

COILS

APPLICATION

For the normally closed solenoid valves, previously shown in this Handbook, Castel puts the following types of coils at disposal of its own customers:

- coils series HM2, only for A.C. (catalogue numbers 9100 - 9105).
- coils series CM2, only for A.C. (catalogue number 9110);
- coils series HM3, either for A.C. or for D.C. (catalogue number 9120).
- coils series HM4, only for A.C. (catalogue number 9160).

For the normally open solenoid valves, always shown in this Handbook, the customer's selection must compulsorily apply to the coils series HM3 – D.C.

For applications of the NO solenoid valves with a voltage supply of 220 VAC, Castel has designed a specific coil at 220 V RAC (code 9120/RD6) that must be used solely with the 220 VAC connector/rectifier circuit (code 9150/R45).

CONSTRUCTION

Coils HM2 (9100) are class H, whereas coils CM2, HM3 and HM4 are class F, in compliance with IEC 85 standard and their construction is in compliance with EN 60730-1 and EN 60730-2-8 standards. The windings are made with copper wire, insulation class H 180 °C, in compliance with IEC 85 standard. The outer casing is provided with dielectric and waterproof resins that assure a reinforced insulation making the coils suitable for all assemblies.

Coils HM2 (9105) are class F, with UL approved EIS (Electrical Insulation System), and their construction is in compliance with UL 429 Standards.

Protection against electric contacts is class I for all the coils. Therefore, for safety purposes, coils must be effectively connected to an earthing system. Rubber gaskets on the upper and lower ends of coil ensure moisture protection of winding. Coils HM2 and HM3 may be joined to all connectors produced by Castel except type 9155/R01; protection degree guaranteed by this system, coil (HM2, HM3) + connector, is IP65 according to EN 60529. Coils HM4 must be preferably used with connector type 9155/R01; protection degree guaranteed by this other system, coil HM4 + connector 9155/R01, is IP65/IP68 according to EN 60529. Coils HM4 can be used with connectors series 9150 and 9900 too; protection degree guaranteed by this system is IP65.

Either the terminals of coils series HM2 and HM3 or the ones of coils series HM4 consist of two Faston line connections plus one Faston earthing connection. Coil type CM2 has a pre-assembled cable (length 1 meter).


The coils are designed for continuous use. The solid construction of these coils is suitable for heavy-duty applications in refrigerant systems. The maximum ambient temperature for all coils is 50 °C.

ELECTRIC TYPE APPROVAL

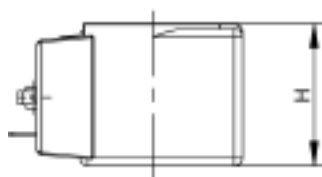
Coils series 9100, 220/230 VAC and 240 VAC supply, are approved by the German registration body VDE.

Coils series 9105 are approved by Underwriters Laboratories Inc. of the United States.

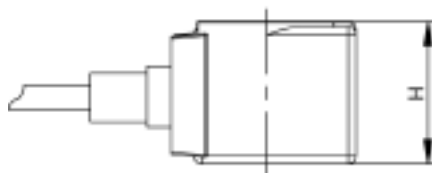
Coils series 9100, 9110 and 9160, 110 VAC, 220/230 Vac and 240 VAC supply, and coils series 9120, 220/230 VAC supply, are manufactured according to low Voltage (LV) Directive 2006/95/EC. Coils series 9100, 9110, 9120 and 9160 are manufactured according to Electromagnetic Compatibility (EMC) Directive 2004/108/EC.

TABLE 1: General Characteristics of coils						
Coil Type	Catalogue number	Voltage [V]	Voltage tolerance [%]	Frequency [Hz]	Connections	Degree of protection
HM2	9100/RA2	24 A.C.	+10 / -10	50 / 60	Junction box DIN 43650	IP65 EN 60529 (with junction box)
	9100/RA4	110 A.C.				
	9100/RA6	220/230 A.C.	+6 / -10			
	9100/RA7	240 A.C.	+10 / -10			
	9100/RA8	380 A.C.				
HM2  Recognized File number E243604	9105/RA2	24 A.C.	+10 / -10	60	junction box DIN 43650	IP65 EN 60529 (with junction box)
	9105/RA4	110/120 A.C.	+6 / -10			
	9105/RA6	220/230 A.C.				
	9105/RA7	240 A.C.	+10 / -10			
CM2	9110/RA2	24 A.C.	+10 / -10	50 / 60	Three wire cable	IP65 EN 60529
	9110/RA4	110 A.C.				
	9110/RA6	220/230 A.C.	+6 / -10			
	9110/RA7	240 A.C.	+10 / -10			
HM3	9120/RA6	220/230 A.C.	+6 / -10	50 / 60	Junction box DIN 43650	IP65 EN 60529 (With junction box)
	9120/RD1	12 D.C.	+10 / -5	–		
	9120/RD2	24 D.C.				
	9120/RD4	48 D.C.				
	9120/RD6	220 RAC				
HM4	9160/RA2	24 A.C.	+10 / -10	50 / 60	Junction box DIN 43650 or Connector 9155/R01 (1)	IP65 EN 60529 (with junction box) IP65/IP68 EN 60529 (with connector)
	9160/RA4	110 A.C.				
	9160/RA6	220/230 A.C.	+6 / -10			
	9160/RA7	240 A.C.	+10 / -10			

(1) Coil HM4 can also be coupled to connectors series 9150 and 9900, achieving a degree of protection IP65, the "versatile" degree of protection (IP65/IP68) is achieved coupling coil HM4 with four screws connector 9155/R01



HM2



CM2

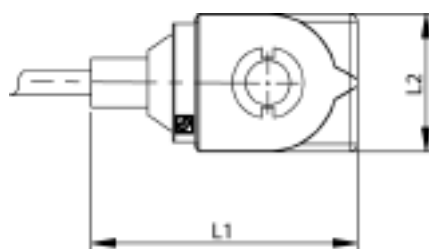
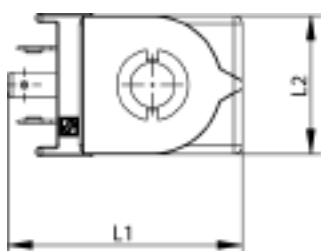


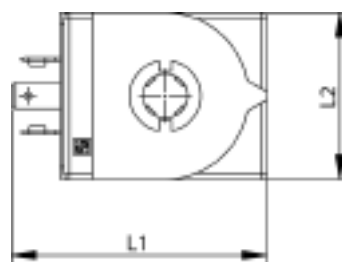
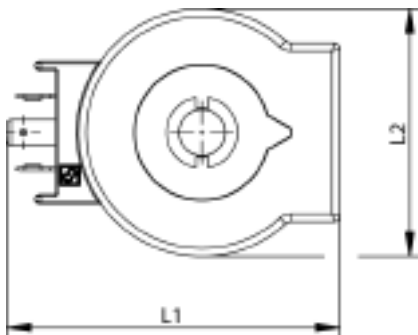
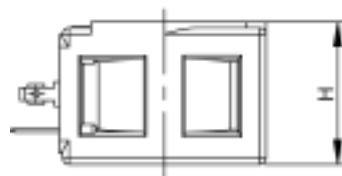
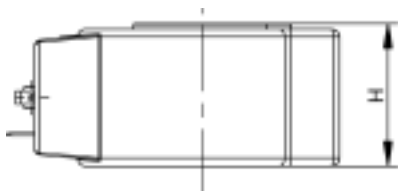


TABLE 2: Coils consumptions											
Coil Type	Catalogue number	Consumptions at 20 °C [mA]						Dimensions [mm]			Weight [g]
		Start			Working						
		50 [Hz]	60 [Hz]	D.C.	50 [Hz]	60 [Hz]	D.C.	L ₁	L ₂	H	
HM2	9100/RA2	920	825	-	527	420	-	57,5	34	35	165
	9100/RA4	230	205		128	114					
	9100/RA6	140	128		68	58					
	9100/RA7	100	87		54	43					
	9100/RA8	58	51		32	23					
HM2  Recognized 	9105/RA2	-	825	-	-	420	-	57,5	34	35	165
9105/RA4	205		114								
9105/RA6	105		58								
9105/RA7	87		43								
CM2	9110/RA2	920	825	-	527	420	-	66,5	34	35	230
	9110/RA4	230	205		128	114					
	9110/RA6	120	105		68	58					
	9110/RA7	100	87		54	43					
HM3	9120/RA6	190	160	-	110	80	-	82	61	35	470
	9120/RD1	-	-	1720	-	-	1720				
	9120/RD2			900			900				
	9120/RD4			460			460				
	9120/RD6			93			93				
HM4	9160/RA2	1490	1320	-	700	530	-	63	41	35	220
	9160/RA4	330	300		156	118					
	9160/RA6	162	142		76	57					
	9160/RA7	147	130		70	53					



HM3

HM4