

CO<sub>2</sub> SOLUTIONS



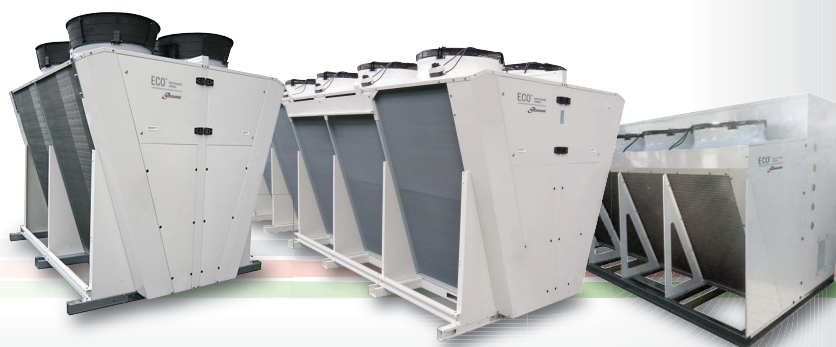
NATURALLY READY  
FOR THE FUTURE!

## CO<sub>2</sub> GAS COOLERS

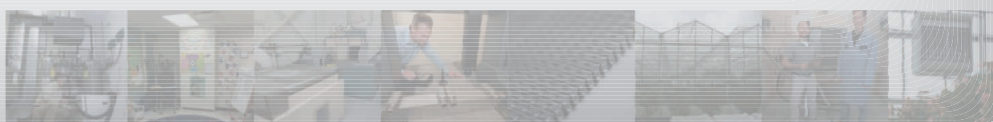
OUR PRODUCT RANGES MEET F-GAS REGULATIONS  
AND HAVE BEEN DEVELOPED FOR PRESENT  
AND FUTURE REFRIGERANTS



ECO<sup>TM</sup> heat transfer  
coolers



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## CO<sub>2</sub>

Low environmental impact refrigerants will soon replace halogenated ones.

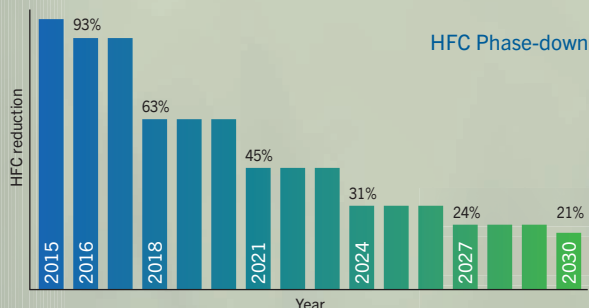
Therefore, today, the construction of installations using refrigerants that are being phased out means being directly exposed to rising set up and running costs.

The continuous evolution of our products is inspired by current regulations, but sometimes we even anticipate the future with innovative product ranges.

Modine has developed a new cooler range for installations that use R744 refrigerant (CO<sub>2</sub> - carbon dioxide).

### Advantages

- First-rate safety features and reduced environmental impact.
- Non-flammable.
- Non-toxic, chemically inert, with no risk of corrosion.
- Degree of contamination nil in case of contact with foodstuff.
- No particular precautionary measures required in case of retrofit of installation.
- Greater installation efficiency resulting in reduced dimensions of compressors and coils in comparison to regular installations.



We have developed a comprehensive range of CO<sub>2</sub> models (GWP = 1), capable of operating at higher operating pressures.

These products can now also be used in regions that are characterized by climates with higher temperatures.

Our units benefit from options and technical solutions that guarantee optimum performance and reduced energy consumption.

Our CO<sub>2</sub> unit coolers can be calculated for direct expansion or pump applications.

## F-GAS READY!

Most of the international scientific community agrees that countries with fossil fuel-based economies are partly responsible for much of global warming.

To remedy the negative effects of climate change, the European Commission has launched a programme to facilitate the establishment of a more sustainable and efficient economy.

This programme covers the main economic sectors, including the refrigeration industry. In fact it also comprises the F-Gas Regulation (EU - No. 517/2014), which aims to drastically reduce emissions of high GWP (Global Warming Potential) fluorinated refrigerants (HFC).

The F-gas regulation imposes the gradual ban of HFCs.

### INNOVATION

**Modine uses state-of-the-art technologies allowing the installation of its gas coolers in regions with higher temperatures**

### ENERGY SAVING

**CO<sub>2</sub> systems recover an important part of the heat they produce, which can be used for heating buildings**

### RELIABILITY

**Thanks to the type of tubes used in Modine units, the maximum operating pressures that they can withstand are 80 bar for CO<sub>2</sub> unit coolers and 130 bar for CO<sub>2</sub> gas coolers**



*"From an environmental point of view CO<sub>2</sub> is a superior alternative to environmentally-damaging hydrofluorocarbons (HFCs), as well as being non-flammable, non-toxic and less expensive. Modine designs and manufactures CO<sub>2</sub> gas coolers suitable to your application"*



## CO<sub>2</sub> GAS COOLERS

The **CO<sub>2</sub> GAS COOLERS** range has been specifically developed to satisfy a wide variety of applications in air conditioning and commercial/industrial refrigeration sectors.

The entire range is equipped with highly efficient coils made from special profile aluminium fins and copper tube, fin spacing is 2,1 mm for the entire range (different fin pitches are available upon request).

The coils have been designed for use with CO<sub>2</sub> and are supplied charged with dry air at a pressure of 2 bars.

In the flat and vertical versions, the particular structure of the side panels and legs/support brackets ensures improved sturdiness and stability, but also provides reinforced support to the coil and reduces vibration during operation with vertical airflow.

The compact V-shape version offers maximum capacity with a small footprint designed for installations in areas with particularly limited floor space.

The axial fan motors employed on the entire range are the most technologically up-to-date available.

New solutions like the hybrid shaped blades or bionic technology are widely used.

These fan motors, offered in AC or EC versions, have a wide range of diameters and rotation speeds: Ø 350, 450, 500, 630, 710, 800, 910 and 1000 mm.

AC fan motors features

- die cast aluminium sickle blades or aluminium/techno polymer hybrid version with optimized sickle blades;
- IP 44 protection grade for Ø 350 mm;
- IP 54 protection grade for Ø 450, 500, 630, 710, 800, 910 and 1000 mm;
- class 155 insulation;
- inner thermal contact protection;
- epoxy coated steel fan guards.

EC fan motors features

- IP 54 protection grade;
- class 130 insulation;
- built-in electronic protection;
- speed regulator with 0-10V signal;
- additional speed regulator with MODBUS system.

The fan motors and the casework are predisposed for grounding.

**The selection of gas coolers is a complex operation, for this reason our qualified personnel is at your complete service to offer assistance.**

By submitting the following information we will be able to quickly calculate the model that will meet your requirements:

1. CO<sub>2</sub> inlet pressure
2. CO<sub>2</sub> input temperature
3. CO<sub>2</sub> output temperature
4. Ambient air temperature
5. Required capacity
6. Sound level
7. Type of fan motors, AC or EC

We can also calculate subcoolers and gas coolers equipped with an additional heat exchangers (false load) for heat recovery.



VCE and VCC range CO<sub>2</sub> gas coolers





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#### About Modine

Modine specializes in thermal management systems and components, bringing highly engineered heating and cooling components, original equipment products, and systems to diversified global markets through its four complementary segments: BHVAC, CIS, HDE, and Automotive. Modine is a global company headquartered in Racine, Wisconsin (USA), with operations in North America, South America, Europe and Asia.

*Cover photo: Nr. 7 VCE 808xx CO<sub>2</sub> transcritical gas coolers.  
The biggest 2017 CO<sub>2</sub> installation in the World.  
Courtesy of "Advansor"*

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