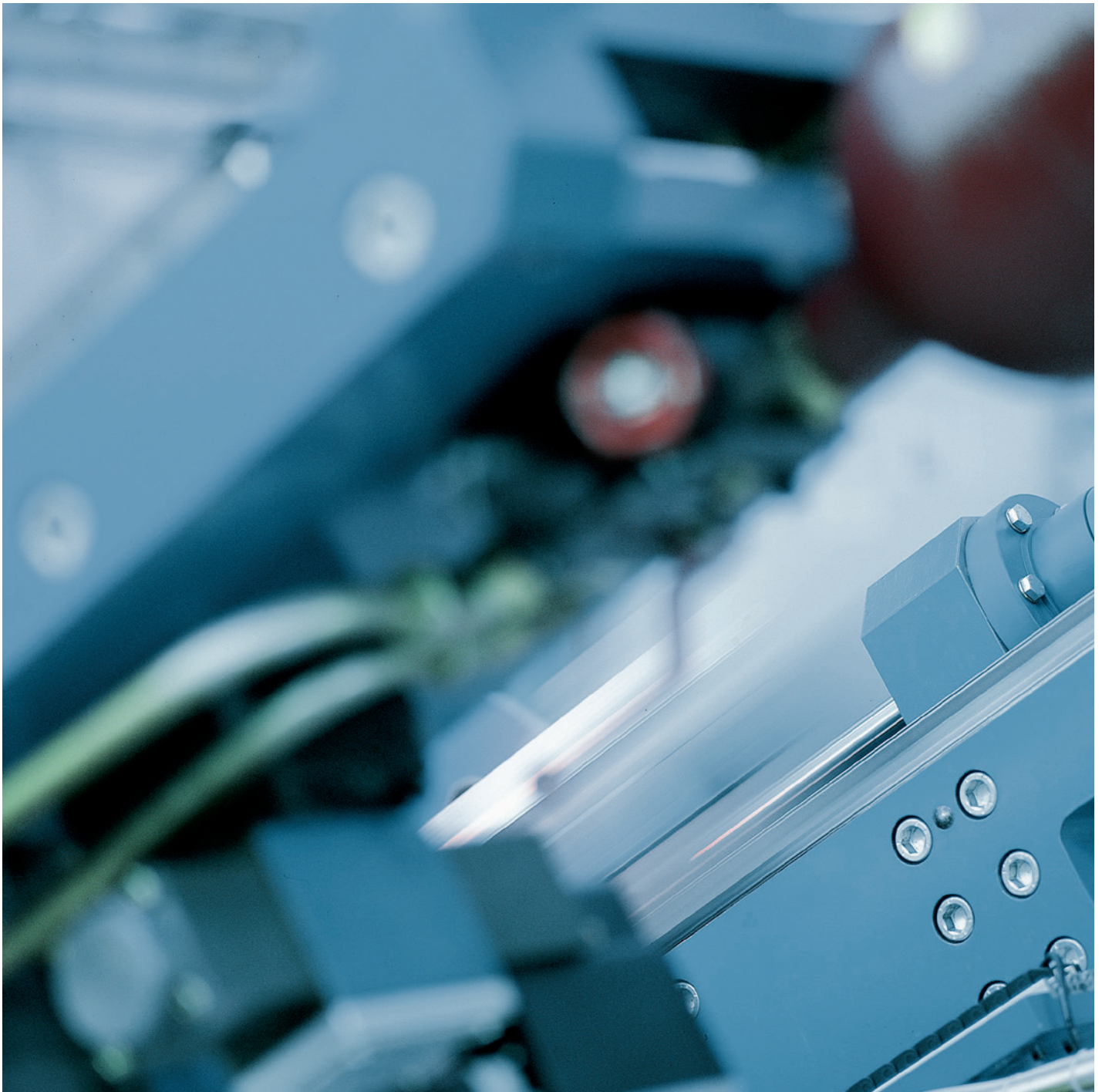


Intelligent Hydraulics in New Dimensions. Industrial Hydraulics from Rexroth





You Have Our Full Support. Our Dedication is to Your Success

With its extensive product range and outstanding application expertise, Rexroth is the technological and market leader in industrial hydraulics. You benefit from the world's broadest range of standard products, application-adapted products, and special customized solutions for industrial hydraulics. Teams operating worldwide engineer and deliver complete turnkey systems. Rexroth is the ideal partner for the development of highly efficient plant and machinery—from the initial contact through to commissioning and for the application's entire life cycle. Extra quality is ensured by Rexroth's internal quality standards that go beyond the ISO standards and extends our performance specifications consistently to the upper limits. It is precisely in international large-scale projects and research projects that the company's financial strength forms a firm foundation. All over the world, Rexroth can provide you with skilled advice, support, and exceptional service—with its own distribution and service companies in 80 countries.

If You Expect Quality, You're in Good Hands With Rexroth

As the world's leading supplier of industrial hydraulics, Rexroth occupies a prominent position with its parts, systems and specially adapted electronic components. With Rexroth, builders of machines and plant have access to products that consistently set new standards of performance and quality.

Rexroth's Industrial Hydraulics division located in Bethlehem, Pennsylvania designs and manufactures high-performance, high-productivity hydraulic power units, systems and components using world-class technologies. Rexroth supports applications in the machine tool and plastics processing machinery, metal forming, civil engineering, power generation, test machinery and simulation, entertainment, presses, automotive, transportation, marine and offshore technology, and wood processing markets.

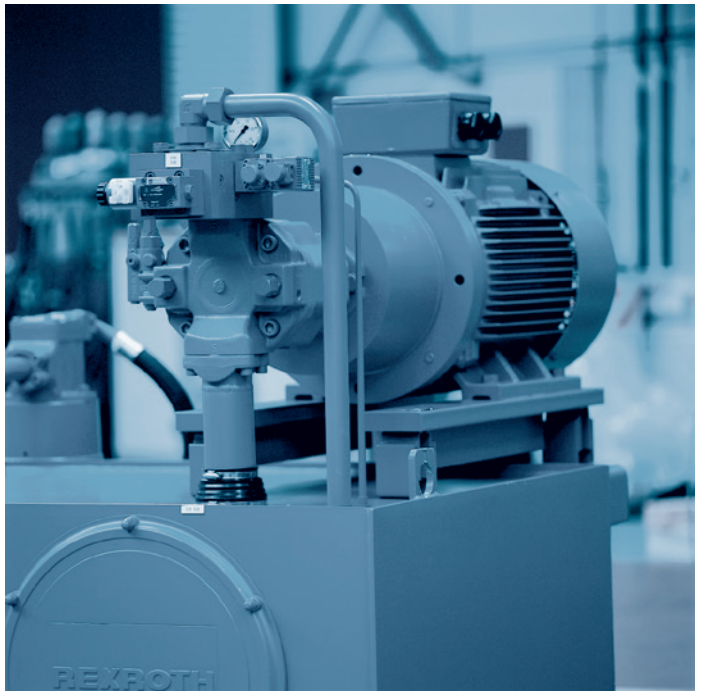
Rexroth serves its customers through an extensive stocking distributor network. Our distributors are the best trained technical sales team in the industry.

Pursuing a comprehensive understanding of these application areas and working closely with customers, our engineers have developed unique electrohydraulic innovations in control technology. The result is hydraulic drives and controls with greater precision, dependability, and reliability.

Our goal is to provide our customers with unique solutions, based on our applications know-how and engineering expertise. This close customer-engineer relationship is supported by six regional centers and ten technical offices which allows us to identify your needs, develop solutions, and provide the unmatched service support that gives you a sustainable competitive advantage.



Behind Every Good Application is a Good Product. And Intelligent Engineering





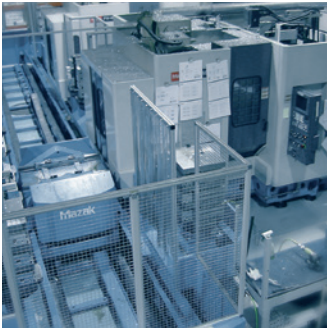
Rexroth's industrial hydraulics product line is as broad, complete, and versatile as the markets we serve. Whether your needs are in the automotive, plastics, presses, marine, offshore, machine tool, wood industry, or power generation markets, or you're a civil, mechanical, or control engineer, Rexroth's engineering expertise is ready to assist with your hydraulic and control challenges utilizing the full complement of products Rexroth can offer.



Our full line of standard valves, high response proportional technology, hydraulics pumps and motors, and cylinders are backed by the quality and performance you've come to rely upon for your innovative control applications. If your application could benefit from customization, our engineers are available to help you design a custom power unit solution utilizing application know-how and machine knowledge cultivated through years of experience. And as the industry leader in hydraulic technology, we're ready to bring our world-class product innovations to provide correct solutions with products that achieve maximum productivity for your applications.



Manufacturing Facilities

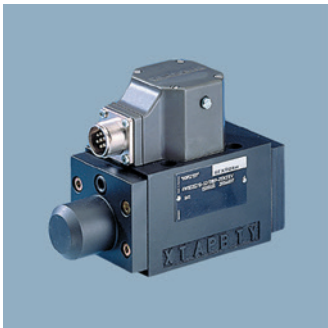
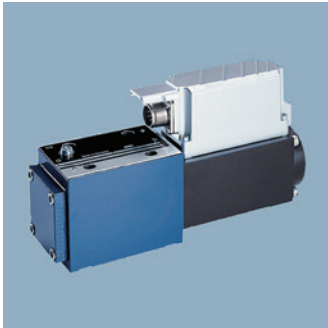


Of the thousands of Rexroth industrial hydraulic products offered worldwide, many are manufactured domestically in our Bethlehem, PA facility. Bethlehem is a major participant in the Rexroth Global Manufacturing Network. Within this network, identical machines, materials and processes are developed and utilized to guarantee product of consistent form, fit, and function worldwide.

Rexroth Bethlehem's manufacturing capability ranges from high volume CNC machining, robotic handling, and computer assisted testing of valves, manifolds, and cylinders to fabrication of power units and piping systems exceeding 10,000 horsepower!

Rexroth products, which are manufactured in our 275,000 square foot facilities, are supported by hundreds of experienced and highly trained team members. The consistently improving quality of every team member, material, machine, and process is certified by our ISO 9001 Lloyd's Registry. In Bethlehem we guarantee satisfaction with our products and services.

Proportional Valves and Electronics



Rexroth offers a complete line of proportional, servo solenoid, and “flapper jet” style servo valves. This total program includes directional, pressure, flow, and throttling valves with options including integral feedback, external or integrated electronics,

and enhanced capabilities on board for “closed loop” applications. Coupled with a full array of analog and digital amplifiers and controllers, Rexroth offers basic control amplifiers through bus-specific capable controllers.

Several electrohydraulic valves have integrated amplifiers. However, in the Rexroth portfolio, external amplifiers are also available to optimize valve performance. Many of these provide additional features to enhance system operation. Additional electronic cards provide closed

loop controllers, various control system modules, card holders, power supplies, and test units.

Proportional Amplifiers

Proportional solenoids need electronic amplifiers to regulate the variable power through the full range of control. Amplifiers can also provide ramp time settings to limit acceleration, preset potentiometers, and fault-detection features. Rexroth amplifiers are calibrated and optimized for corresponding product families. This greatly reduces the need for field adjustments and provides maximum performance.

Servo Amplifiers

Servo amplifier cards convert an input signal to a control current to drive the servo valve torque motor. Several amps feature an integrated PID (proportional, integrator, derivative) control circuit which allows tuning for optimum performance of position control, pressure, or constant velocity circuits. With the added ability to combine the PI, PD, or PID controls, complete versatility is assured.

Control System Components

Building a complete control solution may require various signal conditioners, relays, and other electronic devices. Rexroth provides many of these items to simplify total system integration.

Card Holders, Power Supplies, and Accessories

Many of the valve amplifiers can be mounted in card racks or plugged into individual card holders for panel mounting. Card holders can be clipped onto 35mm DIN rail or mounted by through-holes. Power supplies in various sizes provide the 24 vdc or ± 15 vdc required by most electrohydraulic valving. Transducers and other electronic accessories are also available from Rexroth.

Pumps & Motors and Accumulators



Pumps – Rexroth has a complete line of hydraulic pumps that serve virtually every industry. Applications include: railway engineering, chemical process plants, power and environmental engineering, automotive engineering, plastics processing machinery, paper industry, presses, test rigs and simulation systems, marine/offshore engineering, special projects, civil/water engineering, transportation technology, and machine tools.

You may select from our complete range of bent axis pumps; swashplate pumps; and gear (external and internal), vane (variable displacement and fixed), and radial piston pumps.

Pump accessories help keep your systems operating safely and at maximum efficiency. Modular concepts for pump controls provide flexibility; port relief and cross-port relief valves, mounting flanges, brackets, and adapters make installation easier and faster, too.

Rexroth electronics make monitoring and control easier and more effective.

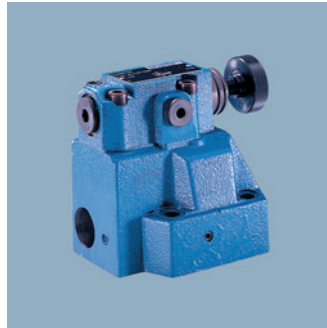
Electrical amplifiers convert low-current control signals into signals to drive solenoids or proportional pressure controllers. Regulators and monitors, including speed, temperature, and pressure sensors, help close the control loop to provide precise solutions.

Motors – Like all motors, Rexroth motors take hydraulic energy and convert it into mechanical energy. For industrial hydraulics applications, we offer bent axis, swashplate, and gear motors with compact and economic design, providing a favorable power/weight ratio for optimum efficiency in operation.

Accumulators – Rexroth accumulators can save energy by utilizing the accumulator as a storage device to accept pump output flow when system demand is low and supplement output when demand is high.

We offer a full range of diaphragm and bladder type accumulators, plus all accumulator accessories required for installation and operation.

Standard Valves



Rexroth offers a full array of hydraulic control valves and is a full line supplier of directional (spool and poppet), proportional, pressure, flow, check, logic cartridges, “sandwich” (modular), and cartridge type valves. Standard pressure capability to 4500 PSI and higher coupled with flow limitations measured to the thousands of gallons per minute provide a breadth of product not found from any other single source supplier.

Optimizing housing designs provide precise spool to land locations in addition to elevated power limits with reduced pressure drop losses and internal spool leakage. High pressure 4000 PSI, 4500 PSI, and 5100 PSI are standard capabilities throughout the direct and pilot operated directional valve program.

The Rexroth program does not end with directional valves and electrohydraulic products. The breadth of our valve program encompasses product families to perform pre-filling tasks, meter in/meter out load

compensators, sandwich pressure, flow, check, and throttle functions. Our valve program includes inline check valves, pilot operated check valves, screw-in cartridge valves, and DIN cartridge elements for directional, flow, and pressure controlling. A full array of accessory items, pressure switches, gauge isolators, subplates, flow switches, and more compliment an already large valve program.

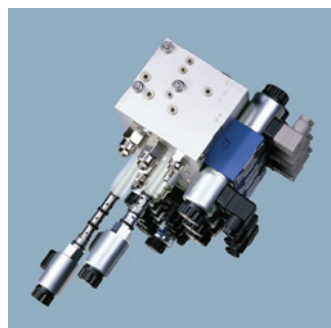
Compact Hydraulics



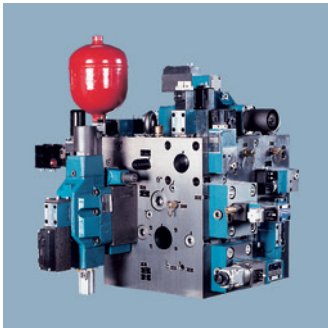
With the aid of its ingenious identical parts strategy, Rexroth offers a broad spectrum of cartridge valves. True to Rexroth's claim, there is not only the standard range, but also high-performance cartridge valves employed in more sophisticated applications with higher pressures and fatigue strengths. Whether these are solenoid operated seat and spool valves, proportional valves with optimized electronics, or aluminum or steel block designs, Rexroth supplies the engineer with compact hydraulic components that set standards in terms of service-friendliness, cost-effectiveness, and quality.

A minimum number of standardized mounting cavities cover all valve functions and ensure maximum flexibility. Highly evolved valve designs permit low power loss, maximum functional reliability, and system pressures up to 7,250 PSI.

Experienced control block engineers are at your disposal for the realization of a compact hydraulics solution for confined spaces with optimum valve combinations.



Manifolds



Rexroth manufactures customized manifolds. We design, machine, assemble, and test to your application.

Bar Manifolds –

Standard bar manifolds range in size from NFPA D03 to NFPA D08, and are available in aluminum and ductile iron. They can be side or bottom ported, SAE and BSPP porting with flanged ports for larger sizes. Mounting kits are included and other accessories are available.



Subplates

Standard subplates are available in aluminum and ductile iron and range in sizes NFPA D03 to NFPA D08. They can be bottom or side ported, and can have SAE, BSPP or NPT porting. Each is supplied with a mounting kit.

Coverplates

Ranging in sizes from NFPA D03 to NFPA D08, coverplates are available in aluminum or ductile iron. Mounting kits are included.

Sandwich Plates

Standard sandwich plates range in size from NFPA D03 to NFPA D08 and are available in aluminum and ductile iron. They are configured for full flow and can offer a test port tap-in. A mounting kit is not supplied, but O-rings are included.

Valve Adaptors

Standard valve adaptors aid in increasing or decreasing originally installed NFPA conforming product. Additionally, adapters are available to connect non-standard port configurations to standard. Available in size adaption from NFPA D03 to NFPA D08. They are available in aluminum and ductile iron and include a mounting kit where applicable.

Pump Manifolds

To maximize application possibilities for pumps, several manifolds have been designed to expand the functionality of a pump control. Unloading manifolds, remote control manifolds, and direct mounted pump relief blocks are a few of the versions available.

Logic Manifolds

Logic manifolds are available for DIN cartridge valves in sizes 16 mm to 63 mm, in ductile iron. A singular block can provide multiple control functions by orifice/plug provisions. Configurations are selected by model code.

Specialty Manifolds

The Rexroth portfolio for manifold products expands beyond standard programs. Manifolds are used to enhance power unit designs, or to consolidate space requirements to improve power density and reduce potential leak paths.

Header and Junction Blocks

Beyond the scope of strictly manifold packages for components and/or pumps, Rexroth can supply header and junction blocks to aid in clean designs for power unit installations or for upgrade/retrofit requirements. These blocks are available from 3/4" to 1-1/4" port configurations to support an array of applications and flow requirements.

Filtration Systems



Our broad range of filter elements includes products to purify virtually all hydraulic media, lubricants and industrial fluids. As the world's leading hydraulics specialist, we have gained experience from working with many thousands of hydraulic applications, and we apply this experience to the development of filters and filter elements. Using filter elements from Rexroth, which are precisely adapted to your application, you can increase the service life of the hydraulic medium and reduce maintenance and repair costs for your entire hydraulic system.

Reliable Purification Reduces Operating Costs

Using simulation processes and state of the art particle measuring technologies, we continuously work on optimization of filter media design. The result is longer change intervals, as the filter material ensures the filter area is fully utilized. Moreover, the outstanding differential pressure characteristics with reduced pressure drop help to save energy and reduce operating costs.

Top Performance that Lasts at Lower Operating Costs

Whether the application is factory automation or continuous production processes, long-term, reliable filtration with long service life ensures that your hydraulics will work even at low cost. Our HydroClean filter elements live up to this promise.

These elements achieve an extremely high filtration rating with a β -value of up to 1000 and the star pleat design ensures a maximum filter area even in the smallest filter sizes. At the same time, this design optimizes the dirt trapping capacity and is reliable at removing particles to protect your system. Moreover, this process is extremely efficient: On average, the multi-layer structure with two separate microglass filter layers doubles dirt absorption compared to conventional single-layer elements.

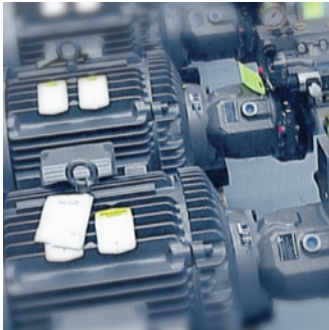
HydroClean filter elements significantly extend your maintenance intervals and boost machine availability. Our standard filter elements cover a wide range of ratings and sizes, and are reliable in ensuring that the specified oil purity class will be achieved. In addition, we develop and produce a variety of application-specific filter elements, using our global experience with hydraulics systems.

Increased Service Life without Water

In practice, it is often impossible to prevent free water from collecting in the hydraulic oil, be it through condensation, chemical processes, or from external water ingress. As a result, the oil ages and will need to be replaced, which costs money and wastes valuable resources. Aquasorb filter elements absorb these volumes of water to slow down the oil aging process considerably, helping you to increase service life and reduce operating costs.

By purifying oil using Aquasorb filter elements, you also have a reliable means of preventing internal corrosion in your system. Thanks to the reduced number of oil changes, you can extend the service life of all components while reducing maintenance and repair costs over the long term.

Power Units & Modules



Based on modular design concepts for consistency, low cost, and quick delivery, Rexroth's standard power units range from 2-1/2 to 100 gallon units, providing power from 0.5 to 50 hp and 0.4 to 31 GPM (fixed or variable displacement), with operating pressure to 3000 PSI—all available with various options for your particular solution.

Fixed Displacement

Standard power packs with fixed displacement output are available for quick delivery of compact, competitively priced, quiet, and high quality units. Ranging from 2-1/2 thru 20 gallon units, providing 0.4 to 10 GPM fixed flow, to 3000 PSI. 0.5 thru 20 HP motors are standard TEFC, 1750 rpm, three phase, with some models available single phase.

Variable Displacement

Standard variable displacement power units are available from 20 thru 100 gallon, with 4.2 to 31 GPM variable displacement, to 3000 PSI, 2 thru 50 HP. Our variable line incorporates

our close-coupled motor-pump group, eliminating the customary bell-housing and providing a more compact design. This close-coupled motor-pump group is available separately as well, for incorporating directly into your machine or system.

Modules and Options

Standard modules are available to either be combined into a 'custom' system for you quickly or can be provided separately for incorporation into your drive or application. Many standard options are avail-

able to select the best solution and incorporate other items of Rexroth's broad product offering.

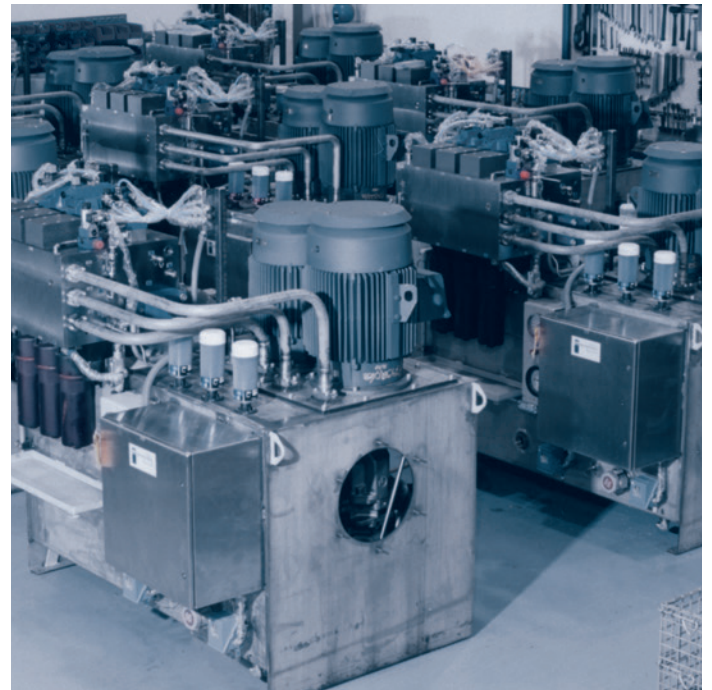
Custom Units

Should your application demand a truly custom solution, Rexroth can provide creative and unique designs to meet your space restrictions or technical needs.

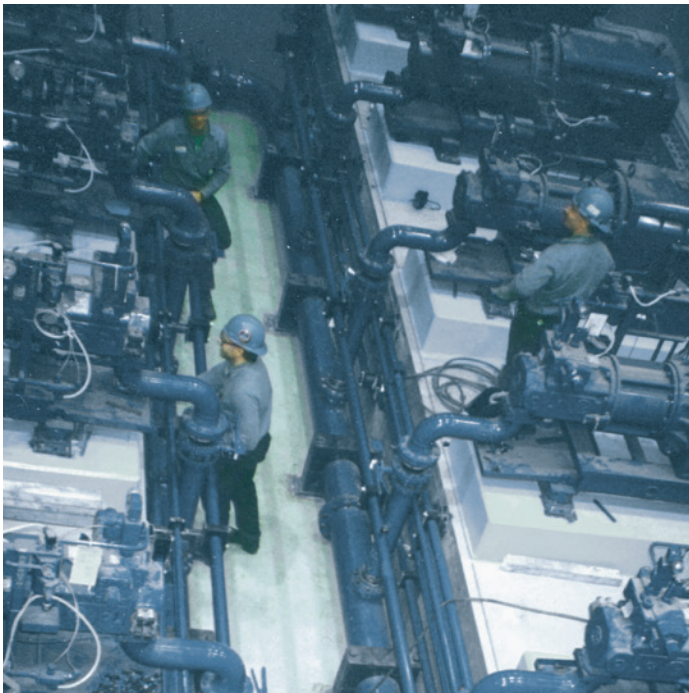
Rexroth's Power Units & Modules team is ready to help solve your needs with a timely and cost-effective solution.



Rexroth offers a growing line of standard power units and modules to assist you with your hydraulic drive solution.



Piping Systems



The right design, fabrication, and installation of piping systems are critical factors in the success of any hydraulic application. Once a piping system is ready for installation, Rexroth engineers assist a project team at our manufacturing facility.



In fact, our experience allows us to conduct 98 percent of system piping prefabrication off site. Prefabrication, for piping or tubing from 0.5 inches to 24 inches or larger, includes measuring, bending, sawing, welding, and pickling the pipes in our workshop, as well as cleaning, flushing, and testing.

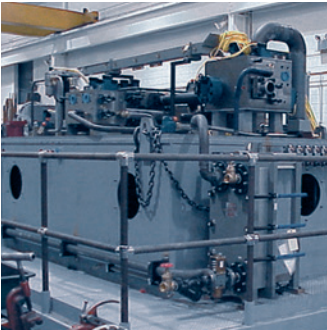


Once prefabrication is complete, a second team installs the system on site. Regular meetings between project management, site crews, and supervisors guarantee the safe and successful installation of a piping system. Rexroth piping system experience includes:



- ▶ Press Systems
- ▶ Heavy Industry
 - Steel mills
- ▶ Civil Engineering
- ▶ Test Machinery

Systems and Engineering. Where It All Comes Together



Whether designing a manufacturing plant, a major expansion, building, repairing, or replacing a major set of navigation locks, or installing a central hydraulics system or a series of separate power units, Rexroth is your solution partner.

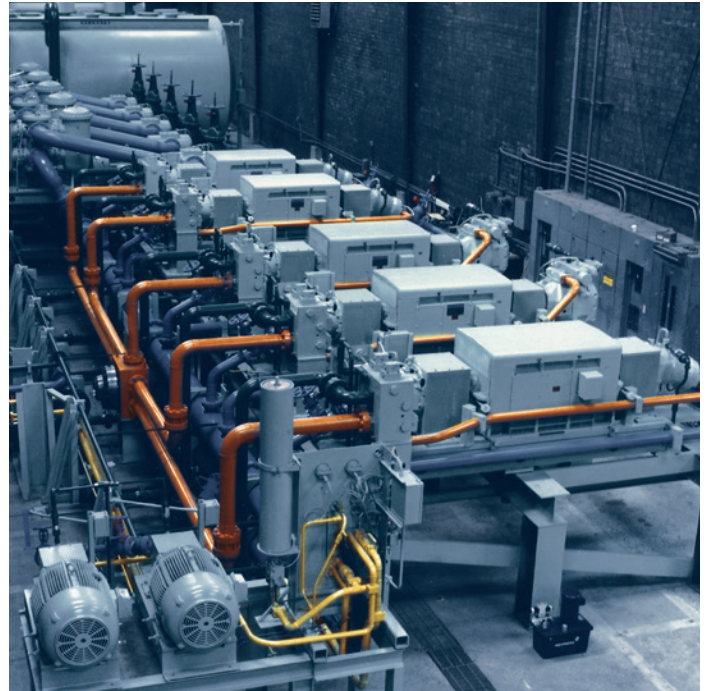


Rexroth can provide design, engineering, and all aspects of installation up to and including being your turnkey supplier. It's the kind of challenge on which we thrive.



When you bring us your needs, we'll put together a team to meet and exceed those needs. Experts from many fields will apply all of their knowledge and experience to provide a solution that will be efficient and cost-effective.

They will run their designs through the most ingenious and foolproof simulation programs. If applicable, you'll know your return on investment as you review the design schematics. You'll also know the service life and reparability of the design.



Application know-how, a close-knit team, the finest components available in the world and the dedication to customer satisfaction and service. That is what you are buying from the Drive & Control Company.

Trust in Our Cross-Technology Service Expertise

The commitment of Rexroth to customer service does not stop after your systems or components have shipped. Our involvement includes all stages of planning, shipment, installation, and commissioning of entire packages of hydraulic drive, control, and regulating equipment, even for large and complex facilities. At Rexroth we are committed to quality. When you buy a component or system from Rexroth, service is part of everything we do. To satisfy the urgent needs of our customers, Rexroth currently maintains a capable staff of field technicians in strategic locations throughout the United States and Canada.



Rexroth Service for Industrial Hydraulics is the competent partner for the complete life cycle of your machines and installations—from the planning phase right through to extending the service life of a product or system. The unique service portfolio comprises helpdesk, field and repair service, spare parts service, as well as training programs that are tailored to your specific needs.



Industrial hydraulic service has the following to offer...

- ▶ Comprehensive pump/motor repair facilities
- ▶ Full industrial and mobile valve repair and testing facilities
- ▶ Comprehensive repair and testing facilities for servo valves and valves with integrated electronics
- ▶ Repair of mill type and tie rod cylinders
- ▶ Supply of genuine Rexroth spare parts
- ▶ Comprehensive customer support
- ▶ Maintenance of hydraulic systems of all sizes and types
- ▶ Fluid management



Cataloged spare parts strategically located at our core facilities and supported by regional service centers across the nation, assure you, our customer, of a quick response to your service needs of genuine Rexroth parts.

For all of your service needs call:

1-800-REXROTH

Focusing on Your Applications. From Design to Completion.

Rexroth supports you competently and comprehensively in the development of innovative drive and control solutions. Regional centers are at your disposal for the development of all conceivable applications—that includes everything from advice, design, development, and testing through to series maturity. Our work is on time and includes the latest project management systems. You can count on Rexroth's unique hydraulics experience and know how. Regional centers are staffed with highly specialized experts who not only have the required hydraulics expertise, but also have a keen eye for customer applications. We are in close contact with our customers and we constantly strive to optimize process technologies and systems.



For Development Partnerships: Regional Centers

To give you the best possible support at the early stages in the development of innovative solutions, Rexroth has established international application centers. Join forces with the specialists for applications in your industry—from design through to series maturity.



For Complete Projects: Systems and Engineering

At Rexroth's integrated Systems and Engineering unit and in cooperation with the client, highly specialized teams develop technology-transcending one-off and customized solutions for specific industries. These can be individual hydraulic components or complete turnkey systems.



For Better Results: Support and Documentation

Rexroth works continuously on improving support and service to the customer. This can include anything from system design, product selection, training, and multilingual technical documentation.



Keeping Things Moving: Worldwide Presence/ After-Sales Service

Rexroth has production plants and distribution service companies in over 80 countries of the world. This means that Rexroth customers can supply the best possible, top quality products and services to all important markets—backed up by a strong technology group with international operations.

We're Familiar with Your Industry.

Industrial hydraulics is a fascinating technology. Its advantages make themselves strongly felt in all areas where force has to be economically applied, loads have to be uniformly lifted and lowered, linear or rotary motions have to be performed, high accelerations achieved or given speeds maintained, positions approached with precision, power transmitted, or processes linked.

As the world market leader in industrial hydraulics, Rexroth has a uniquely broad range of hydraulic and electronic components and an internationally unparalleled systems competence geared to specific industries. We can supply you with not only intelligent engineering, but also with intelligent drive and control concepts. By integrating microelectronics, we have expanded the performance of hydraulics. Today, hydraulic drives from Rexroth can make you more competitive than ever. And enable you to develop new fields of application.

Automotive



When it comes to hydraulic systems for automotive manufacturing facilities, Rexroth has received the green light from some of the world's most renowned car manufacturers.

Rexroth's diverse offering of hydraulic and electrohydraulic products and systems continue to be specified as an integral part of automotive manufacturing machinery.

Years of experience in the automotive industry combined with an expansive support network enables Rexroth to provide automotive customers with advanced hydraulic engineering, product/system application, training, program management, and field service support.

- ▶ **Stamping plants**
- ▶ **Transmission plants**
- ▶ **Engine plants**
- ▶ **Body and assembly**
- ▶ **Foundry operations**

Civil Engineering



- ▶ Dams and weirs
- ▶ Ship locks
- ▶ Moveable bridges
- ▶ Irrigation systems / flood protection
- ▶ Vehicular and passenger transfer spans
- ▶ Wastewater management

The desire for high reliability, great power density, compact flexible dimensions, robustness, and low maintenance requirement make hydraulic drives the premier solution.

With extensive product offerings and superior application experience, Rexroth offers the total solution: hydraulic power units, manifolds, cylinders or motors, and electronic control systems.

In addition, Rexroth offers turn-key support including simulation, installation of field piping, commissioning assistance, and field service.

No project is beyond our capabilities.

Entertainment



- ▶ Theater and leisure platforms
- ▶ Theme parks
- ▶ Custom manifolds
- ▶ Central hydraulic systems
- ▶ Facility piping systems
- ▶ Electrical/electronic control systems
- ▶ Hydraulics and controls for theaters/stages

Rexroth is the world leader in this demanding specialty market, where high expectations for reliability, safety, and low maintenance are the norm. Typical applications require design techniques developed through scores of successful installations. Applying the lessons learned in our many industrial applications and listening to the special needs of the entertainment industry has led to a dramatic growth in our business in this area.

Rexroth supplies hydraulic power units of every size and description, commonly with fire-resistant and environmentally safe fluids. Operator controls can range from simple ON/OFF push-buttons to custom PLC controls providing full sequence, diagnostic, and facility/ride interface.

Heavy Industry

Land Systems / Defense



From flat or sectional steel product manufacturing to steel or non-ferrous metal processing, Rexroth engineers work closely with local, factory trained distributors to provide customers with the best hydraulic system solutions, regardless of the size or complexity of the mill system.



Rexroth provides highly reliable and low maintenance hydraulic components and systems to the defense industry and government. Our Land Systems group specializes in mobile and stationary defense related motion control solutions. Compared to other motion control technologies, the Rexroth hydraulic solution is likely to be the smallest and lightest weight COTS solution.



Our heavy industry experience includes hydraulics for: hot and cold rolling mills, furnaces, continuous casters for slabs, blooms, and billets, degassing systems, inspection lines, process coating lines, coke oven plants, coil handling, mechanical conveying and handling equipment, slitting machinery, coating lines, wire straightening and cutting machinery, and pipe manufacturing mills and processing systems.



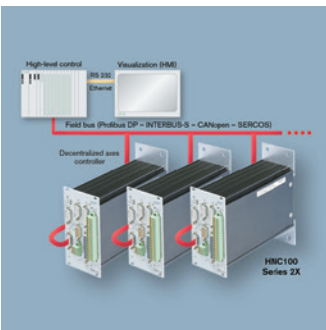
- ▶ **Coke oven plants**
- ▶ **Furnaces**
- ▶ **Degassing systems**
- ▶ **Hot and cold rolling mills**
- ▶ **Coil handling**
- ▶ **Inspection lines**
- ▶ **Coating lines**
- ▶ **Slitting machines**

- ▶ **LAV – Light armored vehicle**
- ▶ **AAAV – Advanced amphibious vehicle**
- ▶ **M88A2 tank recovery vehicle**
- ▶ **RCSS – Robotic combat support system**
- ▶ **HDSB – Heavy dry support bridge**

Applications include:

- ▶ Fan and compensator drives
- ▶ Robotics – Propel and auxiliary
- ▶ Hydrostatic drives
- ▶ NBC protection system drives
- ▶ Winches
- ▶ Hydrostatic power units
- ▶ Deployable bridging systems
- ▶ Electronics

Machine Tool



- ▶ **Broaching**
- ▶ **Gear cutting**
- ▶ **Grinding**
- ▶ **Honing, lapping**
- ▶ **Machining centers**
- ▶ **Transfer machines**
- ▶ **Turning centers**
- ▶ **Friction welding**
- ▶ **Spin forming**
- ▶ **Waterjet cutting**

The machine tool market is characterized by a broad spectrum of applications. Rexroth has a complete portfolio of hydraulic power unit solutions ranging from small catalog power packs to customized state-of-the-art horizontal and vertical Low Noise Power Units. Our designs ensure the reliable and economical supply of pressurized oil, plus maximum flexibility, high power density, and low maintenance.

Rexroth machine tool experience includes: The simulation and design of hydraulic servo axes in closed loop and open loop applications; positioning with an accuracy of 0.001", "true acceleration" for lift, transfer and shuttle operations, load/force controls for valve seating, and "instantaneous reverse" mode for honing and grinding controls, just to name a few.

Marine/Offshore

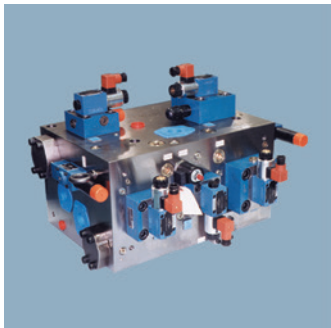
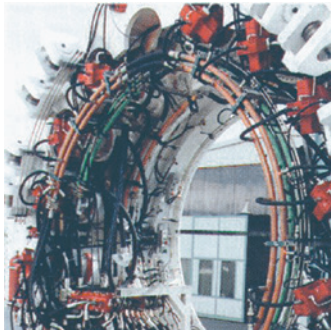


Rexroth provides a complete line of hydraulic components and systems for marine, offshore, U.S. Navy, and U.S. Coast Guard applications. Equipment includes pumps, motors, valves, cylinders, manifolds, and hydraulic power units—all supported by turnkey installations. Our systems are designed and manufactured to meet ABS, API, DNV, Mil Spec, or U.S. Coast Guard regulations, and designed to withstand the rigors experienced in the harsh marine and offshore environments.

Rexroth marine and offshore experience includes heavy lift and rig skidding systems, centralized hydraulic drives and controls for offshore rigs, dredges, and pipe-laying barges. Rexroth has an extensive track record in motion compensation systems and high performance drives.

- ▶ **Winch and windlass drives & controls**
- ▶ **Cranes and loaders**
- ▶ **Hydraulic power units**
- ▶ **Hydraulic drives and control for offshore rigs**
- ▶ **Bow/stern thruster drives and controls**
- ▶ **Ships steering pumps**

Mining, Oil & Gas (Well Servicing)

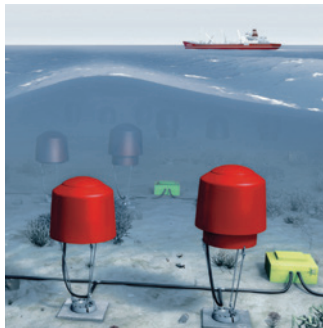
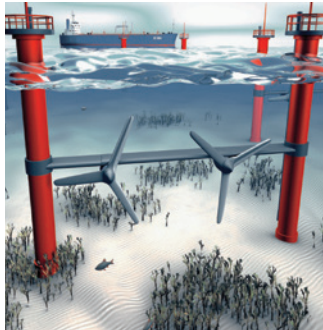


Supplying a wide variety of components—including axial piston pumps and motors, valves and stack valves, and positioning cylinders, as well as electronic control systems, diesel and electric power units, and custom manifolds—Rexroth provides sophisticated solutions for mining, tunneling, and excavating applications.

Our mining industry experience includes: continuous miners, surge and shuttle cars, roof and slope drills, road headers, scoops and loaders, tunneling machines, and rail equipment

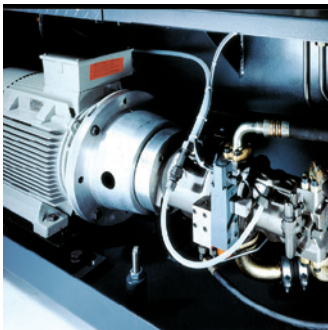
- ▶ Continuous miners
- ▶ Surge & shuttle cars
- ▶ Tunneling machines
- ▶ Rail equipment
- ▶ Wireline datalog
- ▶ Coil tubing injectors
- ▶ Nitrogen fracturing
- ▶ Cementing
- ▶ Ramping
- ▶ Blenders

Ocean Energy



There is no technology more suitable than hydraulics for converting a fluctuating linear motion into a constant rotational motion. Large cylinders act as pumps, driving variable displacement motors for the generation of electrical energy by means of a generator. Complex control algorithms are optimizing energy output. The drive train, combined with components and control know-how from Rexroth, is recuperating energy from the infinite potential of wave motion for application in future marine energy installations.

Plastics



- ▶ Injection molding
- ▶ Injection blow molding
- ▶ Blow molding
- ▶ Die casting
- ▶ Extruder drives
- ▶ Mixer drives

For whatever the machine—be it for injection molding, blow molding, plastics processing, or foaming—Rexroth supplies intelligent hydraulic systems with extra power. On injection molding machines, special pump and control systems are employed that precisely meter pressures and speeds, thus enhancing the quality of the end product. In blow molding, Rexroth electrically controlled valve technology ensures extra precision during the blow molding process and higher speed during mold feed. On plastics processing machines, short cycle times with constant high output are made possible by hydraulics. On foaming machines, where aggressive media have to be metered with precision, Rexroth supplies pumps with corrosion-resistant special alloys.

Power Generation



- ▶ Fuel gas, oil, NOX valve control
- ▶ Steam valve control
- ▶ Steam bypass control
- ▶ Turbine starters
- ▶ Hydraulic power units for turbine controls
- ▶ Hydraulics for wind turbines

Hydraulic control systems have long played a vital role in the construction of gas and steam turbines, and for over 20 years, Rexroth has been improving the safety, availability, and service life of high pressure systems with hydraulic components and controls designed to protect personnel and machinery, and safeguard valuable uptime.

Rexroth power generation experience includes: hydraulic servo actuators for fuel and gas valve control, hydraulic power units for control of fuel and gas valves, steam turbine safety and control systems, hydraulic servo actuators and spring packages for steam valves, and electronic control systems for the auxiliary functions of turbines such as gas diverter control, turbine starters, and steam bypass stations.

Presses – Light & Medium



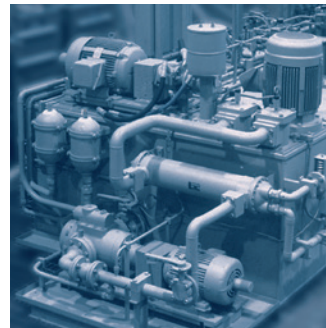
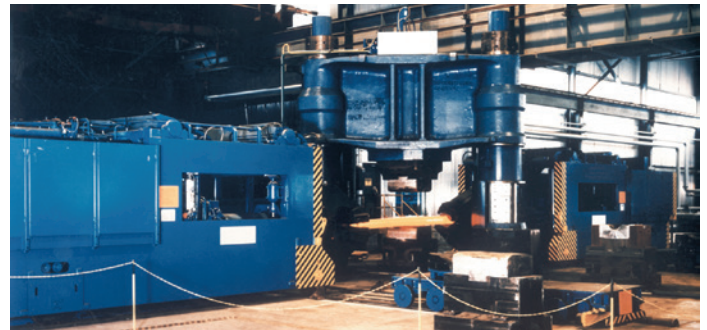
The medium press market encompasses an array of interesting machine types. Whether a precision brake press application or high speed punch press, Rexroth provides sound design solutions to meet the most demanding requirements.

For optimized, comprehensive, and economical solutions to all your forming needs, Rexroth offers: press manifold systems, closed loop servo solenoid valves, primary pump drives, safety valves with monitoring, pre-fill valves, cylinders, and complete system integration.

- ▶ **Integrated hydraulic systems**
- ▶ **Brake presses**
- ▶ **Shear presses**
- ▶ **Nibbling/Punch/Die cutting systems**
- ▶ **Tube bending/End forming**
- ▶ **Compression molding**
- ▶ **Foundry/Match plate molding**

Market based engineering with extensive knowledge and years of experience in application based solutions afford the customer unparalleled expertise with Rexroth solutions.

Presses – Heavy

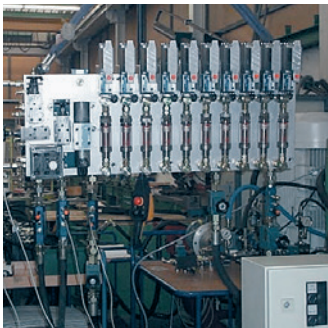


Rexroth industrial hydraulic power units and electronic systems for press applications assure optimum design for the maximum performance of new and rebuilt machines.

Our press experience includes:

- ▶ **Open, closed die and forging machines**
 - ▶ **Complete electronic and hydraulic integration of press and manipulators**
 - ▶ **Aluminum, copper, brass, steel, and propellant extrusion press**
 - ▶ **Closed loop servo speed and pressure controls**
 - ▶ **CRT menu screens for full auto cycle operations and die setups**
 - ▶ **Microprocessor based intelligent levelling subsystems**
 - ▶ **Direct and accumulator driven hydraulic systems**
- ▶ **Hydraulic systems**
 - ▶ **Electronic controls**
 - ▶ **Forging**
 - ▶ **Extrusion**
 - ▶ **SMC**
 - ▶ **Casting**
 - ▶ **Powered metal**
 - ▶ **Drawing operations**
 - ▶ **Baling systems**

Pulp and Paper

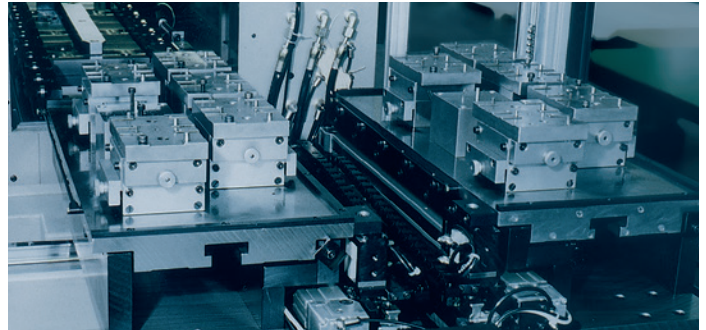


- ▶ Calenders
- ▶ Winders
- ▶ Press rolls
- ▶ Rider roll control
- ▶ Coat rolls
- ▶ Refiners
- ▶ Stock washers & diffusers
- ▶ Digesters

Meeting the ever changing needs of the pulp and paper market, Rexroth provides a complete line of hydraulic drive and control products and systems. Our pulp and paper product experience includes: calenders, winders, press rolls, rider roll control, coat rolls, refiners, stock washers and diffusers, digesters, and more. Our experience is extensive in field bus capable products for control of position or pressure.

Rexroth is a major supplier of decentralized axis control systems. With a product range that includes analog and digital control systems, we are capable of providing closed loop control solutions that best fit your application.

Special Machinery

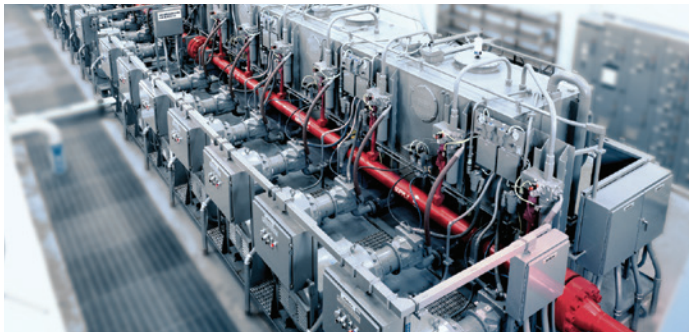


The diverse nature of our product line, from standard valves and controls to sophisticated closed loop applications gives Rexroth a sizeable advantage over the competition in the area of Special Machinery.

Our special machinery experience includes: food processing wash down valves, low cost power units and manifolds, customized servo valves for railroad maintenance, and NFPA cylinders.

- ▶ Food processing
- ▶ Railroad maintenance
- ▶ Material handling
- ▶ Car wash
- ▶ Packaging machinery
- ▶ Concrete products manufacturing

Test Machinery



Building upon our strengths, Rexroth produces a variety of electrohydraulic systems for applications such as aerospace, structural component and fatigue testing, and simulation, which often includes secondary controls and regenerative circuits. We're your one-stop supplier, providing turnkey design, construction, and installation.



Our test machinery experience also includes: central hydraulic systems, electrical/electronic controls and wiring, field piping, start-up, and commissioning.

- ▶ Central hydraulic systems
- ▶ Electrical/electronic controls
- ▶ Turnkey projects including installation
- ▶ Motion system actuators
- ▶ Custom manifolds
- ▶ System simulation services

Wind Energy



Wind energy continues on its road to success by greatly increasing its share in electrical power production on a worldwide basis. The nominal power of wind turbines has risen from 100 kW to 3,000 kW. Now the first 5-MW installations are harvesting power.

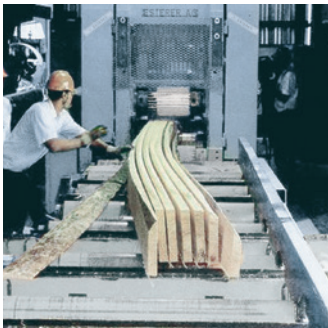
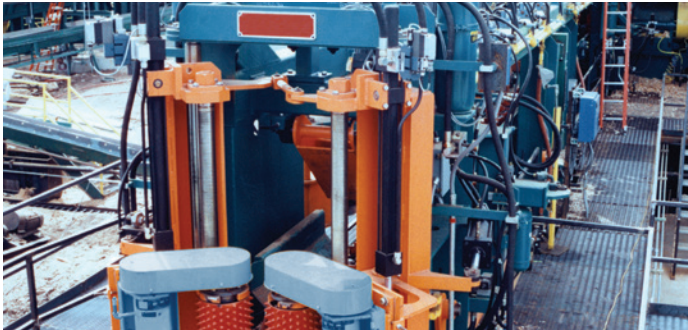


As producer of hydraulic and gear technology systems Rexroth is a competent partner and comprehensive supplier to manufacturers of wind turbines.

No matter whether the traditional concept comprising rotor, gearbox, generator or a direct-drive solution is involved: Rexroth offers matching gearbox and hydraulics solutions for any type of wind turbine.

- ▶ Efficient main gearboxes
- ▶ Highly precise yaw drives for permanent wind tracking purposes
- ▶ Compact pitch drives used for rotor blade adjustment
- ▶ Highly dynamic hydraulic pitch adjustment systems
- ▶ Reliable drive train brakes
- ▶ Yaw drive brakes

Wood Products



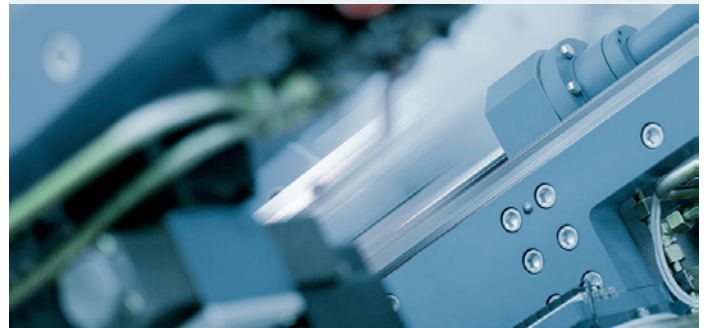
- ▶ **Sawmill equipment**
 - Setworks
 - Double length infeed
 - Shape saws
 - Edgers
- ▶ **Veneer equipment**
 - X-Y chargers
 - Lathe spindles
 - Powered back-up rolls
 - Clipper

If you're looking for innovative hydraulic and control solutions for your wood product applications, Rexroth will show you the forest and the trees. We develop fast, accurate, and economical positioning packages using rugged, reliable proportional and servo valves, as well as digital control technology. This puts you on the leading edge of high performance.

Rexroth is a major supplier of hydraulic power units and custom manifolds. With our Hyvos simulation tool, we can properly size closed loop systems for optimum performance. We consistently obtain accuracies of less than 0.001”.

Efficient Hydraulics Paired with Multi-technology Competence

Intelligent hydraulics in new dimensions: As leading supplier in industrial hydraulics, Rexroth takes an outstanding position with components, systems, distinct application know-how and high engineering competence.



With Rexroth, you can choose from the world's largest product range of application-related systems and customized special solutions of high quality. In conjunction with advanced microelectronics, Rexroth has made hydraulics even more efficient. The products can be easily integrated into modern machine concepts, are extremely powerful and feature high energetic efficiency. Being a supplier for all technologies, Rexroth always offers the ideal application specific drive solution. Rexroth is your ideal development partner for highly efficient machinery and production facilities—from the first contact through to commissioning and over the entire life-cycle. Teams who are active all around the world assume the complete engineering of your plant and machinery, if requested, until maturity for series production or turnkey hand-over. With multi-technological competence and the use of drive and control technology from Rexroth you will be more competitive than ever.

Bosch Rexroth Corporation

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