

# Liquid Indicators & Moisture-Liquid Indicators



 **Castel<sup>®</sup>**

# LIQUID INDICATORS & MOISTURE-LIQUID INDICATORS

## APPLICATIONS

The indicators, shown in this chapter, 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. The indicators series 3780 are excluded from the scope of Directive 97/23/EC, as specified in the Guidelines 1/8 and 1/9, because they are piping components.

They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use refrigerant fluids proper to the Group II

(as defined in Article 9, Section 2.2 of Directive 97/23/EC and referred to in Directive 67/548/EEC).

Liquid indicators and moisture liquid indicators ensure a fast and safe inspection of the conditions of the refrigerant fluid in the circuit concerning regular flow and moisture. Liquid indicators also ensure inspection of the regular return of oil to the compressor crankcase.

## 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, shown in table 1 with the "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.

If the charge and working condition are normal, the refrigerant fluid appears perfectly liquid underneath the "lens" of the indicator. The presence of bubbles indicates that the refrigerant fluid is partial evaporating along the liquid line.

TABLE 1: Moisture contained in the fluid [p.p.m.]

Colour	Refrigerant fluid					
	R22	R134a	R404A	R407C	R410A	R507
Green	<60	<75	<30	<30	<30	<30
Green "Chartreuse"	60	75	30	30	30	30
Yellow	>60	>75	>30	>30	>30	>30

## CONSTRUCTION

New liquid indicators, series 38, and new liquid/moisture indicators, series 39, are manufactured in a total hermetic construction to avoid any possible refrigerant leaks. The glass "lens", with its proper gasket, is housed into the brass body and is fixed in this seat with a edge calking operation.

The main parts of the indicators are made with the following materials:

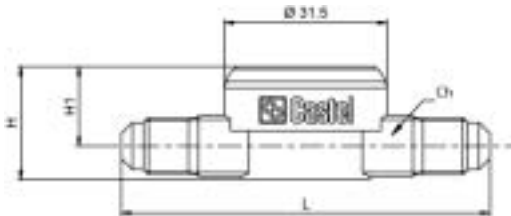
- hot forged brass EN 12420 – CW 617N for body;
- copper tube EN 12735-1 – Cu-DHP for solder connections;
- Glass for lens;
- PTFE for outlet seal gaskets;

Liquid/moisture indicators series 3770, 3771, 3780 and 3781 are manufactured with the glass "lens" directly fused onto a steel metallic ring, with proper surface protection.

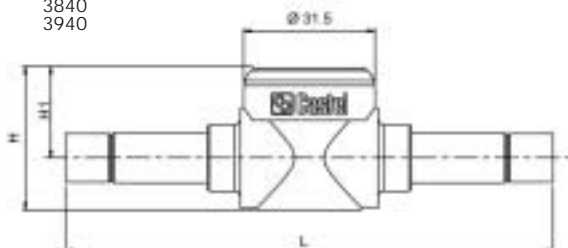
TABLE 3: General Characteristics of liquid / moisture indicators

Catalogue number	Connections									TS [°C]		PS [bar]	Risk Category according to PED
	Type	SAE Flare	ODS		ODM		for pipe			min.	max.		
			Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]	Ø hole [mm]				
3910/22	male-male	1/4"	-	-	-	-						45	Art. 3.3
3910/33		3/8"	-	-	-	-							
3910/44		1/2"	-	-	-	-							
3910/55		5/8"	-	-	-	-							
3910/66		3/4"	-	-	-	-							
3940/2	soldering	-	1/4"	-	-	-							
3940/3		-	3/8"	-	-	-							
3940/M10		-	-	10	-	-							
3940/M12		-	-	12	-	-							
3940/4		-	1/2"	-	-	-							
3940/5		-	5/8"	16	-	-							
3940/M18		-	-	18	-	-							
3940/6		-	3/4"	-	-	-							
3940/7		-	7/8"	22	-	-							
3940/9	-	1.1/8"	-	-	-								
3950/22	male-female	1/4"	-	-	-	-				-30	+110		
3950/33		3/8"	-	-	-	-							
3950/44		1/2"	-	-	-	-							
3950/55		5/8"	-	-	-	-							
3950/66		3/4"	-	-	-	-							
3770/M28	soldering	-	-	-	-	28							
3770/11		-	-	-	1.3/8"	35							
3770/13		-	-	-	1.5/8"	-							
3770/M42		-	-	-	-	42							
3771/11		-	1.3/8"	35	-	-							
3771/M42		-	-	42	-	-							
3771/17	-	2.1/8"	-	-	-								
3780/5	saddle type	-	-	-	-	-	5/8"	16					
3780/M18		-	-	-	-	-	-	18					
3780/7		-	-	-	-	-	-	7/8"	22				
3780/9		-	-	-	-	-	-	1.1/8"	28				
3780/11		-	-	-	-	-	-	1.3/8"	35				
3781/M28	level glass	-	-	-	-	-	-	-	28				

3810  
3910



3840  
3940



3850  
3950

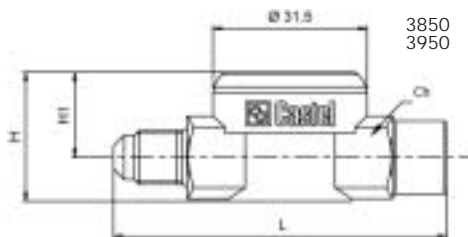
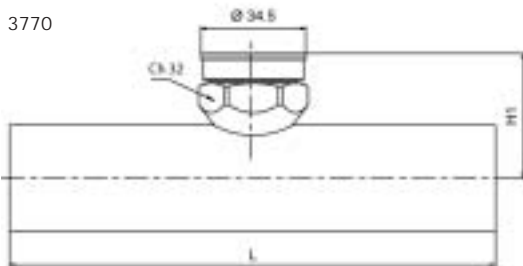


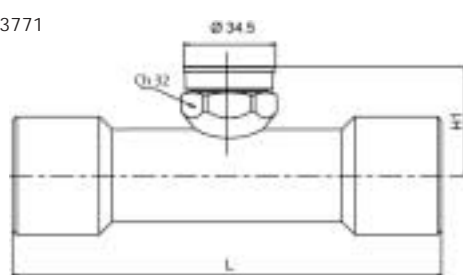
TABLE 4: Dimensions and Weights

Catalogue number		Dimensions [mm]				Weight [g]		
Liquid Indicators	Moisture Liquid Indicators	H	H <sub>1</sub>	L	Ch			
3810/22	3910/22	22	16,5	71,5	12	115		
3810/33	3910/33	26,5	17,5	77,5	17	150		
3810/44	3910/44	30	18,5	81,5	22	210		
3810/55	3910/55	34	21,5	89,5	24	195		
3810/66	3910/66	37,5	23,5	90	28	315		
3840/2	3940/2	22	15,5	133	-	120		
3840/3	3940/3	34	21,5	117		190		
3840/M10	3940/M10					225		
3840/M12	3940/M12							
3840/4	3940/4					131	195	
3840/5	3940/5	215						
3840/M18	3940/M18	310						
3840/6	3940/6	37,5	23,5	151		540		
3840/7	3940/7	43,5	26	186				
3840/9	3940/9	26,5	17,5	68		17	140	
3850/22	3950/22	30	18,5	74		22	190	
3850/33	3950/33	34	21,5	77		24	240	
3850/44	3950/44	37,5	23,5	82		28	300	
3850/55	3950/55	43,5	26	92		35	525	
-	3770/M28	-	38	150	-	250		
	3770/11		41,5	160		300		
	3770/13		45	170		480		
	3770/M42		41,5	160		300		
	3771/11					45	170	480
	3771/M42							550
	3771/17		30	-		90		
	3780/5		31					
	3780/M18		33					
	3780/7		36					
	3780/9		39,5					

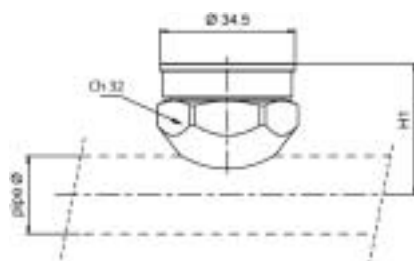
3770



3771



3780



3781

