QUANTUM

Series and features of the energy-efficient chiller series

Optimal use of energies.

engie-refrigeration.de

For chilling: QUANTUM

It starts smoothly, then runs quietly and with low vibration. It features excellent energy efficiency and its oil-free system operates without any difficulties.

It is low maintenance and reliable. It sets standards in chiller technology: the QUANTUM from ENGIE Refrigeration.

After years of continuous development, the QUANTUM is now a chiller that provides an astonishingly broad range of services. The different series offer impressive solutions for each chilling situation and they can each be individually tailored to ensure that every customer gets exactly the refrigeration they need.

Our expert Service department supervises each QUANTUM chiller, from planning, through installation, operation and maintenance, to checking whether the chiller complies perfectly with requirements – or whether it needs to be adjusted. After all, genuinely energy-efficient refrigeration depends on two factors: a chiller from the QUANTUM product family and the technical expertise of the refrigeration specialists at ENGIE Refrigeration.

QUANTUM.
Providing cooling.

Water-cooled QUANTUM in the X series

Impressive performance: **QUANTUM**

50 %

Save operating costs:

- High-efficiency compressors > no friction losses thanks to magnetic bearings
- Each compressor is fitted with a frequency converter > maximum efficiency during partial load
- Heat exchangers with high-performance ribbed pipes > optimum heat transfer with minimum pressure loss
- Minimum overheating of refrigerant

It is the underlying concept of an oil-free compressor and contact-free magnetic bearings that make QUANTUM so powerful and efficient. There is no material wear, significantly lower maintenance costs and all the regulations and precautionary measures associated with oil operation simply do not apply. Another advantage of oil-free operation is the more efficient heat transfer (in the condenser and the evaporator), which is not impaired by oil. This increases efficiency and helps to save on operating costs.

However, it is not just QUANTUM's long-lasting refrigeration and its environmental credentials, with drastically reduced energy costs, that impress. It is also exceptionally easy to handle. It begins with a staggered start-up of the individual compressors, thereby resulting in low start-up currents, among other things. Then it switches over to quiet and low-vibration operation. QUANTUM's continuous power control eliminates inefficient pulsing behaviour in the compressors, ensuring highly constant temperatures.
Result: The network of consumers does not experience negative temperature fluctuations and remains thermally stable; there is no need to take measures to regulate and store cold water.

QUANTUM.
Built for efficiency.

What's in **every QUANTUM**

Turbo compressor

The compressor design enables a high full load and part load EER. The turbo machine operates with minimum internal losses. This results in excellent energy efficiency.

Oil-free system

As no components are required for oil return, there are fewer malfunctions and/or leaks – and any leaks that do occur do not involve flammable oil, which is also hazardous to the groundwater. There is no need for oil changes. The EER is increased because the heat transfer in the refrigeration circuit is not impaired by oil.

Frequency converter on every compressor

Particularly efficient during part load thanks to continuous power control. In general: the QUANTUM controller has an impressively high quality of control.

Open-Flash-Economizer

Built-in Open-Flash-Economizers ensure high EER values. They optimise the entire refrigeration process without increasing the machine's space requirements.

Multiple compressor design (up to 8 parallel)

Better to be safe: other compressors take over in case of failure. The redundant design also makes it possible to replace a compressor during live operation.

Flooded tube bundle evaporator

Low temperatures difference between the chilled medium and refrigerant improve efficiency. High-performance ribbed tubes for optimum heat transfer during evaporation result in low temperature differences between the refrigerant and the chilled medium. The design of the condenser allows minimal refrigerant overheating. These two effects are what make QUANTUM so efficient.

What this means **for you**

- Low operating costs
- Low noise emissions
- Low vibration

- Clear, compact machine design because no complex components are needed for oil return
- Low space requirement
- Simple positioning
- Low operating costs
- High level of operational reliability and safety on site

- Low operating costs
- Low investment costs in system periphery
- Steady chilled medium temperature
- Fewer peripherals in the cold water network

- Low operating costs
- Small machine footprint

- High level of operational reliability

- Low operating costs
- Clear, compact machine design
- Low pressure loss on chilled medium side

Durable, high-quality fittings and sensors

Built to last: the excellent quality of all components guarantees a low susceptibility to errors or failures. It is also easy and efficient to replace a component.

- Low maintenance and servicing costs
- High level of operational reliability

Start-up current of compressors under 5 amp

When a compressor starts up, there are none of the dreaded current peaks. In addition, a staggered start-up is possible.

- Stable electrical mains supply
- Low connected power output needed

Control with PLC

It all depends on the setting: PLC offers more control and regulation possibilities than standard solutions and sets a high level industry standard.

- Adaptation to individual customer requirements
- High level of operational reliability

EMC class B

Complies with EMC guidelines on electromagnetic compatibility DIN EN 61000-6-2 and DIN EN 61000-6-4.

- High level of electromagnetic compatibility in public distribution networks
- Avoidance of malfunctions in electrical equipment

Protection class IP54

For secure refrigeration: QUANTUM machines have protection against physical contact and protection against spray water.

- High level of operational reliability

Large range of electrical options

Each QUANTUM can be equipped with a variety of options to customise it. These include surge protection, integration of pump performance parts, a universal measuring device, a remote access option and various BUS connections.

- Adaptation to individual customer requirements
- Easy to integrate in existing refrigeration systems

Water-cooled QUANTUM in the X-series with 600 kW refrigeration capacity

QUANTUM X

Packs a lot into its small frame: the QUANTUM X is compact and has a variety of uses.

For dry and wet cooling, for heat recovery or even as a heat pump, this all-rounder operates reliably and efficiently in a capacity range of 300 to 2,500 kW.

Thanks to the twin tubed condenser technology, simultaneous refrigeration and heat utilisation are possible, e.g. for heating buildings or pre-warming the hot water system. Unused waste heat can be transferred out through a separate re-cooling circuit.

If the QUANTUM is used as a heat pump, it is controlled in accordance with the desired heating medium temperature.

QUANTUM X.
The all-rounder with a broad range of uses.

The QUANTUM X profile

- Water-cooled compact machine for installation in a machine room
- Capacity range 300–2,500 kW with high re-cooling temperatures
- Flexible application:
  > Dry or wet cooling
  > Heat recovery
  > Heat pump
- Eurovent certification for all models up to 1,500 kW refrigeration capacity

QUANTUM G

Green, sustainable, efficient: QUANTUM G uses the environmentally friendly refrigerant R-1234ze with a GWP value (Global Warming Potential) of less than 1.

Sustainability is a legal requirement: the new Fluorinated Gases Ordinance from the EU prescribes a reduction in the use of environmentally harmful gases. One solution: the latest generation of the synthetic refrigerant (HFO).

QUANTUM G uses R-1234ze as a refrigerant, which persists just 18 days in the Earth's atmosphere and achieves an impressively low GWP value of less than 1.

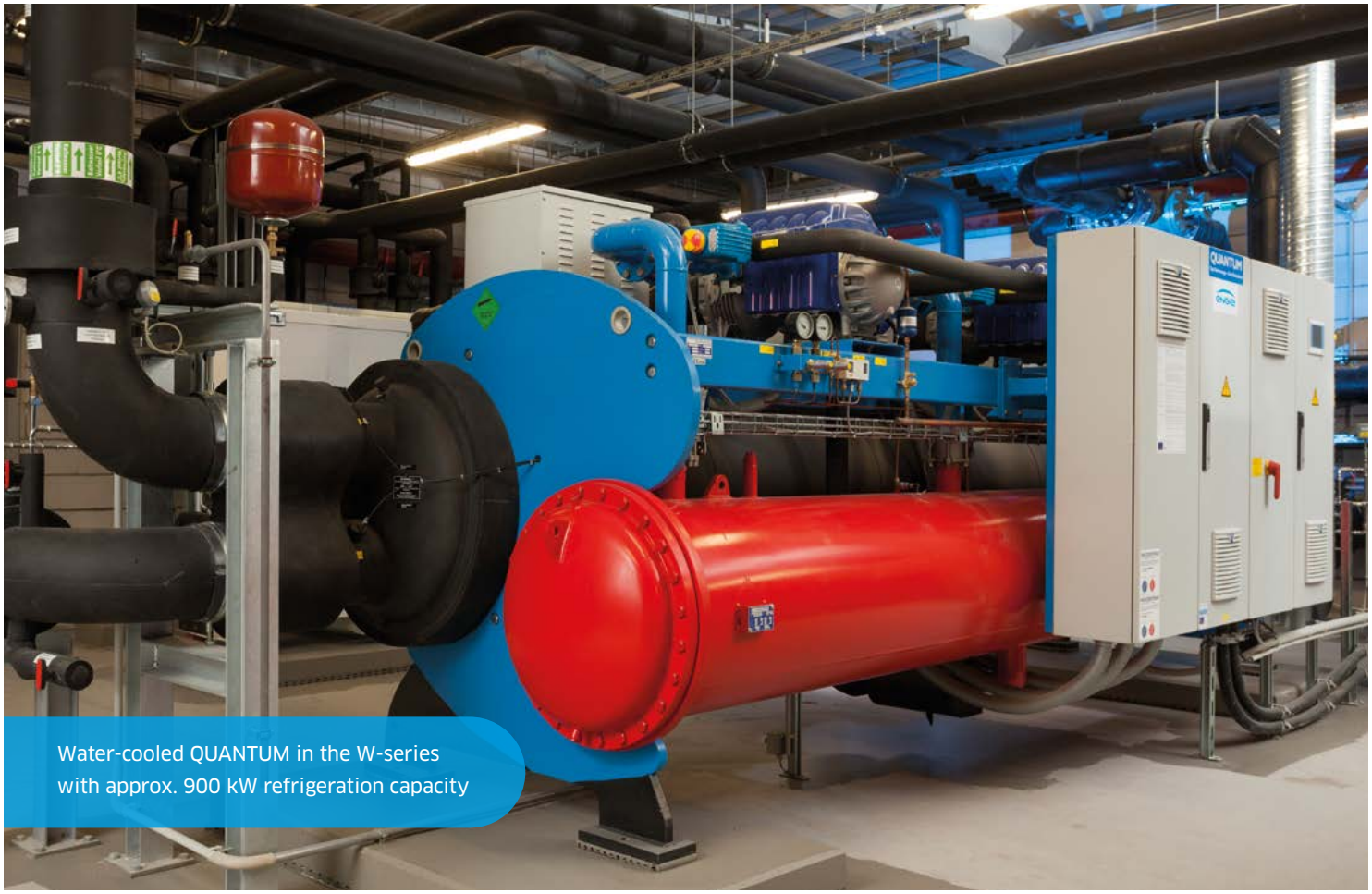
By the way: QUANTUM G also proves with ease that environmental friendliness does not need to come at the expense of performance. Like the QUANTUM X, it takes up little space and has a wide variety of uses, with a capacity range of 300 to 2,000 kW.

QUANTUM G.
Green refrigeration with a sustainable refrigerant.

The QUANTUM G profile

- Water-cooled compact machine for installation in a machine room
- Capacity range 300–2,000 kW with high re-cooling temperatures, sustainable and environmentally friendly:
  > Very small ecological footprint
  > Refrigerant R-1234ze with GWP < 1
- Eurovent certification for all models up to 1,500 kW refrigeration capacity

Water-cooled QUANTUM in the G-series with 1.2 MW refrigeration capacity



Water-cooled QUANTUM in the W-series with approx. 900 kW refrigeration capacity

QUANTUM W

Can we do even better? This is a question that the refrigeration experts at ENGIE Refrigeration ask themselves all the time.

And with the QUANTUM W, they've provided an impressive answer: Yes, they can – once again, efficiency has been increased. Turbo compressors with frequency converter, Open-Flash-Economizers and the completely oil-free machine design are key components of this improvement. Although the operating range is smaller than with the QUANTUM X, the refrigeration capacity and energy efficiency are better. The overall improvement in efficiency under full and part load plays an important role in ensuring that operating costs are reduced to a minimum, when calculated over the machine's service life. A QUANTUM W always provides maximum full load and part load EER values, and the ratio between the power input (electricity consumption) and power output (refrigeration capacity) is excellent.

QUANTUM W.
The efficient machine for minimal operating costs.

The QUANTUM W profile

- Water-cooled compact machine for installation in a machine room
- Capacity range of 400–3,800 kW with low re-cooling temperatures
- Reduces operating costs:
  - > Efficient in full and part load
  - > Highest ESEER value
  - > Maximum full load and part load EER

QUANTUM A

If no cooling water is available, a QUANTUM can also be operated with air.

The QUANTUM A is air-cooled, has a capacity range of 300 to 1,600 kW, and is a refrigeration solution for outside installation. Its quiet running characteristics also fulfil strict requirements for low-noise operation.

Like all machines in the product family, the QUANTUM A is also produced using as few components as possible, in an exceptionally high quality. Long-lasting fittings and sensors ensure secure operation and significantly reduce maintenance and servicing costs in the long run.

Options such as compressor sound-reducing capsules and low-noise fans ensure quiet operation. Other options help ensure safe installation in any weather conditions, e.g. down to -20 °C.

QUANTUM A.
Compact refrigeration with no compromises.

The QUANTUM A profile

- Air-cooled compact machine for outside installation
- Capacity range of 300–1,600 kW
- Space-saving refrigeration solution:
  > No re-cooling system necessary
  > No heating medium circuit necessary
  > No machine room necessary
- Eurovent certification for all models up to 600 kW refrigeration capacity

Air-cooled QUANTUM with approx. 900 kW refrigeration capacity

QUANTUM GA

Airy and green: The QUANTUM GA combines the benefits of QUANTUM G and QUANTUM A in a single machine.

With air cooling, it has a capacity range of 300 to 1,000 kW. It is filled with the environmentally friendly refrigerant R-1234ze, with a GWP of less than 1.

Sustainable refrigeration solutions not only comply with the new Fluorinated Gases Ordinance of the EU, making them a future-proof investment, they also improve a company's image. After all, more and more consumers want to know how the products, goods and services they buy are made.

QUANTUM GA.
Sustainable chilling in compact packaging.

The QUANTUM GA profile

- Air-cooled compact machine for outside installation
- Capacity range or 300–1,000 kW
- Sustainable and environmentally compatible:
  > Very small ecological footprint
  > Refrigerant R-1234ze with GWP < 1
- Compact refrigeration solution:
  > No re-cooling system necessary
  > No heating medium circuit necessary
  > No machine room necessary

QUANTUM GS

Adapts to any space and provides lasting chilling.

The QUANTUM GS is a variant of the QUANTUM S that is operated with the environmentally friendly refrigerant R-1234ze. Like its bigger brother, the QUANTUM GS can be split, when necessary, into a machine unit for indoors installation and a re-cooling system for installation outdoors. It covers a capacity range of 300 to 2,000 kW. The separately positioned condenser is charged directly with refrigerant. The QUANTUM GS does not need any pumps for re-cooling.

QUANTUM GS.
Tailored refrigeration.

The QUANTUM GS profile

- Machine unit inside + condenser outside
- Capacity range of 300–2,000 kW
- Air-cooled
- Efficient overall system, 100% adapted to customer requirements
- Sustainable and environmentally compatible:
  > Meets all current environmental requirements
  > Very small ecological footprint
  > Refrigerant R-1234ze with GWP < 1

QUANTUM S with 1,200 kW refrigeration capacity

QUANTUM S

At ENGIE Refrigeration, we are focussed on refrigeration solutions.

A QUANTUM S is used where re-cooling has to be implemented with air and it is not possible to set up an air-cooled compact machine (e.g. due to limited roof loads, for aesthetic reasons or due to corrosive ambient air).

The QUANTUM S can be used, for example, if condensation heat is used to heat up the inlet air for a clean air system.

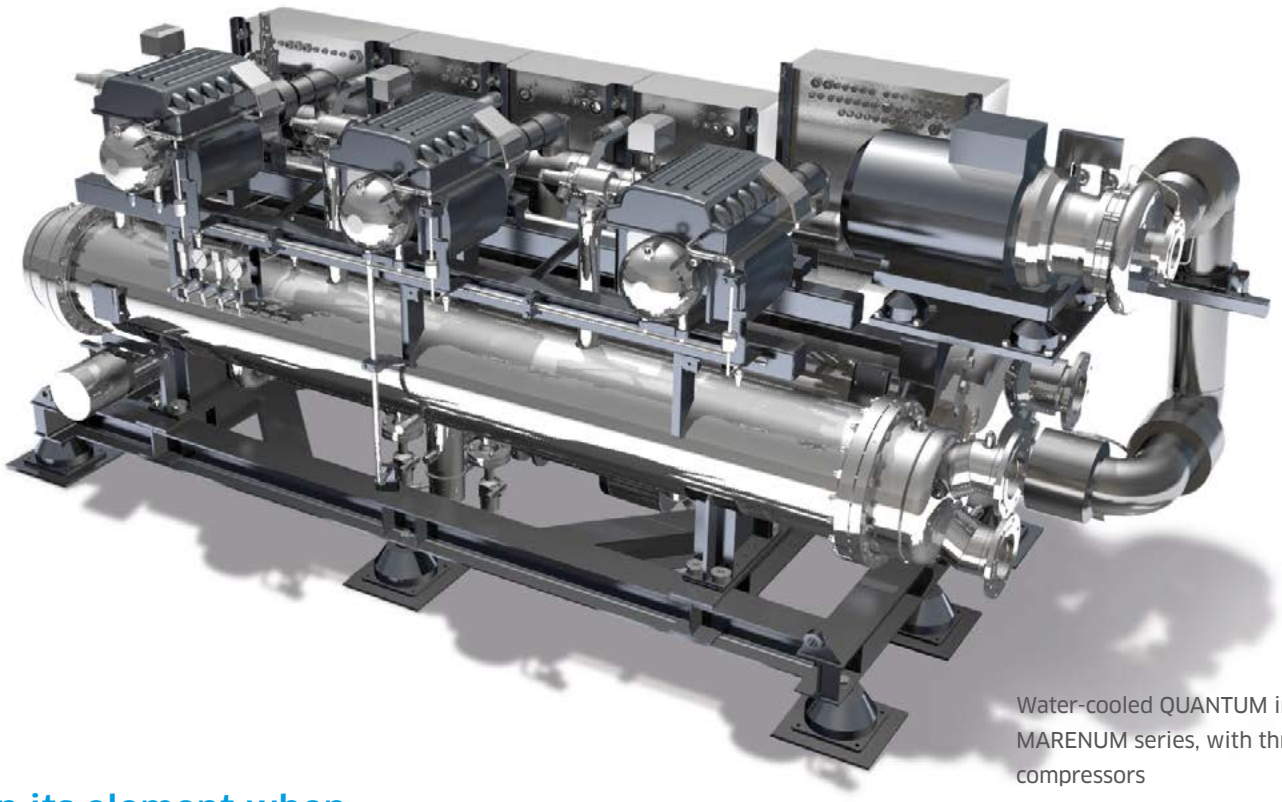
Focussing individually on the requirements and needs of the customer, the refrigeration experts at ENGIE Refrigeration created the split QUANTUM S to provide efficient overall systems with a capacity range of 300 to 2,800 kW.

QUANTUM S.
The separable machine for all-round refrigeration solutions.

The QUANTUM S profile

- Machine unit inside + condenser outside
- Capacity range of 300–2,800 kW.
- Air-cooled
- Efficient overall system, 100% adapted to customer requirements

QUANTUM MARENUM



Water-cooled QUANTUM in the MARENUM series, with three compressors

In its element when things get stormy.

The QUANTUM MARENUM is seaworthy and available in many variants, tailored to individual applications: for ferries, freighters or yachts, and even for use on non-civil ships. Because re-cooling on ships frequently involves the direct use of salty sea water, the QUANTUM MARENUM is especially corrosion-resistant and resilient. It is also stable: thanks to special shock absorbers, the chiller „withstands“ acceleration and rough seas.

It is of course water-cooled, and the QUANTUM MARENUM's refrigeration capacity starts at 300 kW – everything beyond that (capacity range, efficiency, electrics, heating medium) is adapted to the requirements of civil and non-civil shipping.

QUANTUM MARENUM.
The stable chiller for use at sea.

The QUANTUM MARENUM profile

- Compact machine for inside installation
- Capacity range from 300 kW
- Water-cooled (including salt water)
- Specially adapted to maritime requirements, civil and non-civil
- Seaworthy
- Top material quality (e.g. non-rusting steels)
- Redundant compressors for system stability
- Compact construction for high refrigeration power with a small footprint

Water-cooled QUANTUM in the P-series, approx. 4 MW refrigeration capacity

QUANTUM P

It packs a punch.

The QUANTUM P provides a refrigeration capacity of up to 4,500 kW and is therefore especially suitable for use in district cooling networks. In this kind of network, multiple consumers are supplied through a pipeline system with refrigeration that is generated in a refrigeration centre. At the consumer's site, all that is normally installed is a transfer station. This is a highly efficient, space-saving and flexible way to generate and distribute refrigeration. To sum it up: it's forward-looking!

In a large dimensioning in the megawatt range, the QUANTUM P clearly demonstrates its energy efficiency when generating refrigeration, and operators can benefit from significantly lower energy costs, or pass these benefits on to end consumers. Another benefit for the end consumer: a district cooling network is continuously monitored, ensuring a constant supply of refrigeration.

QUANTUM P.
The power pack at the heart of district cooling networks.

The QUANTUM P profile

- Water-cooled compact machine for inside installation
- Capacity range of 2,500–6,000 kW
- Highly efficient in full and part load
- 100% adapted to customer requirements
- Powerful and suitable for use in district cooling networks

ENGIE Refrigeration – efficient refrigeration, designed in Germany – made in Germany.

We have been operating under our new brand name since 2016 and we have a new, modern headquarters – meaning we are better positioned than ever to put our expertise into practice.

1 Excellent refrigeration technology know-how

2 Comprehensive service, tailored to individual requirements

3 A clear eye for detail

4 Selection of the best components

5 An efficient refrigeration solution that is 100% tailored to you

ENGIE Refrigeration.
The home of refrigeration.

QUANTUM chillers are also available as a container solution. The customer receives a fully assembled and space-saving refrigeration system that simply needs to be plugged.

ENGIE Deutschland stands for a sustainable energy future and improved energy efficiency. We generate, buy, distribute, deliver and save energy. As a service provider with profound technical know-how, we plan, install and operate building technology and energy technology systems and plants, and support these via comprehensive services. With a successful company history spanning more than 100 years and the reach of the worldwide ENGIE Group, we are a partner that gets the most out of energy every day – and this includes optimising the energy of the people working together with us.

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