

DISCOVER THE INNOVATIVE SERIES OF CO₂ PRODUCTS

FOR REFRIGERATION APPLICATIONS THAT USE
TRANSCRITICAL AND SUBCRITICAL **R744 REFRIGERANT**



Higher efficiency and lower greenhouse gas emissions

Maximize performance while reducing environmental impact: innovative solutions for a sustainable future through cutting-edge technology and green practices

Environmental concerns about the potential direct emissions from refrigeration systems based on synthetic fluid and EU legislation are driving the market towards higher efficiency and lower greenhouse gas emissions.

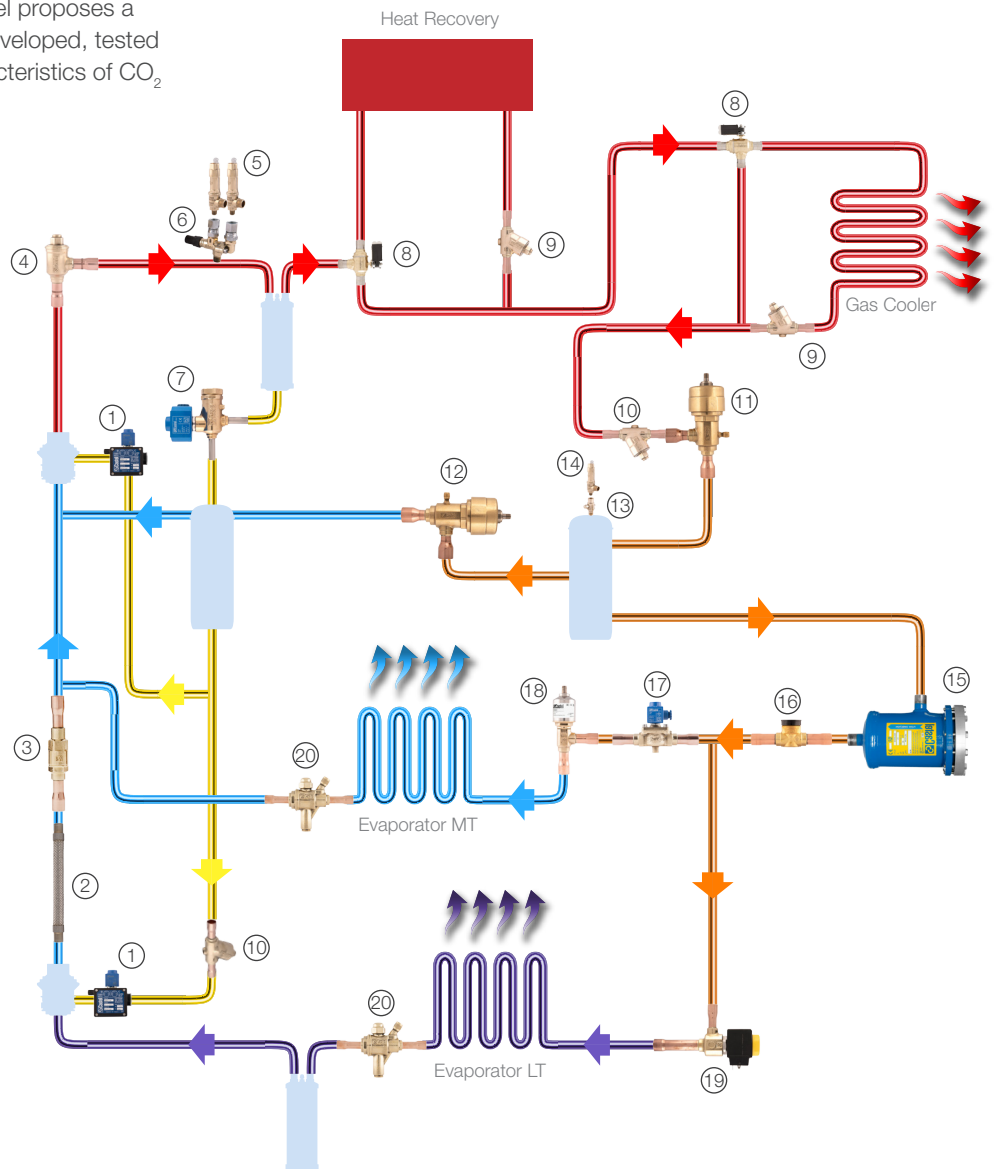
Castel is actively involved in this process to study and develop the right components and solutions to support these trends. As a green alternative, one possible solution to this demand could be covered by Carbon Dioxide (CO₂), due to its good thermodynamic performance, no-toxic and no-inflammable characteristics.

The specific properties of CO₂ require technical changes in the design of the refrigeration system. Castel proposes a complete range of products opportunely developed, tested and produced to be suitable with the characteristics of CO₂ systems and its coolant pressure.

Green, efficiency and cost reduction are pushing the research, unlike most other refrigerants, for different application solutions. In practice CO₂ in the market is applied in the following refrigerant cycles:

- **Subcritical (cascade systems)**
- **Transcritical (CO₂ - only systems)**
- **Secondary fluid (CO₂ used as heat transfer fluid)**

Example of a transcritical CO₂ system



- 1- Electronic oil level regulator 5650E
- 2- Vibration absorber 7690N
- 3- Check valve 3132EW
- 4- Check valve 3187EW
- 5- Safety valve 3030E
- 6- Changeover 3032E
- 7- Solenoid valve 14-E
- 8- 3-way ball valve 6697EM
- 9- Check valve 3147EW
- 10- Strainer 4727E
- 11- High pressure valve 34-E
- 12- Flash gas by-pass valve 34-E
- 13- Shut off valve 3064E
- 14- Safety valve 3061E
- 15- Filter 4431E
- 16- Moisture indicator 3740E
- 17- Solenoid valve 10-E
- 18- Expansion valve 27-E
- 19- PWM valve 2028E
- 20- Ball valve with by-pass 6531E

Maximum efficiency,
minimal impact:
choose a cleaner
tomorrow



The technology applied depends on the application and location area of the installation.

CO₂ is already largely used in:

- **Industrial refrigeration**
- **Food and retail refrigeration**
- **Industrial and civil conditioning plants**
- **Heat pump**
- **Transport refrigeration**

The Castel products of the GoGreen series are designed to be used on refrigeration systems, which use the R744 refrigerant fluid. The materials and thicknesses adopted are able to support the high pressures of CO₂ systems, according to CE directives and UL Standards.

- **PS = 60 bar** reinforced copper connections equipped, for subcritical systems
- **PS = 80/90 bar** reinforced copper connections equipped, for transcritical systems low pressure side and medium pressure side
- **PS = 130 bar** K65 connections equipped, for transcritical systems high pressure side
- **PS = 140/150 bar** stainless steel connections equipped, for transcritical systems high pressure side

Castel Product family for CO₂ application



Product type	Product family	Max Operation Pressure PS (bar)	Application
Pulse Solenoid Expansion Valves	2028E, 2028C	90	Transcritical low pressure side & medium pressure side
Electronic Expansion Valves	27-E	90	Transcritical low pressure side & medium pressure side
High Pressure / Flash Gas by-pass Valves	34-E	140	Transcritical
Normal Close Solenoid Valves	1028E, 1038E, 1048E, 1058E, 1098E, 1078E 1028EL, 1038EL, 1048EL, 1058EL, 1098EL, 1078EL	60 / 80	Transcritical low pressure side & medium pressure side
	1417E, 1427E, 1437E	130	Transcritical
	1418E, 1428E, 1438E	140	Transcritical
Safety Valves	3030, 3060	55	Subcritical
	3061, 3065	70	Subcritical
	3061E, 3030E	165	Transcritical
Change Over Valves	3032E	150	Transcritical
Ball Shut off Valves	3064E	80 / 150	Transcritical low pressure side & medium pressure side
Straight Check Valves	3132W, 3133W	45	Subcritical
	3132EW, 3133EW	80	Transcritical low pressure side & medium pressure side
	3137EW	130	Transcritical
	3138EW	140	Transcritical
	3145W	45	Subcritical
	3145EW	80	Transcritical low pressure side & medium pressure side
	3147EW	130	Transcritical
	3148EW	140	Transcritical
Right Angle Check Valves	3185W	45	Subcritical
	3185EW	80	Transcritical low pressure side & medium pressure side
	3187EW	130	Transcritical
	3188EW	140	Transcritical

The table continues on the back of the cover



Product type	Product family	Max Operation Pressure PS (bar)	Application
Evaporating Pressure Regulators	3335EL	60	Subcritical
Condensing Pressure Regulators	3345EL	60	Subcritical
Moisture and Liquid Indicators	3940EL	60	Subcritical
	3740E	80	Transcritical low pressure side & medium pressure side
	3747E, 3748E	130	Transcritical
Filter Driers	DF-E, DI-E	80	Transcritical low pressure side & medium pressure side
	4520E	60	Subcritical
	4411E, 4412E, 4431E, 4432E	62 / 90	Transcritical low pressure side & medium pressure side
Strainers	4727E	130	Transcritical
	4728E	140	Transcritical
Ball Valves	6570EL	60	Subcritical
	6570E, 6570E/..A	80	Transcritical low pressure side & medium pressure side
	6577E	130	Transcritical
	6578E, 6588E	140 / 150	Transcritical
Three Way Motorized Ball Valves	6690EM, 6790EM	80	Transcritical low pressure side & medium pressure side
	6697EM, 6797EM	130	Transcritical
	6698EM, 6798EM	140	Transcritical
Three Way Manual Ball Valves	6690E, 6790E	80	Transcritical low pressure side & medium pressure side
	6697E, 6797E	130	Transcritical
	6698E, 6798E	140	Transcritical
Three Way Valves to be Motorized	6690EB, 6790EB	80	Transcritical low pressure side & medium pressure side
	6697EB, 6797EB	130	Transcritical
	6698EB, 6798EB	140	Transcritical
Valves	6010E, 6012E, 6110E, 6120E, 6420E	140	Transcritical
Valve cores	8395/A4	140	Transcritical
Threaded brass fittings	71	140	Transcritical
Access Fittings	83	140	Transcritical
Electronic oil level regulators	5650E, 5658E	90 / 140	Transcritical low pressure side & medium pressure side
Vibration Absorbers	7690N	50	Subcritical

GO GREEN

R744 • NATURAL REFRIGERANT



ISO 14001

Castel has always been aware of environmental sustainability issues and gives its contribution to a cleaner environment, supplying the refrigeration and air conditioning industry with state-of-the-art and environment-friendly technology. With its commitment and steady research in its laboratories, Castel has developed a whole range of products using natural refrigerants, which reduce emissions to the minimum. The large range of products belonging to the Castel "GoGreen" line has been developed to be used in CO2 (R744)- and HC hydrocarbon-filled systems.

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