

HANDBOOK
EXPANSION VALVES

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 **Castel**[®]
Italian technology

CHAPTER 10 ■

COILS AND CONNECTORS, ATEX-CERTIFIED



APPLICATIONS

For the solenoid expansion valves compliant with the ATEX Directive and presented in Chapter 6 (series 2028EX), the following coils are available:

- Series 9100EX (coils type HM2)
- Series 9110EX (coils type CM2)

These coils are classified as Group II, Category 3 equipment according to the ATEX Directive (2014/34/EU). This equipment is suitable for use on refrigeration systems located in areas classified as “Zone 2” potentially explosive environments according to the definitions in Annex I of Directive 1999/92/EC.

Coils in series 9100EX must be used only with connector type 9150EX/R02. The protection rating of the coil + connector system is IP65 according to the EN 60529 standard.

CONSTRUCTION

The coils in series 9100EX and 9120EX are manufactured in compliance with European standards EN 60079-0:2009 and 60079-18:2009, which ensure their compliance to the Essential Health and Safety Requirements of Directive 2014/34/EU. The two series of coils are Class F encapsulated and have Class H enamelled copper wire windings, in compliance with IEC standard 85. The outer casing is made of waterproof, dielectric resins that guarantee reinforced insulation and allow any type of assembly.

All coils have Class I protection ratings against electric contacts. Consequently, their safety requires an efficient ground system. Rubber gaskets assembled on the upper and lower ends of the coils complete the protection of the windings from humidity.

The terminals of the coils in series 9100EX consist of two Faston connectors plus a Faston ground connector. Coils in series 9110EX are equipped with a 1 m long power supply cable incorporated in the encapsulated section. The cable has a polyurethane sheath with operating temperature of up to 125 °C and cable insulation in special PVC with an operating temperature of up to 125 °C. All coils in this

chapter are suitable for continuous operation. The solid construction of these coils makes them suitable for use in refrigeration systems operating in heavy-duty environments

CERTIFICATIONS

Compliance of the coils in series 9100EX to Directive 2014/34/EU is certified by the Italian notified body IMQ, with certificate No. IMQ 13 ATEX 002X (Certified Type Test).

Protection type of the coils in series 9100EX: Ex mc IIC T5 Gc / Ex mc IIIC T100°C Dc IP65.

Compliance of the coils in series 9110EX to Directive 94/9/EC is certified by the Italian notified body IMQ, with certificate No. IMQ 13 ATEX 001X (Certified Type Test).

Protection type of the coils in series 9110EX: Ex mc IIC T4 Gc / Ex mc IIIC T135°C Dc IP65.

Coils in series 9100EX and 9110EX with 110 VAC, 220/230 VAC and 240 VAC voltages are produced in accordance with the Low Voltage Directive (2006/95/EC). All coils in series 9100EX and 9110EX comply with the Electromagnetic Compatibility (EMC) Directive (2004/108/EC).

CONNETTORE

Connector 9150EX/R02 is classified as Group II, Category 3 equipment according to the ATEX Directive (2014/34/EU). This equipment is suitable for use on refrigeration systems located in areas classified as “Zone 2” potentially explosive environments according to the definitions in Annex I of Directive 1999/92/EC.

The DIN 43650 standardized connector 9150EX/R02 represents an effective system for the connection of the coil to the power system, thus ensuring safety also in the presence of moisture. Based on the assembly requirements, this connector allows you to choose the orientation of the outer casing with respect to the inner terminal block. The gland nut of the outer casing is suitable for receiving cables with an external diameter of 6 to 9 mm and is equipped with a self-locking device. Three-pole cables with a cross-section greater than or equal to 0.75 mm² are recommended.



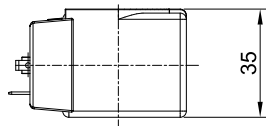
N.B.: PRODUCT SUITABLE FOR HYDROCARBON REFRIGERANTS

The products in this chapter can be used with HC refrigerants classified as flammable fluids and that are in Safety Group A3 according to Standard EN 378-1:2016. These products must be used exclusively in refrigeration systems that comply with the current regulations for

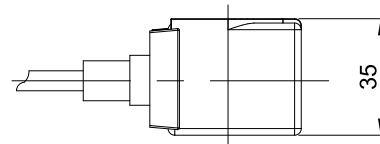
flammable refrigerant fluids (series EN 60335).

Only authorized personnel, qualified to work on flammable refrigeration systems, must perform installation, maintenance and repair operations.

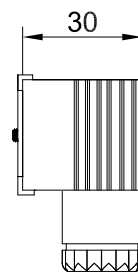
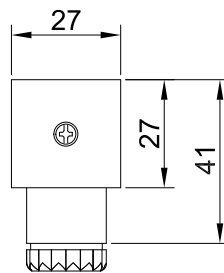
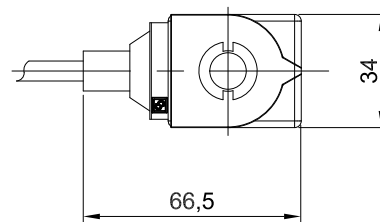
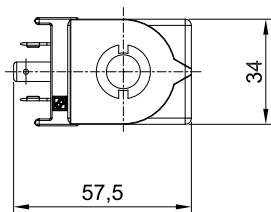
N.B.: The personnel must carefully follow the operating instructions provided in the packaging of said valves.



9100EX (tipo HM2)



9120EX (tipo CM2)



9150EX/R02

TABLE 46: General characteristics of coils ATEX compliance for use in EX Zone 2

Catalogue Number	Coil Type	Voltage [V]	Voltage tolerance [%]	Frequency [Hz]	Insulation class EN 60730	TA [°C]		Connection	Connectors	Protection Degree
						min.	max.			
9100EX/RA2	HM2	24 A.C.	+10 / -10	50 / 60	H	-20	+50	Terminal block for DIN 43650/A	9150EX/R02	IP 65 (with connector)
9100EX/RA4		110 A.C.								
9100EX/RA6		220/230 A.C.	+6 / -10							
9100EX/RA7		240 A.C.	+10 / -10							
9110EX/RA2	CM2	24 A.C.	+10 / -10	50 / 60	H	-20	+50	Three wires cable	-	IP 66
9110EX/RA4		110 A.C.								
9110EX/RA6		220/230 A.C.	+6 / -10							
9110EX/RA7		240 A.C.	+10 / -10							

TABLE 47: Consumptions and weights of coils

Catalogue Number	Coil Type	Voltage [V]	Power [W]	Consumption at 20 °C [mA]						Weight [g]
				Start			Working			
				50 [Hz]	60 [Hz]	D.C.	50 [Hz]	60 [Hz]	D.C.	
9100EX/RA2	HM2	24 A.C.	8	920	825	-	527	420	-	230
9100EX/RA4		110 A.C.		230	205		128	114		
9100EX/RA6		220/230 A.C.		120	105		68	58		
9100EX/RA7		240 A.C.		100	87		54	43		
9110EX/RA2	CM2	24 A.C.	8	920	825	-	527	420	-	230
9110EX/RA4		110 A.C.		230	205		128	114		
9110EX/RA6		220/230 A.C.		120	105		68	58		
9110EX/RA7		240 A.C.		100	87		54	43		

TABLE 48: General characteristics of connectors

Catalogue Number	Standard	Degree of protection	Class of insulation	Approval
9150EX/R02	DIN 43650	IP65 EN 60529	Group C VDE 0110-1 / 89	ATEX compliance for use in EX Zone 2

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Castel Srl - Via Provinciale 2-4 - 20060 Pessano con Bornago - MI