

Check valves for CO₂ systems



Applications

The check valves, shown in this leaflet, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive.

They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the refrigerant fluid R744.

Check valves, introduced by Castel for CO₂ systems, are the following types.

- Valves series 3185EL with PS = 60 bar, copper connections equipped, for subcritical systems.
- Valves series 3185E with PS = 80 bar, copper connections equipped, for trans-critical systems low pressure side and medium pressure side.
- Valves series 3187E with PS = 120 bar, reinforced copper connections (K65) equipped, for trans-critical systems high pressure side.
- Valves series 3188E with PS = 120 bar, stainless steel connections equipped, for trans-critical systems high pressure side.

Constructions

The welding between cover and body prevents any leaks.

The main parts of angleway check valves are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body and cover.
- Austenitic stainless steel AISI 302 for spring.
- Bar brass EN 12164–CW 614N for piston.
- P.T.F.E. for seat piston gasket.

- Copper tube EN 12735-1 – Cu-DHP for solder connections of series 3185EL and 3185E.
- Copper tube EN 12735-1 – CuFe2P (K65) for solder connections of series 3187E.
- Stainless steel tube AISI 304 for solder connections of series 3188E.

Installation

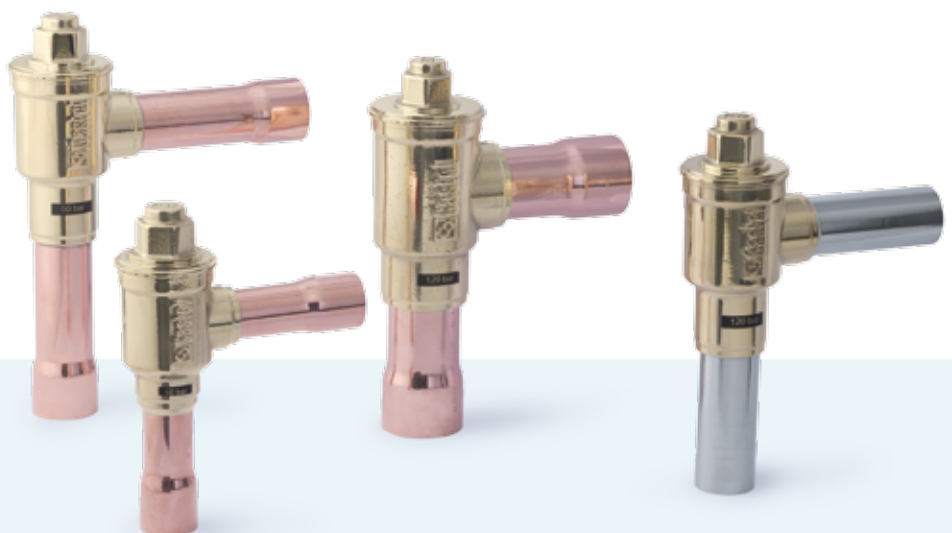
The check valves can be installed in any section of a refrigerating system, where it is necessary to avoid an inversion of the refrigerating flow. The following tables show the main functional characteristics of a check valve.

- PS
- TS
- Kv factor
- Minimum opening pressure differential, which is the minimum pressure differential between inlet and outlet at which a check valve can open and stay opened.

The allowed operating positions are:

- With the inlet pipe facing down and the valve cover facing upward.
- With the inlet pipe horizontal and the outlet pipe horizontal/vertical.

N.B: Do not install the valves with the inlet pipe facing upward and the valve cover facing down.



General Characteristics

SERIES 3185EL	Catalogue Number	Connections		Minimum Opening pressure differential [bar]	Kv Factor [m³/h]	PED Directive			
		ODS				TS [°C]		PS [bar]	Risk Category
		Ø [in.]	Ø [mm]			min.	max.		
		3185EL/7	7/8"			22	0,3 (1)	9	-40
3185EL/M28	-	28	19						
3185EL/9	1.1/8"	-	19						
3185EL/11	1.3/8"	35	29						

(1): minimum pressure at which the valve is completely open.



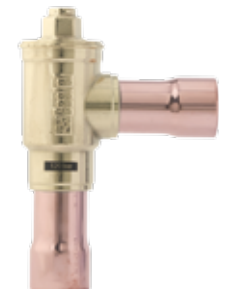
SERIES 3185E	Catalogue Number	Connections		Minimum Opening pressure differential [bar]	Kv Factor [m³/h]	PED Directive			
		ODS				TS [°C]		PS [bar]	Risk Category
		Ø [in.]	Ø [mm]			min.	max.		
		3185E/7	7/8"			22	0,3 (1)	9	-40
3185E/M28	-	28	19						
3185E/9	1.1/8"	-	19						
3185E/11	1.3/8"	35	29						

(1): minimum pressure at which the valve is completely open.



SERIES 3187E	Catalogue Number	Connections		Minimum Opening pressure differential [bar]	Kv Factor [m³/h]	PED Directive			
		ODS				TS [°C]		PS [bar]	Risk Category
		Ø [in.]	Ø [mm]			min.	max.		
		3187E/7	7/8"			22	0,3 (1)	9	-40
3187E/9	1.1/8"	-	19						
3187E/11	1.3/8"	35	29						

(1): minimum pressure at which the valve is completely open.



SERIES 3188E	Catalogue Number	Connections		Minimum Opening pressure differential [bar]	Kv Factor [m³/h]	PED Directive			
		ODS				TS [°C]		PS [bar]	Risk Category
		Ø [in.]	Ø [mm]			min.	max.		
		3188E/M22	7/8"			22	0,3 (1)	9	-40
3188E/M28	-	28	19						
3188E/M35	1.5/16"	33,4	29						

(1): minimum pressure at which the valve is completely open.





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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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