# quattro

**Sustainable and simultaneous cooling and heating. ALL YEAR ROUND.**

**Air-to-water Multi-pipe Units QUATTRO 85 - 345 kW**

HIGH ENERGY EFFICIENCY

ErP COMPLIANT

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

R454B

*We Make Innovations. We Provide Solutions.*

Thermocold® THE AIRVOLUTION

# SUMMARY

- Discover the range
- Product features
- Applications
- Design
- Components
- Main options
- Operating maps
- Documentation

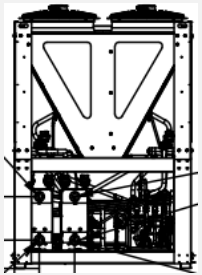
# LET'S DISCOVER THE RANGE

HC: 86 – 149 Kw

CC: 81 - 137 Kw

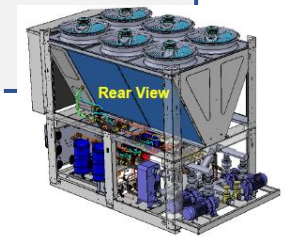
QUATTRO EA

024 026 031 033 037 039



Lenght 2768/3558 mm
Width 1616 mm
Eight 2400 mm

1V

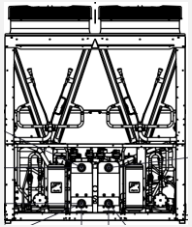


# LET'S DISCOVER THE RANGE

**HC: 145 – 224 Kw**
**CC: 140 - 214 Kw**

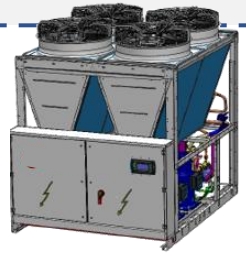
**HC: 244 – 345 Kw**
**CC: 239 – 321 Kw**

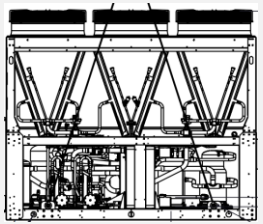
| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| QUATTRO | 040 | 045 | 050 | 055 | 065 | 070 | 075 | 085 | 095 | 105 |
| QUATTRO EA | 040 | 045 | 050 | 055 | 065 | 070 | 075 | 085 | 095 | 105 |



Lenght 2505 mm
Width 1997 mm
Eight 2412 mm

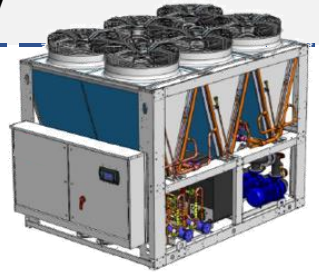
2V





Lenght 3295 mm
Width 2232 mm
Eight 2513 mm

3V



# PRODUCT FEATURES

- ✓ 2 Efficiency levels (**QUATTRO EA / QUATTRO )**
- ✓ Adaptive Refrigerant System™
- ✓Higher efficiency than the same product family with the R410a refrigerant:

  - TER (Total Efficiency Ratio) values up to 8,38
  - COP values up to 3,53
  - EER values up to 3,27

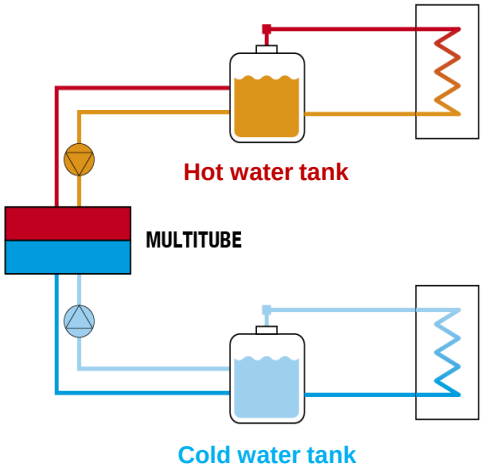
$$TER = \frac{\text{Cooling + Heating Capacity}}{\text{Power input}}$$

TER is the unique index officially recognised by Eurovent for measuring the performance of a multi-functional unit while it is working in simultaneous cooling and heating mode.

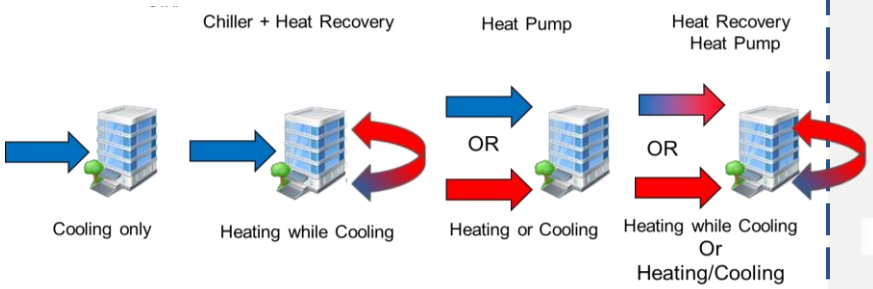

| | | |
|---|---|---|
| **Cooling** | 5 ↔ 20° C | -20 ↔ 51° C |
| **Heating** | 23 ↔ 60° C | -15 ↔ 35° C |

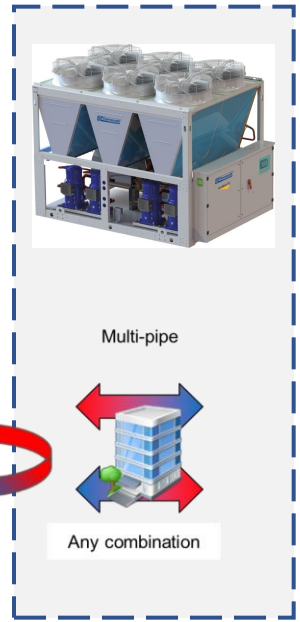
# PRODUCT FEATURES

Multi-pipe units will deliver simultaneous cooling and heating, using two fully independent refrigerant circuits. with an intelligent system able to independently determine the most suitable operating cycle  according to the demand of the plant



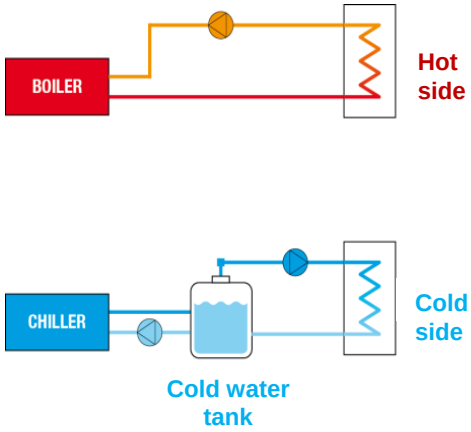

- *Self-adaptive adjustment*
- *Dedicated heat exchanger for hot water production*
- *Dedicated heat exchanger for cold water production*
- *Total heat recovery*



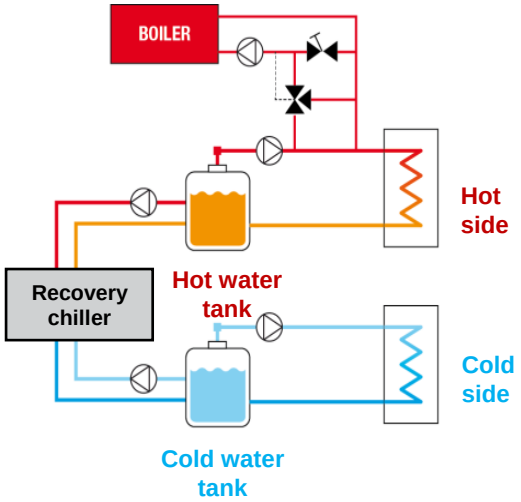



# PRODUCT FEATURES

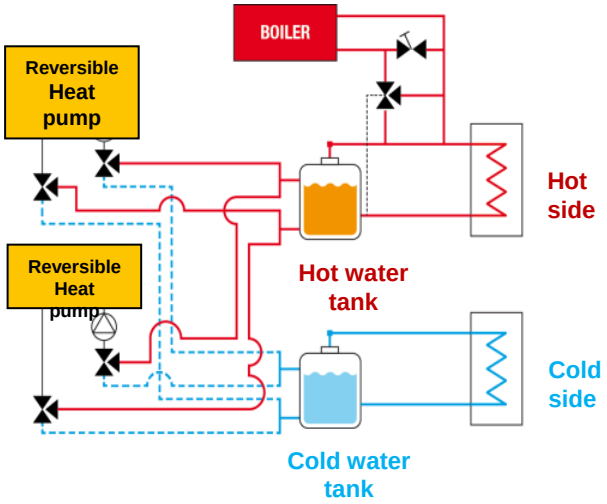
Compared to traditional solutions a multi-pipe unit simplifies the plant: a single unit works, auto-regulating its operation according to the heating and cooling demands of the plant without any external supervisor!




CHILLER + BOILER




RECOVERY CHILLER + BOILER




2 HEAT PUMPS + BOILER

*Compared to the traditional solutions, with the Quattro multifunction unit we get money savings related to unit management costs and unit maintenance costs!*

# APPLICATIONS

Multi-pipe units, a well-known highly sustainable technology, can be used across a wide range of applications. QUATTRO models are designed for medium to large buildings, both for new building installation or renovation projects.

Offices

Hotels

Public buildings

Education

Healthcare

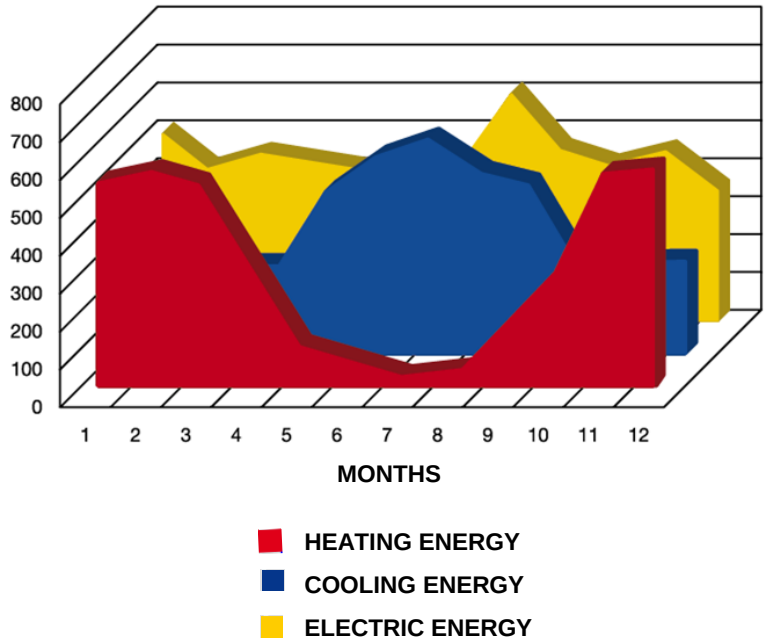
Shopping centers

# APPLICATIONS

Multi-pipe units are the perfect solutions for those buildings with simultaneous request of hot and cold water throughout the whole year

Each building has a characteristic **profile of load** resulting from:

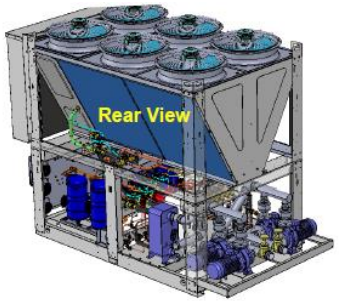
- climatic region;
- insulating;
- type of buildings.



# DESIGN

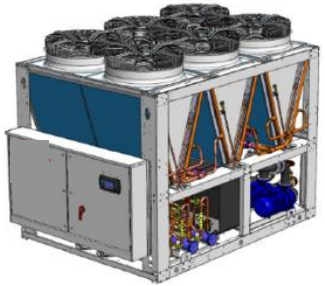
26 MODELS delivering up to 344 kW of heating capacity in a extra compact unit developed in 3 PLATFORMS!

(1V)

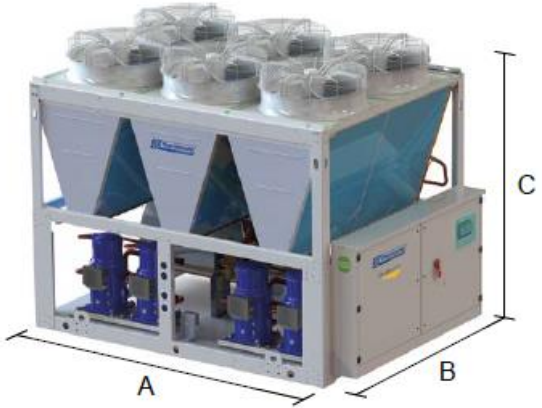



(2V)

(3V)



ULTRA COMPACT




R454B


The platform **1V** is available from size **024** up to size **039**

# COMPONENTS

**Fin & Tube outdoor heat exchanger**
Modular 'V' shape design for maximum performance in a small footprint

**EC fans** for QUATTRO EA 4-pipe range, **AC fans** for QUATTRO range

**Brazed plate heat exchangers**
Compact, reliable and proven design
- Low water pressure drops
- Full protection against ice formation

**Thermologic advanced electronic controller + Touchscreen display**
- Advanced algorithms ensuring optimal control , defrost optimization and smooth operation
- Perfect balance of performance and economy
- Easy service access
- 7" color touchscreen display
- Full interoperability via SmartCom interface LonTalk®, BACnet® and Modbus
- Dynamic Set Point

**Scroll compressor**
- Optimized for higher seasonal efficiency
- Reliable operation over the lifetime of the unit
- Reduced energy consumption: no over-compression thanks to intermediate discharge valves (IDVs)

**Electronic expansion valve** as standard

**Hydraulic module**
- Housing within the unit frame to keep overall footprint to a minimum
- Single or dual pump
- Compatible with variable primary flow

R454B

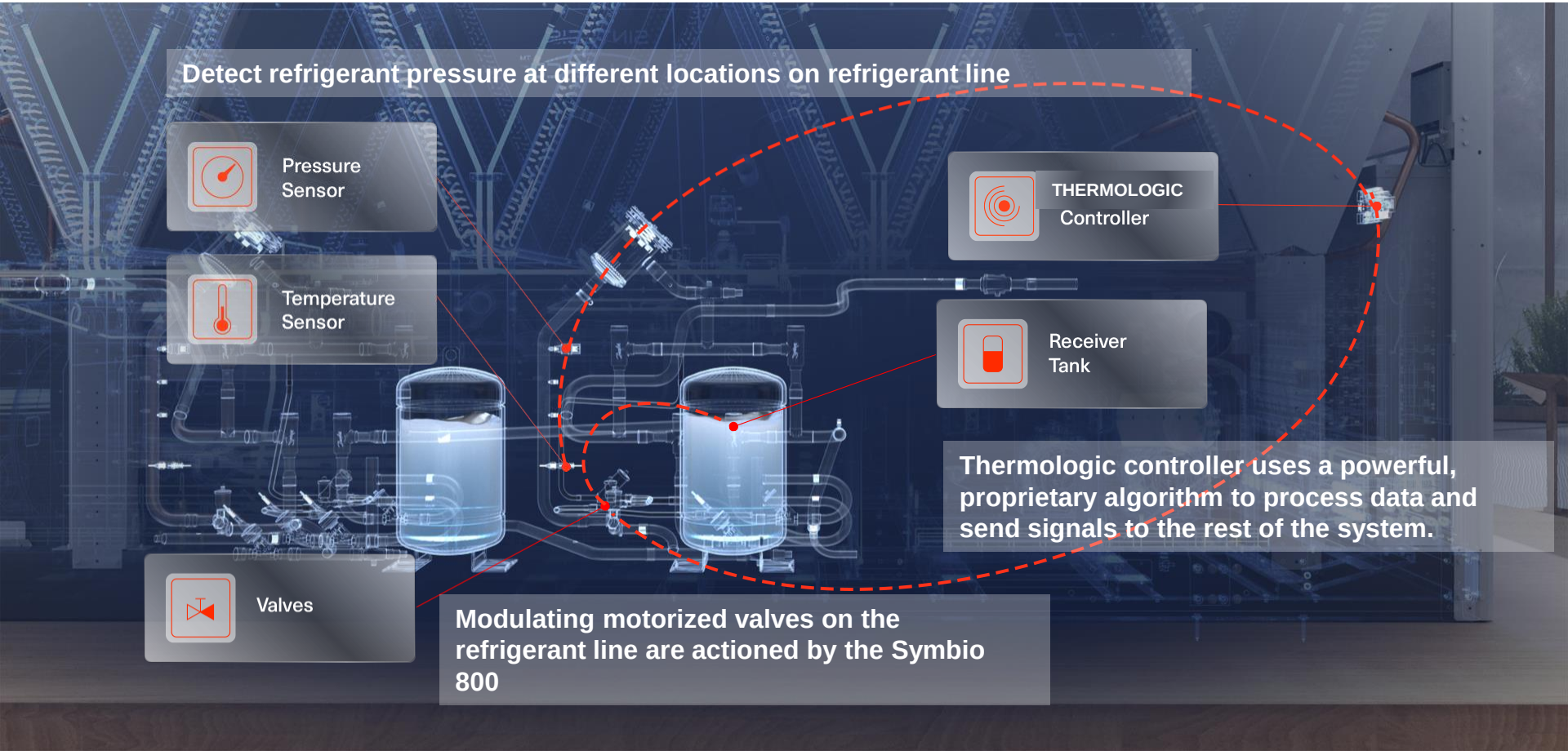
EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

Conto Termico 2.0

# Product features

## Adaptive Refrigerant System™

*Better Performances*
*Extended Operating Map*


Detect refrigerant pressure at different locations on refrigerant line
Pressure Sensor
Temperature Sensor
Valves
THERMOLOGIC Controller
Receiver Tank
Thermologic controller uses a powerful, proprietary algorithm to process data and send signals to the rest of the system.
Modulating motorized valves on the refrigerant line are actioned by the Symbio 800

The ideal refrigerant charge needed for each of the 3 modes (cooling, heating and heat recovery) varies to get the best performance, best operating maps and best efficiency

The refrigerant is stored in a dynamic receiver tanks upstream of the expansion valve.


Refrigerant is filled and drained as required, it is controlled in all operating modes.

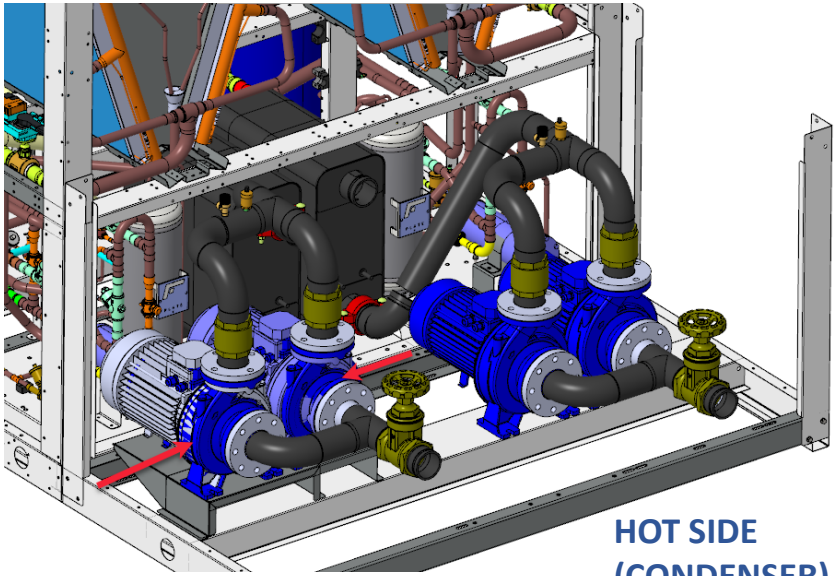
# MAIN OPTIONS

## HYDRAULIC VERSIONS

- **EASY TO SELECT**
- **INTEGRATED** in the unit

The Thermologic controller manage the equalization of the double pump operating hours

Dual pumps configuration are available for alternate or simultaneous running.



**COLD SIDE (EVAPORATOR)**

**HOT SIDE (CONDENSER)**

*For hydraulic versions, please consider the extra dimensions of the unit: for further info please see the dimensional drawings available on [www.thermocold.it](http://www.thermocold.it) in the product page.*

# ACOUSTIC LEVELS

How do we soundproof units?

**L VERSION:** Low noise

**DOWN TO - 3 DB**

Compressors
sound jackets

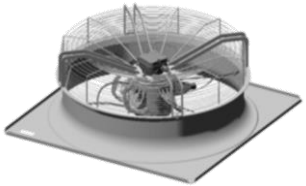
**E VERSION:** Super low noise

**DOWN TO - 4 DB**

Compressors of each circuit are insulated with sound absorbing jackets with double thickness.

**NNSB:** Night Noise Set Back

**DOWN TO - 1 DB**



- When units needs to operate quietly during certain periods of the day (e.g. night)
- Activated via external on/off contact, fans run at a lower speed
- Requires EC fans

# MAIN OPTIONS

**ELECTRONIC EXPANSION VALVE**

The use of an electronic expansion valves allows a precise control of the refrigerant flow so that the system can operate with low condensation temperatures.

STANDARD

***BENEFITS:***

-maximization of the heat exchange at the evaporator
-minimization of the response time according to the load variation
-optimization of the superheating regulation
-maximum energy efficiency

**POWER FACTOR CORRECTION CAPACITORS**

To reduce the reactive power and therefore the electrical current thank to a battery of capacitors which is installed in an electrical box.
Units have in average a cosphi= 0,87; the capacitors are sized in order to have a power factor (cos ϕ) > 0.95

***INCOMPATIBILITIES:***

- Hydraulic versions
- IT system option

**DISCHARGE AND LIQUID ISOLATOR VALVE**

Allow to isolate the refrigerant in the condenser of the unit, for each circuit. This valve allows to isolate the compressor, evaporator, EXV and filter drier from the condenser, for each circuit. It can simplify maintenance operations.

STANDARD

*Visit the website [www.thermocold.it](http://www.thermocold.it) and download the Installation and Maintenance Manual for more details.*

# MAIN OPTIONS

**FLOW SWITCH**

It is mandatory to use a flow switch with multi-pipe unit to stop the unit in case of water flow loss to avoid any water freezing in the Brazed Plates Heat Exchangers. The mechanical flow switches are separately delivered and must be installed on job site by the contractor (see installation detail in the IOM).

Two flow switches are provided: one for cold-water loop and another for hot water loop


*An example of flow switch*

**RUBBER OR SPRING ISOLATORS**

Rubber isolators are used to minimize vibrations transmitted to the building.

Spring isolators are used to avoid direct contact of the unit with the ground.

They are installed on the job site and separately shipped.

**An antivibration kit must be provided for every component.
In case of selection of external hydraulic kit, it is necessary to provide 1 kit for the unit and 1 kit for the external hydraulic kit module.

*Visit the website [www.thermocold.it](http://www.thermocold.it) and download the Installation and Maintenance Manual for more details.*

# MAIN OPTIONS

**WATER STRAINER on hot side (condenser) and cold side (evaporator)**

**Why?**
To filter big impurities into the water, thus it prevents accumulation of the foreign particles in the restricted area as the isolation valves and the brazed plate heat exchange.

**How is it made?**
"Y" water strainer consists of a body and stainless-steel mesh, with a Victaulic type connection from 2" to 4" according to unit size, with replaceable filter through the inspection cap. Loose accessory, to be installed by customer.
The filter is connectable via Victaulic clamps not provided with the kit.

*A water strainer example with Victaulic type coupling.*

**Benefits:**
- Increases the life of heat exchanger and isolation valves.
- Heat exchanger and isolation valves are protected.
- Avoid the abrasive effect of flowing particles.
- The customer do not have to dismount completely the strainer for cleaning or changing the filter.

*Visit the website www.thermocold.it and download the Installation and Maintenance Manual for more details.*

# MAIN OPTIONS

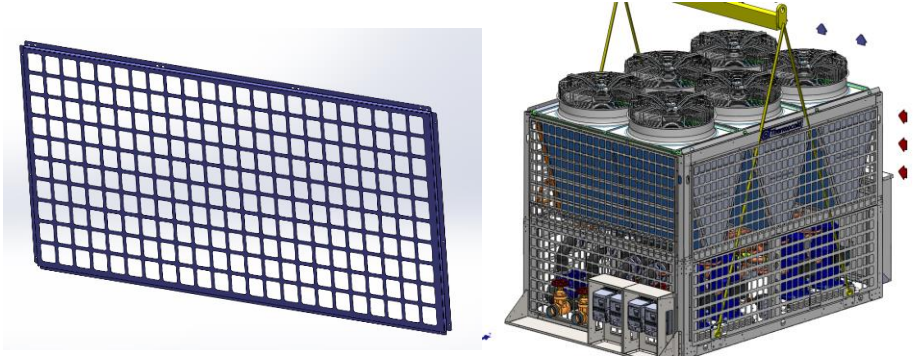
**VICTAULIC KIT ON EVAPORATOR SIDE AND ON CONDENSER SIDE**

Victaulic KIT includes:

- Victaulic Adapter (from Threaded to Victaulic)
- Clamp and pipe

A Victaulic kit must be provided for every side of the unit (user and or source one) to be connected. In case of selection of external hydraulic kit, it is necessary to provide 1 kit for the unit and 1 kit for the external hydraulic kit module.

**PROTECTION GRILLES** to protect the unit from external exposure.
Complete protection grilles constructed of galvanized steel, painted and have a corrosion resistance of 500 hours to salt spray test.

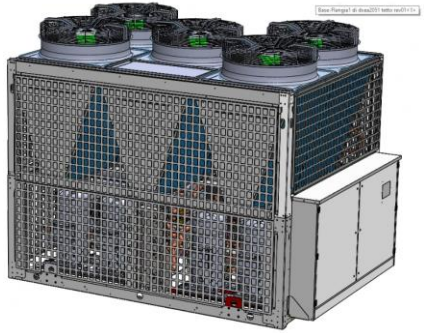


*Visit the website [www.thermocold.it](http://www.thermocold.it) and download the Installation and Maintenance Manual for more details.*

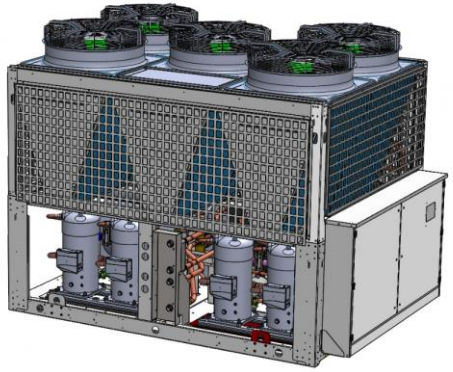
# MAIN OPTIONS

## Digit 52 : Anti-intrusion grilles

**B= Complete anti-intrusion grilles**
Full unit protection grids: To protect the unit and components there installed (upper+ bottom part of the unit is covered by grills)



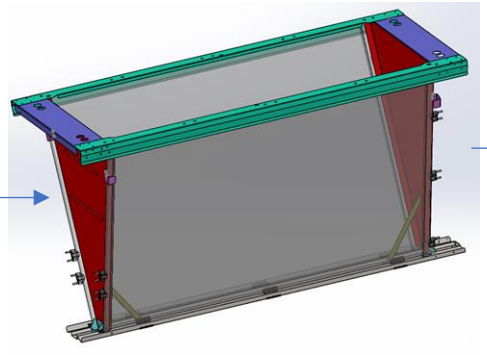
**C= Condensing coil protection grills**
To protect just the unit coils (upper part of the unit is covered by grills)

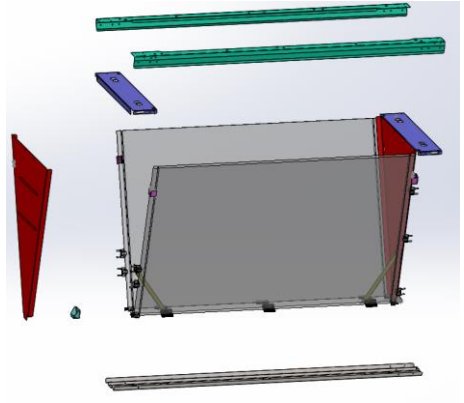


# MAIN OPTIONS

## Digit 52 : Unit appearance

**V panels painted (Digit 52= D) available from October 2023**
V - shape panels are painted with an epoxy material that provides high corrosion resistance





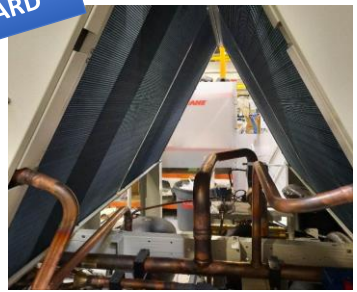
**Complete anti-intrusion grilles with V panels painted (Digit 52= E) available from October 2023**
Full unit protection grids: To protect the unit and components there installed (upper+ bottom part of the unit is covered by grills) with V - shape panels painted with an epoxy material that provides high corrosion resistance

**Condensig coil protection grilles with V panels painted (Digit 52= F) available from October 2023**
To protect just the unit coils (upper part of the unit is covered by grills) with V - shape panels painted with an epoxy material that provides high corrosion resistance

# MAIN OPTIONS

**HYDROPHILIC (BLUE) COATING**

STANDARD



Coils are made of copper tubes and aluminium fins. Fins are recovered with hydrophilic blue coating in order to evacuate easily water particularly during defrost.

***BENEFITS:***

1- High energy efficiency with low outdoor temperature; 2-Better condensate drainage capacity; 3-Reduced risk of accidental icing of the coils; 4-Improved defrost efficiency

**GOLDFINS TREATMENT**

The fins are made of aluminium-coated sheets.

Condenser epoxy coated; epoxy slows down the corrosion process on the aluminium fins when the unit is installed on seaside or in a polluted area.

***BENEFITS:***

This option allows installation near the sea and avoids aluminium corrosion. The epoxy also provides a barrier protection at the fin collar to stop galvanic corrosion action between the aluminium fins and the copper tubes.

*Visit the website www.thermocold.it and download the Installation and Maintenance Manual for more details.*

# MAIN OPTIONS

## R454B REFRIGERANT

### LEAK DETECTOR (optional)

**Why and when to use**

To detect a refrigerant leak, which avoids the risk of the flammability.
To ensure safety for the customer by taking appropriate actions in the case of the leak.

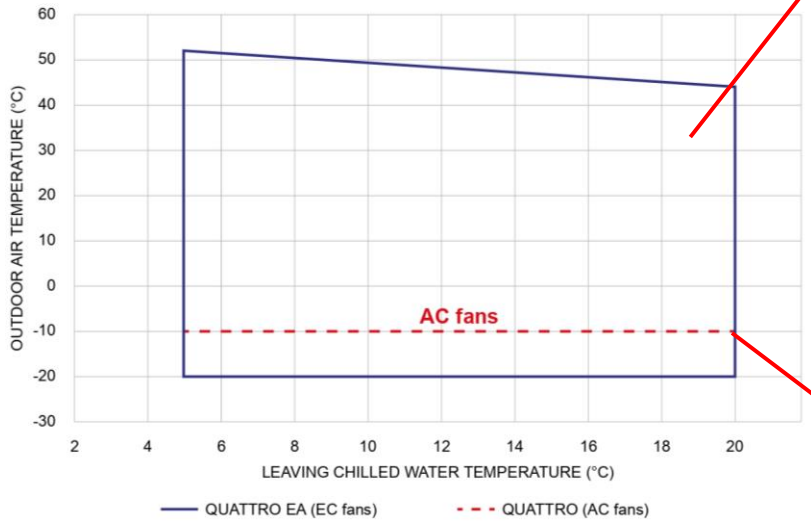
Refrigerant leak detector is **available only on R454B units**. One or two refrigerant leak detectors are placed in the middle of the unit, close to the compressors.


*Example of leak detector*

*Visit the website www.thermocold.it and download the Installation and Maintenance Manual for more details.*

# OPERATING MAPS

**Wider operating map and a smaller footprint** allow more buildings, even in the coldest regions of Europe, to move away from fossil fuel heating systems.




QUATTRO EA

QUATTRO

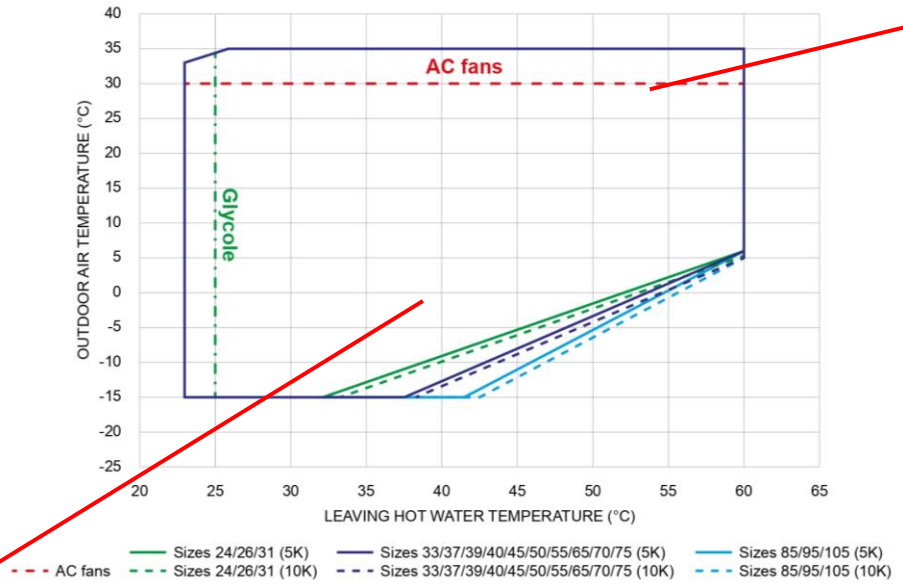
**Performance and Sustainability COMFORT**

QUATTRO multi-pipe units can deliver you chilled water, hot water or any combination of cooling and heating.

**chilled water down to 5 ° C** at ambient air temperatures up to 51° C

# OPERATING MAPS

QUATTRO EA




60°C

The QUATTRO operating maps in heating is the best in the industry for a 4pipes.

**We can go down to -15° C ambient temperature and the unit will continue to run.**

**We can also offer up to 60° C of Leaving water temperature.**

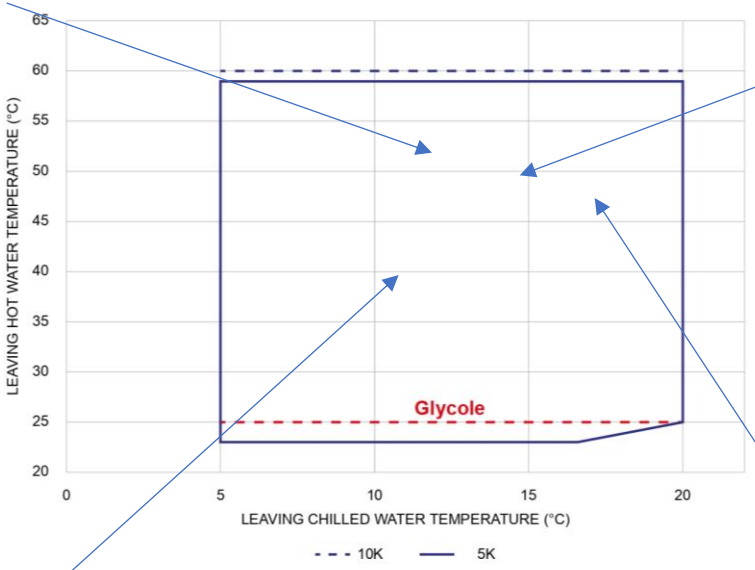
QUATTRO

- ✓ **hot water up to 42° C** at ambient air temperatures down to -15 ° C
- ✓ **hot water up to 60 ° C** at ambient air temperatures down to 5° C

# OPERATING MAPS

Education facilities

Hospital




This final map is when the QUATTRO runs un heat recovery mode. So in simultaneous heating and cooling.

The QUATTRO 4pipes is very versatile and can satisfy comfort needs in all European climates in different modes.

**up to 60 ° C**

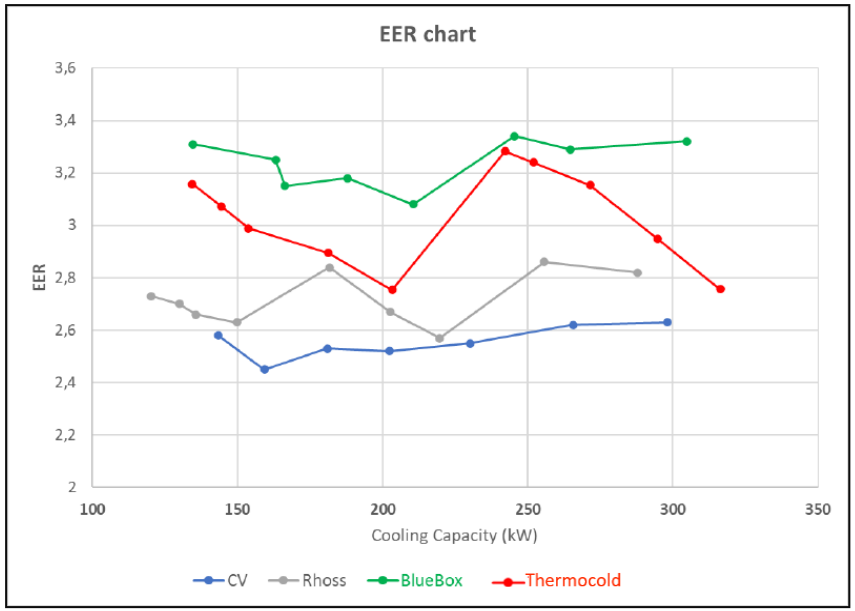
**of hot sanitary water when the ambient air temperature is higher than 5 ° C**

Hotel

Theater

# COMPETITION

The graph shows the EER performances for similar top 3* competitors' multipipe units




**All performance data based on latest Eurovent declared values:**

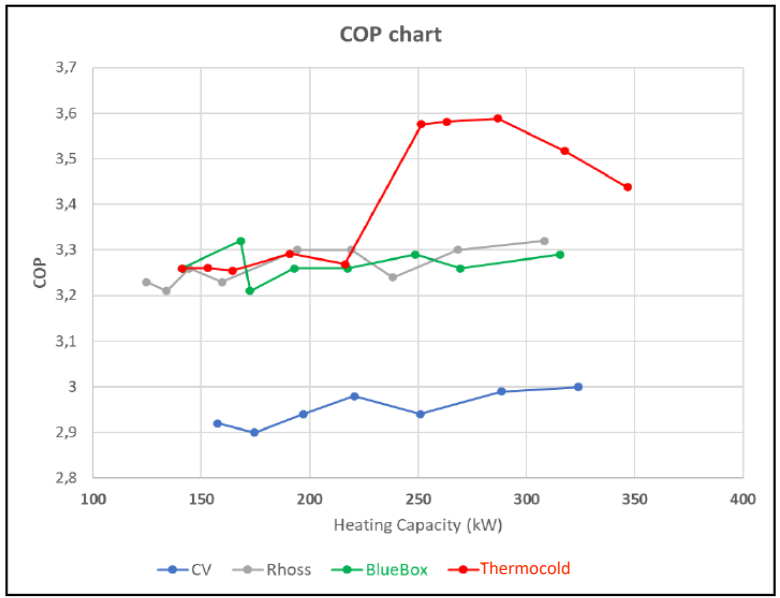
- **R454B** refrigerant
- Standard models with on/off scroll
- Standard noise, no water pumps
- **Aermec & Galletti & Clivet** have no R454B offering (yet)
- **Daikin** has no scroll multi-pipe units. Daikin EWYD 4Z screw multi-pipes, with R134a, start at 350 kW

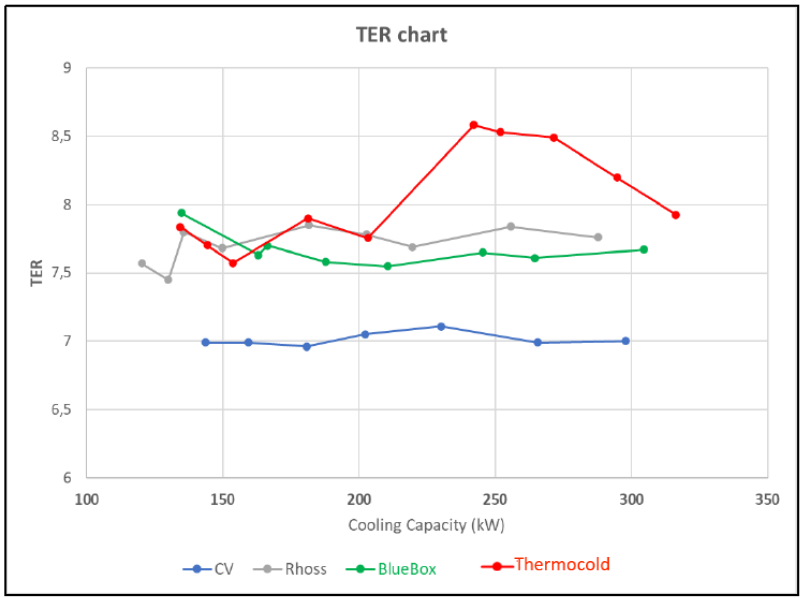
**Promising EER values. 80% of models are in Eurovent Class A/B**

*Fonte: Eurovent certified data June 2022*

# COMPETITION

The graph shows the TER and COP performances for similar top 3* competitors' multipipe units




**Below ~210 kW → Quattro at par with Swegon (BB) and Rhoss**
**Above 210 kW both COP & TER are outperforming main competition**

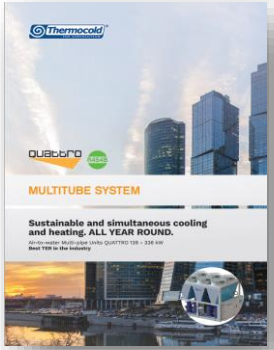
*Fonte: Eurovent certified data June 2022*

Documentation available on www.thermocold.it in Download Area

- On dedicated product pages **QUATTRO R454B**
- Distributors' Intranet

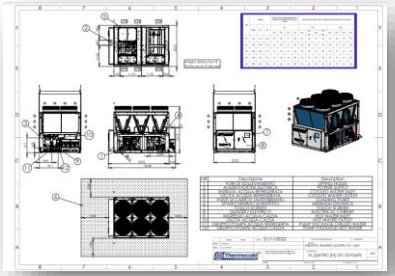
**Technical data sheet**


**Sales Leaflet**

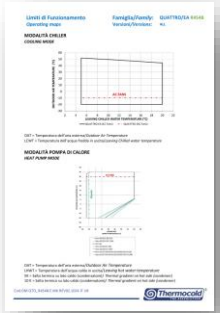



**PPT presentation**


**Dimensional drawings**



**Operating maps**



**...And more:**

- **Wiring Diagrams**
- **BIM File**
- **Options manual**

# THANKS FOR YOUR KIND ATTENTION!