



SKADEC

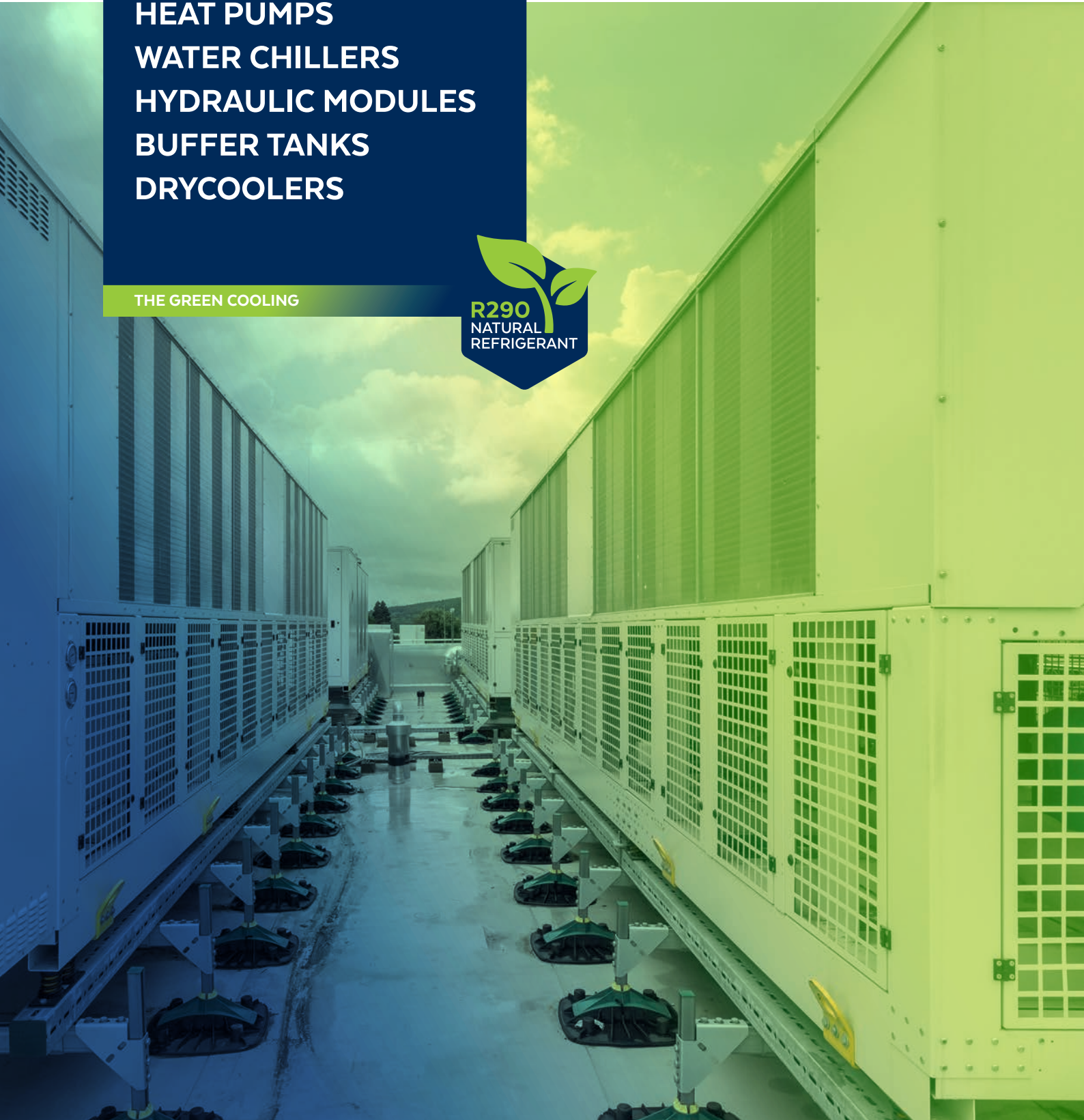
Product overview

**HEAT PUMPS
WATER CHILLERS
HYDRAULIC MODULES
BUFFER TANKS
DRYCOOLERS**

THE GREEN COOLING



**R290
NATURAL
REFRIGERANT**



GREEN COOLING: EFFICIENCY MEETS ECOLOGY



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SUSTAINABLE MODULAR RE- FRIGERATION TECHNOLOGY

In recent years, SKADEC has become one of the leading suppliers of sustainable air-conditioning and refrigeration technology in Germany and other European countries. True to our slogan „Green Cooling“, we have been developing and researching sustainable, high-quality and reliable chillers at our company headquarters in the Hohenlohe region of southern Germany for the past ten years. For this we work exclusively with future-proof low-GWP refrigerants, such as the natural and environmentally friendly refrigerant propane (R290).

Thanks to the more than 300 highly-motivated employees in our group of companies, we have been developing trend-setting products in the field of refrigeration and air-conditioning technology for many years. We are particularly proud of our in-house developed control software. Using freely programmable controllers, our development team – consisting of technicians, master craftsmen and engineers from the fields of refrigeration, control technology and software development – has created innovative control strategies. The focus of their development has been particularly on algorithms combining user-friendliness, maximum availability and system efficiency. In addition, our installations are characterised by their high quality standard based mainly on components from renowned German manufacturers. This guarantees the availability of spare parts and ensures the required reliability.

Skadec GmbH is an independent company within the Kratschmayer Group.

CE Declaration of Conformity and certification

All products offered come with a CE Declaration of Conformity.

Production is certified according to modules A2, B, C2 and D of the Pressure Equipment Directive 2014/68 EU and ISO 9001.

Standards and guidelines adhered to:

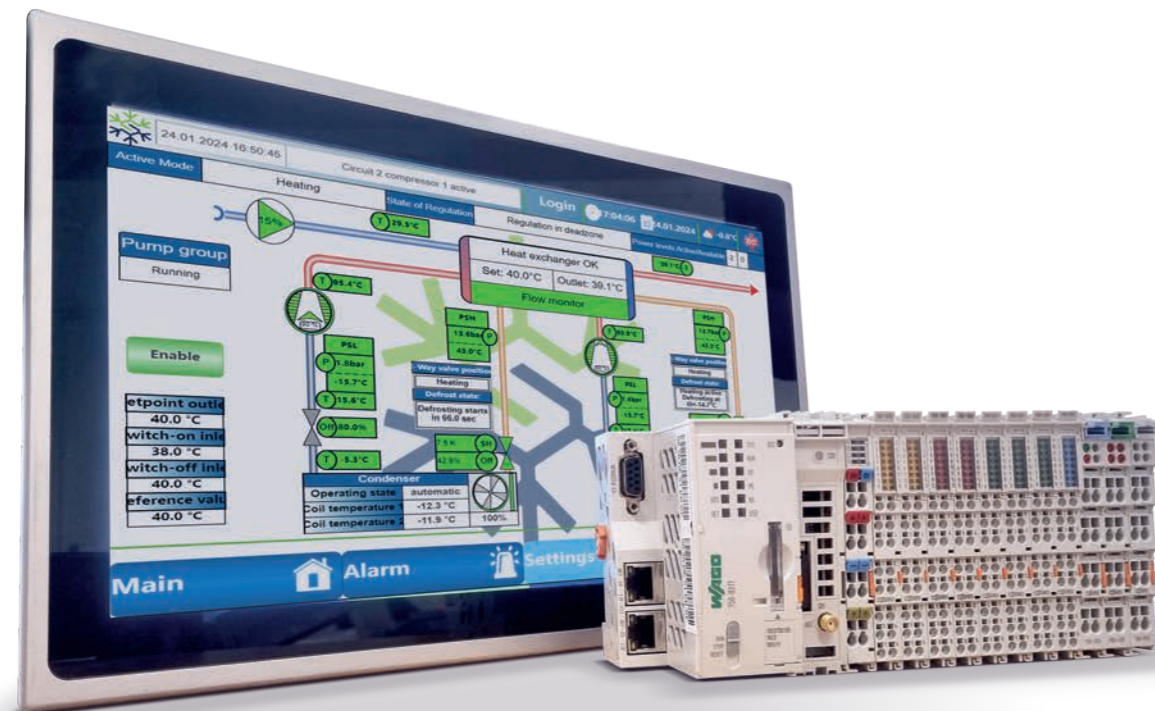
- » DIN EN 378
- » Pressure Equipment Directive
- » Low Voltage Directive
- » Machinery Directive
- » Electromagnetic Compatibility

Our distribution
network – we are
on site for you



INTELLIGENT MACHINE CONTROL

As control systems we use freely programmable controllers. They are ideally suited to combining our many years of experience in refrigeration and air-conditioning technology with our special-purpose control algorithms. In the design of our control software, the main focus of our in-house programming department is on user friendliness, high availability and system efficiency.



Control system

The heart of the machine control system is the programmed algorithm which ensures efficient and trouble-free operation of the system. Thanks to "condition monitoring", the constant monitoring and analysis of all components and process data, emerging problems can be spotted as soon as they arise. As a result, for example, maintenance can be planned in advance. However, should any faults or malfunctions occur, the machine responds automatically, ensuring the maximum possible output in emergency operation despite the impairment.

Whether directly at the touch screen of the machine or remotely on a tablet, mobile phone or PC, the schematic representation of the system makes all important process data visible at a glance. You can see immediately how your plant is performing by the colour coding of each actuator. Faults and irregularities are indicated directly at the relevant part of the system and displayed as full text in the alarm list. The intuitive operating concept enables the user to interact easily with the machine.



Designed to make your work easy

Data logger/Data plotter

Recording and analysis of a wide range of process data is becoming increasingly important. For this purpose, our PLC provides the user with a freely configurable data logger. By default, the controller saves more than 60 values per day on an SD memory card as a *.csv file every 5 seconds. To be able to conveniently analyse the often large amounts of process data, the data plotter converts the values into meaningful line graphs.



Open to communicate

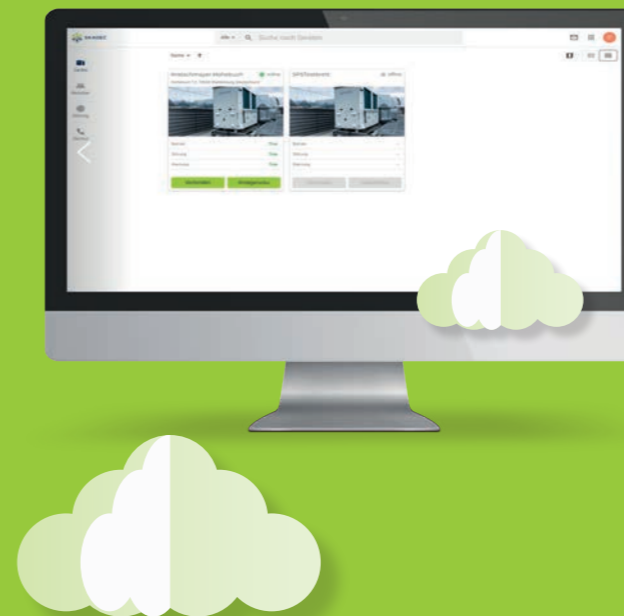
Networking of individual components is essential for the correct functioning and efficient performance of an overall system. Thanks to the implementation of various bus interfaces, our products systems can be easily integrated into existing process control systems. Available interfaces are among others Industrial Ethernet, Profibus, Modbus RTU, Modbus TCP and CANopen.



THE SKADEC CLOUD - FORWARD- LOOKING REMO- TE MAINTENANCE

*Access anywhere
anytime*

Whether from the office or on the road, using a desktop PC, tablet or smartphone, the Skadec cloud ensures you always have full control of your machine. No matter if it's for adjusting set points, just a quick check or a detailed analysis, your machine is just one click away. With the cloud solution from Skadec, you have continuous access to all the relevant data and functions.



Creating added value for yourself and your customers

With the integrated Fleet Manager, you can centrally manage and monitor all the Skadec machines you are responsible for. The Global Alarm Manager provides a detailed overview of all upcoming maintenance and pending errors.

Individual access to each module down to the actuator level allows that occurring errors can be analysed, narrowed down and even rectified remotely. If an on-site visit is nevertheless required, spare parts can be organized in advance and the service technician can be informed about the problem and possible causes before he reaches the machine. This saves time, money and a lot of stress! And should you not be able to find the cause of the fault by yourself, the competent and reliable Skadec Customer Service is at your side to support you via remote access.

ADVANTAGES OF THE SKADEC CLOUD



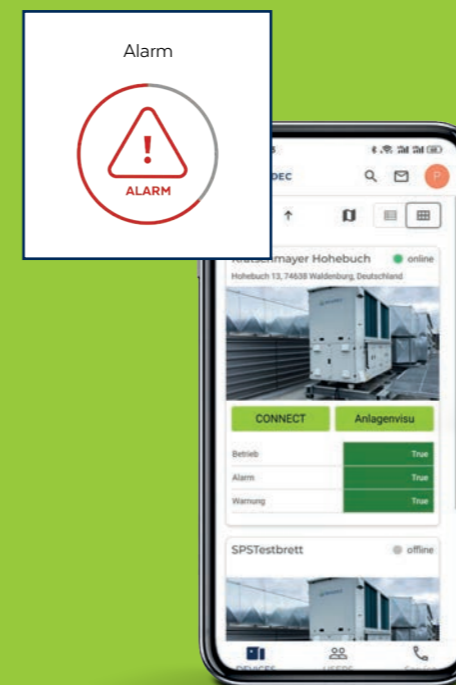
Advanced remote maintenance solution

Remote service and maintenance
Use your technician's valuable time more efficiently. Up to 80% of the problems can be solved remotely.

Status monitoring
Gain an insight into performance and current operational behaviour from real-time machine data.



Alarm-Management
Reduce your response time. Through alarm notification, the cloud informs you via push messaging directly to your smartphone or by email about malfunctions or critical situations of your Skadec machine.



Preventive maintenance
How did the Skadec Chiller actually perform in August? Discover patterns in the machine data. Comprehensive data logging saves all the important operating values from the previous seven years.



AIR-COOLED HEAT PUMPS



Air-cooled R290 heat pump SH.E.F.



Technical details:

- » Heating capacity 35 kW – 65 kW (A7 W45)
- » Refrigeration capacity 30 kW – 60 kW (A35, W7)
- » Max. outlet temperature 62°C (67°C)
- » Min. ambient temperature -20°C
- » Reciprocating compressor
- » Continuously variable capacity control
- » EC fans
- » Low-noise design
- » PLC controller

Natural refrigerant

- » R290

Heating capacity **35 kW – 65 kW**
 Refrigeration capacity **30 kW – 60 kW**

Air-cooled R290 heat pump SH.B.F.



Technical details:

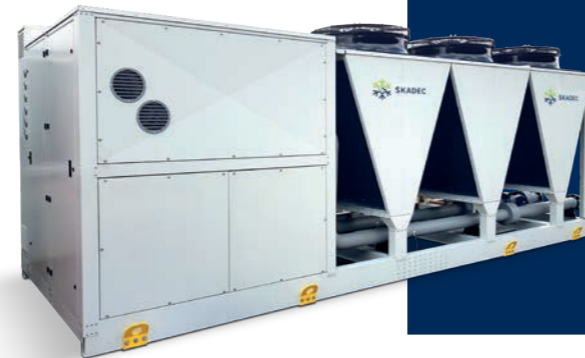
- » Heating capacity 60 kW – 230 kW (A7 W45)
- » Refrigeration capacity 50 kW – 180 kW (A35, W7)
- » Max. outlet temperature 62°C (67°C)
- » Min. ambient temperature -20°C
- » Reciprocating compressor
- » Continuously variable capacity control
- » EC fans
- » Low-noise design
- » Integrated hydraulic module
- » PLC controller

Natural refrigerant

- » R290

Heating capacity **60 kW – 230 kW**
 Refrigeration capacity **50 kW – 180 kW**

Air-cooled R290 heat pump SH.D.F.



Technical details:

- » Heating capacity 240 kW – 460 (610) kW (A7 W45)
- » Refrigeration capacity 200 kW – 380 (480) kW (A35, W7)
- » Max. outlet temperature 62°C (67°C)
- » Min. ambient temperature -20°C
- » Reciprocating compressor
- » Continuously variable capacity control
- » EC fans
- » Low-noise design
- » Integrated hydraulic module
- » PLC controller

Natural refrigerant

- » R290

Heating capacity **240 kW – 460 (610) kW**
 Refrigeration capacity **200 kW – 360 (480) kW**



AIR-COOLED WATER CHILLERS



Air-cooled water chiller SC.E.



Technical details:

- » Refrigeration capacity 30 kW – 60 kW (A35, W7)
- » Reciprocating compressor
- » PLC controller

Natural refrigerants

- » R290
- » R1270

Conventional

- » R1234ze
- » R515B
- » R513A
- » R454B
- » R32

Refrigeration capacity 30 kW – 60 kW

Air-cooled water chiller (with free cooling) SC.A.



Technical details:

- » 50 kW – 1200 kW (A35, W7)
- » Reciprocating compressor, screw compressor
- » Continuously variable capacity control
- » EC fans
- » Low-noise design
- » Integrated free cooling
- » Integrated hydraulic module
- » PLC controller

Natural refrigerants

- » R290
- » R1270

Conventional

- » R1234ze
- » R515B
- » R513A
- » R454B
- » R32

Refrigeration capacity 50 kW – 1200 kW

Air-cooled water chiller (with free cooling) SC.G.



Technical details:

- » 100 kW – 1500 kW (A35, W7)
- » Reciprocating compressor, screw compressor
- » Continuously variable capacity control
- » EC fans
- » Low-noise design
- » Integrated free cooling
- » Integrated hydraulic module
- » PLC controller

Natural refrigerants

- » R290
- » R1270

Conventional

- » R1234ze
- » R515B
- » R513A
- » R454B
- » R32

Refrigeration capacity 100 kW – 1500 kW



WATER-COOLED HEAT PUMPS AND WATER CHILLERS



Water-cooled water chillers SC.I.



Technical details:

- » Heating capacity 17 kW – 83 kW (W7, W45)
- » Refrigeration capacity 13 kW – 65 kW (W7, W45)
- » Reciprocating compressor
- » Continuous and stepped capacity control
- » PLC controller
- » Separate hydraulic module

Natural refrigerants

- » R290
- » R1270

Suitable for installation in buildings
(Follow the safety concept)

Heating capacity **17 kW – 83 kW**
Cooling capacity **13 kW – 65 kW**

Water-cooled heat pumps and water chillers



Technical details:

- » Heating capacity 13 kW – 650 kW (W7, W45)
- » Refrigeration capacity 10 kW – 500 kW (W7, W45)
- » Reciprocating, screw, scroll compressor
- » Continuous and stepped capacity control
- » Low-noise design
- » Integrated free cooling
- » Integrated hydraulic module
- » PLC controller

Natural refrigerants

- » R290
- » R1270
- » R600a
- » CO₂ (subcritical)

Versions:

- » Hydraulically reversible
- » Refrigeration reversible

Conventional

- » R1234ze
- » R515B
- » R513A
- » R454B
- » R32

Heating capacity **13 kW – 650 kW**
Cooling capacity **10 kW – 500 kW**

Water-cooled heat pumps and water chillers in container



Technical details:

- » Heating capacity 130 kW – 3200 kW (W7, W45)
- » Refrigeration capacity 100 kW – 2500 kW (W7, W45)
- » Reciprocating, screw, scroll compressor
- » Continuous and stepped capacity control
- » Low-noise design
- » Integrated free cooling
- » Integrated hydraulic module
- » PLC controller

Natural refrigerants

- » R290
- » R1270
- » R600A
- » CO₂ (subcritical)

Versions:

- » Hydraulically reversible
- » Refrigeration reversible

Conventional

- » R1234ze
- » R515B
- » R513A
- » R454B
- » R32

Heating capacity **130 kW – 3200 kW**
Cooling capacity **100 kW – 2500 kW**



HIGH TEMPERATURE HEAT PUMPS AND SPECIAL-PURPOSE MACHINES



Water chiller with open housing



Technical details:

- » Refrigeration capacity 10 kW – 2500 kW (A35, W7)
- » Reciprocating compressor, screw compressor, scroll compressor
- » Continuously variable and stepwise capacity control
- » Integrated free cooling
- » Integrated hydraulic module
- » PLC controller

Natural refrigerants

- » R290
- » R1270
- » R600a

Conventional

- » R1234ze
- » R515B
- » R513A
- » R454B
- » R32

Water-cooled R600a high-temperature heat pump



Technical details:

- » Max. outlet temperature 90°C
- » Heating capacity 50 kW – 2200 kW
- » Reciprocating compressor, screw compressor
- » Continuously variable and stepwise capacity control
- » Low-noise design
- » Integrated hydraulic module
- » PLC controller

Natural refrigerants

- » R290
- » R600a

Conventional

- » R1234ze
- » R515B

Special-purpose systems of any design



Technical details:

- » Reciprocating compressor, screw compressor, scroll compressor
- » Continuously variable and stepwise capacity control
- » Low-noise design
- » Integrated free cooling
- » Integrated hydraulic module
- » PLC controller

Natural refrigerants

- » R290
- » R1270
- » R600a

Conventional

- » R1234ze
- » R515B
- » R513A
- » R454B
- » R32

DRYCOOLER

Efficient, compact, quiet

Skadec offers an extensive range of drycoolers in a wide performance spectrum. Drycoolers are available in various designs up to a total length of 13m and 3m height. They can be configured to suit any application with EC fans, corrosion-protected lamellae and PLC-based controller. The frame is made of galvanised and powder-coated steel. All modules can be individually adapted to the required sound values.

Table cooler DM



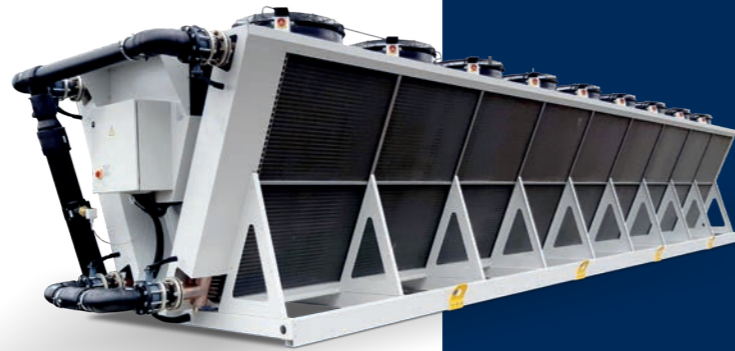
Technical details:

- » Up to 580kW recooling capacity at 40°C/45°C, 34% MEG and ambient temperature +35°C
- » EC fan

Optional:

- » Foldable fans
- » Self-draining design
- » Repair switch
- » Control cabinet
- » Rubber vibration damper
- » Spring vibration damper
- » Housing colour as requested in RAL
- » PLC control

V-shape single and double row DV



Technical details:

- » Up to 580kW recooling capacity at 40°C/45°C, 34% MEG and ambient temperature +35°C
- » EC fan
- » Single row design
- » Double row design

Optional:

- » Foldable fans
- » Repair switch
- » Control cabinet
- » Rubber vibration damper
- » Spring vibration damper
- » Housing colour as requested in RAL
- » PLC control

V-shape single and double row DVHQ



Technical details:

- » Up to 580kW recooling capacity at 40°C/45°C, 34% MEG and ambient temperature +35°C
- » EC fan
- » Single row design
- » Double row design

Optional:

- » Foldable fans
- » Repair switch
- » Control cabinet
- » Rubber vibration damper
- » Spring vibration damper
- » Housing colour as requested in RAL
- » PLC control

HYDRAULIC MODULES

Custom built hydraulic modules



Hydraulic modules are planned and manufactured for specific projects according to the customer's specifications. They are available either with steel frames, transport frames or fully assembled in containers. The modules available include pump groups, buffer tanks, heating and cooling circuit manifolds as well as turnkey technology centers in containers. In the choice of components, there are no restrictions.



All hydraulic modules are visualised as a 3D model before assembling and made available to the customer for approval. In the detailed representation, the arrangement of the components, space conditions and walkways can be evaluated. This saves you time, personnel and costs on the construction site.

Software solutions for hydraulic modules



You need a suitable automation solution for your hydraulic station? Skadec can supply you with the control cabinet including the PLC-based controller, optionally pre-installed and wired to the frame or the technology container. Our customised solutions offer maximum flexibility with a consistently high quality. The user-friendly control system can be operated intuitively via a 7", 10" or 15" touch panel. In addition, the load management of the cooling and heating system can be regulated via the central PLC controller.

BUFFER TANKS

Customised buffer tank configuration

Possible design:

- » Volume 200- 10,000 litres
- » S235JR steel, V2A V4A stainless steel
- » Insulation diffusion thickness 20mm, 40mm, 60mm
- » Polyester fibre fleece thermal insulation
- » Galvanised steel or stainless steel protective jacket
- » Inlet bends
- » Separating plate
- » Nozzle tube



Latent storage systems / PCM storage

Cold storage for the economic operation of brine plants

The latent storage system can store thermal energy and release it when required. The storage is based on the latent heat of fusion principle (phase change of the medium) with the advantage of storing large amounts of energy in a very small space. The PCM (phase change material) is located in airtight welded spheres made of plastic (HDPE) in a buffer storage and is frozen in charging mode or melted in discharging mode with the help of a liquid carrier medium (e.g. glycol).



Advantages:

- » Reduction of peak loads
- » Storage of renewable energy in the form of thermal energy (e.g. electricity from the photovoltaic system)
- » No maintenance costs
- » High storage density on a small footprint
- » PCM material available for 0 to -38°C supply temperature

CURRENT REFERENCES

Our products are used in numerous industries and for a multitude of applications

Skadec water chillers and heat pumps stand for highest quality, reliability, sustainability and energy efficiency. Wherever possible, we rely exclusively on natural refrigerants such as R290, R1270, R600a or CO₂.

Our customers include globally renowned industrial and commercial groups. Our broad product portfolio offers solutions for all applications in the small and large capacity range. Our flexible and efficient production enables us to deliver systems tailored to customers' needs and application areas with short delivery times.

We are proud of

- » Over 500 implemented projects
- » 85 MW installed refrigeration capacity
- » The equivalent of 13,000 tonnes of CO₂ saved



Automotive industry

The German automotive industry is well known for precisely timed just-in-time production. Any disruptions to the supply chain have an immediate impact on production. Reliable process cooling is considered indispensable. For an automotive supplier in southern Germany, Skadec supplied chillers for process cooling of welding robots, heat pumps for building air-conditioning, and a technical container for outdoor installation with buffer tank, system separation, pump groups and backfeed.

Performance data

- » 894 kW refrigeration capacity (2x R290 water chiller)
- » 367 kW free cooling capacity
- » 162 kW heating capacity (2x R290 heat pump)

Data processing centers

Server cooling in data centers has become increasingly important in recent years. Skadec R290 water chillers with free cooling are ideal for energy-efficient and sustainable IT cooling. The intelligent control system installed as standard guarantees maximum system availability. Skadec was able to supply four chillers with free cooling for the cooling of air-conditioning cabinets and a heat pump for building heating and cooling.

Performance data

- » 2412 kW refrigeration capacity (4x R290 water chiller)
- » 2408 kW free cooling capacity
- » 360 kW heating capacity (1x R290 heat pump)



Retail trade

German food retailing is innovative, highly successful and renowned as a pioneer. One of the key competitive factors is energy consumption in the market. In addition to commercial refrigeration, sustainable building heating and cooling is also becoming increasingly important. Skadec supplied two R290 heat pumps and a hydraulic module with buffer tank, heating distribution circuit and control system.

Performance data

- » 392 kW heating capacity (2x R290 heat pump)
- » 280 kW refrigeration capacity

Current references



Public buildings

For comfortable temperatures while studying, Wuppertal University decided years ago to rely on sustainable refrigeration technology. In various projects, Skadec has supplied R290 water chillers with integrated free cooling of different capacities.

Performance data

- » 1918 kW refrigeration capacity (5x R290 water chiller)
- » 1593 kW free cooling capacity



Retail trade

For food retailers, system failures cause inconvenience to customers. The heat pump, specially designed for high operational reliability, has two completely separate refrigeration circuits and three frequency-controlled reciprocating compressors. The fine-tuned power supply enables the required cooling capacity to be delivered extremely precisely and energy-efficiently.

Performance data

- » 160 kW heating capacity (1x R290 heat pump)
- » 50 kW refrigeration capacity

Automotive industry

The market leader and world-renowned automotive supplier for motorsport chassis, KW automotive, decided to use a future-proof R290 air-to-water heat pump for heating and cooling the production and administration facilities. This not only puts the manufacturer in the lead on the road, but also places it at the forefront in the field of building heating and cooling. The high-performance heat pump with three separate refrigeration circuits offers maximum operational reliability with a low refrigerant charge.

Performance data

- » 380 kW heating capacity (1x R290 heat pump)
- » 330 kW refrigeration capacity



Chemical industry

For a long time, the German chemical industry has been a driving force in the international market. No company can afford plant failures with resulting downtimes. For the required process cooling in production, Skadec has therefore focused on maximum plant availability and high machine redundancy.

Performance data

- » 1274 kW refrigeration capacity (2x R290 water chiller)



Cold storage

Fresh German apples – all the year a round. R290 chillers are also ideal for product cooling. At a supply temperature of -7°C , reciprocating compressors have significantly better energy efficiency compared to screw and scroll compressors. For uninterrupted cooling, Skadec supplied a chiller with four separate refrigeration circuits.

Performance data

- » 430 kW refrigeration capacity (1x R290 water chiller)
- » 3000 liters PCM storage



Automotive industry

Simulated environmental conditions play an important part in the automotive industry. Skadec supplied water-cooled R290 chillers for process cooling. The units were manufactured according to the factory's specifications and each equipped with a Siemens S7-1500 PLC.

Performance data

- » 1200 kW refrigeration capacity (-5°C outlet temperature) (4x R290 water chiller)

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