

# Liquid/Moisture Indicators for CO<sub>2</sub> systems



## Applications

The indicators, 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.

**Liquid/moisture indicators, introduced by Castel for CO<sub>2</sub> systems, are the following types.**

- Indicators series 3940EL with PS = 60 bar, copper connections equipped, for subcritical systems.
- Indicators series 3740E with PS = 80 bar, copper connections equipped, for trans-critical systems, low pressure side and medium pressure side.
- Indicators 3747E with PS = 120 bar, reinforced copper connections (K65) equipped, for trans-critical systems, high pressure side.
- Indicators 3748E with PS = 120 bar, stainless steel connections equipped, for trans-critical systems, high pressure side.

## Operation

The moisture/liquid indicators consist of a sensitive element as a ring, which changes color passing from green to yellow according to the percentage of moisture in the system.

The data of moisture content, corresponding to "green" color, can be considered admissible for the proper working of the system. When the sensitive element from green fade to yellow, "green Chartreuse", working conditions of the system could become difficult. When the sensitive element becomes "yellow", it's time to substitute the dehydrator filter.

## Construction

Indicators series 3940EL are manufactured in a total hermetic construction. The glass "lens", with its proper gasket, is housed into the brass body and is fixed in this seat with an edge calking operation.

**The main parts are made with the following materials:**

- Hot forged brass EN 12420 – CW 617N for body.
- Copper tube EN 12735-1 – Cu-DHP for solder connections.
- Glass for lens.
- PTFE for outlet seal gaskets.

Indicators series 3740E, 3747E, 3748E are manufactured with the glass "lens" directly fused onto a steel metallic ring, with proper surface protection. This metallic ring, screwed on the indicator body, is equipped with a proper ethylene-propylene gasket.

**The other main parts of these three series are made with the following materials:**

- Hot forged brass EN12420 – CW 617N for body.
- Copper tube EN12735-1-Cu-DHP for connections of series 3740E.
- Copper tube EN12735-1-CuFe2P (K65) for connections of series 3747E.
- Stainless steel tube AISI 304 for connections of series 3748E.

## Installation

At the start-up the color of the sensitive element may be yellow, due to exposure to air humidity and to moisture in the circuit. When the moisture of the refrigerant is brought back to acceptable levels with the dehydrator, the indicator color is once again green. This is evidence that equilibrium has been re-established. In case of persisting yellow, measures have to be taken to eliminate moisture. Only when the sensitive element comes back to green, there is evidence that adopted measures were effective. About 12 hours of system operation are required to achieve equilibrium. However, the moisture indication is given normally when the plant is in function and the fluid is flowing.



# General characteristics

	Catalogue Number	Connections		PED Directive			
		ODS		TS [°C]		PS [bar]	Risk Category
		Ø [in.]	Ø [mm]	min.	max.		
<b>SERIES 3940EL</b>	3940EL/M6	-	6	-40	+120	60	Art. 3.3
	3940EL/2	1/4"	-				
	3940EL/3	3/8"	-				
	3940EL/M10	-	10				
	3940EL/M12	-	12				
	3940EL/4	1/2"	-				
	3940EL/5	5/8"	16				
	3940EL/M18	-	18				
	3940EL/6	3/4"	-				
	3940EL/7	7/8"	22				
	3940EL/M28	-	28				
	3940EL/9	1.1/8"	-				
<b>SERIES 3740E</b>	3740E/M6	-	6	-40	+120	80	Art. 3.3
	3740E/2	1/4"	-				
	3740E/3	3/8"	-				
	3740E/M10	-	10				
	3740E/M12	-	12				
	3740E/4	1/2"	-				
	3740E/5	5/8"	16				
	3740E/M18	-	18				
	3740E/6	3/4"	-				
	3740E/7	7/8"	22				
	3740E/M28	-	28				
	3740E/9	1.1/8"	-				
<b>SERIES 3747E</b>	3747E/3	3/8"	-	-40	+120	120	Art. 3.3
	3747E/4	1/2"	-				
	3747E/5	5/8"	16				
	3747E/6	3/4"	-				
	3747E/7	7/8"	22				
	3747E/M28	-	28				
	3747E/9	1.1/8"	-				
<b>SERIES 3748E</b>	3748E/M6	-	6	-40	+120	120	Art. 3.3
	3748E/M10	-	10				
	3748E/M12	-	12				
	3748E/M16	5/8"	16				
	3748E/M18	-	18				
	3748E/M22	7/8"	22				
	3748E/M28	-	28				





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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 CO<sub>2</sub> (R744)- and HC hydrocarbon-filled systems.



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