Welcome to Kelvion. As successor to the GEA Heat Exchangers Group, we continue to break new ground, making discerning customers more successful than ever with our integrated heat exchanger solutions.

Our solutions for your applications:
We offer our customers one of the world’s largest product portfolios in the field of heat exchangers. It includes individual solutions for practically all conceivable applications and complex environmental conditions: plate heat exchangers, shell and tube heat exchangers, finned tube heat exchangers, modular cooling tower systems, and refrigeration heat exchangers.

Your markets are our markets, too:
The markets in which you and we together operate are among the most important in the world: the chemical industry, food and beverages, the heavy industry, climate and environment, marine applications, the oil and gas industry, energy, refrigeration technology, sugar and transportation. We provide every single market segment with solutions of outstanding efficiency, safety, and sustainability.

We are highly committed to earning your trust:
We want to win your trust with everything we do and convince you with the solutions we offer. With this high aim in mind, we invest our extensive know-how, our great precision, and our passion in everything we do: including product development, manufacturing, installation, and after-sales support.

Seeing things from the customer perspective:
Your specific requirements count – and nothing else. Whatever we offer you, it must meet these requirements. Our entire way of thinking and working is geared towards this aim. Our customers truly appreciate this: after all, this is how we make their companies more efficient.

We are at your service.
Data centers are the brains of a company or organization, storing vital information and running critical processes.

Online surge boosts storage demand
More and more businesses are working on online platforms, leading to a surge in demand for data storage and processing. The number of data centers is increasing rapidly not just to meet the needs of large companies and government agencies, but also to provide a fast-growing cloud storage service for private and business applications, as well as the further development of telecommunications infrastructure.

Data center cooling market heats up
Cooling technology is essential for maintaining the optimum environment to enable data centers to run effectively. By 2021, the global data center cooling market is expected to reach US$14.28 billion, from US$7.12 billion in 2016 – a CAGR (compound annual growth rate) of 14.95%. Efforts towards sustainability have encouraged a trend towards developing more efficient, low power-consuming alternative cooling solutions.

Growth hot spots
North America, with its mature IT sector, technological developments and rising number of tech start-ups, will have the largest share of the data center cooling market. However, the Asia Pacific region will see the fastest increase, fuelled by China, Japan and India. In Europe stringent environmental regulations and new efficiency standards will propel the cooling market towards further growth.

Efficient cooling solutions
Data centers and the computers and servers they contain have a low tolerance to changes in temperature and humidity. Our advanced range of energy-efficient heat transfer technology helps customers to safeguard their data centers and maintain their peace of mind.

Expansion of the internet of things
It is estimated that the number of connected devices will reach 33.33 billion units by 2021. That is roughly four devices each for every person on the planet.

24/7 Nonstop Operation
While data center temperatures vary, depending on the servers and type of cooling system, it is essential to maintain a consistent environment. Any temperature fluctuations could have serious implications. Downtime at data centers is potentially catastrophic.

For example, if a bank data center went offline, customers would not be able to carry out any transactions on their accounts, withdraw money or use their cards to pay for purchases.
Today’s constantly-changing IT landscape requires cooling methods that continue to push the boundary.

At Kelvion we understand the importance of uninterrupted and energy-efficient data center operation, which is why we offer a wide range of cooling solutions specifically designed to solve the most demanding heat transfer challenges. Our technologies take into account PUE (power usage effectiveness) and WUE (water usage effectiveness) while maintaining peak performance, cost-effectiveness and reliability.

From small server rooms operating at less than 200KW to multi MW sites, Kelvion has the right solution to keep data centers online round the clock.

Kelvion manufactures heat exchangers for computer room air conditioners (CRAC), which typically use a refrigerant in a traditional dry expansion (DX) system in conjunction with a condenser. Furthermore we offer solutions for computer room air handlers (CRAH) which use chilled water from a chiller or similar.

### Server cooling

**TAILOR-MADE COOLING KEEPING DATA CENTERS ONLINE 24/7**

1. **Air Cooled Condenser**
   - This is where the circulating refrigerant rejects heat from the refrigeration system and the heat is carried away by the air.

2. **Custom Air Coil**
   - Kelvion can engineer and manufacture custom evaporators and coils based on your project specifications to provide cool air to the server room.

3. **Brazed Plate Heat Exchanger**
   - A brazed heat exchanger is used as an interchanger between the refrigerant and the server room. It is also often used as an evaporator in a chiller.
Free cooling

SAVING ENERGY WITH AIR AND WATER COOLING POWER

For data centers seeking to use less energy, free cooling solutions that use naturally cool air or water, instead of mechanical refrigeration, are increasingly attractive options. Factors such as the maximum temperature required for the servers and the availability of water will influence which free cooling system to choose.

Our range of plate and frame heat exchangers, cooling towers and dry coolers help to provide a stable temperature, while achieving the lowest possible power consumption.
Heat rejection

EFFECTIVE
HEAT REJECTION
ALTERNATIVES – ALL FROM ONE SOURCE

The way that excess heat is removed from data center cooling systems depends on the location, the availability of water and power requirements.

Where water is in short supply, a dry cooling solution is the best option. Alternatively, adiabatic heat rejection is becoming increasingly popular. Adiabatic coolers use fans to reject heat for most of the year and have a water spray system that only activates during periods of high ambient temperatures. As a result, they require much less water and have lower operational costs than a traditional cooling tower.

Whichever heat rejection method is the most appropriate for your data center, Kelvion has the right solution. Our tried and tested cooling technology ensures optimum heat rejection effectively and reliably.
Keeping data centers running round the clock relies on an uninterrupted power supply. The cost of downtime could be disastrous, both operationally and financially. Reliable and efficient back-up generators are therefore essential for maintaining optimum performance. The level of emergency power a data center requires depends on its Uptime Institute security tier rating.

Historically back-up generators run on natural gas or diesel but rising energy costs are fueling a trend towards new ways of generating power and using sustainable alternatives, such as biogas or biodiesel. Kelvion supports customers’ aims of lower energy consumption with free cooling solutions using water or air. Whatever the cooling requirement, our trusted heat exchange technology provides a robust, effective and long-lasting performance.
Shell & Tubes

Custom designed shell and tubes are used as evaporators or condensers in a data center chiller or heat pump. Water or refrigerant evaporates, absorbing heat from the chilled water, creating a cooling source. We can customize according to the size and connection requirements and use various materials, depending on media restrictions, in order to reduce corrosion.

⊲ Refrigerant, Coolant options NH₃, CO₂, R448A, R449A, R410A and other standard refrigerants available upon request.
⊲ Various global pressure vessel approvals available upon request.
⊲ Accessories include but are not limited to insulation packages, backflush valves and port strainers (filters).

Gasketed Plate Heat Exchangers

Our plate heat exchangers with the patented Optiwave design have been used successfully for cooling and heating all types of fluids. Made from the highest quality materials including 316SS and titanium, among other alloys, they ensure maximum heat transfer, high performance and a long service life.

Plate heat exchangers play an important role in data centers, as isolation between a chiller and open cooling tower and between sea, lake or river water. The efficient plate and frame keeps the potentially polluted water from coming into contact with data center equipment. AHRI Standard 400 certification for liquid-to-liquid heat exchangers is available with up to 20,000 GPM (4500 m³/h) per heat exchanger.

⊲ Various global pressure vessel approvals available upon request.
⊲ Accessories include but are not limited to insulation packages, backflush valves and port strainers (filters).

Brazed Plate Heat Exchangers

Custom designed brazed plate heat exchangers are used as evaporators and condensers in a chiller or heat pump system. Generally, refrigerant evaporates after absorbing heat from the chilled water (or other media) to create a cooling source. Kelvion’s advanced brazing technology – available solder materials are copper or patented VacInox – offers high heat transfer rates, compared with conventional shell & tube technology. The compactness of our brazed plate heat exchangers means a lower carbon footprint for the chiller or system. We manufacture true dual units (for part load) and up to a 100mm (4 inch) connection. Brazed plate and frames are designed with different materials and thicknesses to meet various water quality and refrigerant requirements.

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Adapted and Modular Compact Radiators
Our special-purpose compact radiators can be adapted to suit all requirements, technical specifications, and key manufacturing regulations. Kelvion’s modular, compact radiators are primarily used in large-scale data centers with major power requirements. They feature the impressive benefits of a flat design, either used for generating sets with relatively small engines, or in large scale engines for data centers. A space-saving V-shape is also possible, with and without adiabatic cooling. Various global pressure vessel approvals, AC and EC fan technology and custom loose coils for heat recovery or preheating are all available upon request.

⊲ Applicable products are Eurovent compliant and available with UL and CE approval.
⊲ Accessories include but are not limited to fan controls, extended legs, isolators, junction boxes and more.

Air Cooled Condensers
Kelvion air cooled condensers are perfect for a more traditional DX cooling application. Our condensers can operate with temperature differences down to circa 5K/9F. AC and EC fans technology available upon request. This technology is also equipped with lower sound level motor options for quiet operation. We manufacture condensers in a flat bed or space saving V-bank configuration. Kelvion have a large portfolio of tube and fin configurations which enables the tailoring of units to meet the technical and commercial targets.

⊲ Refrigerant options include ammonia, CO₂, 448A, 449A and 410A.
⊲ Applicable products are Eurovent certified and available with UL and CE approval.
⊲ Accessories include but are not limited to fan controls, extended legs, isolators, junction boxes and more.

Dry Coolers
Our dry coolers are used in data centers to cool within 3K/5F of the dry bulb temperature. These units can be used in a free cooling mode when the ambient temperature is suitable, saving mechanical cooling energy costs. AC and EC fan technology available upon request. This technology is also equipped with lower sound level motor options for quiet operation. Kelvion manufactures dry coolers in a flat bed or space-saving V-bank configuration. All applicable products are Eurovent certified and powder coated for maximum durability in all weather conditions.

⊲ Applicable products are Eurovent compliant and available with UL and CE approval.
⊲ Accessories include but are not limited to fan controls, extended legs, isolators, junction boxes and more.

Adiabatic Spray Dry Coolers
For most of the year, our adiabatic coolers will reject heat from data centers while in dry cooling mode. The adiabatic spray enables the heat exchanger to reject more heat, without the aid of mechanical cooling. Kelvion’s range of tube diameters and fin patterns help to provide a compact, lower cost, solution. AC and EC fan technology available upon request. This technology is also equipped with lower sound level motor options for quiet operation. Kelvion have a large portfolio of tube and fin configurations which enables the tailoring of units to meet the technical and commercial targets.

⊲ Refrigerant options include ammonia, CO₂, 448A, 449A and 410A.
⊲ Applicable products are Eurovent compliant and available with UL and CE approval.
⊲ Accessories include but are not limited to fan controls, extended legs, isolators, junction boxes and more.

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⊲ Applicable products are Eurovent compliant and available with UL and CE approval.
⊲ Accessories include but are not limited to fan controls, extended legs, isolators, junction boxes and more.
**Open Cooling Towers**
Kelvion's open loop cooling towers offer cost-efficient free cooling and are available in cross-flow and counter-flow. Whether modular or field-erected, our towers have a long-lasting stainless steel frame. Durable, heavy-duty, FRP wall casings and direct drive fans, with proven reliability, are included as standard. Our cooling towers can be installed fully assembled, minimizing downtime on replacement projects and reducing congestion at new construction sites.

- CE and UL approved motors available upon request.
- Cooling Tower Institute (CTI) certification available.

**Closed Loop (Fluid) Cooling Towers**
Kelvion's robust closed loop cooling towers are perfect when water quality and availability are an issue. Closed loop cooling towers can provide free cooling in the milder months when mechanical (compressor) cooling may be turned off.

- Refrigerant options include glycols, R410A, and other standard refrigerants available upon request.
- Epoxy precoated fins available upon request.

**Global Solutions Meeting Your Site Conditions**

**Custom Air Coils**
Kelvion custom air coils are used in computer room air handlers (CRAH) and computer room air conditioners (CRAC), located in the server room. They are designed to meet the OEM's desired size and specifications and manufactured in various patterns, using the latest in fin technology. Heat recovery coils are also an option for customers looking to reclaim heat from their data center building, without the danger of cross-contamination.

- Refrigerant options include glycols, R410A, and other standard refrigerants available upon request.
- Epoxy precoated fins available upon request.
KEEPING INNOVATION AT THE FOREFRONT

Kelvin's comprehensive research and development facilities enable us not only to validate the performance of our products, but also to optimize customized solutions directly for your application.

Our extensive, decades-long, experience of working as a nominated technical partner with end users, technology start-ups, universities and established engineering organizations has given us a diverse knowledge base. This enables us to find a solution to meet the most challenging cooling and heat transfer requirements. Continuously researching heat exchanger optimization is critical to achieving our innovation goals and understanding our application is pivotal to this success. Our laboratory facilities across Europe can test air coolers with a thermal balance up to a nominal maximum capacity of 600 kW (from 100W), and dry air coolers/ambient rejecters up to a 1.4 MW.

A calibrated calorimeter chamber capable of holding units with dimensions of up to 12 m long, 4 m high and 3 m wide, allows for the largest of heat exchangers to be tested.

The in-house wind tunnels can test air volumes up to 50,000 m³/hour and higher air volumes can be calculated from lower fan speed testing. Synthetic refrigerants can be tested up to a nominal capacity of 600 kW and CO₂ systems can be tested up to 150 kW, a range of other working fluid (synthetic and natural) can also be tested at various conditions and capacities. With a range of facilities available, we will try and find rapid testing solutions to meet requirements.

Component analysis using the x-ray micro-tomography ensures the quality of fin press and joint integrity, and is also available to validate contractor joints or other component analysis on request.

Resident CFD and FEA can be used for a range of investigations, which can also be validated against physical simulations of most scenarios in the laboratory.

We take great pride in offering a high quality, robust, efficient and reliable solution specific to application environments and the laboratory is there to help facilitate innovation and remove the risk from application critical environments.

Summary of laboratory facilities:

- Temperature controlled chamber with full control from -40°C to +60°C
- Dimension of chamber: 16 m long, 7 m wide, 8 m high
- R507A refrigeration plant with nominal cooling capacity range 0.1 kW - 600 kW
- Natural refrigerant plant (CO₂) with nominal loading of 2.5 kW - 150 kW
- Boiler system capable of 2 kW - 1,400 kW
- Wind tunnel with flow range of 720 to 50,000 m³/hr and up to 1000 Pa back pressure
- Heat transfer coefficient test rig, with air flow rate from 0.5 m/s to 9 m/s
- Free field sound pressure and reverberant sound power measurements
- X-Ray micro-tomography for finite analysis of components
- Burst pressure testing up to 620 Bar
- Small environmental chamber with full humidity control, -60°C to +150°C
- Smoke generation and air distribution testing
- Prototype fabrication, motor test facilities
Developing and supplying products and solutions is one side of our business — comprehensive after-sales support and comprehensive services is the other. The most important aspect is always to satisfy your requirements. This principle has made us a highly reliable service specialist. Our tightly woven network of locations worldwide means we can offer our customers maximum availability everywhere and anytime. We are underway for our customers every day, around the world. The service work we perform provides us with a continual stream of new knowledge and experiences that culminates in valuable improvements and enables us to permanently optimize our range of services. These services include precise installation work, in-house or on-site troubleshooting, visual inspection and performance audit as part of proactive maintenance, repair and cleaning, tube replacement, provision of spare parts, and the chemical cleaning of product components in our own service workshops.

Whatever it is we do for you, our services are oriented to specific values:

**Quality and safety**
We provide the ultimate in service quality with individual customer advice and precision work.

**Innovation**
Innovative service solutions enable us to fulfill the needs of our customers.

**Efficiency**
Our parts and services support ensures greater profitability: we optimize in-house workflows and maximize the availability of our systems at our customers’ premises.

**Professional knowledge**
Our customers benefit from the knowledge and experience we have gained through decades of service work.

**Trust**
The work performed by our service staff is reliable, responsible, and transparent: which is how we have earned the trust of our customers.

**The multi-stage model — service as you need it**
Our after-sales and service portfolio is based on service levels in which the range of services agreed upon is an integral part of an individually tailored service agreement. The clearly described contents of the various service levels ensure reliable cost transparency. The various service components can be combined as required to form a tailor-made service agreement. You can put together your own personal service package, tailored to suit your individual needs: to include the provision of spare parts, staff training, a help desk, or permanent on-site service.
Companies such as Kelvion that are internationally active are obliged to conform to internationally accepted conventions: of social, political, and legal nature. Our corporate code of conduct describes the principles and procedures behind our corporate actions. This code applies to all our employees worldwide. We ensure compliance with the regulations in a working environment that is characterized by integrity, respect, fairness, and responsibility.

We respect and observe the law.
The basis for all action at Kelvion is the observation of all applicable laws and other regulations. We supplement these rules with especially designed, particularly strict internal guidelines and training with regard to certain aspects of the law.

We act internationally.
Kelvion strictly observes as binding the statutory regulations that apply to our products and services involved in international commerce. We observe all applicable bans on exports and imports and observe all official authorization procedures.

We wholly reject corruption.
Kelvion rejects any type of commercial corruption, both domestically and on foreign markets. In order to underline this fact, we have drawn up our own anti-corruption guidelines that enforce rules of proper conduct to which we adhere at all times. These rules apply both in our dealings with officials and with the bodies and employees of other companies.

We support fair competition.
In a spirit of fair competition, we work hard, orient this work to our customers’ needs and ensure the quality of our products and services. We observe all applicable domestic, supranational, and foreign anti-trust laws as well as any laws pertaining to unfair competition. We also expect this level of fairness from our competitors.

We ensure socially acceptable working conditions.
We are committed to the principles of social responsibility towards our employees and society. Kelvion offers its employees fair working conditions worldwide. We reject any form of discrimination, with respect to gender, sexual orientation, origin, skin color, or any other personal characteristics. We see ourselves as a socially responsible employer that treats its employees with respect.

We protect the environment.
From development, to manufacturing, and to the sale of our products, we protect the environment throughout each of these phases. This principle applies not only to the energy we employ, but also to the protection of our natural environment at every workplace worldwide.

We ensure product safety.
For our customers, we develop innovative, high-quality products and processes — and product safety enjoys top priority.

FAIRNESS FIRST:
FOR CUSTOMERS, EMPLOYEES, COMPETITORS, AND THE ENVIRONMENT
No matter where your market is, regardless of country, we are never far away. We are always happy to answer any questions you may have and meet your requirements. Even the largest, most successful project begins with an initial, profitable conversation. We look forward to hearing from you.