



# CENTRO DE PESQUISAS DE ENERGIA ELÉTRICA

Organismo de Certificação Acreditado pela Cgcre



## Certificado de Conformidade

Certificate of Conformity / Certificado de Conformidad

|                             |                                 |                                  |
|-----------------------------|---------------------------------|----------------------------------|
| Número:<br>Number<br>Número | Emissão:<br>Issue<br>Expedición | Validade:<br>Validity<br>Validez |
| <b>CEPEL 08.1717X</b>       | <b>29/05/2019</b>               | <b>28/05/2022</b>                |

Produto: **EXPLOSION PROOF SOLENOID WITH JUNCTION BOX**

Product  
Producto

Tipo/Modelo: **37-03, 39-03 and 87**

Type - Model  
Tipo - Modelo

Número de Série: ---

Serial Number  
Número de Serie

Solicitante/Endereço: **ROTEX AUTOMATION LIMITED**

Requester - Address  
Solicitante - Dirección

987/11, GIDC - Makapura  
Vadodora 390010  
India

Fabricante/Endereço: **ROTEX AUTOMATION LIMITED**

Manufacturer - Address  
Fabricante - Dirección

987/11, GIDC - Makapura  
Vadodora 390010  
India

Norma(s) Aplicáveis: ABNT NBR IEC 60079-0:2013 Atmosferas explosivas - Parte 0: Equipamentos - Requisitos gerais;

Suitable Standard(s)  
Norma(s) de Aplicación

ABNT NBR IEC 60079-1:2016 Atmosferas explosivas - Parte 1: Proteção de equipamento por invólucro à prova de explosão "d";  
ABNT NBR IEC 60079-31:2014 Atmosferas explosivas - Parte 31: Proteção de equipamento contra ignição de poeira por invólucro "t";  
ABNT NBR IEC 60529:2017 Graus de proteção para invólucros de equipamentos elétricos (Códigos IP).

Laboratório de Ensaio: CEPEL - Centro de Pesquisas de Energia Elétrica

Testing Laboratory  
Laboratório de Ensayo

Laboratório de Acionamentos e Segurança em Equipamentos Eletroeletrônicos - AP4

Número do Relatório: **RAV-EX-1658/09, RAV-EX-4602/13 and RAV-EX-17631/13X**

Report Number  
Número del Informe

**RASQ-EX-3377/19**

Marcação:

Marking  
Marcado

**Complete marking presented in the pages 4 and 5.**

Condições de Emissão: According to INMETRO Directive 179 dated May 18th, 2010. Model with Evaluation of the Quality System of the Manufacturer and tests on the product. Process of assessment of the product approved on 128<sup>a</sup> Meeting of the Certification CCEX in 21/01/2009. Process of assessment of the Quality System to be presented for ratification in 225<sup>a</sup> CCEX in 13/06/2019.

Conditions of Issue  
Condiciones de Expedición

- The letters "X" or "U" after the conformity certificate's reference, mean that there is a special condition that must be analysed at the momento of installation (see remarks field).


- Conformity Certificate of validity only with pages 1 to 7.

CERT-19808/19 Número da Emissão: **05** Emissão original: **19/01/2009**

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Issue number  
Número de la Expedición

Original Issue  
Expedición Original

  
Carlos Azevedo Sanguedo  
SIGNATÁRIO AUTORIZADO  
Authorized Signatory  
Persona Autorizada



## CONFORMITY CERTIFICATE CEPEL 08.1717X



The **EXPLOSION PROOF SOLENOIDS, TYPES 37-03, 39-03 and 87**, manufactured by **ROTEX AUTOMATION LIMITED**, are bellow qualified in terms of their specifications, analysis and tests performed, in accordance with descriptive documentation.

### Specifications for types 37-03 and 39-03:

The Explosion proof Solenoids with junction box types 37-03 and 39-03, sizes I/II/III/IV, are manufactured in light metal or stainless steel. The Solenoids are used in valve actuators and identified by following codes:

37-03, with cable entrance 1/2" NPT - Female  
39-03, with cable entrance M20x1.5 - Female

### Electrical characteristics:

Rated voltage of feed: 6, 12, 24, 27, 38, 42, 48, 72, 110, 125, 220, 240, 256 e 440 Vdc or Vac  
(Permissible variation:  $\pm 20\%$ )

Frequency: (50 or 60) Hz  $\pm 5\%$   
Maximum power dissipation: 20 W

### Specifications for type 87:

The Explosion proof cum Weather proof Solenoids has 3 different coil size of II/III and IV which are designed to operate 2/ 3/ 4/ 5/ port single or double solenoid valve in Gas and Dust hazardous atmospheres. These Explosion proff cum Weather proof Solenoids are suitable for use in hazardous location classified as Zone 1and 21for Group IIC and IIIC IP 67 rated.

The solenoid has Bottom Cable Entry and has integral terminals for terminating cable. The enclosure has a threaded joint only for the cable entry, where an adaptor of various size M20x1,5 / 1/2" NPT and 3/4" NPT is used to suit the entry of M25x1,5 of the enclosure. LED can be optionally provided to check the availability of the electrical supply to the solenoid.

Solenoid is Enamelled Copper wire when wound on the bobbin. When electrical power supply passes through the winding it produces magnetic flux due to which plunger which remains in the centre of the solenoid get attached by which flow of the fluid can be controlled.

These solenoids are suitable for varies wattages restricted up to 30 W maximum and ambient temperature is  $-60\text{ }^{\circ}\text{C} \leq T_a \leq +100\text{ }^{\circ}\text{C}$  for power up to 20 W and  $-60\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$  for power up to 30 W. The Solenoid Enclosure normally constructed in Aluminium cast (ADC12) and the alaternate material used is stainless steel cast (CF8M).

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### Electrical characteristics – Table 1:

| Coil Size | Max. Power | Max. Ambient Temperature |         |          |          | Max. AC voltage | Max DC voltage |
|-----------|------------|--------------------------|---------|----------|----------|-----------------|----------------|
|           |            | T6 (80)                  | T5 (95) | T4 (130) | T3 (155) |                 |                |
| III       | 5          | 65                       | 80      | 100      |          | 240             | 256            |
|           | 8          | 60                       | 75      | 100      |          | 440             | 256            |
|           | 15         | 50                       | 65      | 100      |          | 240             | 256            |
| II        | 8          | 65                       | 80      | 100      |          | 240             | 256            |
|           | 13         | 60                       | 75      | 100      |          | 240             | 256            |
|           | 20         |                          | 45      | 80       | 100      | 240             | 256            |
|           | 30         |                          |         | 60       | 70       | 240             | 256            |
| IV        | 5          | 70                       | 85      | 100      |          | 240             | 256            |
|           | 11         | 65                       | 80      | 100      |          | 240             | 256            |

### Analysis and tests performed:

Product assessment following the requirements of the Standards ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-1:2016, ABNT NBR IEC 60079-31:2014 and ABNT NBR IEC 60529:2017. Results recorded in the Report RAV-CERT-EX-1658/09, RAV-EX-4602/13 and RAV-EX-17631/13X and Test report NO/DNV/ExTR12.0017/00, date of issue 12/11/2012.

### Descriptive documentation of the equipment (filed together to the equipment process - confidential):

| Code              | Description   | Rev. | Date       |
|-------------------|---|------|------------|
| 11-BCE-INMETRO    | Name Plate for Bottom Cable Entry - IN-METRO  | 00   | 30/05/2015 |
| 11-HCE-INMETRO    | Coil label for FPJB Hor. Cable entry - IN-METRO   | 00   | 30/05/2015 |
| 3.0.4             | Design and Engineering Input Specification  | 00   | 21/10/2008 |
| WN-1353           | Solenoid code   | 23   | 03/11/2012 |
| 090-01-10-03C     | FPJBND Coil Bott. Cover Size I-LM6  | 04   | 16/04/2004 |
| 11-IEC-02-013-000 | GA Drawing for Flameproof Junction Box - BCE (Size II/III/IV)<br>Solenoid code -87 (4 sheets) | 00   | 12/05/2012 |

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## CONFORMITY CERTIFICATE CEPEL 08.1717X



**Marking:**

The marking of the **EXPLOSION PROOF SOLENOIDS, TYPES 37-03 and 39-03**, shall contains the followings information:

|   |
|---|
|    |
| <b>CEPEL 08.1717X</b>   |
| <p><b>Ex d IIC T* (in accordance with table 2) Gb IP66</b></p> <p><b>Tamb = -40 °C +* (in accordance with table 2)</b></p> <p><b>Ex tb IIIC T** ( in accordance with table 3) Db IP66</b></p> <p><b>Tamb = -40 °C +** ( in accordance with table 3)</b></p> |

**Table 2-\* Temperature Class for Gas.**

| Range of enviroment temperature Ta (°C) | Temperature Class |
|---|-------------------|
| -40 to +60                              | T4                |
| -40 to +50                              | T5                |
| -40 to +35                              | T6                |

**Table 3- \*\* Temperature Class for combustibile Dust.**

| Range of enviroment temperature Ta (°C) | Temperature Class |
|---|-------------------|
| -40 to +60                              | T135 °C           |
| -40 to +50                              | T100 °C           |
| -40 to +35                              | T85 °C            |

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## CONFORMITY CERTIFICATE CEPEL 08.1717X

The marking of the **EXPLOSION PROOF SOLENOID, TYPE 87**, shall contains the followings information:

|   |   |
|---|---|
| <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p style="margin: 0;"><b>Segurança</b></p> <div style="display: flex; justify-content: space-around; align-items: center;"> </div> <p style="margin: 0; font-size: small;">INMETRO    OCP 0007</p> </div> |   |
| <b>CEPEL 08.1717X</b>   |   |
| <b>Ex d junction Box for Solenoid power up to ≤ 20 W</b>  | <b>Ex d IIC T6 a T3 Gb<br/>Ex tb IIIC T80 °C a T155 °C Db, IP67<br/>-60 °C ≤ Ta ≤ +100 °C</b> |
| <b>Ex d junction Box for Solenoid power up to ≤ 30 W</b>  | <b>Ex d IIC T4 a T3 Gb<br/>Ex tb IIIC T135 °C a T155 °C Db, IP67<br/>-60 °C ≤ Ta ≤ +70 °C</b> |

**Remarks:**

- 1) The validity of this Certificate of Conformity is linked to the performance of the maintenance and treatment evaluations of possible nonconformities, in accordance with Cepel guidelines provided for in the Conformity Assessment Requirements for electrical and electronic equipment for explosive atmospheres. In order to verify the updated condition of regularity of this Certificate of Conformity, the database of certified products and services of Inmetro must be consulted;
- 2) The letter "X" placed at the end of the certificate number is to indicate the following special conditions of safety use:
  - Shall be used wirings suitable to operation temperature ≥ 80 °C;
  - The accessories used in the cable entrances shall be certified in accordance with the standard ABNT NBR IEC 60079-0:2013 , ABNT NBR IEC 60079-1:2016, ABNT NBR IEC 60079-31:2014 and ABNT NBR IEC 60529:2017 and shall to ensure the minimum index of protection IP66 and shall be suitable to operation temperature of the solenoids;
- 3) The manufactory is responsible to ensure that the equipments manufactured are in accordance with the equipment specifications related in this certificate and submit then to the static overpressure routine test in the welded joint of the plunger, with a minimum pressure of 15,3 bar during the time not less than 10 s;
- 4) This certificate is only valid to the Solenoids with flameproof junction box effectively tested. Any modification in the design or using of the different material those defined by descriptive documentation of the equipment without CEPEL's authorization, will invalid this certificate;

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5) The activity of installation, inspection, maintenance, repair, revision and, recovery of the solenoids are responsibility of the users and shall be performed in accordance with the requirements of valid technical Standards and in accordance with the manufacturer recommendation;

6) The marking shall be done in accordance with the Standard ABNT NBR IEC 60079-0:2013 and with the Requirement for assessment of the Conformity for Electrical Equipment for Explosive Atmospheres compound by gas and flammable steams and shall be fixed in the external surface of the equipment in a visible place. This marking shall be clear and durable considering possible chemical corrosion.

Rio de Janeiro, May 29<sup>th</sup>, 2019.

  
Carlos Azevedo Sanguedo  
Responsable of Certification

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## CONFORMITY CERTIFICATE CEPEL 08.1717X



**Validity of the Certificate: 28/05/2022**

### Control of issue:

| Date       | Issue | Description  |
|------------|-------|--|
| 18/05/2012 | 01    | First issue in accordance with Directive 179 issued in 18/05/2010.   |
| 12/08/2013 | 02    | Second issue in order to include dust marking.   |
| 18/05/2015 | 03    | Third issue of the certificate in accordance with Directive Inmetro 179 issued in May, 18 <sup>th</sup> 2010. Issue with extending of the validity for conclusion of the renewal process including audit at the costumer facilities. |
| 18/06/2016 | 04    | Fourth issue in accordance with Directive Inmetro 179, issued in 18/05/2010, conforming RASQ-EX-20663/16.  |
| 29/05/2019 | 05    | Fifth issue in accordance with Directive Inmetro 179, issued in 18/05/2010, conforming RASQ-EX-3377/19.  |

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