Kelvion CMK (Cu/Al) & CML (StSt/Al)

HIGH AIR VOLUME FOR BLAST CHILLING AND SHOCK FREEZING
Welcome to Kelvion! Where Heat Exchange is our Business. We are one of the leading global manufacturers of heat exchangers and have been providing solutions for almost every industrial application imaginable since the 1920s, specializing in customized solutions suitable for extreme environmental conditions - as of 2015 under the name of Kelvion.

With one of the most extensive selections of heat exchangers in the world, we are a well-known partner in many industries, including transportation, energy, oil and gas, the heavy industry, chemical and marine as well as sugar, food and beverage and the HVAC and refrigeration technology sector. Our products include Compact Fin Heat Exchangers, Plate Heat Exchangers, Single Tube Heat Exchangers, Transformer Cooling Systems, Cooling Towers and Shell & Tube Heat Exchangers.

Our many years of experience and in-depth expertise have made us specialists in this field. Our heat exchangers are designed specifically to meet the needs of the respective machine or equipment system, ensuring outstanding energy efficiency and reliability in any market segment. This gives our customers a cutting-edge over their competitors while also reducing operating costs over the long term.

As your heat exchange partner, we understand that outstanding and reliable after-sales services are critical for you, our customer, and we work alongside with you in close partnership supporting you throughout the full life cycle of your plant and equipment to ensure lasting business success.


**EXPERTS IN HEAT EXCHANGE – SINCE 1920**

Lord Kelvin formulated the laws of thermodynamics and absolute units of temperature are stated in kelvin, in his honor.

**KELVION – A TRIBUTE TO LORD KELVIN (1824 - 1907)**

**OUR LOGO – INSPIRED FROM THE SCHEMATIC FOR HEAT EXCHANGER**

**67 BRANCHES AND SALES PARTNERS WORLDWIDE**

**4,500 EMPLOYEES WORLDWIDE**

**KELVION HAS A LONG HISTORY**

- 2015: With the new name, the former GEA Heat Exchangers is writing its own history as Kelvion.
- 2014: GEA sells the Heat Exchangers Segment to Triton.
- 2010: Reorganization of GEA’s 9 Divisions into technologically distinct Segments. The largest segment is the Heat Exchangers Segment.
- 1999: In April 1999, GEA was acquired by mg technologies AG.
- 1920: Foundation of GEA in Bochum by Otto Happel sen. (Born 1882).
Kelvion CMK / CML

HIGH-PERFORMANCE AIR COOLER FOR BLAST CHILLING AND SHOCK FREEZING

Kelvion CMK (Cu/Al)

<table>
<thead>
<tr>
<th>Capacity range (for R404 DX - SC3)</th>
<th>Temperature range ((t_{L1}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 kW 116 kW</td>
<td>-40°C 20°C</td>
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</table>

Kelvion CML (St/St/Al)

<table>
<thead>
<tr>
<th>Capacity range (for NH3 pump - SC3)</th>
<th>Temperature range ((t_{L1}))</th>
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</thead>
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<tr>
<td>14 kW 126 kW</td>
<td>-40°C 20°C</td>
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NOMENCLATURE

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>C M K - 56 4 - 6 L N</td>
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</tbody>
</table>

1 Size of product 5 Number of fans
2 Case style of product 6 Number of rows deep
3 Coil block system 7 Fin spacing
4 Fan diameter 8 Defrost system
Application examples:

- Blast chilling
- Shock freezing

Shock freezing foodstuffs is technically extremely demanding on air coolers. The Kelvion CMK/CML blastfreezer meets these demands effortlessly. The technical specifications covering the cooling surface, the air volume, the tube-fin-system and the distribution of the refrigerant have all created benchmarks and guarantee the reliability of the process. Those specifications are precisely matched to each other to optimise blast freezing. Optimal air volume flow for shock freezing: Blow through fans guide the air flow horizontally through the heat exchanger. This creates maximum air velocity over refrigerated goods exposed to the air flow. The dimensions are designed to suit standard tray carts: perfect distribution of cold air directly onto the chilled goods. This ensures high efficiency, preserves quality and reaching the core temperature of the produce in the shortest possible time.

For blast chilling and freezing application: Specially designed for quick chilling and freezing of food products; large scale kitchens, bakery products, pizza and vegetables; meat or sausages, fish, poultry and the production of ice cream

- Powerful: High performance due to application-suited circuit design
- Optimized heat exchanger geometry and an aerodynamically integrated fan system: Higher specific power, reduced fan speed and air velocity through the coil and significantly reduced current consumption
- Blow-through fans plug-and-play
- Quick freezing process: Minimize the weight loss and conserving the qualities of the food product. Standard 50 Pa or 100 Pa external pressure available
- CAL® distributor option available
- Construction for adjustable floor mounting (optional)
- Optimized ratio price/kW

Even more flow optimised through precise matching of fans and heat exchangers:

- Improved distribution of air in the heat exchanger
- Integrated full bell mouth
- ErP 2020 compliant
- Significantly improved energy efficiency
- Suitable for 50 and 100 Pa external pressure

The electrical power consumption has been reduced considerably. The saved electrical energy is not absorbed by the evaporator. It contributes increasing the actual delivered cooling capacity.

Available as a variant:

- Hinged fan system
- More stability while opening the cooler
- Increased opening angle
- To open the cooler only four screws have to be removed
- Advantage: 30% less installation effort:
  Fast, easy and thus cost-efficient cleaning

Even more power optimised through a reduced weight loss and more stable as a whole: ErP 2022 compliant.
COIL BLOCK KELVION CMK
- Tube: Copper, internally enhanced, Ø 15 mm
- Fins: HFE-Fins® from Aluminium
- End plate: Aluminium
- Aligned tube system
- Fin spacing: B = 7 mm | K = 10 mm | L = 12 mm
- Copper tubes are mechanically expanded into fully collared aluminium fins.
- Internal purity according to EN 14276
- Inlet connections: Distributor with copper tube for brazing connection, multiple injections via CAL® distributor as option
- Outlet connections: Copper tube for brazing connection with Schrader valve UNF 7/16", sealed

COIL BLOCK KELVION CML
- Tube: Stainless steel V2A, Ø 15 mm
- Fins: HFE-Fins® from Aluminium
- End plate: Aluminium
- Aligned tube system
- Fin spacing: B = 7 mm | K = 10 mm | L = 12 mm
- A good thermal contact is achieved by hydraulic expansion of the stainless steel tubes into the fin collars
- Internal purity according to EN 14276
- Inlet/Outlet connections: Stainless steel tube for welding connection

CASING
- Sendzimir zinc-plated steel
- Blow-through or Draw-through execution
- Neutral finishing (no painting)
- Food-safe
- Smooth surfaces: Easy to clean
- Hinged drip tray, removable
- Standard fixed floor mounting brackets, height-adjustable optional on both sides, from 0 mm to 175 mm stepless

FAN UNIT
- AC or EC technology
- 2 speed operation
- Fan diameter: 560 and 630 mm
- Permissible fan motor operating temperatures:
  - -40°C up to +60°C (50Hz)
  - -40°C up to +40°C (60Hz)
- Connection voltage: 3/PE 400V 50/60Hz
- Motor protection: External thermocontact
- Protection class IP54
- Insulation class F
- 50Pa and 100Pa external pressure available
- Fans wired on 1 internal terminal box (blow-through)
- AC Motor Control:
  - Phase control
  - Transformer
  - Delta/Star
  - Frequency converter*
- EC Motor Control:
  - Adjustable via 0-10V interface
  - Modbus
  - Motor protection: External thermocontact
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  - Adjustable via 0-10V interface
  - Modbus

Please observe the manufacturer’s information!
### TECHNICAL DATA

**Kelvin CMK**

#### Fin spacing 7 mm (B)

<table>
<thead>
<tr>
<th>Type</th>
<th>SC2</th>
<th>SC3</th>
<th>SC4</th>
<th>In</th>
<th>Out</th>
<th>Fan</th>
<th>Voltage</th>
<th>Per Air Cooler</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMK-562-4B</td>
<td>21,8</td>
<td>16,7</td>
<td>12,1</td>
<td>82</td>
<td>16356</td>
<td>3,5</td>
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<tr>
<td>CMK-562-6B</td>
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<td>16356</td>
<td>3,5</td>
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<td>16</td>
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<tr>
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<td>22</td>
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#### Fin spacing 10 mm (K)

<table>
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#### Fin spacing 12 mm (L)

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</table>

### Changes subject to modifications

- Capacities Q0 at 50Hz, R404A, R448A, R449A, R407C
- Surface Air Volume
- Air Speed
- Voltage Per Air Cooler
- Motor
- Fin spacing 7 mm (B)
- Connections Fans (values at 50Hz)
- DPext= 100Pa
- LWA
- Multiple Injection via Venturi
- CAU-Distributor on demand
### TECHNICAL DATA

#### Kelvion CML

#### Fin spacing 7 mm (B)

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<th>Type</th>
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<tbody>
<tr>
<td>Capacities Q. at SOH, (NH3) pump</td>
<td>kW</td>
<td>kW</td>
<td>kW</td>
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<tr>
<td>Surface</td>
<td>m²</td>
<td>m²</td>
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<tr>
<td>Volume</td>
<td>m³</td>
<td>m³</td>
<td>m³</td>
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<tr>
<td>Fans (values at 50Hz)</td>
<td>LWA</td>
<td>kW</td>
<td>kW</td>
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<tr>
<td>Connections</td>
<td>350Pa</td>
<td>100Pa</td>
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<tr>
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<td>m³</td>
<td>m³</td>
<td>m³</td>
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<td>Fans (values at 50Hz)</td>
<td>LWA</td>
<td>kW</td>
<td>kW</td>
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<tr>
<td>Connections</td>
<td>350Pa</td>
<td>100Pa</td>
<td>100Pa</td>
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</tbody>
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**Type**
- Kelvion CML

**Capacities Q. at SOH, (NH3) pump**
- kW
- kW
- kW

**Surface**
- m²
- m²
- m²

**Volume**
- m³
- m³
- m³

**Fans (values at 50Hz)**
- LWA
- kW
- kW

**Connections**
- 350Pa
- 100Pa
- 100Pa

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**Connections**
- 350Pa
- 100Pa
- 100Pa

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- 100Pa
- 100Pa

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- 350Pa
- 100Pa
- 100Pa

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**Connections**
- 350Pa
- 100Pa
- 100Pa

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## ELECTRIC DEFROST & WEIGHTS

**Kelvion CMK / CML**

<table>
<thead>
<tr>
<th>Model</th>
<th>Coil</th>
<th>Drip Tray</th>
<th>Total</th>
<th>Weight (net)</th>
<th>B (kg)</th>
<th>K (kg)</th>
<th>L (kg)</th>
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<tbody>
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## DIMENSIONS & DRAIN

**Kelvion CMK / CML**

<table>
<thead>
<tr>
<th>Type</th>
<th>B (mm)</th>
<th>T (mm)</th>
<th>Hmin (mm)</th>
<th>Hmax (mm)</th>
<th>L (mm)</th>
<th>E1 (mm)</th>
<th>E2 (mm)</th>
<th>Wmin1 (mm)</th>
<th>Wmin (mm)</th>
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**ELECTRIC DEFROST**

- **CMK-562-4x**: 230V 1 / 400V 3-Y
- **CMK-562-6x**: 230V 1 / 400V 3-Y

**DRAWING**

- Kelvion CMK / CML
- **CMK-562-4x**: 6,02 kW, 1,04 kW, 7,06 kW
- **CMK-562-6x**: 7,02 kW, 1,07 kW, 8,09 kW

**DIMENSIONS & DRAIN**

- **CMK-562-6x**: 1316 mm x 811 mm x 1850 mm
- **CMK-632-6x**: 1516 mm x 1022 mm x 2050 mm

**Stepples height-adjustable floor mounting brackets (optional) and wall clearance**

**Note:**

- **B**: Width
- **T**: Depth
- **Hmin**: Minimum dimension
- **Hmax**: Maximum dimension
- **L**: Length
- **E1**: Distance from front to front
- **E2**: Distance from side to side
- **Wmin1**: Minimum distance from front to side
- **Wmin**: Minimum distance from side to side
**FAN VARIANTS**

- **EC FAN WITH CONTROLLABLE SPEED**
  - 0-10V
  - Modbus

**CONSTRUCTION VARIANTS**

- **WATER / BRINE CIRCULATION**
  Small and large pressure drop, 16 bar

- **FANS HINGED**
  For easy cleaning of the units, the fans swivel on stainless steel hinges

- **STEPLESS HEIGHT-ADJUSTABLE FLOOR MOUNTING BRACKETS**
  Flexible stepless adjustable floor mounting brackets on both sides, steples from 0 mm to 175 mm

**CO₂ VARIANTS**

- **CO₂-DIRECT EXPANSION**
  - up to 40 bar operating pressure
  - up to 60 bar operating pressure

  *Please use our Product Selection Software GPC or RT SELECT for CMK/CML CO₂ specific data.

**PROTECTION AGAINST CORROSION**

**CORROSION PROTECTION 1**
- Tubing: Copper (Kelvion CMK)
- Fins: Aluminum AmG
- End plates: AmG
- Casing: Aluminum/zinc coated steel, protective coating on both sides

**CORROSION PROTECTION 2**
- Tubing: Copper (Kelvion CMK)
- Fins: Aluminum AmG
- End plates: AmG
- Casing: Aluminum/zinc coated steel, protective coating on one sides

**CORROSION PROTECTION 3**
- Tubing: Copper (Kelvion CMK)
- Fins: Aluminum AmG
- End plates: AmG
- Casing: Aluminum/zinc coated steel, pre-painted

**STAINLESS STEEL CASING**
For aggressive airborne particles which can arise in industrial cooling processes (salts, organic acids in pickle rooms; organic acids, amines in meat and sausage products).
DEFROST SYSTEMS
For room temperatures where ice-build up can be expected and where the coil can not be defrosted by the room air, an defrost system is available.

Electrical defrost
- Heating elements made from stainless steel
- Connections steam-proof
- Connection voltage: 3/N/PE 400V 50/60Hz
- Wired to a terminal box, ready for connection
- An optimized heating element configuration ensure fast and even defrosting
- Standard defrost loads for low temperatures and light defrost load for higher temperatures (room temperature approximately 0°C)
- The stainless steel heating elements are fitted within aluminium tubes, which forms a highly conductive medium between heaters and fins, which ensure efficient defrosting cycles with optimized life cycle

The heater elements in the coil block are removable from the connection side, whilst the tray heater elements can be removed once the outer tray has been removed.

The exact number of elements and electrical power for light and heavy defrost each air cooler, you can find in our Goedhart selection program.

Heating section
The air cooler can be carried out with a heating section with electric heating elements to heat up again dehumidified air. The heating section is compared to the air flow placed after the coil block. The heating elements can be placed with holders against the coil block or completely integrated in the casing.

Hot gas defrost
The coil block is as standard suited for hot gas defrost (hot gas supply through the suction header). Against an extra price the drip tray can be provided with a copper hot gas spiral. This is enclosed in aluminium profiles that are rigidly secured to the under side of the aluminium inner drip tray. As a result, a very good heat transfer is realized. As with electric defrost a distinction is made with light defrost (room temperature around 0°C) and heavy defrost.

Water defrost
On top of the coil block a removable water defrost tray is mounted. The height of the water defrost tray is 80 mm, which increases the total height of the air cooler. The standard discharge head of the water in the water defrost tray is 25 mm, the maximum speed in the water supply line is 5m / sec. For an optimal functioning of the water defrost, the temperature of the defrost water must be between + 15°C and at + 30°C. The water defrost tray is executed with handles, easy for disassemble and cleaning.

FAN HEATING
The fan heating prevents ice build-up between the fan impeller and fan bellmouth during the defrost cycle. This prevent damaging of the fan. We advise to use fan heating as option on your air cooler when the room temperature < -10°C

Delivery
- Is mounted and connected to a junction box
- Covers almost the whole fan bellmouth periphery
- Executed with 8 mm foam insulation, less defrost time, better heat transfer
- Executed with limiter 70°C
- Can also be retrofitted

<table>
<thead>
<tr>
<th>Fan diameter</th>
<th>Power at 230V kW</th>
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<tr>
<td>mm</td>
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<td>560</td>
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SIDE COVER HOODS
Construction
- Standard material as air cooler casing
- White High-grade powder coating or spray painting optional
- Obligated in combination with electrical defrost
- Including plastic handles for easy removing

HINGED FANS
Construction
- More stability while opening the cooler
- Increased opening angle
- To open the cooler only four screws have to be removed

DEFROST HOOD
Build-up of heat during the defrost cycle in the air cooler. Reduces the defrost time by more than 50%. (combination with multi-dampers mandatory)

REPAIR SWITCH
Safety during repair and maintenance of single fan units

HEIGHT-ADJUSTABLE FLOOR MOUNTING BRACKETS
Can be adjusted to on-site conditions. (Brackets not compatible with defrost hood)

DRAW-THROUGH FAN VERSION
Better distribution of cold air, greater air throws and higher air velocities

DEFROST DAMPER / INSULATED FAN PLATES / INSULATED DRIP TRAY
The heat remains in the cooler block. This results in a low defrost termination temperature and leads to significant energy savings.