



Ex Certificate of Conformity

Standard Form for Evaluation of the Quality Management System used in the
Production Process and Product Testing

Certificate No.: NCC 12.0767 X Issue: 2

Issue date: 09-10-2015 Page 1 of 5

Expiration date: 09-10-2018

Applicant: **TopWorx**
3300 Fern Valley Road
Louisville, KY 40213
United States

Certificate history:

Issue No. 2 (10-09-2015)
Issue No. 1 (11-05-2014)
Issue No. 0 (05-02-2012)

Electrical apparatus: **Valve controller, D2-FF series (DXx-F*0*****)**

Main type of protection: **i, n, t**

Ex ib IIC T4 (-20°C ≤ Ta ≤ +50°C) Gb

Labeling: Ex tb IIIC T80°C (-20°C ≤ Ta ≤ +50°C) IP67 (for DXS and DXP models only)

Ex nA nC IIC T6 Gc

Ex tc IIIC T80°C IP67 (for DXS and DXP models only)

Approved for issue in conformity with the rules and applicable standards
Certification body:

SERGIO TOSHIO
YOCHIY:11159173826

Digitally signed by
SERGIO TOSHIO
YOCHIY:11159173826
Date: 2015.09.10
17:35:08 -0300

Position:

Sergio Toshio Yochiy
President

Certificate issued in accordance with the requirements for conformity assessment of electrical equipment for explosive atmospheres, set out in Inmetro Ordinance No. 179 of May 18, 2010

1. This certificate may only be reproduced with all of its pages.
2. This certificate is not transferrable and is the property of the issuing body.
3. The status and authenticity of this certificate can be verified on the official Inmetro website.
4. This certificate of conformity was issued by a certification body accredited by CGCRE - General Accreditation Coordination.

Certificate issued by:

NCC Certificações do Brasil Ltda.
CGRE Accreditation no. 0034
(10/16/2003) www.ncc.com.br





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Manufacturer: **TopWorx**
3300 Fern Valley Road
Louisville, KY 40213
United States

Additional manufacturing locations: **Emerson Process Management**
Magyarország Kft
8000 Székesfehérvár
Holland Fásor 6
Hungary

Emerson Machinery Equipment (Shenzhen) Co. Ltd.
Bao Heng Technology Industry Park, Liu Xian 1st Road
District 68, Bao'an District, Shenzhen 518101
China

This certificate is issued as verification that samples, representative of production, were assessed and tested and found to comply with the standards listed 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 requirements of the Inmetro Rules. This certificate is granted subject to the conditions stipulated in the Inmetro Rules.

STANDARDS:

The electrical apparatus and any acceptable variations specified in the report of this certificate and mentioned documents were found to comply with the following standards:

- ABNT NBR IEC 60079-0:2013** Explosive Atmospheres – Part 0: Equipment – General requirements.
- ABNT NBR IEC 60079-11:2013** Explosive Atmospheres – Part 11: "i" intrinsic safety equipment protection.
- ABNT NBR IEC 60079-15:2012** Explosive Atmospheres – Part 15: "n" type protection equipment.
- ABNT NBR IEC 60079-31:2014** Explosive Atmospheres – Part 31: Protection of equipment against dust ignition by "t" casings.

This certificate **does not** indicate conformity with any safety and electrical performance requirements other than those expressly included in the standards listed above.

TEST AND ASSESSMENT REPORTS:

Samples of the listed equipment have successfully met the examination and test requirements as recorded in;

Technical conformity assessment report (presents the verification of the documents used for analysis and conclusions for the recommendation of certification):

BPM: 218494
Process: 32119/15.1

Test report(s):

- No. GB/BAS/ExTR11.0276/00 (Baseefa – 12/12/2011)
- No. GB/BAS/ExTR11.0279/00 (Baseefa – 12/12/2011)
- No. GB/BAS/ExTR11.0121/00 (Baseefa – 06/22/2011)
- No. GB/BAS/ExTR11.0122/00 (Baseefa – 06/22/2011)

Auditing report / Quality Evaluation Report:

- NCC: 06/29/2015 (China)
- NCC: 06/30/2015 (USA)
- NCC: 07/29/2015 to 07/30/2015 (Hungary)



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EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The valve controller, D2-FF series (DXx-F*0*****), is designed to control and provide position feedback of an actuator/combination of valves, located in a hazardous area, via a Foundation Fieldbus or FISCO network.

The equipment may comprise a stainless steel (DXS models), aluminum (DXP model) or resin reinforced fiberglass (DXR models) casing, containing an FF CC electronic unit, up to two piezoelectric valves (certified in Brazil), up to two limit switches and an optional position sensor potentiometer. A shaft which crosses the base of the casing is connected to a potentiometer (to provide information on the position of the actuator/valve) or a disc with metal contacts is fitted in order to activate the limit switches mounted around the shaft, or a combination of both may be fitted. Based on inputs from the mounted devices, the FF CC electronic unit processes the information and communicates over the Fieldbus network. The FF CC electronic unit also controls operation of the piezoelectric valves (when fitted) which are connected to pneumatic valves attached to the side of the casing.

A visual indicator is fitted to the upper part of the casing and is mechanically connected to the shaft in order to provide an indication of the position of the actuator/valve to which the equipment is connected.

External connections to the equipment are made using a plug and a connector with a terminal via one or two threaded inputs on both sides of the casing. Installation of external connections and closure of an unused input should be performed using a cable fitting or suitable "Ex e" or "Ex n" sealing components with a minimum protection rating of IP67, certified in Brazil.

Technical specifications:

Input parameters – J1 connector, pins 1 to 3:

$$U_m = 32 \text{ V}_{dc}$$

Intrinsic safety parameters:

$$U_i = 30 \text{ V}$$
$$I_i = 380 \text{ mA}$$
$$P_i = 1.5 \text{ W}$$
$$C_i = 5 \text{ nF}$$
$$L_i = 10 \text{ }\mu\text{H}$$

FISCO parameters:

$$U_i = 17.5 \text{ V}$$
$$I_i = 380 \text{ mA}$$
$$P_i = 5.32 \text{ W}$$
$$C_i = 5 \text{ nF}$$
$$L_i = 10 \text{ }\mu\text{H}$$

Output parameters – FF CC electronic unit:

Piezoelectric valve terminals (V1 + & - and V2 + & -):

$$U_o = 9.56 \text{ V}$$
$$I_o = 11.4 \text{ mA}$$
$$P_o = 27.2 \text{ mW}$$
$$C_i = \text{negligible}$$
$$L_i = \text{negligible}$$

NO/NC switch terminals:

$$U_o = 9.56 \text{ V}$$
$$I_o = 3.7 \text{ mA}$$
$$P_o = 8.8 \text{ mW}$$
$$C_i = \text{negligible}$$
$$L_i = \text{negligible}$$



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Position sensor connector (pins 1 & 4 in relation to 3):

$U_o = 9.56 \text{ V}$
 $I_o = 7.6 \text{ mA}$
 $P_o = 15 \text{ mW}$
 $C_i = \text{negligible}$
 $L_i = \text{negligible}$

Position sensor connector (pins 1 to 4 combined):

$U_o = 9.56 \text{ V}$
 $I_o = 58.6 \text{ mA}$
 $P_o = 112 \text{ mW}$
 $C_i = 2.67 \text{ }\mu\text{F}$
 $L_i = \text{negligible}$

CONDITIONS OF CERTIFICATION:

This certificate is valid only for equipment of a model identical to that of the equipment actually tested. All changes to the design and usage of components and/or materials that are different from those defined by the descriptive documentation of the equipment without prior authorization from NCC, shall invalidate this certificate.

The end user is responsible for ensuring that the product will be installed/used according to the manufacturer's instructions and relevant standards regarding electrical installations in potentially explosive atmospheres.

Installation, inspection, maintenance, repair, revision and recovery of equipment are the responsibility of end users and must be performed in accordance with the requirements of current technical standards and the manufacturer's recommendations.

Because this involves a certification process in which the applicant is not legally established in Brazil, the user shall comply with item 10.1 of Inmetro Ordinance no. 179 of May 18, 2010, and the manufacturer is responsible for complying with item 7 of the latter ordinance.

Manufacturing conditions:

A dielectric strength test should be performed, applying $500 \text{ V}_{\text{rms}}$ between the terminals and the housing for 1 minute, according to ABNT NBR IEC 60079-15 requirements.

Warning label:

WARNING – POTENTIAL RISK OF ELECTROSTATIC CHARGE – SEE INSTRUCTIONS.

Specific usage conditions:

Only non-combustible fluids may be used in the pneumatic circuit.

For DXR models only: the equipment must only be installed in a location where there is a low risk of mechanical damage. The casing poses a potential risk of electrostatic charge and must only be cleaned with a damp cloth.

The cable fittings and stop plugs used must be Inmetro certified and guarantee a minimum protection rating of IP67.



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DETAILS OF CERTIFICATE ISSUES (for issues 0 and above):

Issue 0:

Initial issue.

Issue 1:

Inclusion of manufacturing unit.

Issue 2:

Recertification of process 12829/10.1. Updating of applicable standards.

CONTROLLED DESCRIPTIVE DOCUMENTS OF THE EQUIPMENT (CONFIDENTIAL):

Table 1

Number	Revision
CERT-ES-02495-1 (page 1)	C
CERT-ES-02495-1 (page 2)	C
CERT-ES-02495-1 (page 3)	C
CERT-ES-02495-1 (page 4)	C
ES-01962-1	2
ES-02040-1	4

Number	Revision
ES-02193-1 (page 5)	5
ES-02193-1 (page 6)	6
ES-02193-1 (page 7)	6
ES-02193-1 (page 8)	6
CERT-Es-01857-1B	R3
CERT-ES-01378-1	1

Number	Revision
ES-02193-1 (page 2)	6
ES-02193-1 (page 3)	6
ES-02193-1 (page 4)	6
CERT-ES-01379-1	1
ES-02193-1 (page 1)	6