

THE CUSTOMER IN FOCUS

Welcome to Grundfos HVAC OEM. This is the place to be, if you are looking for a global and innovative OEM business partner who can keep you abreast with new developments in pumps, hydraulic systems, and associated components for your systems.

At Grundfos HVAC OEM, we have high focus on renewables and sustainable solutions. All our high efficiency circulator pumps already meet EU's energy efficiency requirements for integrated circulators, which come into effect on 1 August 2015.

We know that when you develop products and solutions you need components you can count on and benefit from, so you are able to focus on adding value with your own unique features and applications. The way we see it, meeting the constant changes in end-user wants, market demands, and production mix is a common challenge that we take on and accomplish together through partnership and innovative products and services.

With Grundfos HVAC OEM products inside your systems, you are guaranteed superior quality and perfect integration – our solutions are tried and tested, and substantiated with over six million new OEM pumps and hydraulic systems sold every year. You are able to deliver end-user solutions that increase comfort, reduce costs, and improve operational efficiencies. At the same time, you can speed your time to market and increase your competitive advantage.

Entering a Grundfos partnership will put you on the fast track to developing some of the best HVAC systems on the market.

So let us make a move now!

Our mission is to be the n° 1 partner worldwide to original equipment manufacturers (OEM) in the HVAC industry. Our role is to advise, develop, produce, and sell highly reliable pumps, hydraulic systems, and components.

MOVING FORWARD TOGETHER

APPLICATION AREAS



BOILERS

Gas, oil, and biomass boilers.



SOLAR THERMAL

Solar thermal systems.



HEAT PUMPS

Geothermal, air-to-water and exhaust air heat pumps.



SANITARY HOT WATER

Domestic hot water supply, boosting and recirculation.



MICRO CHP

Micro combined heat and power systems.

A PARTNERSHIP WITH POTENTIAL

Trustful cooperation

We strive for professional dialogue and long-term relationships with our customers through a visionary and dedicated approach to partnership thinking. Because we believe that trustful cooperation and extensive knowledge sharing are positively the best ways to secure our common success. By exploiting your specialist know-how and our expertise, and linking our experts with yours, our solutions will meet and exceed market demands and expectations to cutting-edge innovation, cost savings, and more.

Customer-oriented teamwork

As your partner we become involved in your project at an early stage with technical as well as commercial advice, and we will work out the project specifications in close cooperation with you.

Our professional team focuses on your special needs and requirements to, for instance, design differentiation, technical performance, and logistics, and they will maintain eye contact with you at all times – from initial concept and design to production and delivery.

Our key account manager is guarantor for providing added value to your project through global leadership in cost, quality, and innovation. The role of the technical key account manager is to keep in close contact with your development team and production, ensuring that all objectives, tasks, and technical interfaces are clarified, and that the production-to-production communication runs smoothly from start to finish.

GLOBAL COST LEADERSHIP

- Fewer suppliers
- Integration of functions and systems
- Large-scale manufacturing
- Site specialisation

GLOBAL QUALITY LEADERSHIP

- Quality management
- High reliability and responsibility

BUILDING LEADING PARTNERSHIP

- Co-strategy coordination and marketing
- Co-R&D in projects, co-production, and co-logistics

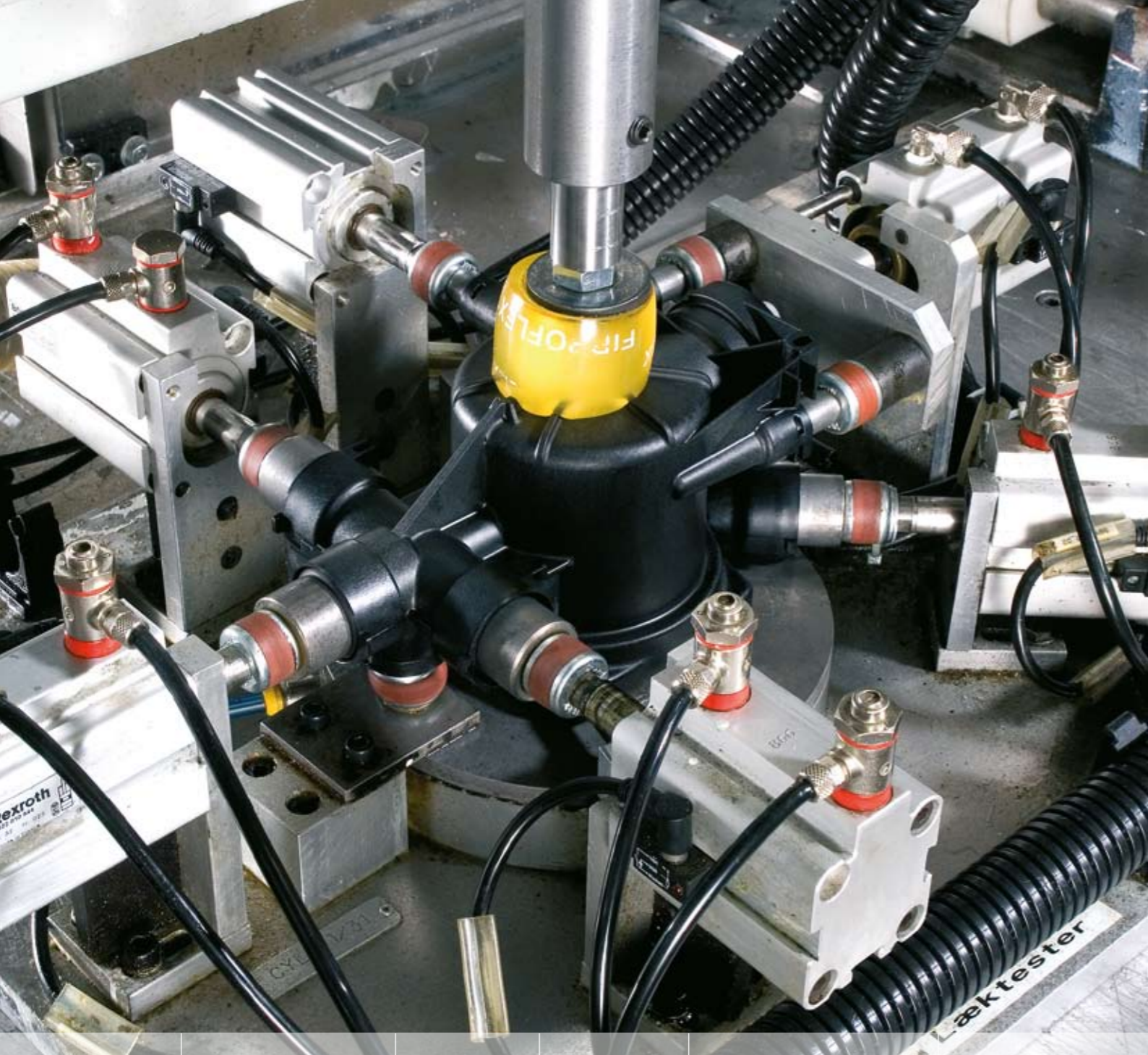
GLOBAL INNOVATIVE LEADERSHIP

- Continuous product development
- Integration of functions
- Improved materials, components, processes, and tools



LISTENING AND UNDERSTANDING IS WHAT WE DO BEST





QUALITY IN EVERY ASPECT

Our quality is your quality

Striving for lean design and production for our mutual benefit is also an integral part of our partnership philosophy. A major factor of the lean approach is to enforce quality management into every process at a very early stage. We do this, because we know that if quality verification starts in the design phase by using proven principles, the quality of the final product is greatly increased. By integrating a high-quality product into your system, you can reduce the risk of your product failing in the market.

Zero quality control (ZQC) approach

Grundfos pumps and hydraulic systems are recognised worldwide for their high quality. And rightly so. To disclose any irregularities or deviations before the production is started up, quality verification is carried out using tools such as FMEA, risk assessment, and various other analysis types.

We strongly believe that defect prevention is preferable to quality inspection and correction. Zero defects is our standard, and in our processes we apply poka yoke methods for error-proofing to prevent production

and assembly errors. Poka yoke techniques are used to monitor and give feedback about the process conditions at the source, so that any potential errors and defects are eliminated.

This dedicated approach means that we are able to consistently manufacture a quality product in high volumes.

Stringent test procedures

Also, we test the prototypes far outside normal operation in our laboratories and in field tests to make them fail, because when the prototypes are difficult to terminate, it means that the product will stay healthy with you for many years. Some pumps have been in field test operation for 20 years to learn about their long-term durability, performance, energy consumption, and noise level.

And before leaving the factory you can rest assured that your Grundfos OEM product is approved and verified.



<p>ULTIMATE DESIGN Innovative, fail-safe design. High degree of customisation.</p>	<p>ROBUSTNESS Focus on every detail.</p>	<p>LONG LIFE 15 years+.</p>	<p>ZERO DEFECTS Process FMEA and FAT tests. Poka yoke principles.</p>	<p>DELIVERY QUALITY Lean and JIT principles.</p>
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FACTS
about Grundfos quality

- All complex production tools designed and produced in-house
- Ceramic shaft and bearings for prolonged system life
- FMEA and poka yoke methods as standard
- Zero defects is the quality philosophy
- Very low PPM rate

STAYING INNOVATIVE

FACTS
about Grundfos innovation

- 50 R&D engineers dedicated to OEM solutions
- Application optimised solutions
- Energy saving a top priority
- Rapid laser prototyping for fast design

Radical and incremental innovation

We strive to continuously improve existing products and develop new innovative solutions that become a benchmark for our industry with respect to functionality, system integration, and performance.

For instance, the world's first electronic speed-controlled pump with low energy consumption and easy systems control emerged from Grundfos' laboratories. Reinvestment of millions of euro annually in compact, energy-saving solutions with superior features demonstrates our willingness to shape technological progress, and thus ultimately the value of your product.

Our ability to spot new technology trends and directions in legislation is another driver for developing innovative solutions that match future market demands.

Organisational learning through cooperation

When working with your project, we listen to your needs and suggestions and act accordingly, as it is only by operational excellence and continuous improvements that we can help you succeed.

By sharing and combining our collective knowledge we can learn from each other and transform this learning into true added value for your customers. To us, research and development is all about staying innovative and handling a complex world, where customers' expressed as well as latent needs change all the time.

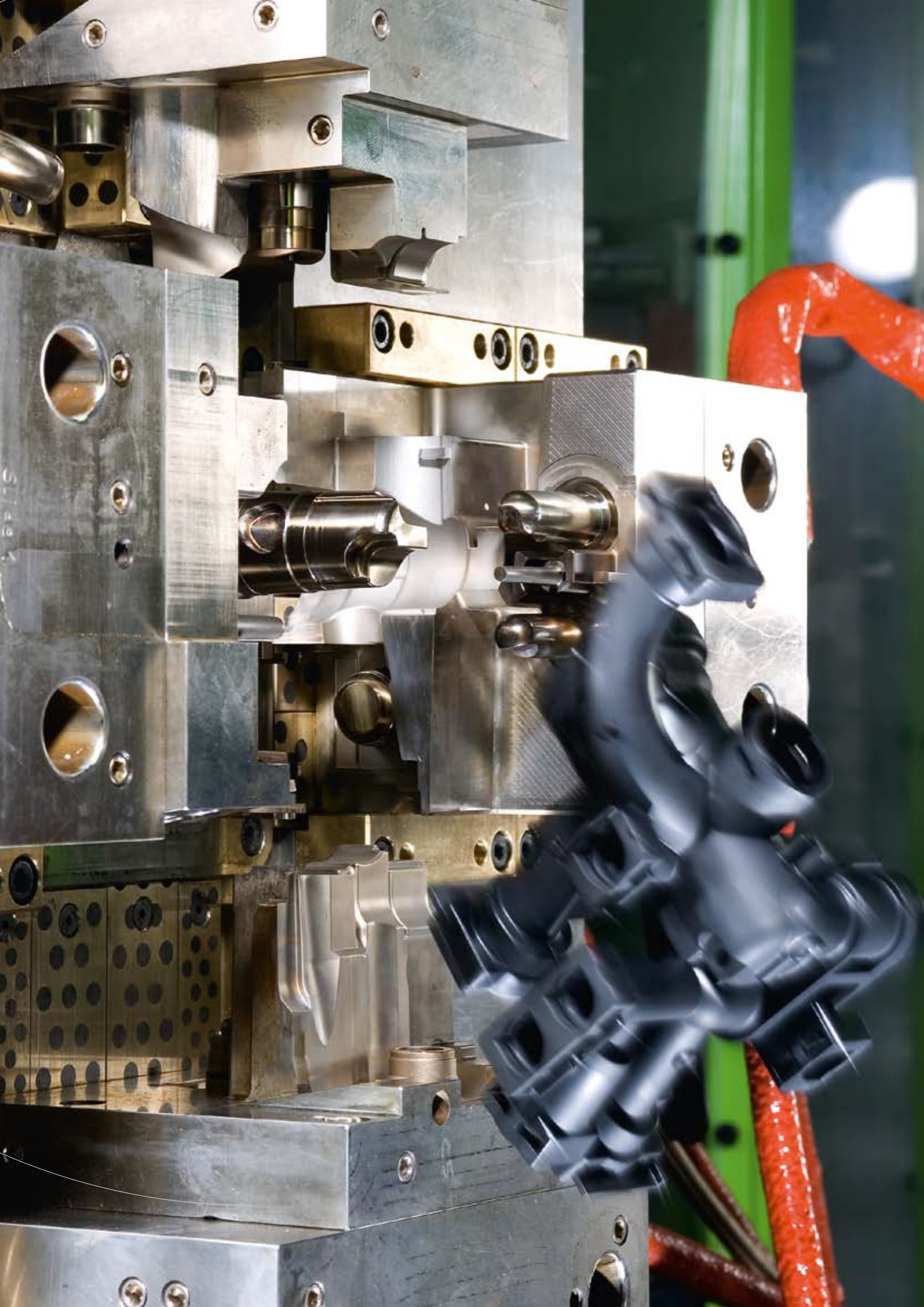
Our high level of application understanding is converted into practical solutions that are beneficial to you and your customers.

Responsibility and sustainability

Saving energy in the production, operation, and disposal of our products is also crucial to us. We therefore design products with the environmental impacts in mind throughout their entire life cycle. Also, the coming EUP/ErP ecodesign requirements are going to significantly change our industry and make it more sustainable.

At Grundfos we strive for sustainable standards – every day.





STANDARD OR CUSTOMISED

We offer a very flexible standard OEM programme consisting of standardised components such as hydraulics, housings, connectors, motors, electronics, and more. These standard components can be mixed and matched to produce hundreds of thousands of different product variants. So in many cases we will be able to meet your requirements to pumps and hydraulic systems with a standard solution.

If standard is not enough, our customised solutions are 100% tailored to your technical specifications and application needs in close cooperation with your development team and production. These are the typical phases we go through when customising a project for you:

**[CONCEPT DESIGN | FINAL PART DESIGN | TOOLING DESIGN |
TOOLING MANUFACTURING | PRODUCTION | DELIVERY]**

Whatever solution you get from us, pump, hydraulics, and associated components are perfectly matched to ensure optimum interfaces and easy integration in your application. Grundfos HVAC OEM solutions deliver superior value on all key parameters: cost efficiency, quality, performance, comfort, safety, and environmental sustainability.





BOILERS

Hydraulic systems for every need

Grundfos HVAC OEM offers everything from standard pump solutions to customised and highly complex Integrated Water Circuit (IWC) solutions, integrating multiple functions optimised for boilers. And, of course, all our solutions are available with a high-efficiency pump.

Our setup is organised to effectively support your projects and meet your milestones. Total control of all vital processes is a prerequisite for this, and the reason why we design and manufacture all critical components in-house. It also enables us to innovate and optimise all interdependent components

and ultimately important performance parameters such as reliability, energy efficiency, and noise.

Sharing our knowledge with you

Continuous dialogue with customers coupled with 30 years of hands-on experience with hydraulics help us to understand what adds value to a boiler solution. We are more than happy to share our extensive knowhow and application understanding with you. When working with Grundfos our experts will be there for you whether you need just good advice, real serious trouble-shooting assistance, or test and laboratory facilities.

6,500,000 HYDRAULIC SYSTEMS CAN'T BE WRONG

Benefits

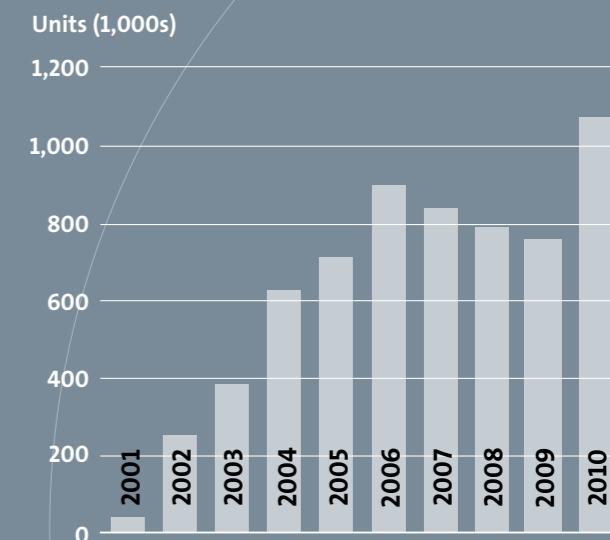
- Proven performance through 6.5 million hydraulic systems in operation since 2001
- Knowhow and application understanding
- Small, large, standard, and customised solutions
- High reliability, long life materials
- Compact and flexible design for easy integration in different boiler types
- Hydraulic systems designed for easy assembly and service
- One unit, one supplier – improved supply chain management

Features

- High-efficiency pumps optimised for boiler applications
- Optimised for variable flow and speed – high part load efficiency
- Energy savings of up to 80% compared to conventional pumps
- Integration of additional functions such as air-venting, diverter valve, alternate connections, sensors, filling loop, pressure relieve valve, actuators, etc.
- Housing in cast iron, stainless steel, bronze, and various composite materials



HYDRAULIC SYSTEM SALES 2001-2010





SOLAR THERMAL

Specialised solar thermal programme

The Grundfos SOLAR range is simply unique. It is developed and optimised especially for solar thermal systems with respect to flow requirements and low energy consumption. Because, the way we see it, standard circulator pumps do not deliver optimum performance in solar thermal applications.

When you opt for a Grundfos SOLAR product you not only get a high performance pump but also our specialised knowledge about creating optimal hydraulic conditions in solar thermal systems.

Focus on the future

The development of sustainable solar thermal solutions continues as top priority. SOLAR PM2 and

MAGNA SOLAR are already compliant with the EuP/ErP Directive's 2015 requirements for energy efficiency.

Furthermore, our engineers constantly develop and test new features that will improve performance, reliability and functionality in your solar thermal systems.

Our latest SOLAR range can now send feedback signals to the system control: power consumption or flow estimation and various alarms such as under-voltage warning, under-voltage stop, locked rotor and confirmation of standby mode. And there is more to come!

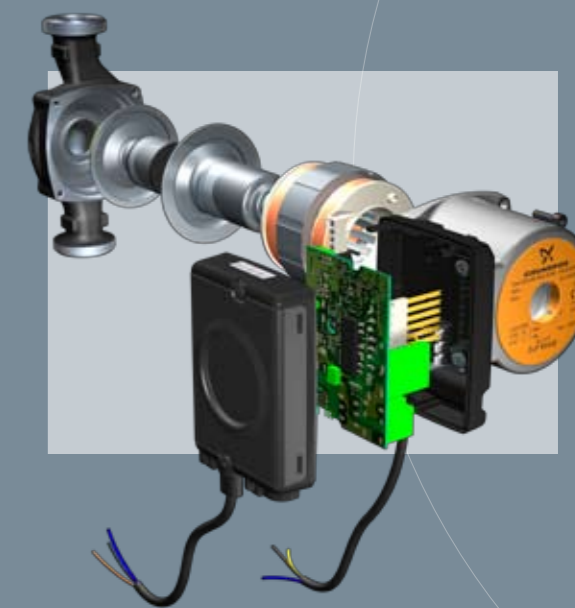
SUNNY PERSPECTIVES WITH GRUNDFOS SOLAR

Benefits

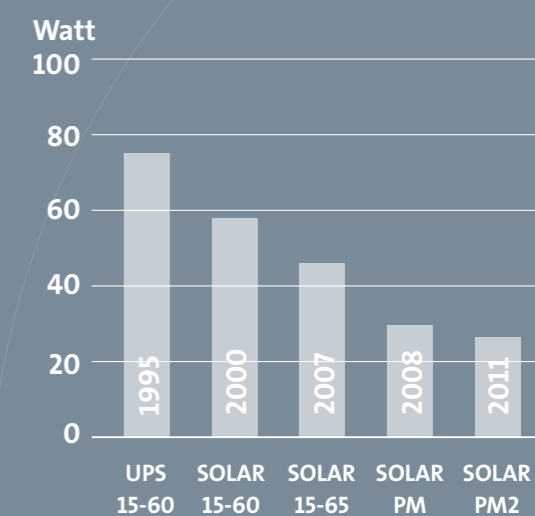
- Full product range developed and optimised especially for solar thermal applications
- Competent application experts in solar thermal technology
- Innovative solar technology based on the world-recognised Grundfos circulator pumps
- Substantial end-user energy savings and CO₂ reductions
- Specialised solar thermal programme for the US market

Features

- Very reliable and robust
- Energy savings of up to 80% compared to conventional pumps
- High pump efficiency – optimised motor technology and hydraulics
- Optimised performance to match the different system requirements
- Fit for hot and cold antifreeze media containing glycol
- Motor protected against condensed water by drain holes and special wiring
- Cataphoretically coated cast iron housing
- Resistant to system pressure up to 10 bar and even higher pressure shocks



GRUNDFOS SOLAR POWER CONSUMPTION



Development in energy-saving SOLAR pumps (1995-2011)

Calculations are based on:

Flow: 0.25 m³/h

Head: App. 5.5 m



HEAT PUMPS

Toward a sustainable future

Renewable energy technologies such as heat pumps are bound to play a vital role in future heating, cooling, and air-conditioning systems. Grundfos is a frontrunner in hydraulic solutions used in renewable and sustainable systems. We help you develop and optimise efficient heat pumps that reduce the impact on the environment by sharing our expertise and working closely with you throughout the development processes.

Your professional partner

We understand the world of heat pumps and their special working conditions. Our products are optimised for heat pump operations to meet the demands of high performance and low energy consumption. This means that you can reduce the yearly power consumption of your heat pumps, making your customers save energy and money. Also, extensive product testing under real-life heat pump conditions clearly substantiates that Grundfos pump technology is the best around.

ADDING VALUE WITH GRUNDFOS TECHNOLOGY

Benefits

- Expertise and development assistance
- Focus on innovative, energy-efficient, and sustainable solutions
- Broad product portfolio for heat pumps
- Standard and customised pumps and hydraulic systems
- Energy-efficient pumps optimised for heat pump applications (hot and cold water)
- Long life under extreme conditions

Features

- Energy savings of up to 80% compared to conventional pumps
- High performance and high reliability under all conditions
- Tested under simulated geothermal conditions and in real-life heat pump applications with respect to media, temperature, start/stop frequencies, etc.
- Durable and corrosion-resistant materials
- Suitable for pumping water-glycol media and other special media
- Additional functions such as air-venting, diverter valve, or alternate connections





SANITARY HOT WATER

Drawing on 60 years of experience

At Grundfos we are experts in heating and recirculating domestic hot water. More than 60 years of experience with pumping drinking water in domestic applications have been applied by our designers in the development of our sanitary products with high focus on comfort and safety.

Comfort and safety

Instant hot water and pressure boosting to increase comfort, and constant recirculation to avoid hot water stagnation and thus Legionella bacteria, are just some of the added value you get from choosing a Grundfos solution.

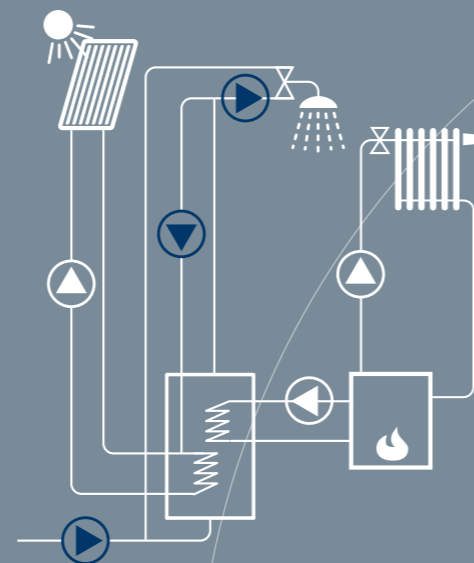
Tough pumps for tough environments

To ensure continuous trouble-free operation in domestic hot water, the pumps need to be very robust and resistant to for instance lime and chlorine. With Grundfos sanitary hot water pumps, your customers' systems will run smoothly year after year.

YOU ARE SAFE WITH US

- Experts on hot water applications
- Special pumps designed for hot water applications
- High reliability
- Instant hot water and pressure boosting for high comfort
- Continuous recirculation to avoid stagnation for high safety
- Built-in antiblocking feature for high durability
- Different housings in high-resistance materials with all necessary approvals

SANITARY HOT WATER



 Pumps for sanitary hot water



MICRO CHP

The future of heat and power supply

Micro CHP has come to stay. Using combined heat and power (CHP) systems to generate electricity and thermal energy in one single, integrated system, rather than electricity generation at a central power plant and on-site heating/cooling, represents the future domestic energy supply. Because CHP captures the heat that would otherwise be rejected in traditional separate systems, the total efficiency of these integrated systems is much greater.

Knowledge is power

Grundfos is a frontrunner in renewable energy technologies for the pump industry, and we work actively with the major OEM players on the Micro CHP market to develop products optimised for CHP operations. Compact and energy-saving solutions that can deliver optimum performance and long life in all types of environments, for instance with deionised water, are some of our key focus areas.

Combining knowledge centres and involving lead users are critical facilitators of success, especially in connection with new product development. So we are ready for the challenge whenever you are.

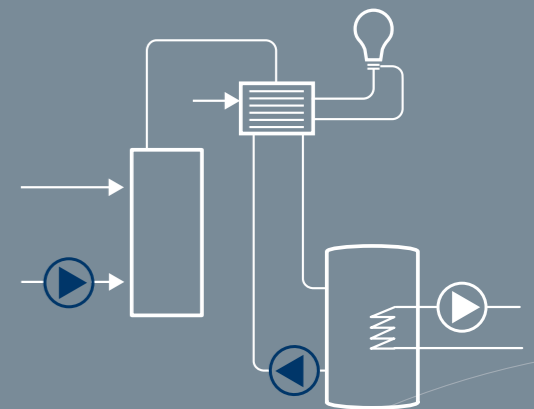
TEAM UP FOR THE FUTURE

- Competent development partner
- Dedicated team for Micro CHP solutions
- Optimised solutions
- Low parasitic power consumption
- High reliability

CHP solutions for:

- Stirling engine
- Gas motor
- Micro turbine
- Fuel cells

FUEL CELL



 Pumps for fuel cells

EFFICIENT LOGISTICS IS THE KEY TO SUCCESS
FOR YOU AND FOR US



SMART AND SMOOTH DELIVERY SERVICE

High focus on your needs

Grundfos HVAC OEM solutions are manufactured exclusively in-house, and in order to reduce the cost of the final product we operate with just-in-time manufacturing. This means making what the customer wants, when he wants it. An added benefit of this lean manufacturing approach is that we are flexible and in most cases can respond rapidly and efficiently to new enquiries and requests for modified or extra deliveries.

Leave the logistics to us

Because of our long experience with serving OEM customers and our organisational size and strength we are able to deliver effective supply chain management. We offer extensive inter-company communication of order, production, and stock data through EDI – with some customers we have a fully integrated electronic value chain, involving sharing of forecasts, enquiries, and more.

By automating our transactions and the many data that flow between our organisations, the whole supply chain is optimised and streamlined, ensuring that your delivery is in the right place, at the right time, and in the right quantities. High reliability from us means that you get early-mover advantages and high product availability in the market.

Decentralised warehousing

Our supply chain activities also extend into decentralised warehousing of Grundfos HVAC OEM products in the form of a consignment stock at your premises. If we are linked up with your warehouse inventory control system we know exactly when to ship the next delivery to you.

At Grundfos you get more than you expect!



FACTS

about Grundfos logistics

- Customised logistics solutions
- Global pump supply
- 7 OEM factories in Europe, China, and USA
- 30,000 IWCs and OEM pumps leave the factories every day

GO GLOBAL AND STAY LOCAL

Go global and stay local. That is another great advantage of doing business with Grundfos. We are a truly global group with sales and production companies spread all over the world, and strategically positioned HVAC OEM sales forces where you can get in touch with us to discuss your next idea or project.

Our global perspective combined with a strong local presence enable us to continuously gather market intelligence on local trends and conditions, legislation, and so on.

By sharing this strategic industry and market intelligence with you we can assist you in making accurate and confident decisions and growing your business.

With thousands of people out in the field every day, and more than 60 years of industry experience to draw from, we know the game and the markets better than most.

Let us use our combined market knowledge to find the best solution for you and your customers.

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■ Grundfos sales companies

BE > THINK > INNOVATE >

Being responsible is our foundation
Thinking ahead makes it possible
Innovation is the essence



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