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CERTIFICATE



[1] EU-TYPE EXAMINATION CERTIFICATE

Equipment or Protective System intended for use
in potentially explosive atmospheres
Directive 2014/34/EU

[3] EU-Type Examination Certificate number:

CESI 19 ATEX 028 X

[4] Product: **Solenoids for electric valves type 87, sizes II, III and IV**

[5] Manufacturer: **Rotex Automation Limited**

[6] Address: **987/11 GIDC Makarpura
Vadodara 390010
India**

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] CESI, notified body n. 0722 in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and Council of 26 February 2014, certifies that this Product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Product intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report n. EX-B9013298.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 EN 60079-1:2014 EN 60079-31: 2014

except in respect of those requirements listed at item 18 of the Schedule.

[10] If the sign "X" is placed after the certificate number, it indicates that the Product is subject to special conditions for safe use specified in the schedule to this certificate.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified Product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this Product. These are not covered by this certificate.

[12] The marking of the Product shall include the following:

II 2G Ex db IIC T6...T3 Gb
II 2D Ex tb IIIC T85°C...T155°C Db

This certificate may only be reproduced in its entirety and without any change, schedule included.

Date 2019/07/16 - Translation issued the 2019/07/16

Prepared
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Approved
Roberto PICCIN

CESI S.p.A.
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Responsabile

(Roberto Piccin)

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Schema di certificazione

CESI-ATEX

ACCREDIA
ENTE ITALIANO DI ACCREDITAMENTO

PRD N. 018B
Membro degli Accordi di Mutuo
Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC
Mutual Recognition Agreements

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Schedule

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EU-TYPE EXAMINATION CERTIFICATE n. CESI 19 ATEX 028 X

[15] **Description of Product**

The explosion proof solenoids type 87, subject of this certificate, are equipment designed to operate valves in hazardous atmospheres due to gas or dust. They are suitable to work in ambient classified as zone 21 or 22 and zone 1 or 2. They can also be furnished with the core tube/guide assembly included

The solenoids are realized inside flameproof enclosures, made of stainless steel or aluminium alloy, having three different sizes: size II, III and IV; size III the small one, size II the big one and size IV is as big as size II with a smaller hole for the valve connection.

The enamelled copper winding which creates the magnetic field, able to move a special plunger (which opens/closes the valve), is cemented inside the flameproof enclosure. The plunger slides inside the core tube lodged in the cylindrical hole at the centre of the bobbin around which the copper wire is wound.

At the opposite side with respect to the winding, inside the enclosure, there are the terminals for the power connection, as well as earth connection. A cover closes the box and allows a direct access to the terminals.

The enclosure has a unique threaded entry (M25x1.5), at the bottom, for the connection of the cable gland. Three possible adapters allow the connection of different sized cable glands: M20x1.5, 1/2" NPT or 3/4" NPT. An LED can be optionally provided, only for class T6 products, to check the availability of the electrical supply.

According to the characteristics of the winding, different powers are possible: up to 20W with maximum ambient temperature 100°C and up to 30W with maximum ambient temperature 70°C.

The full list of all models is defined in the annexed documents. The terminal box can contain special circuits for controlling the winding current in case of AC power supply:

- Surge suppressor circuit, to protect the solenoid against high voltage spikes
- Rectifying circuit, for solenoids rated for AC/DC supply
- Latching circuit, for controlling two separate windings on the same bobbin
- Power saving circuit, to lower the power consumption after the plunger is actuated

The Solenoids type 87, subject of this certificate, shall be marked as follows:

II 2G Ex db IIC T6...T3 Gb

II 2D Ex tb IIIC T85°C...T155°C Db

The actual temperature class depends on the maximum ambient temperature. In the following table it is shown the maximum admissible ambient temperature as a function of the temperature class and the maximum power of the solenoid.

Size	Maximum voltage		Maximum power [W]	Maximum ambient temperature [°C]			
	[Vac]	[Vdc]		T6 (80°C)	T5 (95°C)	T4 (130°C)	T3 (155°C)
II	240	256	8	65	80	100	-
	240	256	13	60	75	100	-
	240	256	20	-	45	80	100
	240	256	30	-	-	60	70
III	240	256	5	65	80	100	-
	440	256	8	60	75	100	-
	240	256	15	50	65	100	-
IV	240	256	5	70	85	100	-
	240	256	11	65	80	100	-

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As shown in the table above, the maximum ambient temperature is limited to 100°C for powers up to 20W and 70°C for powers up to 30W. The maximum ambient temperature ranges are synthetized in the following values:

$$-60^{\circ}\text{C} \leq T_{\text{amb}} \leq +100^{\circ}\text{C} \quad (\text{for powers up to } 20\text{W})$$

$$-60^{\circ}\text{C} \leq T_{\text{amb}} \leq +70^{\circ}\text{C} \quad (\text{for powers up to } 30\text{W})$$

Cable entry

The equipment are provided with a single threaded cable entry M25x1.5. In case, three different adapters can be used to change the entry thread to M20x1.5, 1/2" NPT or 3/4" NPT. These three adapters are able to maintain the protection of the enclosure.

The cable gland shall be certified according to the standards EN IEC 60079-0, EN 60079-1 and EN 60079-31 and shall be selected and installed according to the standard EN 60079-14; it shall be suitable for the temperature also required for the cable.

In case of cylindrical threads, to guarantee anti-loosening, a thread-lock compound shall be interposed between the two parts.

Warning labels

"DO NOT OPEN WHEN ENERGIZED"

"USE CABLES SUITABLE FOR THE TEMPERATURE XX°C" (*)

(*) The actual temperature depends on the temperature class as shown in the following table:

T. class	T. cable
T6	85°C
T5	100°C
T4	135°C
T3	150°C

[16] **Report n. EX-B9013298**

Routine tests

The manufacturer is exempted from carrying out the routine overpressure test on the Ex d enclosure since the type test has been overcome at 4 times the reference pressure relative to the minimum ambient temperature of -60°C.

[17] **Special conditions for safe use**

- Contact the manufacturer for the actual sizes of the flame proof joints;
- Use cables and cable glands suitable for temperature greater than 70°C, the actual temperature is written on the marking plate.

[18] **Essential Health and Safety Requirements**

Assured by conformity with the harmonized standards, by the manufacturer's risk assessment and by compliance with the safety instructions.

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Schedule

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EU-TYPE EXAMINATION CERTIFICATE n. CESI 19 ATEX 028 X

[19] **Descriptive documents** (prot. EX-B9013296)

- Technical document CESI/BCE/5.19 rev. 00 (5 pages) dated 2019/05/15
- Safety instructions IM/BCE (2 pages) dated 2019/05/13
- Technical drawings n. 11-CESI-1305 rev. 0 (7 pages) dated 2019/04/09
- Risk assessment document (2 pages)
- Data sheets of the components (9 pages)
- Facsimile EU declaration of conformity

One copy of all documents is kept in CESI files.