

Rexroth Hydraulics for Two-Stroke Ship's Diesel Engine from MAN B&W



Precision, robustness and reliability





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It is hard to imagine life nowadays without ships as a modern mode of transport. They fulfil many tasks and have to measure to the most stringent requirements. For the technical systems on board this means: No compromises. Reliability, robustness, always ready for operation, low-maintenance and a long service life – these are just a few of the attributes required by ship components. Challenges that we also face when supplying optimum and technically innovative solutions in hydraulic drive and control technology.

Our specialists work together with ship's chandlers right from the initial development phase of a project. In doing so we utilize to the maximum our application-specific know-how, combined with the experience of our Rexroth hydraulics specialists extending over decades, in order to enable us to find the optimum solution for the specific task. Our scope of supply ranges from the complete development of a system right through to component solutions using components especially developed for marine applications. We test our products with specially developed simulation software, which carries out tests on functionality, efficiency and service life using the latest calcula-

tion methods. The acceptance and certification process rounds off our program.

Rexroth products for marine applications are low maintenance, robust and reliable. And, just in case something goes wrong, we have sales and service centers in over 80 countries. All this enables us to offer our customers a competent and reliable service, combined with swift supply of spare parts. Major shipyards, shipping companies and ship's chandlers put their trust in Rexroth systems. Why don't you too opt for safety and economy in sea travel?

Precision engineering



Quality and reliability



Worldwide service

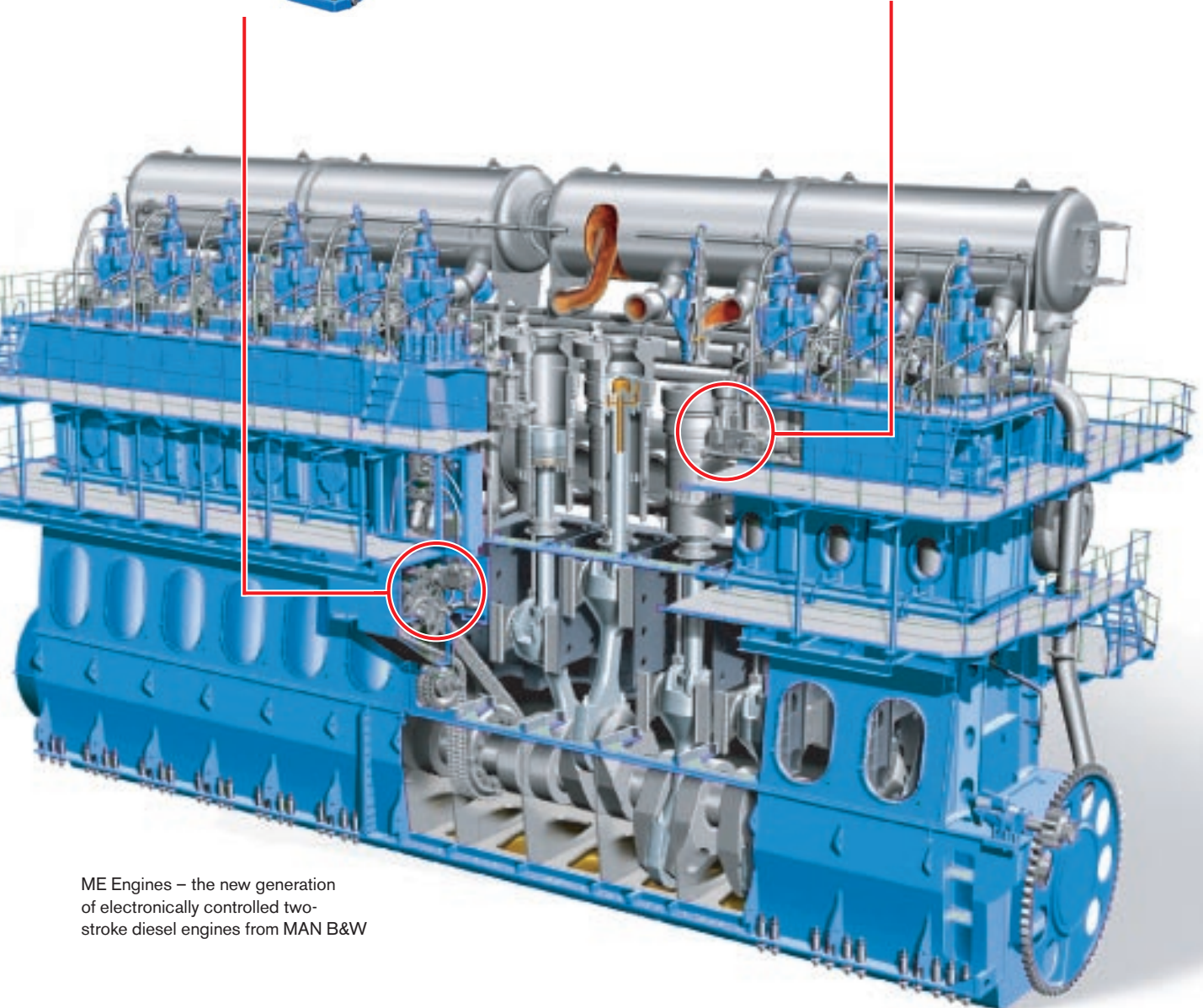




Rexroth A4 axial piston pump – the robust pump for reliable hydraulic power supply



Rexroth FIVA Valve – core components for optimum fuel consumption and low emissions



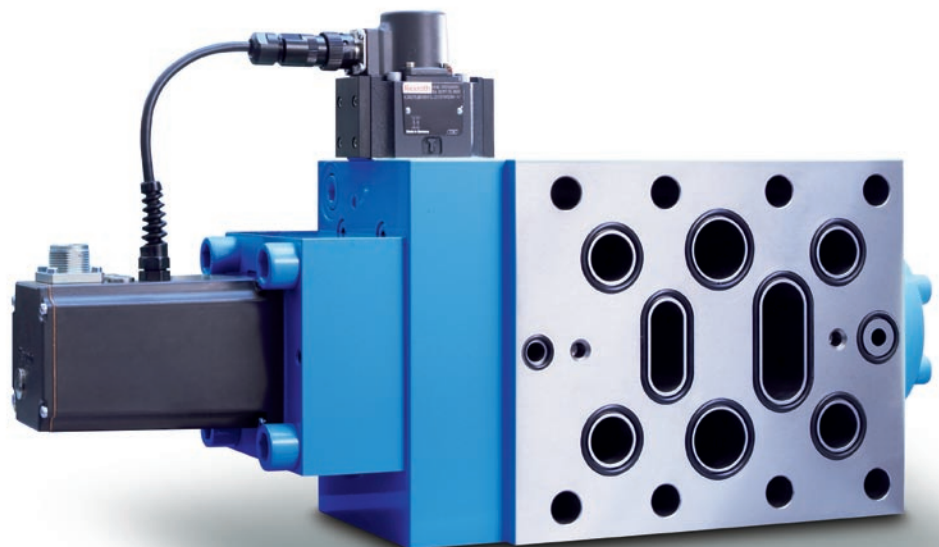
ME Engines – the new generation of electronically controlled two-stroke diesel engines from MAN B&W



FIVA – Core Component of the New ME Technology



FIVA stands for “Fuel Injection & Valve Activation”. This hydraulic actuator assumes the function of the camshaft and is thus responsible for the injection process as well as the control of the exhaust valve of the new ME motor generation.





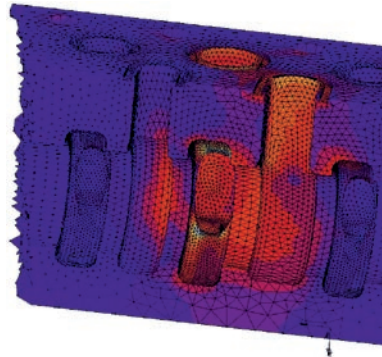
MARPOL Annex VI stipulates limiting values for emissions for 90,000 merchant and passenger ships world-wide. It is the priority environmental target to continuously reduce harmful emissions. The FIVA valve ensure considerably reduced emissions of harmful substances by means of special command values.

Excellent dynamics and repetitive accuracy

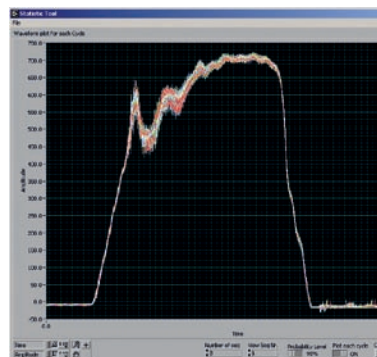
The Rexroth FIVA valve converts the injection profiles specified by the control with a high level of precision. This permits the realization of low fuel consumption as well as low emission values for the two-stroke engine. If this ideal profile is accurately adhered to then maximum performance is guaranteed.

High product standard

A combination of the latest test procedures, calculation and simulation techniques for analyzing vibrations and component deformation, prototype testing and optimization – all these guarantee a high product standard.



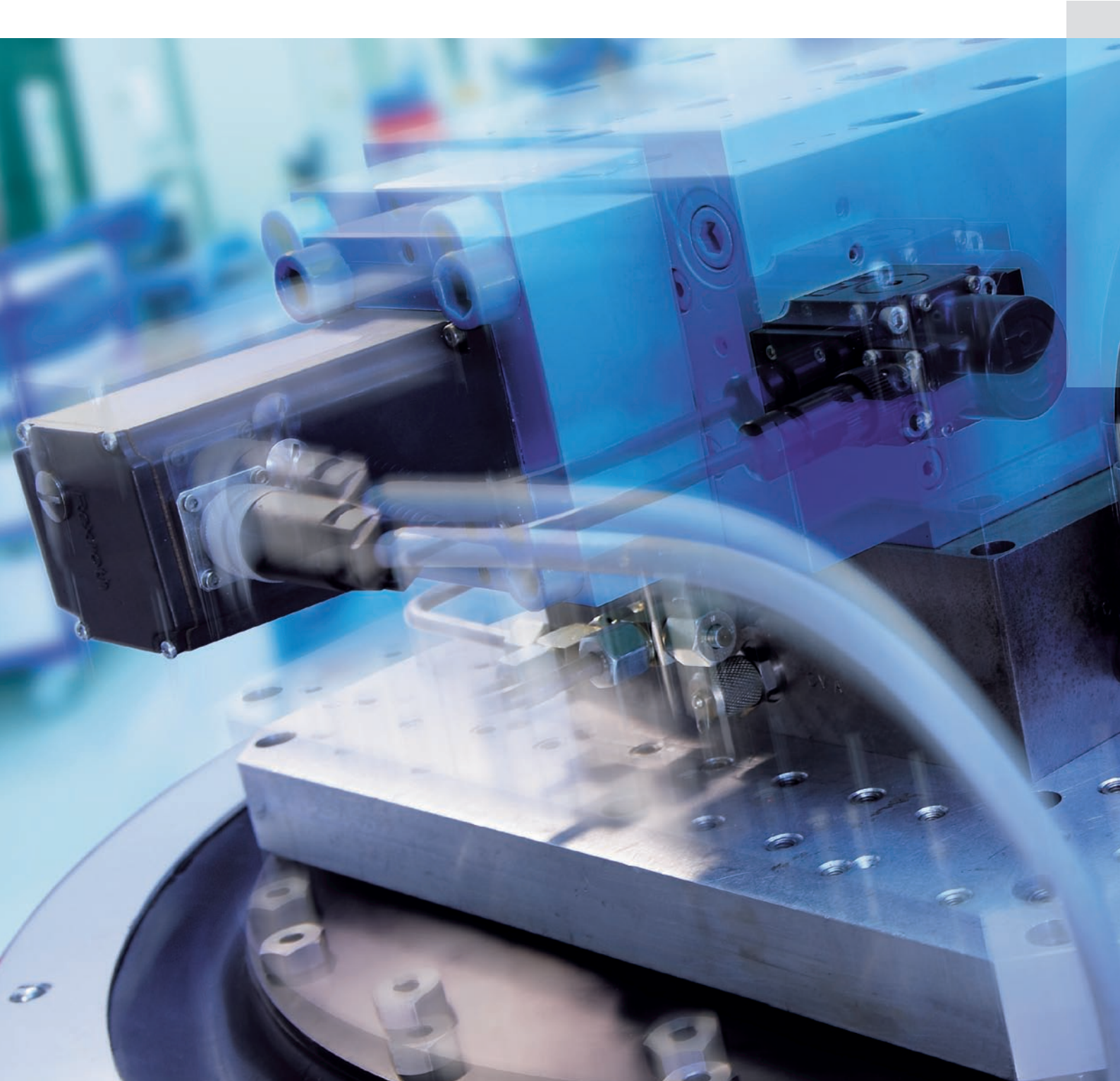
The latest simulation instruments (FEM Finite Elements and CFD Computational Fluid Dynamics) support our development engineers in getting the balance right between dynamics and repetitive accuracy.



- 41 injections
- 100% load
- 200 (gram/shot)

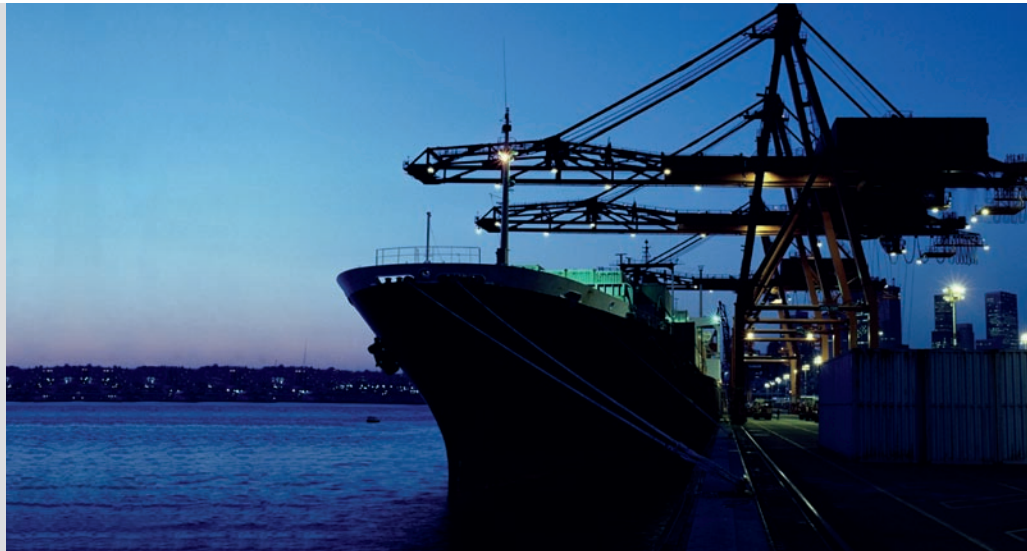
The curves show the measurements in 41 injection operations in one diagram. During the injection process, which lasts approx. 40 ms, there is hardly any detectable deviation between the different graphs. This level of dynamics and precision is unique.

Rexroth Hydraulics Stands for Quality and Reliability



Long service life for reliable operation – and low total cost of ownership.

- Low wear
- Vibration-proof
- Electromagnetic compatibility (EMC)



For more than half a century now Rexroth has been world market leader in hydraulics. We benefit from decades of field experience in the most demanding of industrial hydraulic applications.

Long service life

Particular importance is attached to the tribology of all moving parts of an FIVA valve. Measurements of frictional force in our test field confirm the excellent performance of this valve.

Electromagnetic compatibility (EMC)

At least as important as the mechanical properties of the valve is the choice of electronic components. High-quality electronic modular components are used here, with special filter boards ensuring adherence to the required EMC values.

Vibration-proof

Particular attention was paid to a vibration-proof design during the project design phase. When the vibration tests are carried out we are not satisfied with just the requirements of the classification societies. Our FIVA valves were loaded to the upper power limit of the test devices and this exceeds the required values by a multiple factor. The valve withstood even this extreme loading without problem.



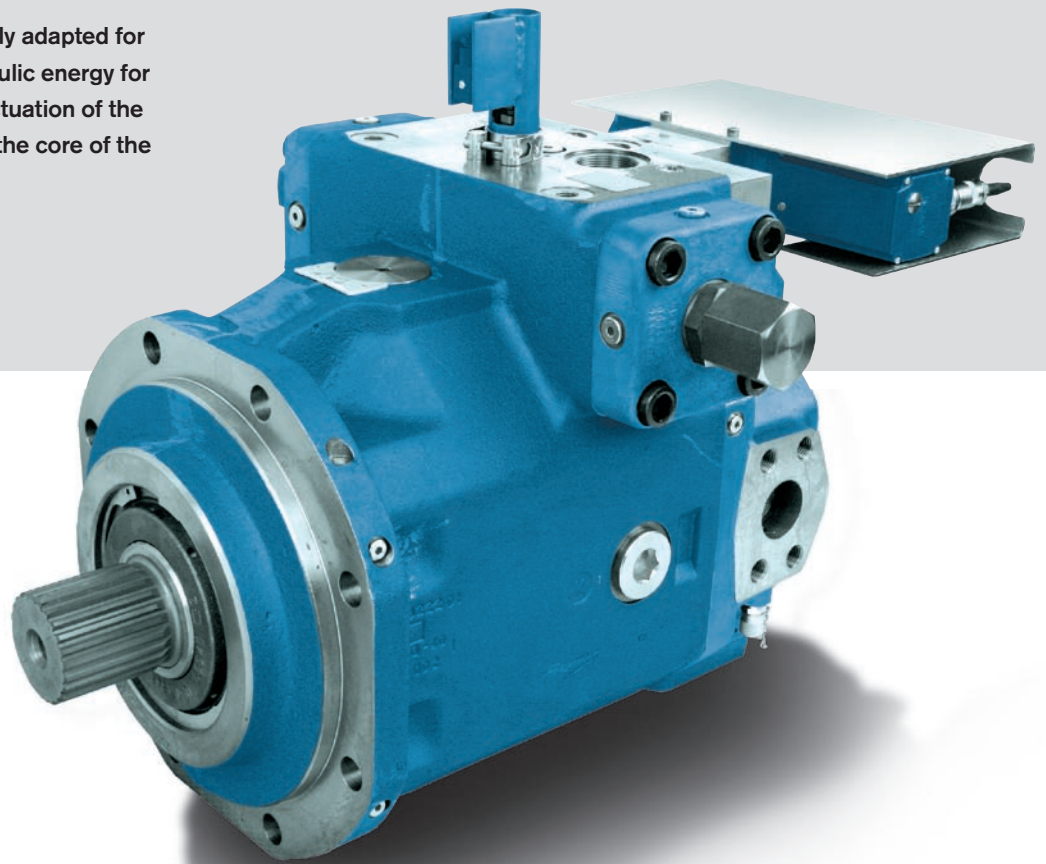
Classification societies undertake acceptance and prototype testing, thus ensuring that we attain a high standard of product.

A4VSO with Electro-proportional Adjustment for Hydraulic Oil Supply of the ME Motor

The A4VSO axial piston pump, specially adapted for these applications, supplies the hydraulic energy for the fuel injection process and valve actuation of the ship's diesel engine. It thus becomes the core of the complete hydraulic system.

Features of the A4VSO:

Nominal size: 180, 250,
355, 500
Nominal pressure: 350 bar
Maximum pressure: 400 bar



Rexroth axial piston pumps are characterized by an exceptionally robust design. They are extremely economical and highly efficient and this has helped to establish them as standard pumps that can be used universally in industrial hydraulics. The A4VSO axial piston pump in swashplate design meets customer requirements in the most demanding applications.

Sensors for pressure and swivel angle register the correct pump delivery to the master engine control. The built-on proportional valve guarantees dynamic compensation when the ME motor is operating at different speeds and load changes.

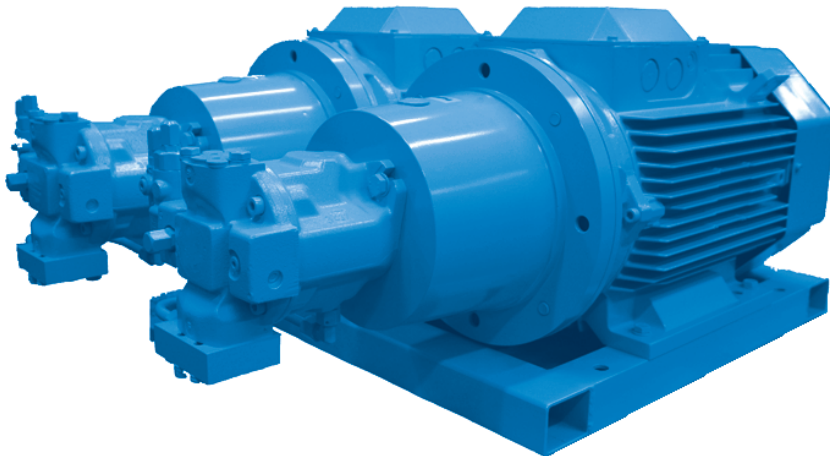
Start-up Unit and Logic Elements

Rexroth naturally also offers further components to complete your hydraulic system.



Logic elements

In the event of an overload our proven logic elements safeguard the hydraulic system against power failure.



Start-up unit

The redundant start-up unit serves as an accumulator charger before start-up of the motor. The different sizes available are designed to be efficient and space saving and meet the stipulations of the classification societies.



We are There, Wherever You Need Us – Be It an Emergency or for Planned Service Call-out

Rexroth Service operates on an international, professionally coordinated basis, providing the highest level of service. All our services are available the world over and to a unified standard.



You can contact your qualified partner as follows:
www.boschrexroth.com/shipservice





Competent help around the clock

Qualified personnel will assist you swiftly, competently and without red tape. Around the clock and 365 days a year.



Excellent service know-how on-site

Rexroth co-ordinates worldwide field service call-outs with short response times. Our experienced service technicians will undertake your system maintenance work on board.

High availability of replacement parts

With respect to logistics and quality and there is no alternative to Rexroth original spare parts. You benefit from extensive support when it comes to parts identification as well as a high level of availability of many parts, subassemblies and replacement components on site.



Always state-of-the-art technology

Rexroth undertakes all overhaul work and repairs in accordance with standards that are unified worldwide and using exclusively original replacement parts. Swiftly, with technical competence and reliability.

Rexroth in Motion:

Animation FIVA Ventil





The Drive & Control Company

Rexroth is unique. No other brand on the world market can offer all drive and control technologies, both on a specialized and integrated basis. With approximately 28,000 employees in more than 80 countries around the world, Rexroth has an infrastructure designed with partnership and customer proximity in mind. Over 500,000 customers worldwide utilize the know-how of the technology leader.

- Electric Drives and Controls
- Hydraulics
- Linear Motion and Assembly Technologies
- Pneumatics
- Service



Intelligent Hydraulics in New Dimensions

Whether it's a case of raising or lowering loads smoothly, undertaking linear or rotational movements, achieving even acceleration or accurate positioning, maintaining preset speeds, transmitting power or linking motion sequences – in fact, wherever economical power is required, this is where hydraulics comes into its own.

Using hydraulic drive and control technology from Rexroth will help you become more competitive than ever.

Service: www.boschrexroth.com/shipservice

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