

CO₂ Application



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 on this process to study and develop the right components and solution 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 characteristic of CO₂ systems and its coolant pressure.

Green, efficiency and cost less is pushing the research, unlike most other refrigerants, for different application solutions. In the practice the 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)

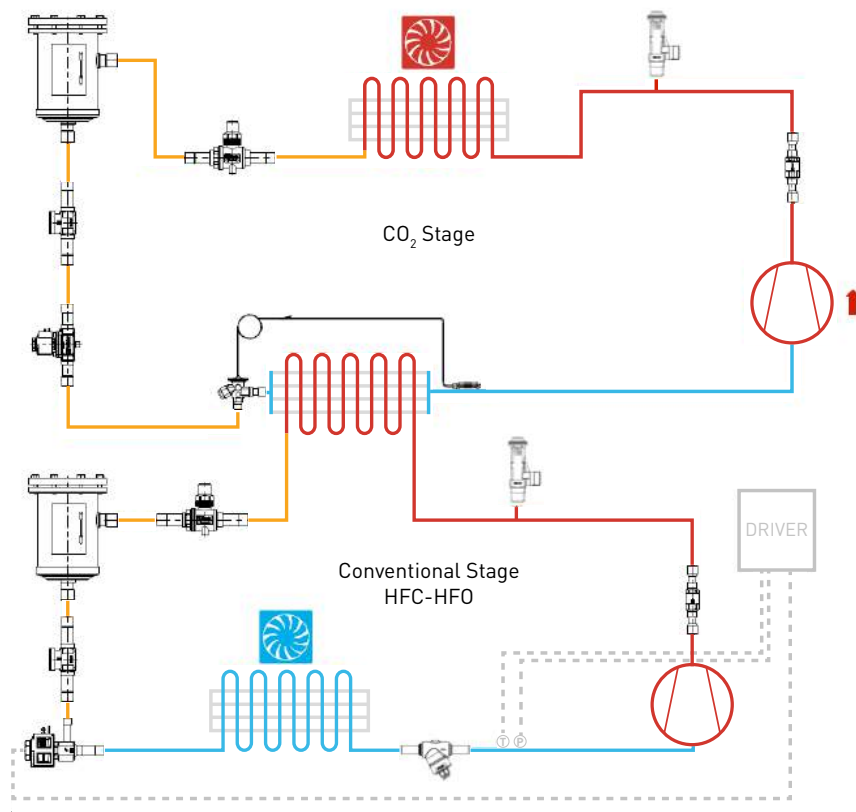
The technology applied depends on the application and location area of the installation.

CO₂ uses is attractive and already largely used today in:

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

Castel products for CO₂ are designed for installation on refrigerating systems, which use the refrigerant fluid R744 using the best technology to achieve the maximum pressure in the appropriate technology.

- PS = 60 bar, copper connections equipped, for subcritical systems
- PS = 80 bar, copper connections equipped, for transcritical systems low pressure side and medium pressure side
- PS = 120 bar, reinforced copper connections (K65) equipped, for transcritical systems high pressure side
- PS = 140 bar, stainless steel connections equipped, for transcritical systems high pressure side.



CASTEL CO₂ PRODUCTS RANGE 2017

Product type	Product family	Max Operation Pressure PS (bar)	Application	Catalogue ED 01/2017 Page Nr.
Pulse Solenoid Expansion Valve	2028E	80	Transcritical low pressure side & medium pressure side	136
Normal Close Solenoid Valve	1028EL, 1038EL, 1048EL	60	Subcritical	138
Safety Valve	3030, 3060; 3061, 3065	55 70	Subcritical	140
Change Over Valves	3032E	120	Transcritical	141
Ball Shut off Valves	3064E	80	Transcritical low pressure side & medium pressure side	142
Straight Check Valves	3132E,3133E,3132EW,3133EW	80	Transcritical low pressure side & medium pressure side	145
	3137E,3137EW	120	Transcritical	
	3138E,3138EW	140	Transcritical	
	3145EL	60	Subcritical	
	3145E	80	Transcritical low pressure side & medium pressure side	
	3147E	120	Transcritical	
	3148E	140	Transcritical	
Right Angle Check Valve	3185EL	60	Subcritical	146
	3185E	80	Transcritical low pressure side & medium pressure side	
	3187E, 3188E	120	Transcritical	
Evaporating Pressure Regulators	3335EL	45	Subcritical	147
Moisture and Liquid Indicators	3940EL	60	Subcritical	147
	3740E	80	Transcritical low pressure side & medium pressure side	148
	3747 E,3748E	120	Transcritical	
Filter Driers	4108E, 4116E	52	Subcritical	149 →151
	4303E, 4305E	60	Subcritical	
	4411E, 4412E	62	Subcritical	
Strainers	4727E	120	Transcritical	152
	4728E	140	Transcritical	
Ball Valves	6570EL, 6590EL	60	Subcritical	155
	6570E	80	Transcritical low pressure side & medium pressure side	
	6590E			
	6577E	120	Transcritical	156
	6597E	140	Transcritical	
	6578E			
6598E				
Three Ways Motorized	6690EM	80	Transcritical low pressure side & medium pressure side	160 →161
	6697EM	120	Transcritical	
	6698EM	140	Transcritical	
Valves	6010E, 6012E	120	Transcritical	153 →154
	6110E			
	6120E			
	6420E			
Valve cores	8395/A4	140	Transcritical	178
Threaded brass fitting & Access fittings	7020, 71XX, 9901, 72XX, 73XX, 7410, 75XX	120	Transcritical	165 →178
	8350, 8351, 8352, 8354, 8362, 8380, 8382, 8395/A4	120	Transcritical	



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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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