



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	18/05/2016	Validade: Validity Validez	17/05/2019
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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
Índia

Fabricante/Endereço: **The same.**
*Manufacturer - Address
Fabricante - Dirección*

Norma(s) Aplicáveis: ABNT NBR IEC 60079-0:2008 Explosive Atmospheres - Part 0: Equipments - General Requirements;
*Suitable Standard(s)
Norma(s) de Aplicación*
ABNT NBR IEC 60079-1:2009 Explosive Atmospheres - Part 1: Equipment protection by flameproof enclosures "d";
IEC 60079-31:2008 Explosive Atmospheres - Part 31: Equipment dust ignition protection by enclosure "t";
ABNT NBR IEC 60529:2009 Degree of protection for enclosures of electrical equipments (IP code).

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-20663/16

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^a Meeting of the Certification CCEX in 21/01/2009. Process of assessment of the Quality System approved on 197^a CCEX in 24/09/2015.
*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).

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Número da Emissão: **04** Emissão original: **19/01/2009**
*Issue number
Número de la Expedición* *Original Issue
Expedición Original*

Carlos Azevedo Sanguedo
SIGNATARIO 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 below qualified in terms of their specifications, analysis and tests performed.

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 ½" NPT - Female

39-03, with cable entrance M20x1.5 - Female

Electrical characteristics:

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 1 and 2 for 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 / ½" NPT and ¾" 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 30W 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 aleternate 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 60079-0:2008, ABNT NBR IEC 60079-1:2009, IEC 60079-31:2008 and ABNT NBR IEC 60529:2009. Results recorded in the Report RAV-CERT-EX-1658/09, RAV-EX-4602/13 and RAV-EX-17631/13X and Tesr 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	Revision	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 Jounction Box – BCE (Size II/III/IV) Solenoid code -87 (4 sheets)	00	12/05/2012

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Marking:

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

Segurança   INMETRO OCP 0007	
CEPEL 08.1717X	
Ex d IIC T* (in accordance with table 2) Gb IP66 Tamb = -40 °C +* (in accordance with table 2) Ex tb IIIC T** (in accordance with table 3) Db IP66 Tamb = -40 °C +** (in accordance with table 3)	

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

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

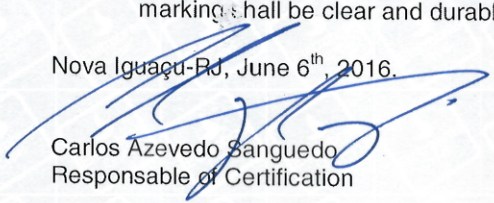
Segurança   INMETRO OCP 0007	
CEPEL 08.1717X	
Ex d junction Box for Solenoid power up to $\leq 20W$	Ex d IIC T6 a T3 Gb Ex tb IIIC T80 °C a T155 °C Db, IP67 -60 °C $\leq$ Ta $\leq$ +100 °C
Ex d junction Box for Solenoid power up to $\leq 30W$	Ex d IIC T4 a T3 Gb Ex tb IIIC T135 °C a T155 °C Db, IP67 -60 °C $\leq$ Ta $\leq$ +70 °C

Remarks:

- 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 Standards ABNT NBR IEC 60079-0, ABNT NBR IEC 60079-1, IEC 60079-31 and ABNT NBR IEC 60529 and shall be suitable to operation temperature of the solenoids;
- 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 between 10 s and 60 s;
- 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;
- 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;
- The marking shall be done in accordance with the Standard ABNT NBR IEC 60079-0:2008 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 local. This marking shall be clear and durable considering possible chemical corrosion.

Nova Iguaçu-RJ, June 6th, 2016.


Carlos Azevedo Sanguedo
Responsible of Certification

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Validity of the Certificate: 17/05/2019

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 th 2010. Issue with extending of the validity for conclusion of the renewal process including audit at the customer facilities.
18/06/2016	04	Fourth issue in accordance with Directive Inmetro 179, issued in 18/05/2010, conforming RASQ-EX-20663/16.

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