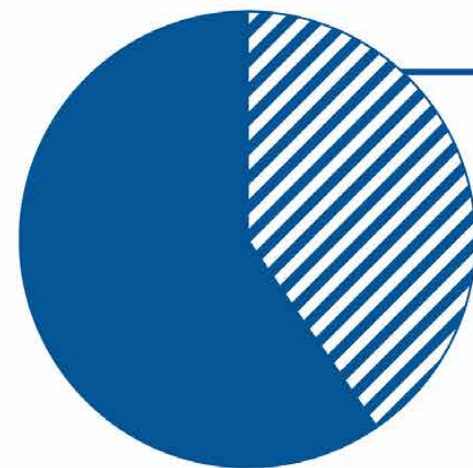
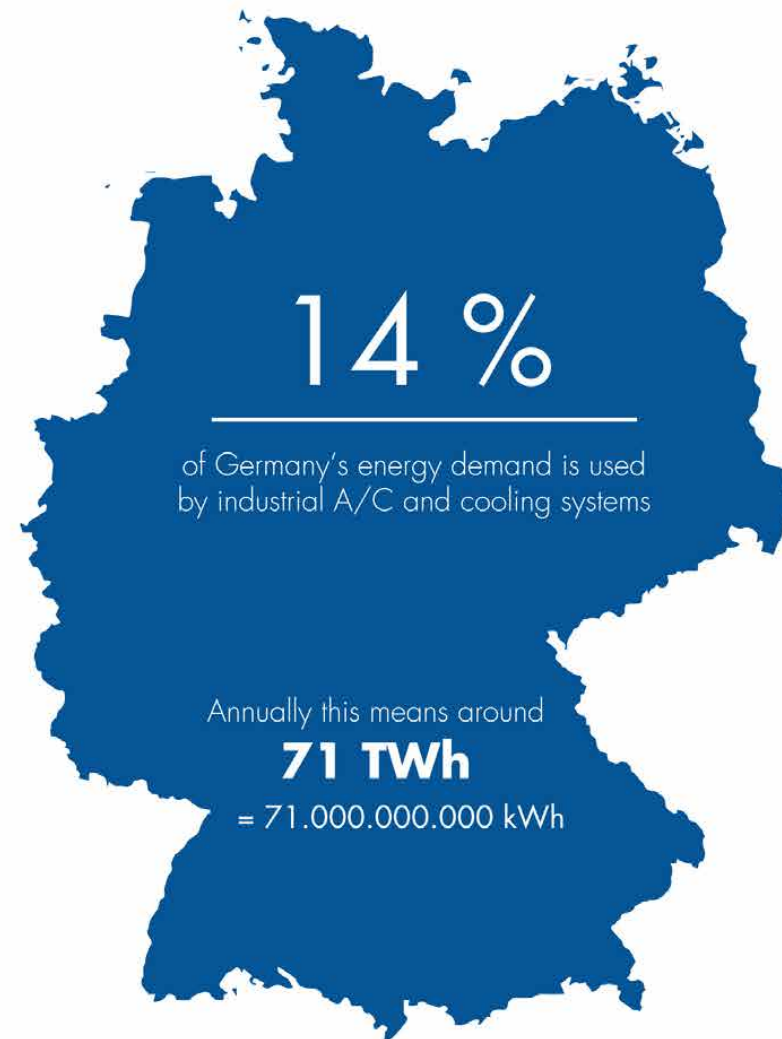




**REVOLUTIONARY ENERGY SAVINGS,  
INNOVATIVE COOLING SOLUTIONS**

From the global #1 in oil-free cooling

**SMARTD**



**40 %**

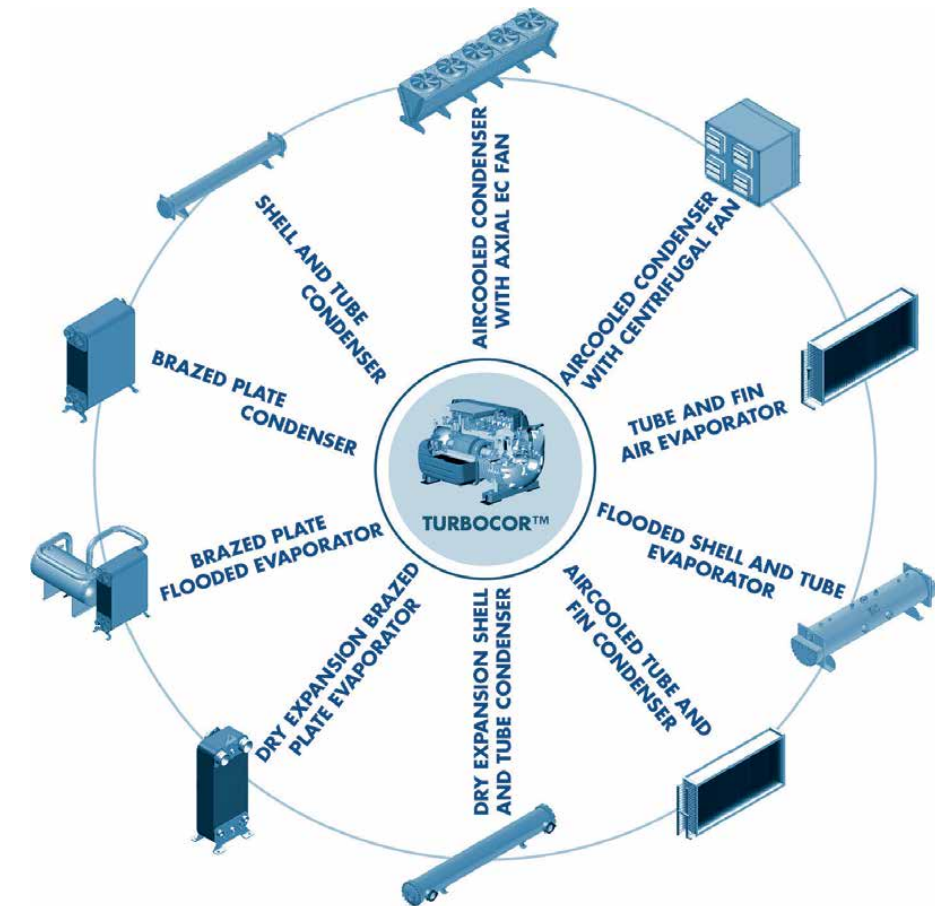
Up to 40% of this demand can be saved by using more efficient technologies

This means up to  
**28,4 TWh**

This is a simplified description.  
Source: Study of 17.03.2011 by the VDMA working party, "Energy efficiency in cooling systems"

## PAY OFFS

Realizing saving potentials in cooling systems

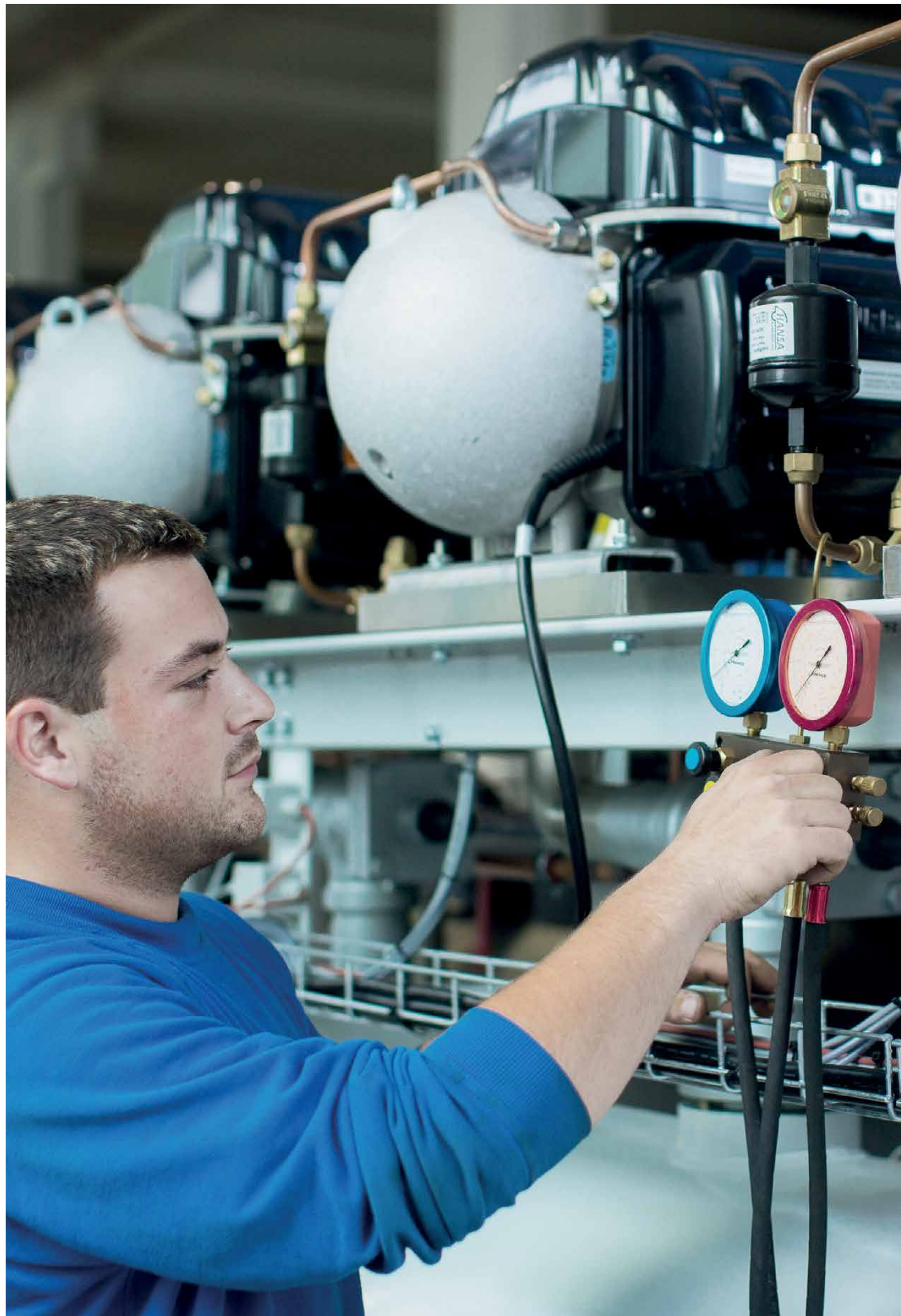


You'll find our cooling systems applied in a wide range of industries such as automotive, chemical, IT services, pharmaceuticals, building management technology as well as manufacturing plants all over the world. For years now we have set the standard for efficiency and reliability with our oil-free centrifugal compressors and the innovative technologies integrated into our systems.

Savings in operating costs of up to 50 % are not unusual. Low operation and maintenance costs with high efficiency and reliability ensure our customers realize outstanding ROI's within very short periods.

- Tried & tested and successful application in our systems of the world's first oil-free Turbocor™ centrifugal compressor with magnetic bearings.
- Highly efficient, especially at part load and condenser relief (up to 99 % of run time). That means lower energy requirements, reduced operating costs and comparatively short amortization times.





## FLEXIBLE DESIGNS

### Systems for the most demanding applications

**SMARDT**

Customized solutions take into account your specific plant requirements, including not only efficiency and overall operation, but also installation. We take the conditions on site and build a fully customized unit precisely configured to the customer's needs, whether they be space, efficiency or sound related.

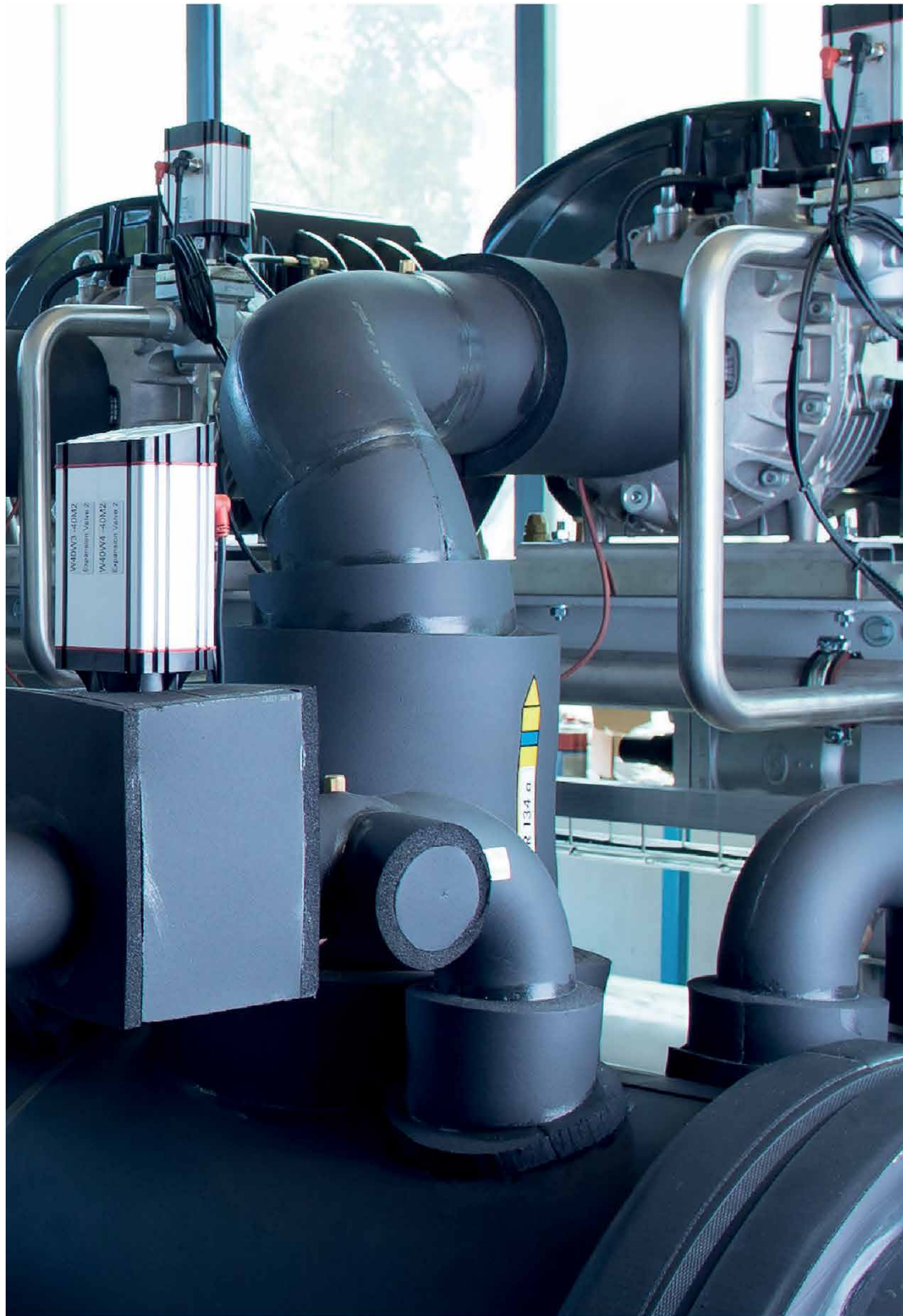
We even offer accessories for almost any application: explosion protection, protection against corrosive fluids, special corrosion protection coatings, critical sites or silicone-free systems for use in paint shops.

Our Total Life Cycle Cost comparisons allow the selection of the most cost effective combination of componentry at an early stage.

With our wide ranging experience and detailed knowledge of customer requirements and processes we can show you just what modern cooling systems are capable of.

- Modular production allows the flexibility to meet customer specifications and requirements such as noise values, dimensions and measurement and control requirements
- Continuous quality checks ensure high production quality and a rigorous R&D schedule.
- Plug & play system solutions with ready assembled compact and container units.
- Oil-free systems are less hazardous to the environment, and mean that no additional protective measures are required.
- Cost-effective modernization (retrofitting).





## CONTROLLED SUCCESS

Across the entire system

**SMARDT**



- Monitoring and long-term data recording, evaluation and analysis increase the availability of systems by shorter reaction times.
- Data communication via all common bus protocols and Web-Application.
- Use of proprietary controllers in our systems.
- In-house controls programming as well as control and switch cabinets made in Germany.

Since 1998 we have maximized the potential of our fully configurable logic controllers with data capture and BMS connection. This electronic centrepiece of our systems supports ongoing analyses and optimization with previously unattainable degrees of flexibility.

Our systems can thus be seamlessly integrated in your automated building management system. With the fully programmable logic controller, our machines can be operated in a variable, versatile and efficient way.





## OUTSTANDING QUALITY

### Consistently reliable

**SMARDT**

As an integral part of modern production and supply chains, reliable and efficient cooling systems are essential in ensuring competitiveness.

Smardt systems are characterized by outstanding reliability resulting in low maintenance outlay. Our customers from the automotive, chemical, medical technology and pharmaceutical industries rely on operating parameters being strictly adhered to.

Our systems are built under strict quality standards at Smardt's European production facility near Stuttgart, Germany. Each machine is produced and developed according to processes certified in line with DIN EN ISO 9001.

- 
- Precise compliance with all operating parameters per customer specifications.
  - High reliability/low failure risk due to reduced number of moving parts.
  - Maintenance savings due to absence of oil in the entire system and use of magnetic bearing compressors.
  - All company divisions are ISO 9001-certified, making all processes transparent.
- 





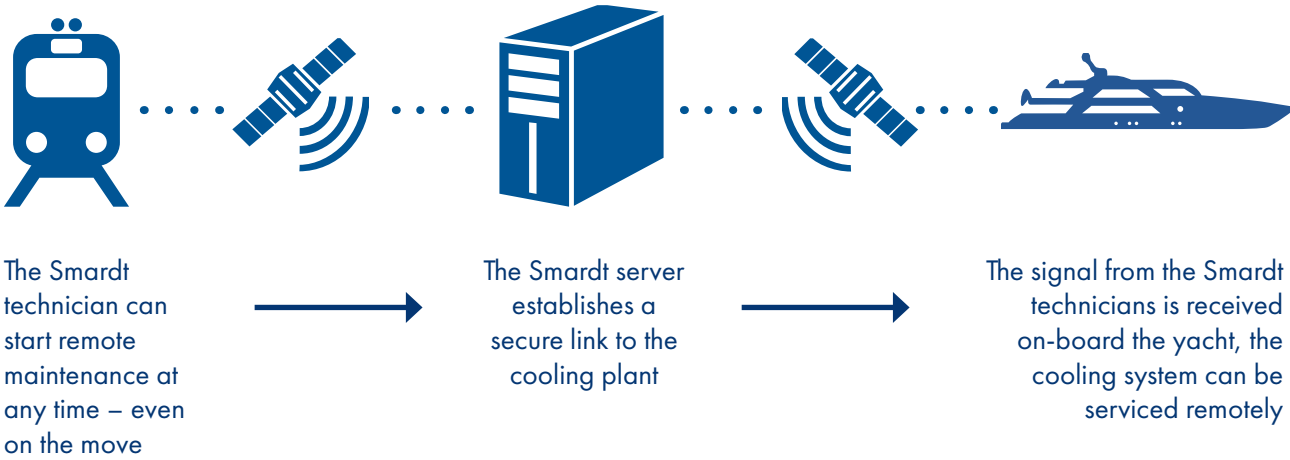
The cooling system on a 66 metre yacht was replaced by Smardt.

In addition to benefiting from our remote maintenance options, the ship's cooling system is 30% more efficient, which is realized in fuel savings.

As one of the pioneers in the areas of remote servicing and BMS connections with data transfer in cooling systems, we have completely redefined precisely what constitutes 'maintenance'. With this technology, our service department can perform fault analyses on an on-board cooling system on a yacht sailing in the middle of the ocean from our online service centre or even while in transit. Under a service contract, our service team can perform rapid analyses and proactively intervene or make modifications as the need arises. Often this is completed before the customer even realizes it. Thus processes and operation can continue without major restrictions.

- Cost-saving and rapid remote service for control, analysis and optimization.
- Europe-wide service network with 24 hr standby, supported in the rest of the world by Smardt Chiller Group subsidiaries.
- BMS communication to service centre for tests, visualization and optimization.
- Service and maintenance by highly qualified personnel who undergo continuous in-service training.

RAPID REMOTE SERVICE





OUTSTANDING POTENTIAL  
Investment in the future



At Smardt we take our responsibility as a company very seriously. In addition to developing technologies that help save resources for future generations, we also commit to the training of new technicians.

Since our company was first established, we have always included young, industrious personnel in our enthusiastic team – good for the working environment and good for new ideas.

We maintain close contacts with universities in the region and in addition to traditional traineeships as HVAC technicians, we also offer internships for students at all levels, from those studying engineering degrees to master's theses. We thus take an active role in the professional development of the industry leaders of tomorrow.



STRONG GROWTH SINCE 2011  
OPK becomes Smardt



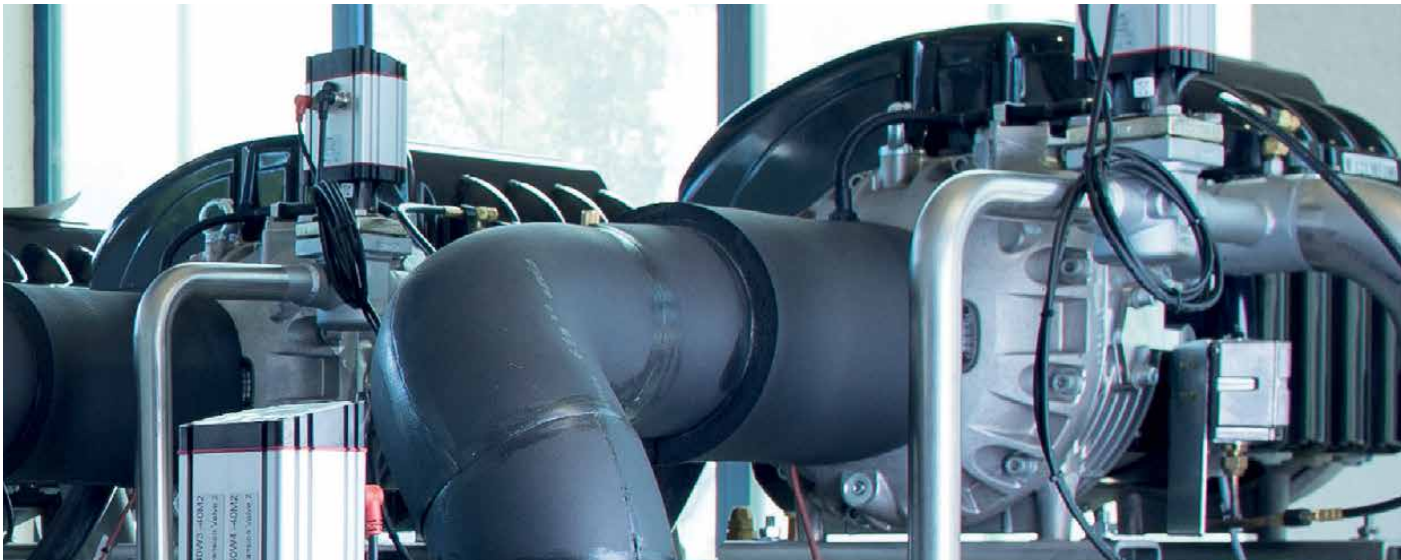
opk was established in 1985 in Neckartailfingen and obtained an enviable reputation in the development of new technologies for cooling and air-conditioning systems with an impressive number of new processes and registered patents.

Since 1998 the systems have been continuously enhanced by the use of the latest electronics and componentry. In 2003, opk first combined intelligent control with an electronic compressor that heralded a genuine revolution in the use of refrigerant compressors.

In the years that followed completely new products were developed on the basis of the controller in combination with these compressors. New ground was broken and entirely new, free design and application options in the use of liquid cooling systems and direct expansion were created. Modern production methods and CNC machines created further foundation for today's success and continual improvement.

In 2011, opk was acquired by the Smardt Chiller Group. Within the Smardt organisation, a worldwide network between individual plants and the various R&D departments has been established. This affords the basis for cutting-edge product development and in turn product offerings that are pioneering in world terms.

In Wendlingen, Smardt-OPK Chillers GmbH is an expanding facility. Our engineers, technicians, sales people and production team are focused on delivering products that not only meet customer's expectations but far exceed them.





AUTOMOTIVE

Production systems, machining centres for engines + transmissions, coating systems/supply air conditioning. Environmental simulation. Various machining processes such as grinding, drilling, milling, polishing, welding, forging, casting, tempering, pressing, punching etc.  
Paint cooling in systems with circulation processes, immersion bath cooling in cataphoretic coatings, simulation systems for various climatic conditions.  
Extraction of heat from test rigs, test chambers and air ducts. Also silicone-free.

CHEMICALS

Cooling/temperature control of process systems. Protected versions and special materials for corrosion protection.

FOOD & BEVERAGES

Cool stores + product/buffer stores. Deep freeze systems with peripherals. Various production processes such as storing, processing, pumping, filling, packing, convection cooling under room conditions for germ-free filling and packing.

GEOHERMAL SYSTEMS >200 kW

Heat pump systems for cooling and heating larger buildings using sub-surface geothermal heat with partial direct cooling or direct heating. Reduced environmental impact as system is oil-free.

IT & DATA TECHNOLOGY

Cooling/temperature control of computer systems, ventilation systems, convection coolers. Vented computer racks via convection cooling devices. Fluid-cooled computer units. Fresh air supply. High degree of redundancy/availability/operating reliability.

PLASTICS

Cooling moulds in injection moulding machines, hydraulic oil circuit dehumidification with granulate drying. Compact systems.

METAL WORKING

Emulsions, machining processes such as grinding, drilling, milling, polishing, electric discharge machining, welding, forging, casting, tempering, pressing, punching etc.



MEDICAL TECHNOLOGY

Medical equipment, sterile MRT production systems, systems in hospitals. Optical adjustment options. Various processing stages and processes such as stirring, pumping, metering, mixing, drying etc.  
Dehumidification of packaging and preparation for mixing and metering.  
Controlled ambient conditions for storage, processing and packing. Clean rooms in clinics, universities, laboratories and research institutes.

SURFACE PROCESSING

Coating systems/paintshops and supply air conditioning. Production clean rooms, dehumidification processes. Extraction of heat from various production processes such as paint cooling in spray system with convection processes. Immersion bath cooling for cataphoretic coatings. Temperatures below dew point on spray walls.  
Bath cooling for galvanic processes. Furnace cooling in production of sintered metals and automatic soldering processes for PCBs.

PHARMACEUTICALS & PROCESSES

Various processing stages and processes such as reaction heating, stirring, pumping, metering, mixing, phase separation, drying etc.  
Dehumidification of packaging and preparation for mixing and metering. Solvent recovery. Controlled ambient conditions for storage, processing and packing. Convection cooling under clean room conditions.

TECHNICAL BUILDING EQUIPMENT

A/C systems for offices, headquarters, hotels, exhibition centres, halls and museums. A/C systems for radio, TV studios, universities and event venues. Clean rooms for production, testing, environment and simulation.

All company divisions of Smardt-OPK  
Chillers GmbH have been ISO 9001-certified.







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