



RENEWABLE ENERGY - HYDROPOWER

Innovative solutions that harness the power of water



ENGINEERING YOUR SUCCESS.

Hydropower innovations that add value

Parker offers systems and intelligent solutions that reduce costs from the outset of the build phase through operation and maintenance. By working with Parker, you'll benefit from collaborative engineering at the beginning of the project and field support through the entire construction cycle. Our advanced hydraulic, pneumatic, electromechanical, and sealing technologies help realize hydropower as a viable source of renewable energy, minimizing cost and installation time while maximizing safety. For example:

- Our proprietary **Global Shield Coating Technology** for steel cylinder rods offers significantly increased corrosion protection for longer component field life, but is not as expensive as investing in stainless steel.
- **Parker F37 / CPS Piping Solutions** eliminate welded pipe connections, increasing safety and decreasing installation time.
- The **Parker Tracking System (PTS)** reduces asset downtime as well as the efforts of the maintenance staff when replacing products such as ruptured hoses.



Parker Tracking System

See more Parker innovations on the Engineered Solutions pages.

Condition-based monitoring and diagnostics

To maximize productivity and efficiency, power plant management is investing heavily in condition monitoring and predictive maintenance products and systems that can identify and eliminate potential problems. Parker offers in-depth expertise in this area with:

- **icountPD Online Particle Detector:** The most up-to-date technology in solid particle detection for independent, real-time monitoring of system contamination trends.



- **Parker Kittiwake On-site Heated Viscometer:** On-site oil analysis detects out-of-spec fuels or lubricants before equipment damage occurs.



- **Parker Kittiwake ANALEX fdMplus Ferrous Debris Monitor:** Measures uncombined ferrous wear metal particles in oil or grease samples.



- **Parker Kittiwake Acoustic Bearing Checker:** Monitors high frequency Acoustic Emissions (AE) signals naturally generated by deterioration in rotating machinery.



ENGINEERING YOUR SUCCESS.

Micro-hydro: Harnessing the power of small rivers

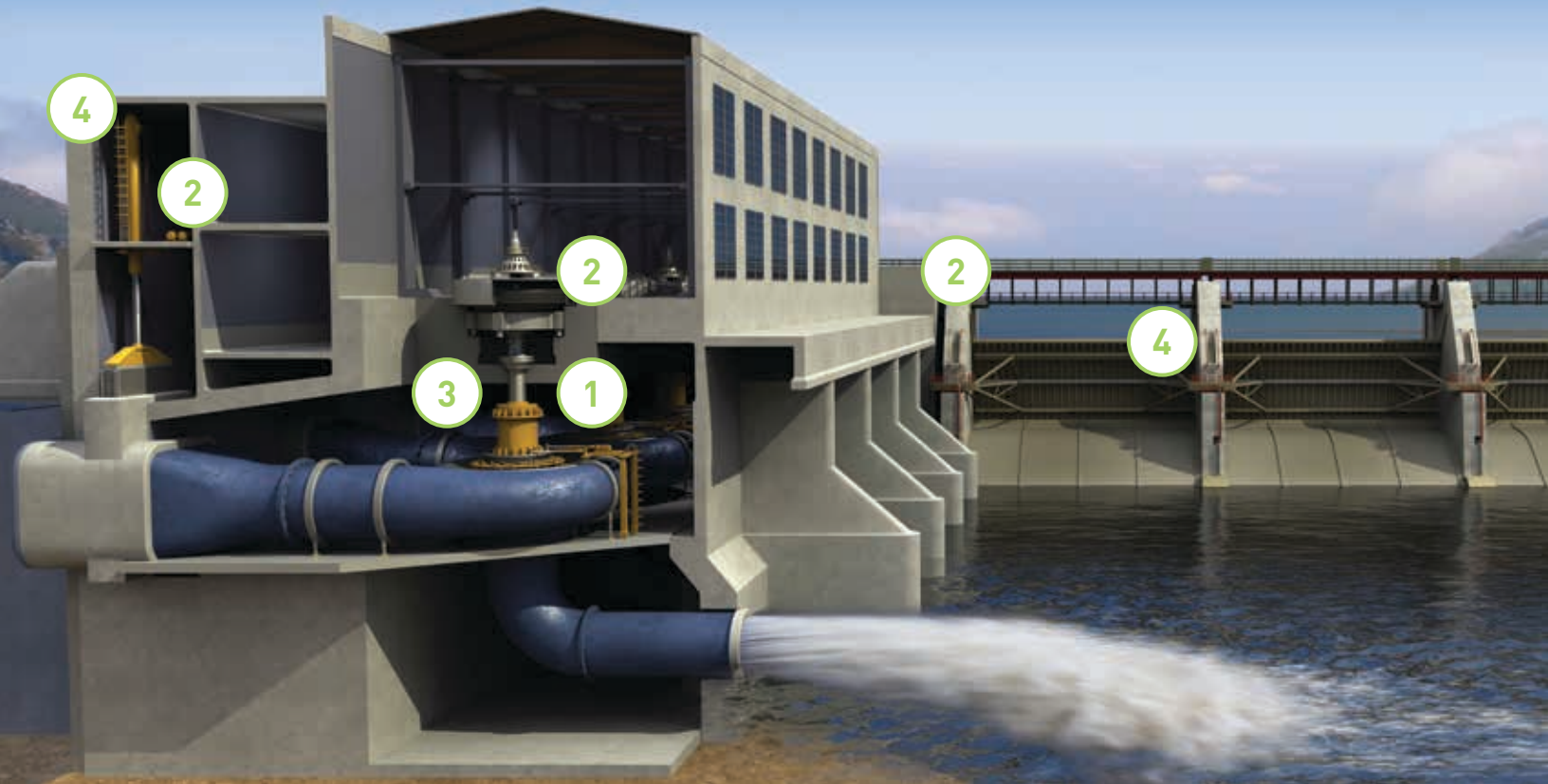
By transferring the power of flowing water from small rivers into rotational movement and spinning a generator, electricity in the magnitude of kilowatts is produced.

Varying river flows result in inconsistent generator speeds, which prevent the generation of electricity at a constant frequency. Rather than regulating water flow to control the generator speed, a more cost-effective approach is to apply the generated power to a conversion system incorporating a Parker grid tie inverter that will then produce regulated AC output at grid frequency. The core of the power conversion system, Parker's AC890PX Inverter provides quality power by incorporating an advanced pulse-width modulated switching technology, automatically synchronizing to the AC power grid.

In addition to micro-hydro, higher power applications like wave buoys and tidal turbines can utilize Parker grid tie inverters in the megawatt range. With over 100 megawatts of grid tie inverters deployed, Parker offers experience and expertise in power conversion in the energy segment.

Parker in Hydropower

Whatever the water generation method, Parker is there with a wide range of motion and control systems and components that further the science of water energy. From cylinders that move the wicket gates in “mega-dam” hydro installations ... to power conversion systems that harness the energy of varying river flows ... Parker has the experience, products, and technical competence needed to deliver consistent, regulated power.



Look to Parker for these hydro solutions:

1 Hydraulic controls for turbines and generators
Modern turbine governing systems rely extensively on hydraulic systems for high power density and precise position control. Parker's Intellinder™ Cylinder, custom cylinder capabilities, and high performance DF Plus Proportional Valves provide superior control along with robust operation.

2 Fluid conveyance
Parker's F37 family of non-welded piping solutions reduces potential failure points from traditional welded pipe systems. Parker stainless E02 fittings provide leak-free connections for standard tubes. Parker is also the global leader for medium- and high-pressure hydraulic hoses, available with stainless steel connections.

3 Bearing lube oil system
Bearings used in hydro-electric turbines require clean fluid for trouble-free operation. Parker can provide in-line filtration solutions or complete kidney loops for continuous off-line filtration. We also recommend using Parker reservoir vent filters or isolation systems to prevent the ingress of harmful particles into the lube oil system.

4 Gate actuation
Hydraulics are used to control the main inlet valve, outlet, flood, and Tainter gates, and trash racks. Parker manufactures highly engineered, custom cylinders to operate gates. We can provide all required plumbing for gate systems with our F37 piping solutions. Parker also has global capabilities to design and build custom hydraulic power units.



>> Specially Designed Cylinders

Situation:

Hydraulic cylinders are critical components of many hydro installations and ocean devices that must deliver reliable performance under tough conditions.

Solution:

Parker designs and builds customized special cylinders – whether long stroke gate cylinders or large bore MIV cylinders – that deliver long-term performance for all hydro plant applications. And when maintenance is required, Parker has the sealing kits as spare parts.



>> Hydraulic Systems

Situation:

In an environment where leveled cost of energy is the overall greatest influencing factor in the success or failure of a project, reliability becomes a critical element. A reliable hydraulic system is a must.

Solution:

Hydraulic systems and power units designed and built by Parker with Parker's high quality components assure longest system uptime for increased field life. Plus maintenance can be planned, part sourcing is easy, and running costs are kept low.



>> Fluid Connectors

Situation:

Most fluid system failures resulting in expensive and unplanned repairs originate from leaking connectors or failed hoses.

Solution:

With pressure ratings up to 4,000 bar and bore sizes up to 6", Parker offers the world's largest selection of approved and tested hoses, fittings and couplings for reliable, leak-free connections that minimize the cost of downtime and protect the environment.



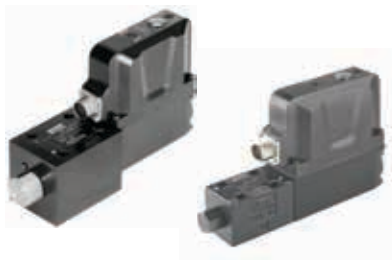
>> Accumulators

Situation:

When hydraulic system stability or reserve power for peak requirements or emergency shutdowns is required, hydraulic accumulators are essential.

Solution:

Parker's complete range of CE-approved piston, bladder, and diaphragm accumulators allow high pressure dynamic control of the system, reducing cost through greater system efficiency, longer system life, less noise, and no need for smaller pumps.



>> DF Plus Proportional Valves

Situation:

Traditional torque motor style servovalves are commonly used to position governor controls in hydropower turbine speed regulation. Servovalves are especially sensitive to contamination and can experience uncontrolled failure modes.

Solution:

Parker DF Plus high dynamic proportional valves are ideally suited for governor controls. Dirt tolerant, they offer a defined fail-safe mode upon loss of power, making them the best choice to optimize turbine speed control and provide precise control of wicket gates.



>> Parflange® F37 Non-Welded Systems – Complete Piping Solution (CPS)

Situation:

Welded piping systems are expensive, time consuming, high in particulate contamination, and hazardous for both workers and the environment.

Solution:

Non-welded high and low pressure metal pipe connection systems and turnkey services from a single, global source. Non-welded piping systems are cleaner, quicker to install, safer for workers and the environment, and require fewer interconnects, saving both time and money. Parker CPS global piping centers provide engineering, installation, and flushing services.



>> Intellinder™ Intelligent Hydraulic Cylinder

Situation:

Time-consuming gun drilling adds cost to cylinder installation for gate actuation and governance; plus unprotected external sensors with complex linkages are prone to damage.

Solution:

New “smart cylinder” equipped with Absolute Position Sensors signals absolute positioning rather than position relative to the starting location of the rod. Eliminates time and costs associated with gun drilling and unprotected external sensors with complex linkages. Installation is virtually plug-and-play. IP65 rated.



>> ATSUKAN Servo for Hydro Governor Control

Situation:

Governor and valve actuator systems use large, energy-consuming power units, often requiring a great deal of pipe and consumables.

Solution:

Parker ATSUKAN EHA is an efficient, all-in-one, electricity-to-action hydraulic cylinder servo system. It is smaller in size, requires little or no piping, and uses a fraction of the consumables, as well as much less power. This results in reduced installation and MRO time and cost.



>> Wicket Gate Servomotor

Situation:

Older, original hydraulic actuators / servomotors for wicket gate actuation are causing significant downtime and maintenance. This affects turbine speed control performance.

Solution:

Parker custom cylinders “drop-in” for easy installation and include semiautomatic rod-locking design, upgraded materials, and commercially available, high performance seals, resulting in less downtime, lower maintenance costs, longer life, and improved turbine speed control performance.



>> SensoNODE Low Energy Wireless Monitoring

Situation:

On-site monitoring, diagnosing, and managing a variety of equipment for temperature, pressure, and flow is both expensive and labor-intensive.

Solution:

Wireless pressure, temperature, and humidity sensors work with a mobile app to quickly, easily, and cost-effectively monitor a variety of equipment, media, and applications. Easy installation – just locate, place, and monitor. In-app diagnostic tools provide alert notifications and trending.



>> Sentinel Portable Oil Purification System

Situation:

Moisture in hydraulic oils leads to degradation of the hydraulic components and significantly reduces the field life of the system.

Solution:

With Parker’s Sentinel oil purification system, the oil in the system is constantly monitored and kept dry.

LEARN MORE

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