



# CENTRO DE PESQUISAS DE ENERGIA ELÉTRICA

Organismo de Certificação Acreditado pela Cgcre



## Certificado de Conformidade

Certificate of Conformity / Certificado de Conformidad

Número:

Number  
Número

**CEPEL 08.1717X**

Emissão:

Issue  
Expedición

**29/05/2019**

Validade:

Validity  
Validez

**28/05/2022**

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:

Suitable Standard(s)  
Norma(s) de Aplicación

ABNT NBR IEC 60079-0:2013

Atmosferas explosivas - Parte 0: Equipamentos - Requisitos gerais;

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:

Report Number  
Número del Informe

**RAV-EX-1658/09, RAV-EX-4602/13 and RAV-EX-17631/13X  
RASQ-EX-3377/19**

Marcação:

Marking  
Marcado

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

Condições de Emissão:

Conditions of Issue  
Condiciones de Expedición

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.

- 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**

Page: 1/7

Número da Emissão: **05**

Issue number  
Número de la Expedición

Emissão original: **19/01/2009**

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 descrepitive 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 Wheather 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 Wheather 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  $-60^{\circ}\text{C} \leq T_a \leq +100^{\circ}\text{C}$  for power up to 20 W and  $-60^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$  for power up to 30 W. The Solenoid Enclosure normally constructed in Aluminium cast (ADC12) and the alèternate material used is stainless steel cast (CF8M).

Emissão: 29/15/2019  
Issue  
Expedición

Número da Emissão: 05  
Issue Number  
Numero de la Expedición

CERT-19808/19  
Página 2/7

## CONFORMITY CERTIFICATE CEPEL 08.1717X

### 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) Solenoid code -87 (4 sheets)	00	12/05/2012

Emissão: 29/15/2019  
Issue  
Expedición

Número da Emissão: 05  
Issue Number  
Numero de la Expedición

CERT-19808/19  
Página 3/7



## CONFORMITY CERTIFICATE CEPEL 08.1717X

### Marking:

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

<p><b>Segurança</b></p> <p><b>N</b> <b>C</b> <b>INMETRO</b> <b>CEPEL</b> <b>OCP 0007</b></p>	
<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 combustible Dust.**

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

Emissão: 29/15/2019  
Issue  
Expedición

Número da Emissão: 05  
Issue Number  
Numero de la Expedición

CERT-19808/19  
Página 4/7

## CONFORMITY CERTIFICATE CEPEL 08.1717X

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

<p><b>Segurança</b></p> <p><b>N</b> INMETRO</p> <p><b>C</b> CEPEL OCP 0007</p>	
<b>CEPEL 08.1717X</b>	
<b>Ex d junction Box for Solenoid power up to <math>\leq 20</math> W</b>	<b>Ex d IIC T6 a T3 Gb Ex tb IIIC T80 °C a T155 °C Db, IP67 <math>-60\text{ °C} \leq T_a \leq +100\text{ °C}</math></b>
<b>Ex d junction Box for Solenoid power up to <math>\leq 30</math> W</b>	<b>Ex d IIC T4 a T3 Gb Ex tb IIIC T135 °C a T155 °C Db, IP67 <math>-60\text{ °C} \leq T_a \leq +70\text{ °C}</math></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  $\geq 80\text{ °C}$ ;

-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;

Emissão: 29/15/2019  
Issue  
Expedición

Número da Emissão: 05  
Issue Number  
Numero de la Expedición

CERT-19808/19  
Página 5/7





## CONFORMITY CERTIFICATE CEPEL 08.1717X



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  
Responsible of Certification

Emissão: 29/15/2019  
Issue  
Expedición

Número da Emissão: 05  
Issue Number  
Numero de la Expedición

CERT-19808/19  
Página 6/7



## 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.

Emissão: 29/15/2019  
Issue  
Expedición

Número da Emissão: 05  
Issue Number  
Numero de la Expedición

CERT-19808/19  
Página 7/7