disassemble to grease the mating Pump and P.T.O. shafts
• Four direct mount pump options
• Four Shift Options
• No gear back lash to set - simplifying installation

<table>
<thead>
<tr>
<th>Series 523</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Output Shaft Size</td>
</tr>
<tr>
<td>4-Bolt DIN 5462</td>
</tr>
<tr>
<td>Continuous Torque Rating (Nm)</td>
</tr>
<tr>
<td>Power rating for Continuous Service At 500 rpm of the Output Shaft (kW)</td>
</tr>
<tr>
<td>At 1000 rpm of the Output Shaft (kW)</td>
</tr>
</tbody>
</table>
Parker PTO’s

Parker’s power take-off units are designed to meet the requirement of the majority of today’s truck applications. The PTO range covers a great many trucks and is being continually updated to fit new gearboxes. The PTO’s are used in a variety of applications such as Tippers, Hook Loaders, Skip Loaders and Cranes, and are specifically designed to close-couple pumps with the current ISO-Standard mounting flange. Alternatively, the units can be fitted with our cardan shaft adaptor to enable them to be used for a wide range of propshaft driven applications.

- Tailor made for the Parker Truck Hydraulics pumps
- Possibility to close-couple any ISO-standard pump
- Shaft-driven adaptor for other applications
- Competitively priced
- Easy to install
- Electrical indicator available on latest PTO’s

Parker can, with its range of PTO units, the F1, F2, T1 and VP1 truck pumps and a great number of accessories, offer the total truck hydraulic package. Parker have become synonymous with extraordinary quality. Many body builders and chassis manufacturers now include our products as a standard part of their programme.
## Pumps - Fixed Displacement

### Gear

**GPA**

- Low noise
- High efficiency
- Bi-rotational
- Compact design
- Low weight / Aluminium body
- Pressure and suction connection in the rear and on the side

<table>
<thead>
<tr>
<th>Frame Size GPA</th>
<th>008</th>
<th>012</th>
<th>016</th>
<th>019</th>
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<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>19</td>
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<tr>
<td>Max cont pressure (bar)</td>
<td>250</td>
<td>250</td>
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<tr>
<td>Weight (kg)</td>
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<td>4.8</td>
<td>5.1</td>
<td>5.3</td>
</tr>
</tbody>
</table>

**GP1**

- Low noise
- High efficiency
- Bi-rotational
- Exceptional durability
- Compact design
- Low weight
- Pressure and suction connection in the rear or on the side

<table>
<thead>
<tr>
<th>Frame Size GP1</th>
<th>016</th>
<th>019</th>
<th>023</th>
<th>029</th>
<th>036</th>
<th>041</th>
<th>046</th>
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<th>060</th>
<th>070</th>
<th>080</th>
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<td>23</td>
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<td>Max. cont. pressure (bar)</td>
<td>270</td>
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<td>250</td>
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<td>13.5</td>
<td>14.0</td>
<td>15.0</td>
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</table>
## Pumps - Fixed Displacement

### Vane – SAE

#### Single

- 275 bar max pressure for T6CM, 240 bar for T6DM & T6EM
- Silent technology even under high pressure
- Wide range of displacements
- User friendly = easy conversions & evolutions
- Wide number of shafts available (SAE, ISO & specials)
- Double shaft seal option possible (T6CP, T6DP & T6EP)
- Rear drive train options available (SAE A, SAE B or SAE C)

<table>
<thead>
<tr>
<th>Frame size TB</th>
<th>003</th>
<th>004</th>
<th>005</th>
<th>006</th>
<th>008</th>
<th>009</th>
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<td>12.8</td>
<td>16.0</td>
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<td>175</td>
<td>175</td>
<td>175</td>
<td>175</td>
<td>175</td>
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<td>Max int pressure (bar)</td>
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<td>190</td>
<td>190</td>
<td>190</td>
<td>190</td>
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<td>3400</td>
<td>3400</td>
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<td>7.0</td>
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<th>B20</th>
<th>B22</th>
<th>B25</th>
<th>B28</th>
<th>B31</th>
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<tr>
<td>Displacement (cm³/rev)</td>
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<td>21.3</td>
<td>26.4</td>
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<td>37.1</td>
<td>46.0</td>
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<td>70.3</td>
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<td>240</td>
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<tr>
<td>Input power (kW)</td>
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<td>14.7</td>
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<td>24.1</td>
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<td>36.9</td>
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<td>15.7</td>
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<th>B24</th>
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<th>B35</th>
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<th>B42</th>
<th>B45</th>
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<tr>
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<td>210</td>
<td>210</td>
<td>210</td>
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<td>210</td>
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<tr>
<td>Max int pressure (bar)</td>
<td>240</td>
<td>240</td>
<td>240</td>
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<tr>
<td>Max operating speed (rpm)</td>
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<td>2500</td>
<td>2500</td>
<td>2500</td>
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<td>Input power (kW)</td>
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<th>057</th>
<th>062</th>
<th>066</th>
<th>072</th>
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</thead>
<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>132.3</td>
<td>142.4</td>
<td>158.5</td>
<td>164.8</td>
<td>171.0</td>
<td>183.3</td>
<td>196.7</td>
<td>213.3</td>
<td>227.1</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>210</td>
<td>210</td>
<td>210</td>
<td>210</td>
<td>210</td>
<td>210</td>
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<tr>
<td>Max int pressure (bar)</td>
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<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
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<tr>
<td>Max operating speed (rpm)</td>
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<td>2200</td>
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<td>Input power (kW)</td>
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<td>113.2</td>
<td>121.3</td>
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<td>Weight (kg)</td>
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<td>43.3</td>
<td>43.3</td>
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<td>43.3</td>
<td>43.3</td>
<td>43.3</td>
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</tr>
</tbody>
</table>

1) Shaft speed for petroleum based fluids. For higher speeds, please contact Parker
2) 1500 rpm at 240 bar (except TB at 175 bar)
3) 140 bar
4) 210 bar max

### Double

- Very low noise
- SAE or ISO standards
- One piece shaft (no internal torque limitations)
- Single common inlet
- 32 porting orientations available, 16 different double pump frames
- 819 displacement possibility (from 10.8 to 227.1 cm³/rev) with a max displacement of 454.2 cm³/rev
- Displacement combinations with above T6CM – T6DM & T6EM
- High power to weight ratio
- Wide range of options available = different shafts, threads, pilots
- Double shaft seal option possible (T6CP, T6DP & T6EP)
- Special shafts for tractors (J718c) T6CCMW, T6DCMW, T6ECM & T6EDM

### Triple

- Very low noise
- Single common inlet
- 128 porting orientations available
- 6766 displacement combinations (from 10.8 to 227.1 cm³/rev) with a max displacement of 552 cm³/rev
- One piece shaft (no internal torque limitation)
- High power to weight ratio
- 15 different triple pump frames available
Pumps - Fixed Displacement

Vane

- Special PTO shaft DIN 5462
- Silent technology
- Designed for radial load capability
- Flexibility in the porting
- Two pilot options = 4 bolts Ø 80.0 or 3 bolts Ø 52.0
- Maximum working pressure 275 bar
- Double pump available (T6GCC)

<table>
<thead>
<tr>
<th>Frame size T6GC - T6ZC</th>
<th>B03</th>
<th>B05</th>
<th>B06</th>
<th>B08</th>
<th>B10</th>
<th>B12</th>
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<th>B20</th>
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<th>B25</th>
<th>B28</th>
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<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>10.8</td>
<td>17.2</td>
<td>21.3</td>
<td>26.4</td>
<td>34.1</td>
<td>37.1</td>
<td>46.0</td>
<td>58.3</td>
<td>63.8</td>
<td>79.3</td>
<td>88.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
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<td>Max int pressure (bar)</td>
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<td>275</td>
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<td>Max operating speed1 (rpm)</td>
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<td>2800</td>
<td>2800</td>
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<td>2800</td>
<td>2800</td>
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<td>Max input power2 (kW)</td>
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<td>17.7</td>
<td>22.3</td>
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<td>40.2</td>
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<tr>
<td>Weight (kg)</td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Shaft speed for petroleum based fluids. For higher speeds, please contact Parker Denison
2) 1500 rpm at 240 bar

Vane – Cardan Shaft

Double – T6CCZ

- High radial & axial loads capabilities
- 3 different keyed shafts available
- One inlet
- Displacements = on P1 from 10 to 100 cm³/rev & P2 from 10 to 100 cm³/rev
- Pressure: up to 275 bar on P1 & P2
### Pumps - Fixed Displacement

#### Axial Piston

**F1**
- Intermittent pressures up to 400 bar
- High power capability
- High shaft speed
- Low weight
- Bi-directional
- Volumetric efficiency 98%
- Also SAE-B available sizes 25 up to 61

<table>
<thead>
<tr>
<th>Frame size F1</th>
<th>25</th>
<th>41</th>
<th>51</th>
<th>61</th>
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<tbody>
<tr>
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<td>25.6</td>
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<td>51.1</td>
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<td>2700</td>
<td>2300</td>
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<td>2400</td>
<td>2200</td>
<td>2200</td>
<td>2000</td>
<td>1800</td>
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<tr>
<td>Input torque at 350 bar (Nm)</td>
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<td>227</td>
<td>284</td>
<td>331</td>
<td>453</td>
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<td>8.5</td>
<td>8.5</td>
<td>12.5</td>
<td>12.5</td>
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</tbody>
</table>

* Unloaded pump (BPV)  
** In service 350 bar

**F2**
- Twin Flow / Dual displacement
- High power capability
- High shaft speed
- Easy to install
- Smart System Solutions
- Proven reliability

<table>
<thead>
<tr>
<th>Frame size F2</th>
<th>42/42</th>
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<th>70/35</th>
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<td>55/28</td>
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<td>2550</td>
<td>2550</td>
</tr>
<tr>
<td>Max operating speed** (rpm)</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>1650</td>
</tr>
<tr>
<td>Input torque at 350 bar (Nm)</td>
<td>467</td>
<td>461</td>
<td>589</td>
<td>583</td>
<td>648</td>
</tr>
<tr>
<td>Max cont input power (kW)</td>
<td>88</td>
<td>88</td>
<td>110</td>
<td>110</td>
<td>112</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

* Unloaded pump (BPV)  
** In service 350 bar

**T1**
- Pressures up to 350 bar
- Shaft speed to 2300 rpm
- High overall efficiency
- Bi-directional
- Proven reliability

<table>
<thead>
<tr>
<th>Frame size T1</th>
<th>51</th>
<th>81</th>
<th>121</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>50.0</td>
<td>81.5</td>
<td>118.5</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>2300</td>
<td>2300</td>
<td>2300</td>
</tr>
<tr>
<td>Max operating speed** (rpm)</td>
<td>2100</td>
<td>2000</td>
<td>1600</td>
</tr>
<tr>
<td>Input torque at 200 bar (Nm)</td>
<td>158</td>
<td>258</td>
<td>375</td>
</tr>
<tr>
<td>Max cont input power (kW)</td>
<td>27</td>
<td>54</td>
<td>71</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>7.2</td>
<td>8.5</td>
<td>12.5</td>
</tr>
</tbody>
</table>

* Unloaded pump (BPV)  
** In service 350 bar
Pumps - Fixed Displacement

Axial Piston

F11

- Pressures up to 420 bar
- High overall efficiency (low losses)
- Accept high external shaft loads
- Good resistance to vibrations and temperature shocks
- Proven reliability
- Easy to service
- CETOP, ISO and SAE versions available

<table>
<thead>
<tr>
<th>Frame size F11</th>
<th>05</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>4.9</td>
<td>9.8</td>
<td>12.5</td>
<td>14.3</td>
<td>19.0</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>4600</td>
<td>4200</td>
<td>4000</td>
<td>3900</td>
<td>3500</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>5</td>
<td>7.5</td>
<td>8.2</td>
<td>8.3</td>
<td>11</td>
</tr>
</tbody>
</table>

F12

- Pressures up to 480 bar
- Very high power capability
- High overall efficiency
- Small envelope size
- ISO, SAE and cartridge versions available
- Proven reliability
- Easy to service

<table>
<thead>
<tr>
<th>Frame size F12</th>
<th>30</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>90</th>
<th>110</th>
<th>125</th>
<th>150</th>
<th>250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>30.0</td>
<td>40.0</td>
<td>59.8</td>
<td>80.4</td>
<td>93.0</td>
<td>110.1</td>
<td>125</td>
<td>150.0</td>
<td>242.0</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>420</td>
<td>420</td>
<td>420</td>
<td>420</td>
<td>350</td>
<td>420</td>
<td>420</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>3150</td>
<td>2870</td>
<td>2500</td>
<td>2300</td>
<td>2300</td>
<td>2200</td>
<td>2100</td>
<td>1700</td>
<td>1500</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>12</td>
<td>16.5</td>
<td>21</td>
<td>26</td>
<td>26</td>
<td>36</td>
<td>36</td>
<td>70</td>
<td>77</td>
</tr>
</tbody>
</table>

Boost Unit

BLA

The boost unit provides filtration and make-up fluid to replace pump and motor volumetric losses, while maintaining sufficient pump inlet pressure to avoid cavitation. The semi-closed system could be built with a smaller and lighter reservoir at the same time as, the pump speed is possible to increase. The Boost Units BLA are available in two different sizes:

BLA 4 for flow 25–160 litres per minute,
BLA 6 for flow 150–400 litres per minute.
Pumps - Variable Displacement

Axial Piston

VP1

- Intermittent pressure up to 400 bar
- Suitable for all load-sensing systems
- Splined shaft DIN 5462
- Light and compact
- Mounting flange and shaft meet the ISO Standard
- Strong and reliable
- Less energy – less fuel – less heat

<table>
<thead>
<tr>
<th>Frame size* VP1</th>
<th>45</th>
<th>75</th>
<th>95</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement (cm³/rev)</td>
<td>45</td>
<td>75</td>
<td>95</td>
<td>120</td>
</tr>
<tr>
<td>Max cont pressure (bar)</td>
<td>350</td>
<td>350</td>
<td>400</td>
<td>360</td>
</tr>
<tr>
<td>Max operating speed (rpm)</td>
<td>2400*</td>
<td>2200*</td>
<td>2200**</td>
<td>1900*</td>
</tr>
<tr>
<td>Input power (kW)</td>
<td>63</td>
<td>96</td>
<td>139</td>
<td>137</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>27</td>
<td>27</td>
<td>27</td>
<td>27</td>
</tr>
</tbody>
</table>

* 2 1/2" suction line  ** 3" suction line

Axial Piston & Fixed Vane Combination

Double & Triple

- Variable piston & vane pump combination
- Wide range of displacements:
  - Variable piston unit of 42 cm³/rev (SAE B) or 62 cm³/rev (SAE C)
  - Vane unit from 6 cm³/rev to 158 cm³/rev
- One inlet, one shaft (no internal torque limitations)
- Pressure controls (standard, ventable & ventable by electronic valve, load sensing)
- Very compact unit
- Splined & keyed shafts available
- 10 frame size available
## Directional Control Valves

### Load Sensing Valves

- **Product type**: Load Sensing
- **Product name**: P70LS
- **No of sections**: 10

### Constant Flow Valves

- **Product type**: Constant Flow
- **Product name**: P70CF
- **No of sections**: 11

Parker Directional Control Valves have built-in functionality that support Truck market applications. See details in spreadsheet below.

<table>
<thead>
<tr>
<th>Product type</th>
<th>Load Sensing</th>
<th>Constant Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensator Y/N</td>
<td>No Compensator</td>
<td>P70CF</td>
</tr>
<tr>
<td>Product name</td>
<td>P70LS</td>
<td>L90LS</td>
</tr>
<tr>
<td>No of sections</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

### Covers

- Pump flow (l/min): 90 | 200 | 160
- Section flow (l/min): 90 | 125 | 120
- Pump port (bar): 320 | 320 | 280
- Work port (bar): 350 | 350 | 320
- Tank port (bar): 20 | 20 | 15
- Threaded ports: x | x | x
- By-pass: x
- Copy spool in inlet: x
- Counter pressure: x
- Pilot reducer: x | x | x
- Pump protection: x | x | x
- Pump unloading: x
- Pump blocking: x

### Sections

- Port reliefs: x | x | x
- Main spool: x | x | x
- Boost / Margin control: x
- Force feedback: x
- Pressure control: x
- Signal lines: x
- Priority function: x
- LS pick up system: x | x | x
- LS compensator spool: x
- AS compensator spool: x
- Flowsharing compensator spool: x
- Feed reducer, individually: x
- Feed reducer, commonly: x

### Controls

- Manual: x | x | x
- Pneumatic: x
- Hydraulic: x | x | x
- Electro-hydraulic: x | x | x
- On-board electronics: x
Remote Control System

Pneumatic

VP04

- Pneumatic pilot valve
- Proportional
- Linear or joystick hand control
- For controlling valves

<table>
<thead>
<tr>
<th>System Type</th>
<th>Pneumatic Pilot Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control pressure range</td>
<td>0–8 bar</td>
</tr>
<tr>
<td>Control flow</td>
<td>max. 7 nl/s</td>
</tr>
<tr>
<td>Control curves with straight characteristics</td>
<td>X</td>
</tr>
<tr>
<td>Friction brake for retention in any position</td>
<td>X</td>
</tr>
<tr>
<td>Mechanical end-position detent</td>
<td>X</td>
</tr>
</tbody>
</table>

Hydraulic

PCL4

- Hydraulic pilot valve
- Proportional
- Linear hand / foot control
- Joystick hand control
- For controlling valves, pumps or motors

<table>
<thead>
<tr>
<th>System Type</th>
<th>Hydraulic Pilot Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control pressure range</td>
<td>1–75 bar</td>
</tr>
<tr>
<td>Control flow</td>
<td>max. 15 l/min</td>
</tr>
<tr>
<td>Max supply pressure</td>
<td>100 bar</td>
</tr>
<tr>
<td>Individual control characteristics for each direction</td>
<td>X</td>
</tr>
<tr>
<td>Selectable start and final pressures</td>
<td>X</td>
</tr>
<tr>
<td>Selectable lever force</td>
<td>X</td>
</tr>
<tr>
<td>Curves with straight characteristics</td>
<td>X</td>
</tr>
<tr>
<td>Curves with two-step characteristics</td>
<td>X</td>
</tr>
<tr>
<td>Curves with forced opening (final step)</td>
<td>X</td>
</tr>
<tr>
<td>Friction brake for retention in any position</td>
<td>X</td>
</tr>
<tr>
<td>Mechanical or solenoid end position detent</td>
<td>X</td>
</tr>
</tbody>
</table>

Electrohydraulic

PVC6

- Proportional pressure reducing valve assembly
- Up to 6 solenoid sections
- Converts electric current to hydraulic pressure
- For 12 or 24 Volt
- Used to control mobile directional control valves
Remote Control Systems

Electronic units

The state-of-the-art IQAN system is a unique, totally electronic approach that replaces mechanical and electromechanical systems for controlling and monitoring hydraulics in mobile machines. With Parker’s IQAN, you have complete freedom to design customized software without the need for advanced programming skills.

The flexible functions available within the IQAN system allow sophisticated applications to be programmed and optimized very quickly, enabling huge savings on development time - and cost. The IQAN software tools cover all phases of a machine’s life cycle, from development through production to after sales.

Functional safety

The robust hardware, built in error-detection and the high-level development tool IQANdesign, are important factors that reduce the risk of dangerous faults in the machine.

For applications with high demands on safety function, such as overload prevention or wheel steering, the IQAN-MC3 is the state-of-the-art choice. The IQAN-MC3 is a controller developed in accordance with IEC 61508, for safety functions requiring up to SIL2.

Components

Remote diagnostics

When a modem is fitted to the machine, it allows for remote diagnostics with the same powerful diagnostic features as when connected locally.

<table>
<thead>
<tr>
<th>System Types</th>
<th>IQANdesign platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANbus Master</td>
<td>IQAN-MD4, IQAN-MD3, IQAN-MC2, IQAN-MC3</td>
</tr>
<tr>
<td>CANbus Modules</td>
<td>IQAN-XA2, IQAN-XS2, IQAN-XS3, IQAN-XT2, IQAN-XC10, IQAN-G2</td>
</tr>
<tr>
<td>CANbus Joysticks</td>
<td>IQAN-LC5-C01, IQAN-LM</td>
</tr>
<tr>
<td>Analog Joysticks</td>
<td>IQAN-LC6, IQAN-LSL, IQAN-LST, IQAN-LF1, IQAN-LC5-X05</td>
</tr>
<tr>
<td>Sensors</td>
<td>IQAN-SP035, IQAN-SP500, IQAN-SENSORS</td>
</tr>
</tbody>
</table>

The IQAN software studios cover all phases of a machine’s life cycle, from development through production to after sales. The main philosophy behind the IQAN Software Studios is that the OEM, with their extensive knowledge of their machine’s life cycle, should be able to create software that makes their product perform at top level, easy to produce and giving the end user maximum up-time. All this can be achieved without any previous programming experience – anyone who knows what functions are needed can learn to build them in a remarkably short time.

IQANdesign - Development tool for application software
IQANsimulate - For simulation during development, but also for training of service technicians and operators
IQANrun - Service tool, used both in production line and as a powerful diagnostic tool for field service
IQANscript - Scripting of IQANrun operations for production and field service
IQANcustomize - Enhance the look and feel of the service tool IQANrun, to make it OEM specific.
Auxiliary Valves - Threaded Cartridge Valves

### Directional Control Valves

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Max Working Pressure (bar)</th>
<th>Flow Capacity (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual valves</td>
<td>240</td>
<td>50</td>
</tr>
<tr>
<td>Manual three-way valves</td>
<td>240</td>
<td>25</td>
</tr>
<tr>
<td>Manual four-way valves</td>
<td>240</td>
<td>8</td>
</tr>
<tr>
<td>Pilot operated valves</td>
<td>240</td>
<td>40</td>
</tr>
<tr>
<td>Solenoid, poppet-type, two-way valves</td>
<td>345</td>
<td>265</td>
</tr>
<tr>
<td>Solenoid, poppet-type, bi-directional valves</td>
<td>345</td>
<td>20</td>
</tr>
<tr>
<td>Solenoid, spool-type, two-way valves</td>
<td>345</td>
<td>75</td>
</tr>
<tr>
<td>Solenoid, spool-type, three-way valves</td>
<td>345</td>
<td>65</td>
</tr>
<tr>
<td>Solenoid, spool-type, four-way valves</td>
<td>345</td>
<td>30</td>
</tr>
<tr>
<td>Double solenoid, spool-type, four-way valves</td>
<td>345</td>
<td>25</td>
</tr>
</tbody>
</table>

### Proportional Control Valves

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Max Working Pressure (bar)</th>
<th>Flow Capacity (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid operated, two-way NC or NO proportional flow control valves</td>
<td>207</td>
<td>225</td>
</tr>
<tr>
<td>Solenoid operated, two-way NO, proportional pressure control valves</td>
<td>207</td>
<td>150</td>
</tr>
<tr>
<td>Solenoid operated, two-way NC throttle valves</td>
<td>207</td>
<td>20</td>
</tr>
<tr>
<td>Solenoid operated, proportional pressure reducing valves</td>
<td>207</td>
<td>40</td>
</tr>
<tr>
<td>Solenoid operated, three-way, proportional pressure control valves</td>
<td>207</td>
<td>11</td>
</tr>
</tbody>
</table>
### Auxiliary Valves - Threaded Cartridge Valves

#### Load Holding Valves

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Max Working Pressure (bar)</th>
<th>Flow Capacity (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterbalance valves</td>
<td>345</td>
<td>0–750</td>
</tr>
<tr>
<td>Check valves</td>
<td>345</td>
<td>0–375</td>
</tr>
<tr>
<td>Soft seat check valves</td>
<td>207</td>
<td>0–60</td>
</tr>
<tr>
<td>Vent-to-open check valves</td>
<td>240</td>
<td>0–225</td>
</tr>
<tr>
<td>Pilot-to-close check valves</td>
<td>240</td>
<td>0–150</td>
</tr>
<tr>
<td>Single pilot operated check valves</td>
<td>207</td>
<td>0–190</td>
</tr>
<tr>
<td>Double pilot operated check valves</td>
<td>207</td>
<td>0–190</td>
</tr>
<tr>
<td>Shuttle valves</td>
<td>240</td>
<td>0–25</td>
</tr>
</tbody>
</table>

#### Pressure Control Valves

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Max Working Pressure (bar)</th>
<th>Max Setting Pressure (bar)</th>
<th>Flow Capacity (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct acting relief valves</td>
<td>345</td>
<td>345</td>
<td>0–150</td>
</tr>
<tr>
<td>Cross-over relief valves</td>
<td>240</td>
<td>240</td>
<td>0–75</td>
</tr>
<tr>
<td>Dual relief with anti-cavitation checks</td>
<td>345</td>
<td>345</td>
<td>0–60</td>
</tr>
<tr>
<td>Pilot operated relief valves</td>
<td>345</td>
<td>345</td>
<td>0–375</td>
</tr>
<tr>
<td>Pressure sensing valves</td>
<td>345</td>
<td>345</td>
<td>0–190</td>
</tr>
<tr>
<td>Reducing/releasing valves</td>
<td>345</td>
<td>345</td>
<td>0–150</td>
</tr>
<tr>
<td>Direct acting pressure reducing valves</td>
<td>345</td>
<td>345</td>
<td>0–60</td>
</tr>
<tr>
<td>Pressure reducing valves</td>
<td>345</td>
<td>345</td>
<td>0–60</td>
</tr>
<tr>
<td>Pressure reducing spools</td>
<td>345</td>
<td>345</td>
<td>0–19</td>
</tr>
<tr>
<td>Sequence valves</td>
<td>345</td>
<td>345</td>
<td>0–150</td>
</tr>
<tr>
<td>Unloading relief valves</td>
<td>240</td>
<td>207</td>
<td>0–6</td>
</tr>
<tr>
<td>Logic elements</td>
<td>250</td>
<td>250</td>
<td>0–19</td>
</tr>
<tr>
<td>Thermal relief</td>
<td>250</td>
<td>250</td>
<td>0–30</td>
</tr>
</tbody>
</table>

#### Flow Control Valves

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Max Working Pressure (bar)</th>
<th>Max Flow Setting (l/min)</th>
<th>Flow Capacity (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needle valves</td>
<td>240</td>
<td>0–190</td>
<td></td>
</tr>
<tr>
<td>Rotary adjust needle valves</td>
<td>240</td>
<td>0–60</td>
<td></td>
</tr>
<tr>
<td>Flow divider/combiner valves</td>
<td>207</td>
<td>0–45</td>
<td></td>
</tr>
<tr>
<td>Pilot control flow control valves</td>
<td>207</td>
<td>0–60</td>
<td></td>
</tr>
<tr>
<td>Flow control valves</td>
<td>240</td>
<td>0–45</td>
<td></td>
</tr>
<tr>
<td>Restrictive-type, pressure compensated valves</td>
<td>240</td>
<td>0–150</td>
<td></td>
</tr>
<tr>
<td>Priority-type, pressure compensated valves</td>
<td>240</td>
<td>0–40</td>
<td>0–60</td>
</tr>
<tr>
<td>Restrictive-type, pressure compensated flow regulator valves</td>
<td>240</td>
<td>0–60</td>
<td></td>
</tr>
<tr>
<td>Priority-type, pressure compensated flow regulator valves with relief</td>
<td>240</td>
<td>0–35</td>
<td>0–60</td>
</tr>
<tr>
<td>Velocity fuses</td>
<td>207</td>
<td>0–30</td>
<td></td>
</tr>
</tbody>
</table>
### Auxiliary Valves

#### Threaded Cartridge Valves

Directly controlled pressure-relief valves with anti-cavitation function. The valves have good pressure characteristics together with very short reaction times. They are compact, tight, reliable and not sensitive to contamination.

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Max Working Pressure bar</th>
<th>Max Setting Pressure bar</th>
<th>Flow Capacity l/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure relief valves</td>
<td>600</td>
<td>25-550</td>
<td>0-350</td>
</tr>
</tbody>
</table>

### Auxiliary Valves

Parker’s stackable selector valve is operated by a wet pin solenoid. The valve is capable of switching from one circuit to another at a variety of flows and pressures. If more than two circuits are to be controlled then additional units can be stacked together. Alternatively, the valve can be connected to a pump and used to direct the flow to either one of two different circuits.

- Stackable
- Reduce pipe work
- Reduce number of fittings
- Reduce number of directional control valves spool sections

The pressure reducing valve is of three-way design.

- Compact
- Easy to adjust
- Factory set and sealed

The sequence valve is designed to open or close a hydraulic pilot signal when it reaches a predetermined pressure level.

- Compact
- Several pressure ranges available
- Can be factory set and sealed

The shuttle valve enables two signal flows in a hydraulic system to be directed alternately into a common service line. The flow with the highest pressure takes priority.

- Small dimensions
- Rapid switching
- Negative overlapping
- Reacts on very small flows
- Minimal leakage

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Max Working Pressure bar</th>
<th>Flow Capacity l/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stackable, 2-position, 4-way, solenoid operated, circuit selector control valves</td>
<td>210</td>
<td>40</td>
</tr>
<tr>
<td>Pressure reducer valve</td>
<td>250</td>
<td>25</td>
</tr>
<tr>
<td>Sequence valve</td>
<td>250</td>
<td>25</td>
</tr>
<tr>
<td>Shuttle valve</td>
<td>250</td>
<td>20</td>
</tr>
</tbody>
</table>
Hydraulic Manifold Blocks

Hydraulic Cartridge Systems

Hydraulic Manifold Blocks are designed to meet the many demands on mobile hydraulic equipment. Manifold blocks offer you the following benefits:

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

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 by Parker include:

- Directional Control Valves
- Logic Elements and Flow Controls
- Pressure Controls
- Proportional Valves
- Powershift Transmission Controls
- Load Holding Valves

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

When you need finished integrated hydraulic circuits with extremely short lead times, the Parker ‘Speed Shop’ is the place to go. Parker’s expert application engineers along with the latest computer-aided design technology can bring advanced new custom products to market faster.

The solution to your problem is only minutes away when Parker’s Quick Design proposals and quotes that are created using 3D CAD. Once the design is finalized, the ‘Speed Shop’ process is further streamlined by utilizing electronic communications and approvals. When design specifications meet customer requirements, Parker’s CAD linked prototype machining produces fully functional hydraulic integrated circuits. All prototypes are fully tested and documented before being released to production. In today’s highly competitive market, speed and quality are critical for success.
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 00800 27 27 5374

**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 & actuators
- Engine systems & components
- Fluid conveyance systems & components
- Fluid metering, delivery & absorption devices
- Fuel systems & components
- Fuel tank lining 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
- CO₂ controls
- Electronic controllers
- Filter dryers
- Hand shut-off valves
- Heat exchangers
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Small pumps
- Suction valves
- Thermostatic expansion valves

**Electromechanical**

**Key Markets**
- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastic machinery & converting
- Primary metals
- Semiconductors & electronics
- Textile
- Wire & cable

**Key Products**
- AC/DC drives & systems
- Electric actuators, gatways & robots & drives
- Electrohydraulic actuation systems
- Electromechanical actuation systems
- Fluid condition monitoring systems
- Hydraulic & fluid filtration
- Hydrogen & nitrogen & zero air generators
- Instrumentation filters
- Membrane & & filters
- Microfiltration
- Sterile air filters
- 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
- Misting systems & power cables
- PTFE, hose & tubing
- Quick couplings
- Rubber & thermoplastic hose
- Tubing fittings & adapters
- Tubing & plastic fittings

**Hydraulics**

**Key Markets**
- Aerial lift
- Agriculture
- Bulk & chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Life sciences
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**Pneumatics**

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

**Key Products**
- Accumulators
- Cartridge valves
- Electrohydraulic actuators
- Human machine interfaces
- Hinged doors
- Hydraulic cylinders
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Hydraulic steering
- Integrated hydraulic circuits
- Power take-offs
- Power units
- Rotary actuators
- Sensors

**Process Control**

**Key Markets**
- 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 tubing fittings
- Precision industrial regulators & flow controllers
- Process control double block & bleed
- Process control fittings, valves, regulators & manifold valves

**Key Products**
- Alternative fuels
- Biopharmaceuticals
- Chemical & refining
- Food & beverage
- Marine & shipbuilding
- Medical & dental
- Microelectronics
- Nuclear Power
- Oil & gas equipment preparation
- Power generation
- Pulp & paper
- Steel
- Water/wastewater

**Filtration**

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

**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-mechanical fluid sealing
- EMI shielding
- Extruded & precision cut, fabricated elastomeric seals
- High temperature metal seals
- Homogeneous & inserted elastomeric shapes
- Medical device fabrication & assembly
- Metal & plastic retainers
- Composite seals
- Shielded optical windows
- Silicone tubing & extrusions
- Thermal management
- Vibration damping
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• Win® XP, SP3
• 128 MB of RAM (512 MB recommended)

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To View the DVD
The document viewer application will launch, and the opening page will appear on your monitor. If the application does not start when you have inserted the disc, right-click on the DVD icon in the Explorer view and select Explore. Double click on start.bat and the application will launch.

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