COOLING
ON POINT

The new **SPECTRUM Water chiller**
from ENGIE Refrigeration

Excellence
IN COOLING & HEATING

CONTENTS

THIS IS HOW SUSTAINABLE COOLING IS DONE!

6 BASIC **MODELS**

WATER-COOLED BRINE COOLER

Up to 6 OIL-FREE **TURBO COMPRESSORS**

RATED COOLING **CAPACITY** 170 to 1,100 kW

LOW-GWP REFRIGERANT R-1234ZE

Optionally available as **BRINE/WATER** LARGE SCALED **HEAT PUMP**

BRINE **TEMPERATURE** down to -10 °C

PROCESS COOLING **SEPR-MT** to 4.96-

TRIED-AND-TESTED QUANTUM WATER **TECHNOLOGY**

The **NEW** SPECTRUM Water chiller at a glance

“The SPECTRUM Water chiller is in the spirit of the times: as the only series-ready water-cooled chiller in its performance class with oil-free high-lift turbo compressors on the market, it guarantees maximum seasonal efficiency and maximum operational reliability. It also utilises the low-GWP refrigerant R-1234ze – this makes the SPECTRUM Water chiller an eco-friendly and future-proof investment.”

Jochen Hornung
CEO of ENGIE Refrigeration

THIS CHILLER SHOULD BE **PART OF YOUR FACILITIES.**

1. LARGE CAPACITY RANGE

- Six basic models
- Rated refrigeration capacity of 170 kW to 1,100 kW
- Chilled medium outlet temperature down to –10 °C

2. MAXIMUM ENERGY EFFICIENCY

- Top cooling efficiency under full and partial load
- SEPR-MT values to 4.96–
- $EER_{B\text{-}2|W35}$ to 3,36–

3. OIL-FREE MACHINE DESIGN

- No performance and efficiency losses
- No lubricants hazardous to groundwater
- Low level of machine complexity
- Particularly reliable and low-maintenance

The new SPECTRUM Water chiller will prepare your cooling supply for the future – in both economic and environmental terms.

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THIS CHILLER SHOULD BE **PART OF YOUR FACILITIES.**

4. FUTURE-PROOF INVESTMENT

- Exceeds the Ecodesign requirements (MEPS) by a multiple
- Refrigerant complies with the current F-gas Regulation
- Eligible for subsidies in numerous categories

5. MODULAR DESIGN

- Optimum cost-quality ratio
- Fast, simple planning process
- Quality made in Germany

6. BRINE/WATER HEAT PUMP

- Can be used as a brine/water heat pump
- Rated heating capacity of 170 kW to 1,070 kW
- $ETA_{s,h\ B0/W35}$ to 241 %

7. HIGH LEVEL OF OPERATIONAL RELIABILITY

- One to six redundantly connected turbo compressors
- Permanently tight technical design
- Tried-and-tested Quantum Water technology
- High-quality technological components

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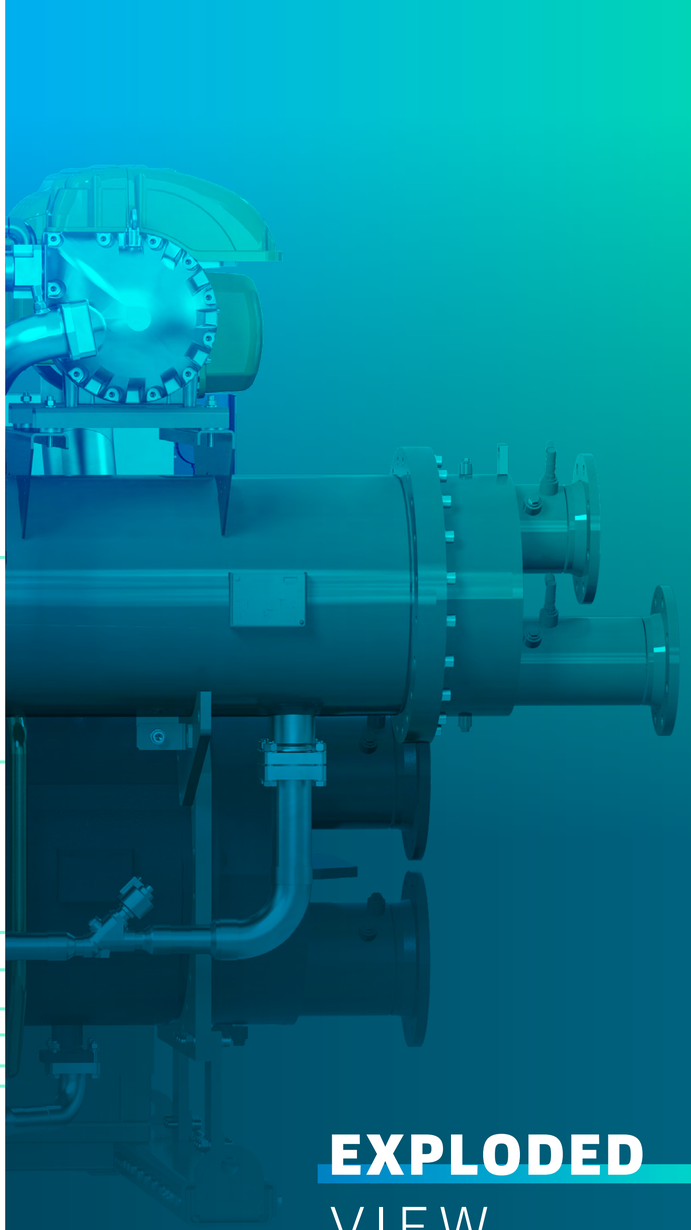
IT’S THE INSIDES
THAT COUNT!

The SPECTRUM Water chiller contains only high-end components of excellent quality. This is truly convincing technology.

WATCH THE ANIMATED FILM →



EXPLODED VIEW 07

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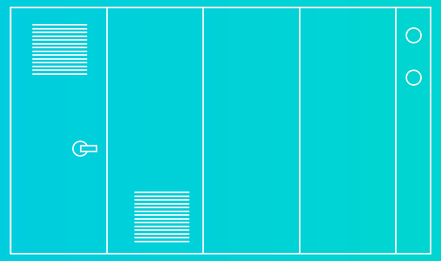
Refrigerant

- Low-GWP refrigerant R-1234ze (GWP < 1)
- A1 safety refrigerant R-515B (GWP 299)



Switch cabinet

- Quality made in Germany
- Siemens S7 PLC for top control quality and operational reliability
- Energy management options
- Power quality unit for increasing compressor service life and reducing circuit feedback
- Smart control or 10 inch touch display
- Reversible on hydraulic side for use as a brine/water heat pump

Highly efficient turbo compressors

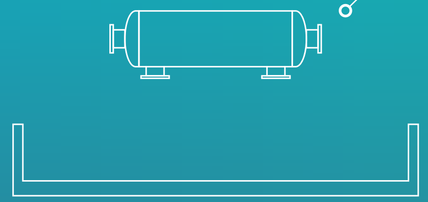
- Magnetic bearing, oil-free
- Chilled medium outlet down to –10°C
- Redundant compressor design
- Inverter-controlled, integrated soft starter
- Low-vibration, low-maintenance, low-noise

Flooded heat exchangers

- Ultramodern inner tube technology for maximum efficiency and low pressure loss
- Optimised for glycol applications
- Compact design, low refrigerant charge
- Flexible hydraulic connections

Insulation

- 19 mm insulation (optional: halogen-free) of the low and medium pressure side to prevent condensation and corrosion
- Expanded insulation for heat pump mode



Open-flash economizer

- Increased refrigeration capacity (kW)
- Increased system efficiency (EER/COP)
- Lower operating costs (€/kWh)
- Lower specific investment costs (€/kW)

Frame

- Compact footprint, high power density (kW/m²)
- Easy transport due to integrated eyelets in the frame
- Optimised positioning of components for easy maintenance and accessibility

EXPLODED VIEW 08

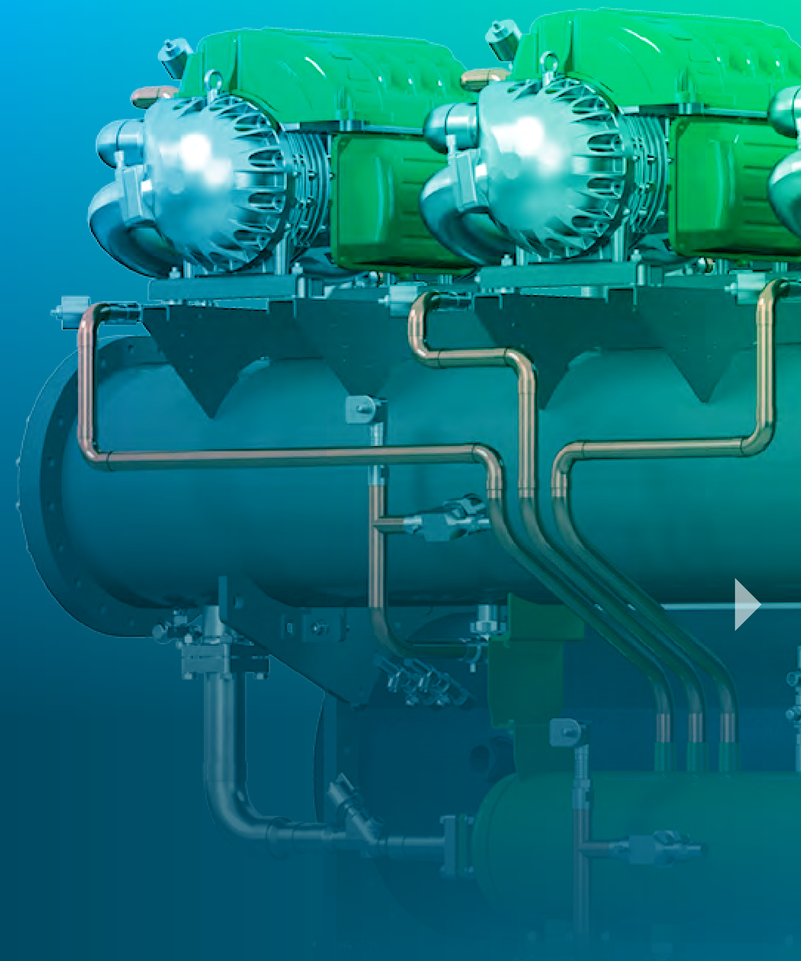
DO YOU CARE ABOUT **SUSTAINABILITY** AND **SAFETY**?

Then the SPECTRUM Water is exactly the right chiller for you.

The SPECTRUM Water uses the low-GWP refrigerant R-1234ze; alternatively, it is also available with the A1 safety refrigerant R-515B. R-1234ze has a GWP value of < 1 (AR-5) and an ODP value of 0.

That means it has almost no effect on the greenhouse or ozone depletion potential in the atmosphere. Its direct global warming potential is 99 % lower than that of the refrigerant traditionally used for MT process cooling, R-134a. As a result, the refrigerant is not affected by the phase-down scenario stipulated by F-gas Regulation 517/2014, making it fully future-proof in terms of current legislation.

As an A2L-class refrigerant as per ISO 817, it is flame-retardant and non-toxic, so its requirements for system safety and machine room equipment are lower than those for propane (R-290) and ammonia (R-717), which are natural refrigerants.



EFFICIENCY 09
VALUES

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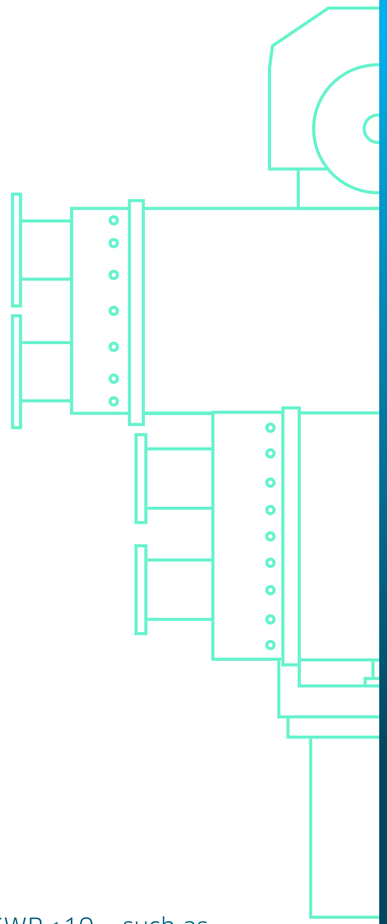
For the SPECTRUM, this combination of maximum system efficiency and refrigerants with a low global warming potential reduces both the direct and the indirect emissions of the system and leads to an **unbeatably low overall ecological impact** (TEWI – total equivalent warming impact).



Especially if the compressor runs on green electricity from renewable energies. In this case, the combination with a permanently technically tight system design means that the system can be operated in almost carbon-neutral fashion. This will bring you, the user, a good step closer to your target of climate neutrality.

By the way: using refrigerants with GWP < 10 – such as R-1234ze – adds two points in the Building Research Establishment Environmental Assessment Method (BREEAM) sustainability certification. This makes the SPECTRUM Water perfect for anyone interested in green building architecture!

EFFICIENCY 10
VALUES

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WE HELP YOU **SAVE**.

ECODESIGN DIRECTIVE EU 2015/1095	SPC-W0555 (R-1234ZE)
SEPR: 3.93	**SEPR: 4.91**
967,176 kWh_{el}	773,358 kWh_{el}
287,269 CO_2	229,705 kg CO_2
271,317 €/a	216,946 €/a

Whether operating costs, electricity or carbon emissions, the SPECTRUM Water provides savings all round. We compare our ecological and economic values to the minimum efficiency requirements (MEPS) in the Ecodesign Directive – and you save money, power and emissions.

Savings compared to the Ecodesign Directive (per year; 520 kW rated heating capacity; 8,760 operating hours; standard load profile and operating conditions as per Regulation (EU) 2015/1095 (–2/–8 °C | 30/35 °C)

EFFICIENCY 11
VALUES

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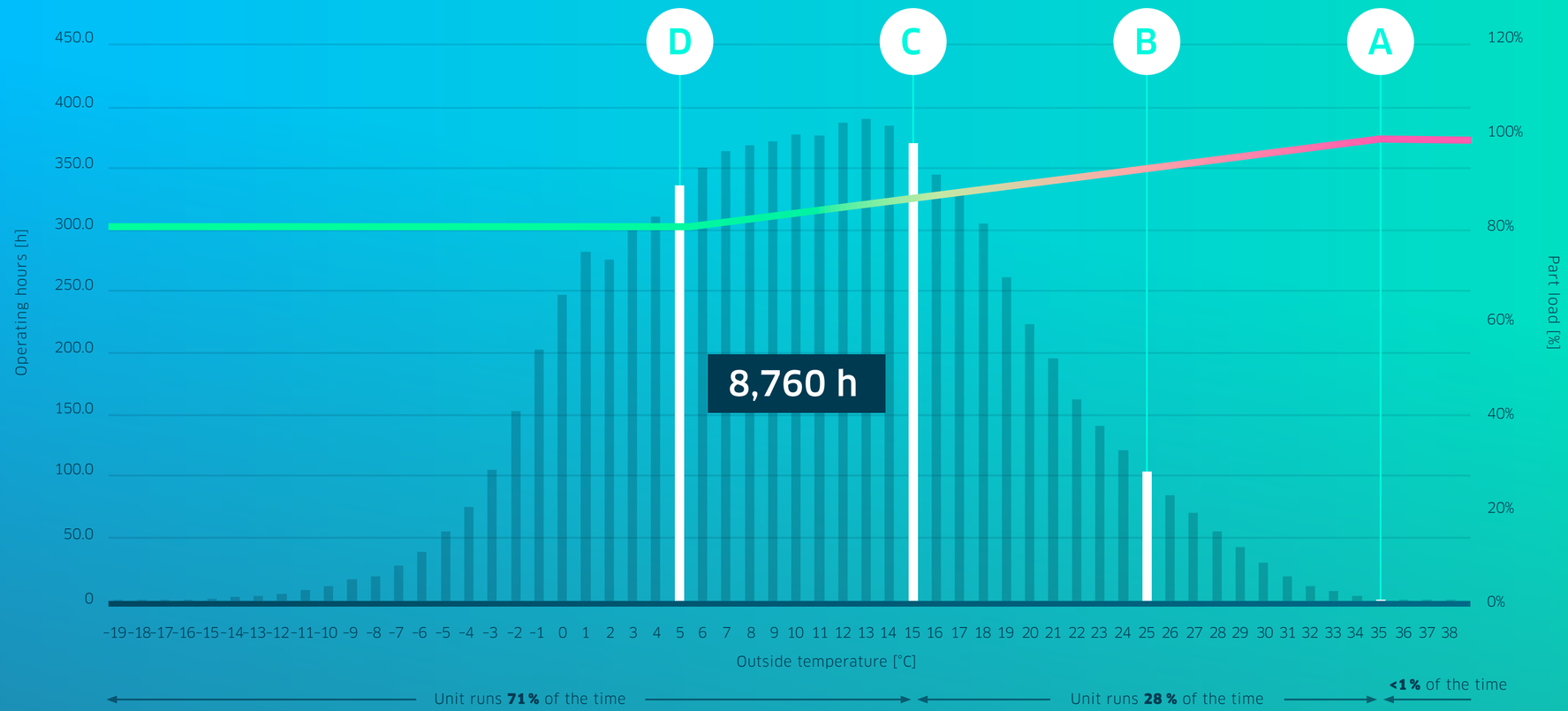
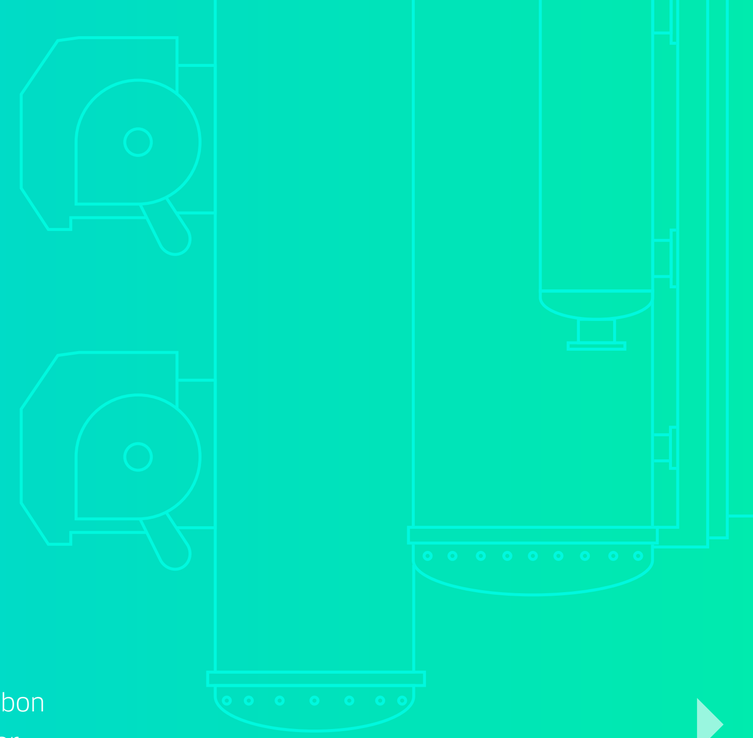
WHEN IT COMES TO **EFFICIENCY**, ENGIE REFRIGERATION IS IN THE GAME.



EFFICIENCY 12
VALUES

WE HELP YOU **SAVE**.



CO_2

–57.6 t

of carbon reduction per year for an emission factor of 297 gCO_2/kWh (average value for 2018–2038 in Germany, source: bwp), a leakage rate of 1%/a and a recycling factor of 90%.

~20 cars

CO_2 reduction corresponds to the carbon emissions of around 20 petrol cars for a fuel consumption of 6 l/100 km and a mileage of 20,000 km per year.

–54,370 €

of energy cost savings per year, based on: 28.05 ct/kWhel including energy tax (average value for 2020-07/2022, source: German Association of Energy and Water Industries (BDEW))

–20 %

electricity savings [kWh] per year for 8,760 h operating hours annually and a load profile as per Regulation 2015/1095.

EFFICIENCY 13
VALUES

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OIL-FREE = OUTSTANDING!

Outstanding efficiency

Due to the magnetic contact-free bearing of the shaft, the SPECTRUM Water suffers no mechanical friction losses and no oil deposits in the heat exchangers that impair efficiency and performance (referred to as oil fouling).

Your advantage: higher efficiency and lower operating costs! Efficiency and power remain stable throughout the system's service life.

Eco-friendly design

The SPECTRUM Water operates without synthetic lubricant oils with a Water Hazard Class (WHC) that are hazardous to water

Your advantage: no need for measures such as capture and retention systems to prevent contamination of the groundwater!

Low noise and vibration

Due to the magnetic shaft bearings, the vibration and structure-borne noise levels of the SPECTRUM Water are very low.

Your advantage: fewer vibration-related leaks on the components and a low noise level!

High level of operational reliability

The SPECTRUM Water has no need for malfunction-prone oil management peripherals..

Your advantage: fewer fault-related failures and increased operational reliability!

Low maintenance costs

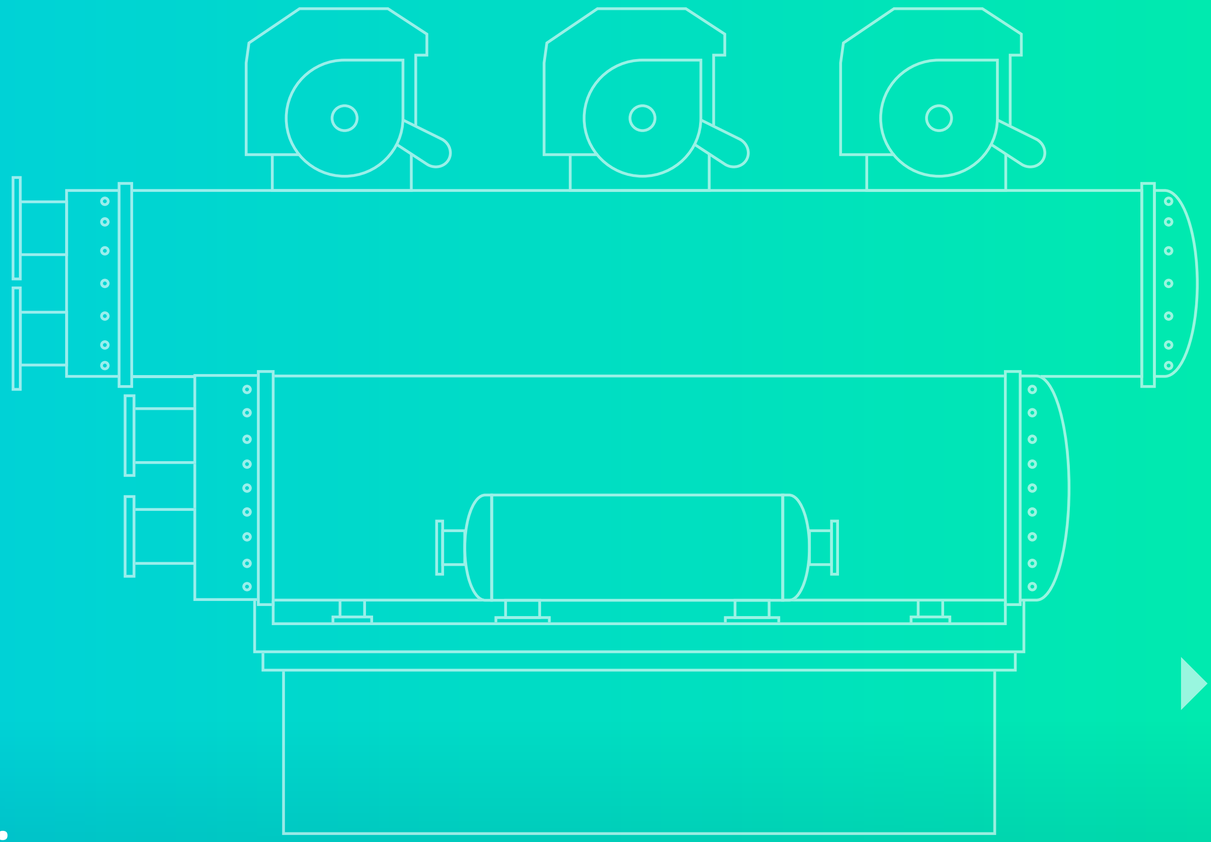
The SPECTRUM Water does not require any time- and cost-intensive service deployments for oil changes, oil filter replacements and oil pump maintenance.

Your advantage: lower maintenance costs and fewer service-related downtimes of the system!

With its oil-free design, the SPECTRUM Water heat pump is unique on the market in its performance range.

And you benefit in five different ways!

COMPACT – **BUT POWERFUL!**



SPECTRUM offers you performance, compactness and flexibility in perfection.

Thanks to its smart design and small footprint, the SPECTRUM Water chiller saves space and is easy to integrate, especially in existing machinery rooms or container applications. At the same time, the versatile water connection options and hydraulic/ electrical extension options enable exceedingly flexible installation. And all that at a low operational weight of both the machine and the individual components.

This improves serviceability and involves only minor statics requirements. In short, **a persuasive efficiency in terms of utilisation of space!**

PRECISE COOLING IS REQUIRED IN MANY APPLICATIONS.

This includes the food and drink industry, for example. In dairies, breweries, cold stores and dairy farms, the SPECTRUM Water chiller secures all the cooling processes in the normal cooling range. It is also perfect for use in the chemicals and pharmaceuticals industry, and for climate chambers used in environmental simulation.

The SPECTRUM Water can also be deployed as a brine/water large scaled heat pump for low-temperature heating applications in combination with ice storage systems. This creates an innovative source of heat that is easy to exploit. **This is what the supply of the future looks like!**

APPLICATIONS 16
AND INDUSTRIES

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AREAS OF APPLICATION
Cold applications

down to
–10°C

up to
1 MW

- Beverage and food industry
- Chemicals and pharmaceuticals industry
- Environmental simulation climate chambers
- Ice storage systems

“The SPECTRUM Water chiller is suitable for all applications in the field of process cooling that have high cooling requirements and low chilled medium outlet temperatures and require maximum operational reliability. This applies to the food and pharmaceuticals industries in particular. As foods and medicines requiring cooling are needed in increasing quantities around the world, the need for cooling is increasing steadily as well – along with demand for energy-efficient and climate-friendly concepts. The new SPECTRUM Water meets all these requirements perfectly.”

Roman Steddin
Product Manager at ENGIE Refrigeration

THE SPECTRUM WATER IS **DOUBLY CONVINCING.**

Always the right choice: our SPECTRUM Water series functions as both a chiller application and a heat pump application. It covers the full temperature range from a chilled medium outlet temperature down to –10 degrees Celsius to a condenser leaving water temperature up to +65 degrees Celsius – and will certainly be suitable for your case as well.

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AREAS OF APPLICATION
in the context of the Ecodesign Regulation

LT: Low-Temperature (low temperature applications)
MT: Medium-Temperature (medium temperature applications)
HT: High-Temperature (high temperature applications)
acc. DIN EN EN14825:2018

Comfort heaters acc. VO (EU) 813/2013
Comfort cooler acc. VO (EU) 2016/2281
HT process cooler acc. VO (EU) 2016/2281
MT process cooler acc. VO (EU) 2015/1095

Spectrum SPC

−10°C — 12°C
LT-comfort cooling applications – SEER | $\eta_{s,c}$
MT-process cooling applications – SEPR MT

Standard | Option

40°C — 65°C
LT-/MT-/HT-comfort heating applications – SCOP | $\eta_{s,h}$
LT-process heat applications

Spectrum SPH

3°C — 25°C
LT-/MT-comfort cooling applications | $\eta_{s,c}$

Option | Standard

65°C
LT-/MT-/HT-comfort heating applications – SCOP | $\eta_{s,h}$
LT-process heat applications

Quantum W4.0

3°C — 25°C
LT-/MT-comfort cooling applications – SEER | $\eta_{s,c}$
HT-process cooling applications - SEPR HT

Standard | Option

55°C
LT-/MT-comfort heating applications – SCOP | $\eta_{s,h}$
LT-process heat applications

Chiller application — **Heat pump application**

°C −10 −5 0 5 10 15 20 25 40 45 50 55 60 65 °C

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READY FOR THE **COOLING** OF THE **FUTURE**?

ENGIE Refrigeration ensures the right temperature for every process. Around the world, our heat pumps and chillers stand for maximum technical expertise, economy, efficiency and sustainability.

Our aim: to provide our customers with the best solutions for their path towards climate neutrality. To achieve this, we rely on individual consultation, customised concepts and comprehensive services.

As a member of the worldwide ENGIE Group, we have a global network of specialists at our disposal and can realise our refrigeration and heating solutions for you, both at home and abroad.

The experts at ENGIE Refrigeration are here for you:

National/International Service
service.refrigeration.de@engie.com

National/International Sales
sales.refrigeration.de@engie.com

With eleven branch offices and around 130 service employees, we are always nearby and available around the clock, anywhere in Germany:
engie-refrigeration.de/en/contact

We are happy to **ADVISE YOU**!

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