



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx CES 19.0010X

Issue No: 0

Certificate history:

Issue No. 0 (2019-07-16)

Status: Current

Page 1 of 3

Date of Issue: 2019-07-16

Applicant: **Rotex Automation Limited**
987/11 GIDC Makarpura
Vadodara 390010
India

Equipment: **Explosion proof solenoids with bottom cable entry, type 87 – size II, III and IV**
Optional accessory:

Type of Protection: **Flameproof enclosures 'd'; Dust ignition protection 't'**

Marking:

Ex db IIC T6...T3 Gb

Ex tb IIIC T85°C...T155°C Db

Approved for issue on behalf of the IECEx
Certification Body:

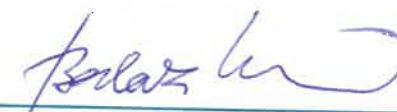
Mirko Balaz

Position:

Head of IECEx CB

Signature:
(for printed version)

Date:


16-7-2019

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

CESI
Centro Elettrotecnico
Sperimentale Italiano S.p.A.
Via Rubattino 54
20134 Milano
Italy

CESI

CESI S.p.A.
Testing & Certification Division
Business Area Certification
Il Responsabile

(Roberto Piccin)





IECEX Certificate of Conformity

Certificate No: IECEX CES 19.0010X Issue No: 0

Date of Issue: 2019-07-16 Page 2 of 3

Manufacturer: **Rotex Automation Limited**
987/11 GIDC Makarpura
Vadodara 390010
India

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended.

STANDARDS:

The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2017 Edition:7.0	Explosive atmospheres - Part 0: Equipment - General requirements
IEC 60079-1 : 2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

IT/CES/ExTR19.0011/00

Quality Assessment Report:

GB/BAS/QAR13.0001/03



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The explosion proof solenoids type 87, are equipment designed to operate valves in hazardous atmospheres due to gas or dust. The solenoids are realized inside flameproof enclosures, made of stainless steel or aluminium alloy, having three different sizes: sizes 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 inside the coil 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. A LED can be optionally provided, only for class T6 products, to check the availability of the electric 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 manufacturer 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

See annex for further description.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- The flame-paths are specified in the manufacturer drawings. For information regarding the dimensions of the flameproof joints the manufacturer shall be contacted;
- Use cables and cable glands suitable for temperature greater than 70°C, the actual temperature is written on the marking plate.

Annex:

[ROTEX IECEx_CES_19.0010X_0 ANNEX - Solenoids type 87.pdf](#)



IECEX Certificate of Conformity



Prot: B9014709

**Annex to certificate:
Applicant:**

**IECEX CES 19.0010X Issue No.:0 of 2019-07-16
Rotex Automation Limited
987/11 GIDC Makarpura
Vadodara 390010; India**

Electrical Apparatus:

**Explosion proof solenoids with bottom cable entry,
type 87 – size II, III and IV**

Description of product

The explosion proof solenoids type 87 are realized inside flameproof enclosures, made of stainless steel or aluminium alloy, having three different sizes: sizes 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 inside the coil for the valve connection.

The Solenoids type 87, shall be marked as follows:

**Ex db IIC T6...T3 Gb
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	Max AC Voltage [Vac]	Max DC Voltage [Vdc]	Max Power [W]	Maximum ambient temperature [°C]			
				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	-

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 is 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 IEC 60079-0, IEC 60079-1 and IEC 60079-31 and shall be selected and installed according to the standard IEC 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.



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Electrical Apparatus:

Explosion proof solenoids with bottom cable entry,
type 87 – size II, III and IV

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:*

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