



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 SIR 12.0035X** issue No.: **7**

Status: **Current**

Date of Issue: **2017-06-06** Page 1 of 4

Applicant: **Emerson Process Management Valve Automation, Inc.**
19200 Northwest Freeway
Houston
Texas 77065
United States of America

Certificate history:
Issue No. 7 (2017-6-6)
Issue No. 6 (2017-1-31)
Issue No. 5 (2016-9-27)
Issue No. 4 (2016-7-13)
Issue No. 3 (2016-5-9)
Issue No. 2 (2015-7-16)
Issue No. 1 (2013-5-15)
Issue No. 0 (2012-3-5)

Equipment: **TEC 2000/TEC2 Valve Actuator, ECP 2000 Valve Actuator and RDM Remote Display Module**
Optional accessory:

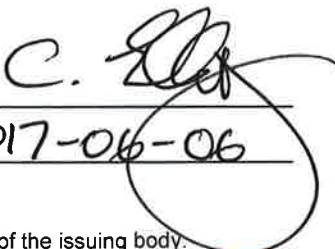
Type of Protection: **Flameproof and Dust Protection by Enclosure**

Marking: **RDM Module**
Ex db IIB + H2 T6 Gb
Ex tb III C T85°C Db IP68
Ta = -20°C to +60°C
Refer to the Annexe for additional Marking

Approved for issue on behalf of the IECEX Certification Body: **N Jones**

Position: **Certification Manager**

Signature:
(for printed version)


2017-06-06

Date:

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:

SIRA Certification Service
CSA Group
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
United Kingdom





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Manufacturer: **Emerson Process Management Valve Automation, Inc.**
19200 Northwest Freeway
Houston
Texas 77065
United States of America

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 electrical 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 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: 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:

[GB/SIR/ExTR12.0072/00](#)
[GB/SIR/ExTR16.0117/00](#)
[GB/SIR/ExTR17.0015/00](#)

[GB/SIR/ExTR13.0113/00](#)
[GB/SIR/ExTR16.0180/00](#)
[GB/SIR/ExTR17.0107/00](#)

[GB/SIR/ExTR15.0191/00](#)
[GB/SIR/ExTR16.0230/00](#)

Quality Assessment Report:

[GB/SIR/QAR06.0045/03](#)



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

TEC2000 and ECP 2000 Electric Valve Actuators: The TEC2000 and ECP 2000 Electric Valve Actuators are self-contained electromechanical devices designed to operate various type of valves and multi-turn damper drives. TEC 2000 and ECP 2000 are mechanically identical machines. The TEC 2000 limit position sensing is conducted using a Hall Effect Absolute Position Encoder, whereas the ECP 2000 position sensing is conducted by intermitting gear trains operating double-make double-break precision switches.

The RDM module: The RDM module enclosure is cast from aluminium alloy and consists of a cover that bolts to the enclosure base using (4) M8-1.25 stainless steel bolts. The bolt-on cover for the RDM is of the same design (that has a cemented viewing window and control and selector handles) as the LDM cover used in the electronics enclosure. The enclosure contains (3) 1 inch NPT conduit openings. An O-ring is present between the enclosure base and bolt-on cover. The free internal volume for the RDM Module is 56 in³ (918cubic cm). For the full description, additional marking and Conditions of Manufacture, refer to the Annexe.

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. All replacement fasteners shall meet the minimum requirements detailed below:

- The M8 fasteners used to secure each cover to the electronics enclosure and the RDM cover to the RDM enclosure shall be of property class (or 'grade') 8.8.
- The fasteners used to secure the motor enclosure to the electronics enclosure, the electronics enclosure to the gear box and the end caps to the motor frame shall of property class (or 'grade') 5.
- The HMA shall be secured to the electronics enclosure by M8 x 1.25, 316 stainless steel bolts.

In all of the above cases, when fasteners are fully tightened into the threaded holes without the use of a washer, at least one full thread shall remain free at the base of the hole.

2. The flameproof joints shall not be repaired.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1 to Issue 4 – for changes refer to Issue 4

Issue 5 – this Issue introduced the following change:

The company name and address was changed:

From:

Emerson Process Management Valve Actuation LLC
13840 Pike Road
Missouri City
Texas 77489

To:

Emerson Process Management Valve Automation Inc.
19200 Northwest Freeway
Houston
Texas 77065

Issue 6 – this Issue introduced the following changes:

1. To permit modifications to internal Printed Circuit Boards collectively listed as TEC2 controls.
2. Due to an administrative oversight, the Annexe associated with Issue 5 of the certificate was omitted. Annexe Issue 6 is now attached to the certificate IECEx SIR 12.0035X Issue 6.

Issue 7 – this Issue introduced the following changes:

1. Update the product name to reflect the change of product from the TEC 2000 to the TEC 2000/TEC2 which contains replacement TEC2 electronics.
2. Update the marking to reflect the change of product from the TEC 2000 to the TEC 2000/TEC2.
3. Update drawings to remove reference to TEC 2000 and replace with TEC 2000/TEC2.
4. Update of the company name on drawings.
5. Update all drawings to revision G.
6. Update LDM cover assembly with the removal of the jack screw holes, redesigned control/selector handles design and a redesigned mandrel.
7. Inclusion of an additional gear option in the documentation.

Annexe to: IECEx SIR 12.0035X Issue 7

Applicant: Emerson Process Management Valve Automation, Inc.



**Apparatus : TEC 2000/TEC2 Valve Actuator
ECP 2000 Valve Actuator
RDM Remote Display Module**

Additional Marking:

TEC 2000 and ECP 2000 Electric Valve Actuators

When thermal cutouts rated at 130°C are used:

Ex db IIB T4 Gb
Ex tb III C T135°C Db IP68 or
Ex db IIB + H2 T4 Gb
Ex tb III C T135°C Db IP68

When thermal cutouts rated at 115°C are used:

Ex db IIB 120°C (T4) Gb
Ex tb III C T120°C Db IP68 or
Ex db IIB + H2 120°C (T4) Gb
Ex tb III C T120°C Db IP68
Ta = -20°C to +60°C

TEC2000 and ECP 2000 Electric Valve Actuators: The TEC2000 and ECP 2000 Electric Valve Actuators are self-contained electromechanical devices designed to operate various type of valves and multi-turn damper drives. TEC 2000 and ECP 2000 are mechanically identical machines. The TEC 2000 limit position sensing is conducted using a Hall Effect Absolute Position Encoder, whereas the ECP 2000 position sensing is conducted by intermitting gear trains operating double-make double-break precision switches.

The TEC2000 and ECP 2000 Electric Valve Actuators consist of three interconnected assemblies: gear housing assembly, electronics enclosure and motor enclosure. There is no flamepath construction difference between the TEC 2000 and ECP 2000 Valve Actuators. Also available as a separate assembly option is the RDM Remote Display Module. The Ex d IIB and the Ex d IIB+H2 valve actuators use different bolts to secure the electronics enclosure to the motor enclosure and to the gear housing assembly, in addition, the gear and torque limit assemblies used between the electronics enclosure and the gear housing assembly also differ.

The gear housing is cast from ductile iron. This housing contains the main drive gears, clutch lever and a handwheel for manual operation of the output drive. The clutch lever controls the output drive to be engaged either electrically (motor driven) or by the manual handwheel. When the clutch lever is in the "MOTOR" position, the manual handwheel is disengaged and does not move when the actuator is operated electrically. The gear housing is bolted to the electronics enclosure using (4) 3/8-16 UNC steel bolts and to the motor enclosure using (4) 3/8-16 UNC stainless steel bolts.

The electronics enclosure is cast from aluminium, ductile iron or bronze. The enclosure includes (1) extended and (3) shallow spigot bolt-on covers each using (4) M8-1.25 stainless steel bolts. One LDM cover, located on one end of the enclosure, includes a tempered lime glass viewing window and control/selector handles that do not penetrate the cover wall. The tempered lime glass viewing window is cemented to the cover using A-271 epoxy material. The extended cover on the other end of the enclosure includes (3) 1-NPT and (1) 1½-NPT conduit openings for field wiring connections. The extended cover includes a threaded blank cover. The electronics enclosure is bolted to the gear housing using (4) 3/8-16 UNC steel bolts and to the motor enclosure using (4) 1/4-20 UNC stainless steel bolts. For Ex d IIB+H2 rating, the 1/4-20 UNC and 3/8-16 UNC bolts and the gear and torque limit assemblies between the gear housing and electronics enclosure form spigot type flamepaths (cylindrical portion formed between the bolt/limit assemblies and enclosure and flanged portion between the gear housing and electronics enclosure). Whereas for Ex d IIB rating, only a flanged joint is present between the electronics enclosure and motor enclosure, and between the electronics enclosure and gear housing. O-rings are provided between the enclosure and bolt-on covers, between the threaded cover and extended cover,

Date: 06 June 2017

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Sira Certification Service

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Annexe to: IECEx SIR 12.0035X Issue 7

Applicant: Emerson Process Management Valve Automation, Inc.



**Apparatus : TEC 2000/TEC2 Valve Actuator
ECP 2000 Valve Actuator
RDM Remote Display Module**

as well as between the interconnection of the electronics enclosure, the gear housing and the motor enclosure. The free internal volume for the motor enclosure is 308 in³ (5047 cm³).

The motor enclosure consists of cold rolled steel and aluminium end caps. Supply voltage to the motors is 115/208/220/230 V, 50/60 Hz, single phase, 208/230/380/415/460/575 V, 50/60 Hz, three phase, or 12/24/48/125/250 Vdc with a horsepower range of 1/60 to 8. The motors contain (2) thermal cutout switches, rated at either 130°C ±5°C with a T4 temperature code marking or 115°C ±5°C with a 120°C (T4) temperature code marking, these are wound into the motor stator. The motor enclosure bolts to the electronics enclosure using (4) 1/4-20 UNC stainless steel bolts and to the gear housing using (4) 3/8-16 UNC stainless steel bolts. The wiring from the electronics enclosure to the motor enclosure is cemented using either Appleton "Kwiko" or Crouse-Hinds "Chico A" sealing material. The free internal volume for the motor enclosure is 154 in³ (2524 cm³).

The RDM module: The RDM module enclosure is cast from aluminium alloy and consists of a cover that bolts to the enclosure base using (4) M8-1.25 stainless steel bolts. The bolt-on cover for the RDM is of the same design (that has a cemented viewing window and control and selector handles) as the LDM cover used in the electronics enclosure. The enclosure contains (3) 1 inch NPT conduit openings. An O-ring is present between the enclosure base and bolt-on cover. The free internal volume for the RDM Module is 56 in³ (918 cm³).

Note:

This certificate covers the electrical equipment associated with the TEC 2000 and ECP 2000 Electric Valve Actuators and RDM Module

Conditions of Manufacture

The Manufacturer shall comply with the following:

- i. Each Hydraulic Manifold Assembly shall be subjected to a routine overpressure of 4500 psig for a minimum period of 10 seconds; no damage, permanent deformation or leakage, other than through flameproof joints is permitted.
- ii. The products covered by this certificate incorporate previously certified devices, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform Sira of any modifications of the devices that may impinge upon the explosion safety design of their products.
- iii. The TEC 2000 Electro-Hydraulic Operator Versions shall only be marked IIB.
- iv. Suitably certified and rated metallic blanking elements shall be installed in the conduit entries.

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