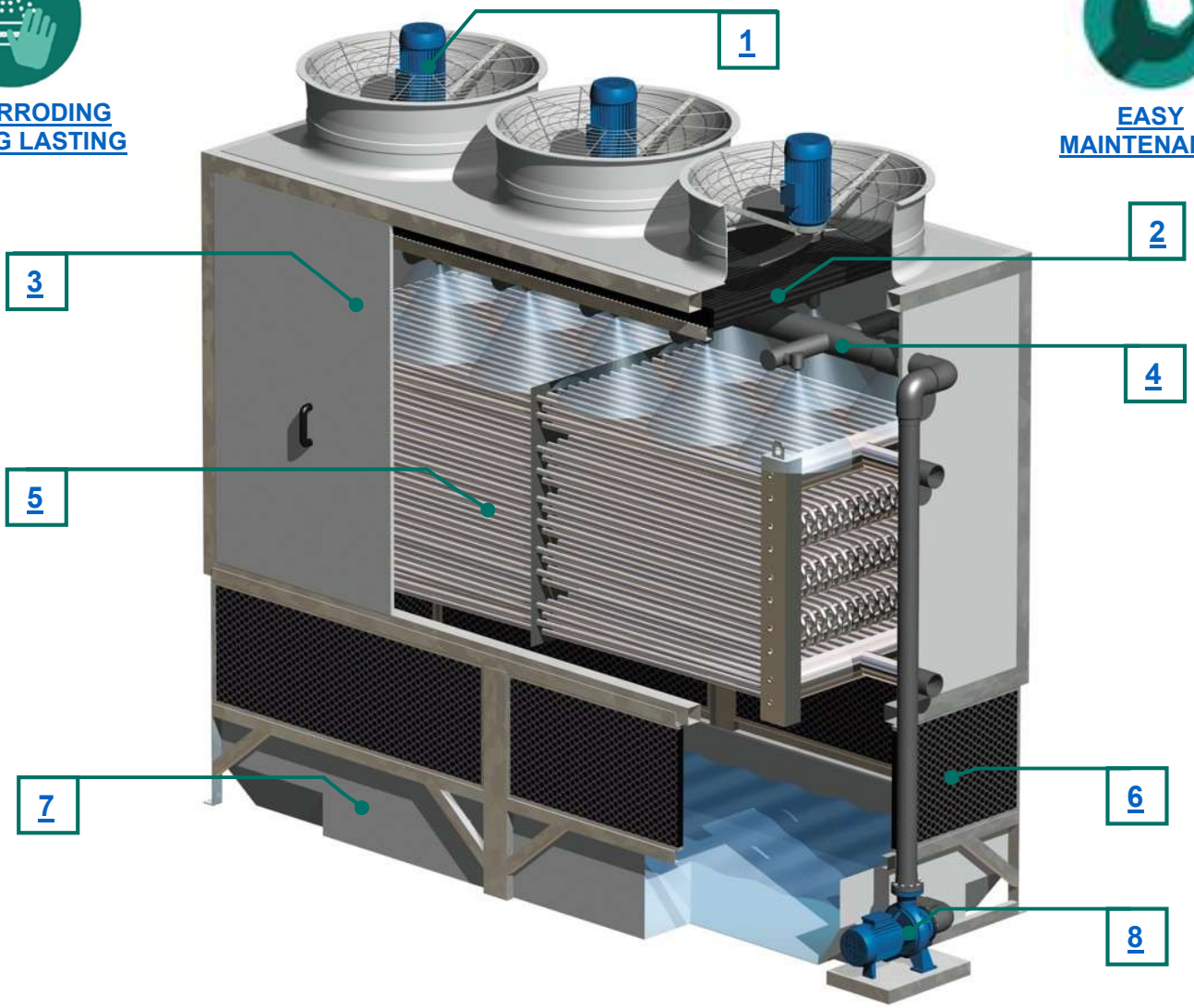
EVAPORATIVE CONDENSER
Design Features

INDUSTRIAL PROCESS | HVAC

MCE SERIES

NON-CORRODING AND LONG LASTING

EASY MAINTENANCE



Evaporative condenser	
Factory Assembled - Modular Compact Design	
1	**IP56** Motor(s) **directly coupled** to low energy and high efficiency fan
2	**EUROVENT Certified** High Efficiency DRIFT ELIMINATORS
3	Fibreglass reinforced polyester (**FRP**) sandwich casing panels and hot dip galvanised steel (HDGS) **after fabrication** perimeter frame
4	Water distribution system with **non-clogging** tangential Polypropylene (PP) nozzles for a full cone water distribution. Flanged water inlet connection
5	**Condensing coil(s): high quality steel smooth tubes, CE 1115, PED 2014/68/UE**
6	Honeycomb air inlet louvers
7	Fibreglass reinforced polyester (FRP) water collection basin with **sloping base and smooth internal finish** with rounded corners for easy cleaning
8	Circulating pump
9	**Factory assembled** evaporative condeser, easy on-site **installation**

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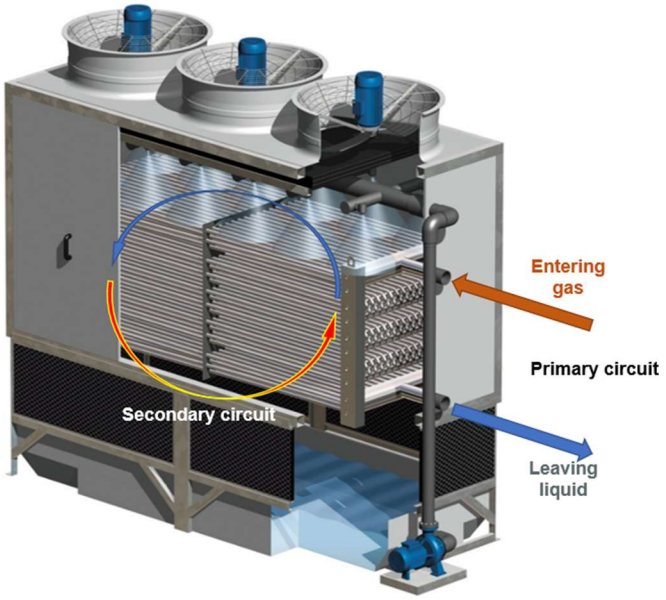
THEORY AND OPERATION OF EVAPORATIVE COOLING

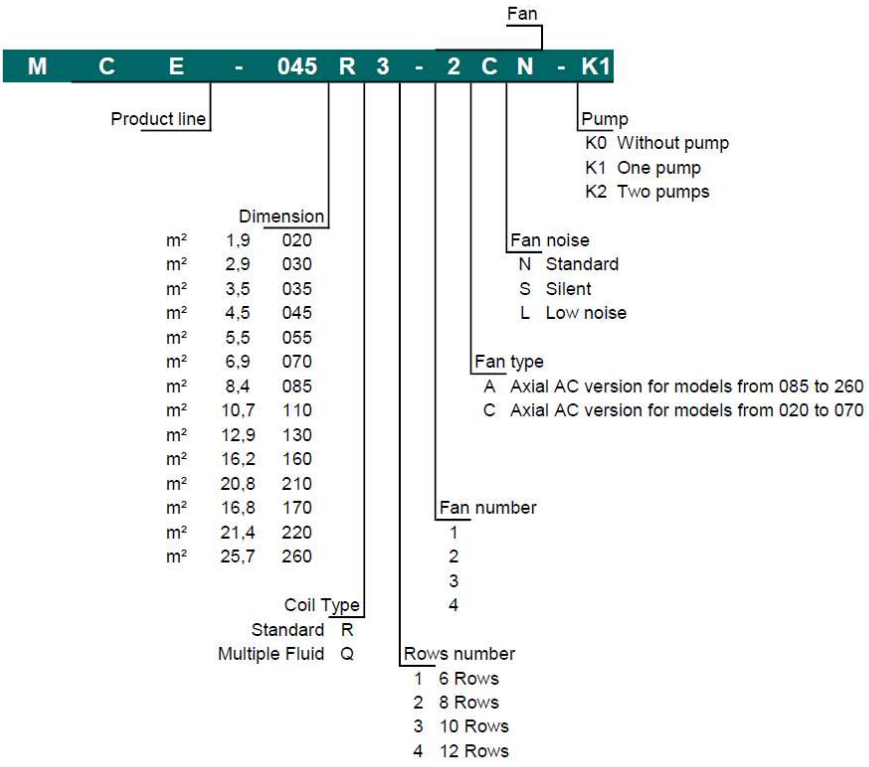
In the primary circuit, incoming **gaseous refrigerant** enters the coils from the upper inlet while **liquid refrigerant** leaves from the lower connection.

In the secondary circuit water is sprayed from the nozzles onto the coils. From opposite direction air will come and force a small part of the fluid to **evaporate**, causing the remaining water to be **cooled down which in turn cools the coils**. Air is sucked in by the fan and rejected from the top, recirculating water is collected in the basin.

Important values
Approach: temperature difference between outlet and wet bulb. Must be minimum 2-3 °C.



PRODUCT NOMENCLATURE



1. MOTOR FAN GROUP

UPPER SECTION(S) made of reinforced polyester (**FRP**) with gel-coat for UV-protection.

High efficiency directly coupled axial fan motor(s) assembly, designed to efficiently convey discharge air.

AXIAL FAN SYSTEM with the following features**:**

- one or more propeller fan(s) in aluminum or plastic, with blades connected to central aluminium hub directly coupled to the motor
- **IC 418** Sealed execution motor(s)
- Designed specifically for evaporative system minimum **IP55**
- **multi-voltage** (400/690/3/50), (50/60 Hertz), Class F insulation
- electric motor(s) suitable for operation with **frequency converter**.

SILENCED: several solutions to reduce noise levels:

- 12 or 16 poles motors to reduce fan speed and blades with special airfoil
- Water attenuators
- Air outlet silencers
- Air inlet silencers.

IMPORTANT SUGGESTION (***expecially in case of 12 poles motors***): it is recommended to start the motor/s by means of a “soft-starter” or with frequency converter.

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2. DRIFT ELIMINATORS

EUROVENT Certified High Efficiency DRIFT ELIMINATORS made of polypropylene (PP) sheets, thermoformed under vacuum and welded together to form panels of such shape and size as to guarantee maximum efficiency of droplet separation from the airflow induced by the fan, substantially reducing drift water.

3. WATER DISTRIBUTION SYSTEM

WATER DISTRIBUTION SYSTEM connected to the water recirculation pump, is entirely mede in PVC. Consisting of a main header with flanged water inlet according to UNI-EN-1092-1- PN 10 and side branches where static type, non-clogging, axial, spray nozzles are fixed.

Such system guarantees optimal water spraying over the whole coil surface.

Spray nozzles are in polypropylene, with full-cone spraying angle of 120°.

4. STRUCTURE AND CASING

CASING walls consisting of 22 mm thick polyester resin sandwich panels reinforced with fibreglass and coloured with paste gel-coat for UV-protection. Seal between the load bearing structure and the panels is guaranteed by a special bituminous sealing gasket.

NUTS AND BOLTS in stainless steel **AISI 304.**

Optional: **Man-sized access door(s)** (each 720x520mm) in FRP sandwich panel in a HDGS (after fabrication) frame to allow easy inspection or access to the inside of the condenser.

Optional: **Totally removable side-wall(s)**, to simplify routine maintenance operations to the condenser internals.

Optional:

- **STAINLESS STEEL METAL STRUCTURE** in AISI 304 or AISI 316
- **C5/CX COATED STRUCTURE**

in case of aggressive water or environment.

5. CONDENSING COIL(S)

CONDENSINGCOIL(S) consisting of high quality steel smooth tubes, supported by a frame made of HDGS profiles: the whole assembly is hot-dip galvanised after fabrication.

During manufacturing process, every circuit is carefully checked and air-pressure tested under water. A final pressure test is performed on the entire coil, after manufacturing.

Coil geometry is designed to ensure complete wetting of the heat exchange surface and to optimize external air-water contact, to maximize the thermal cooling capacity.
Moreover tube sloping ensures fluid's complete water discharge through the outlet connections, placed in line with the bottom of the outlet header to avoid "dead zones".

The coils are marked CE 1115, Pressure Equipment Directive PED 2014/68/UE

Optional:

- **HERESITE COATED COILS**

in case of aggressive water or environment.

6. HONEYCOMB LOUVERS

HONEYCOMB LOUVERS in PP or PVC, to limit the basin's exposure to sunlight and dirt, thus reducing the risk of biological proliferation.

7. WATER COLLECTION BASIN

WATER COLLECTION BASIN is entirely made of fibreglass reinforced polyester (FRP).

SLOPING BASE with **ROUNDED CORNERS** for ease of cleaning and reduced risk of biological growth. Supplied with **drain**, **make-up** and **overflow connections**.

8. CIRCULATING PUMP

WATER CIRCULATING PUMP for the secondary spray-water circuit, connected to the water distribution system, external to the coils. The pump is fixed to the condenser suppport structure and is equipped with PVC piping.

9. TRANSPORT & INSTALLATION

MCE is a **factory assembled** evaporative condenser, designed to be transported with standard trucks in three pieces:

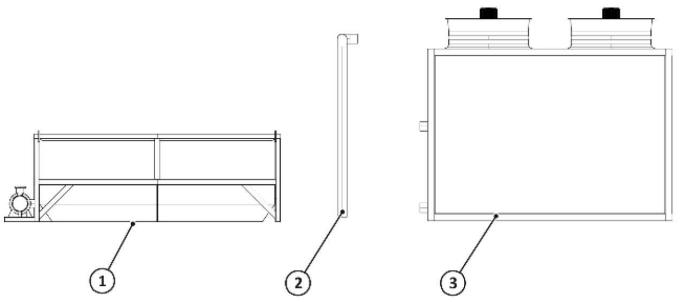
- Basin and lower structure (1)
- Connection pipe (2)
- Body (3).

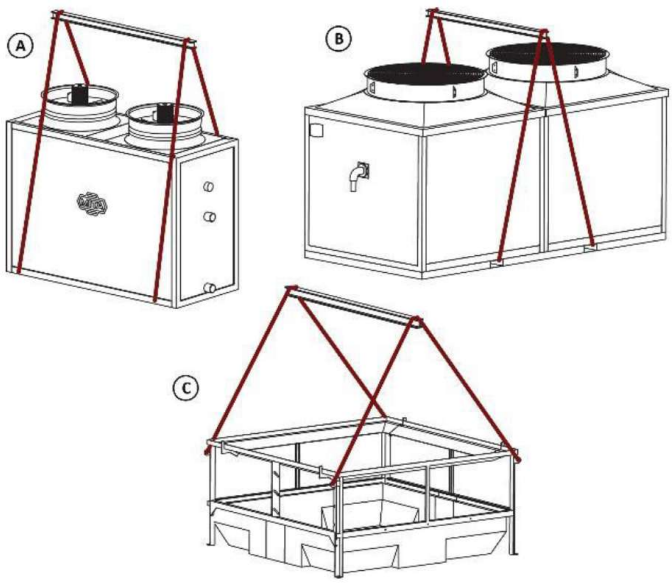
The condenser is designed for the easiest possible on-site installation operations, consisting in positioning and fixing body on top of the structure.

Refrigerant connections are welded, and the electric connection are limited to the electrical junction box or switch box (optional), positioned on the side wall of the unit.

A. Body from MCC 020 to MCC 070
B. Body from MCC 085 to MCC 160
C. Basin and lower structure

The secondary water recirculation circuit must be closed by installing the pipe, supplied separately, between the spraying pump and the connection to the water distribution piping.The connections between tank, water distribution and pump are made using reinforced rubber pipe and hose clamps.





Supply of the condenser is limited to the parts listed above. Building and electrical works, pumps, collectors external to the condenser, valves, hoisting gear and any scaffolding and labour are therefore excluded. Accessories and/or constructive variants are available on request.
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