

# CERTIFICATE OF CONFORMITY



- HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
- Certificate No:** FM16US0324X
- Equipment:  
(Type Reference and Name)** TEC 2000, ECP 2000 and EHO Series Electric Valve Actuators
- Name of Listing Company:** Emerson Process Management Valve Automation, Inc.
- Address of Listing Company:** 19200 NW Freeway  
Houston, TX 77065  
USA
- The examination and test results are recorded in confidential report number:  
  
3004998 dated 9<sup>th</sup> June, 2003
- FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:  
  
FM Class 3600:2011, FM Class 3615:2006, FM Class 3810:2005,  
ANSI/NEMA 250:1991
- If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
- This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
- Equipment Ratings:  
  
**TEC 2000, ECP 2000 and EHO Series Electric Valve Actuators**  
Explosionproof for Class I, Division 1, Groups B, C and D; and dust-ignitionproof for Class II, III, Division 1, Groups E, F, and G hazardous (classified) locations, indoors and outdoors (Type 4X and Type 6P).

**Certificate issued by:**

J. E. Marquedant  
Manager, Electrical Systems

7 December 2016

Date

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

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# SCHEDULE



US Certificate Of Conformity No: FM16US0324X

## **CBM Module**

Explosionproof for Class I, Division 1, Groups C and D; and dust-ignitionproof for Class II, III, Division 1, Groups E, F, and G hazardous (classified) locations, indoors and outdoors (Type 4X and Type 6P). Type

## **RDM Module**

Explosionproof for Class I, Division 1, Groups B, C and D; and dust-ignitionproof for Class II, III, Division 1, Groups E, F, and G hazardous (classified) locations, indoors and outdoors (Type 4X and Type 6P).

### 11. The marking of the equipment shall include:

Class I Division 1, Groups B\*\*\*, C, D; T4\* Type 4X and Type 6P\*\*

Class II, Division 1, Groups E, F, G, Class III, Division 1; T4\* Type 4X and Type 6P\*\*

\*T4 temperature code rating when valve actuator motors are protected with 130°C rated thermal cutouts, and T4A temperature code rating when valve actuator motors are protected with 115°C rated thermal cutouts.

\*\* Type 6P rating was tested at 50 ft for 7 days.

\*\*\* The CBM Module is only rated for Groups C and D

### 12. Description of Equipment:

**General** - The TEC 2000, ECP 2000 and EHO Series Electric Actuators are self-contained electromechanical devices designed to operate various types of valves and multi-turn damper drives.

**Construction** – The TEC 2000, ECP 2000 and EHO Series Electric Actuators consist of three interconnected assemblies: gear housing assembly, electronics enclosure and motor enclosure. Also available as separate assembly options are the CBM Circuit Breaker Module and the RDM Remote Display Module. 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.

**Rating** – Supply voltage to the motor is 115/208/220/230V, 50/60Hz, single phase, 208/230/380/415/460/575V, 50/60Hz, three phase, or 12/24/48/125/250Vdc with a horsepower range of 1/60 to 8.

#### **TEC 2000, ECP 2000 and EHO Series Electric Valve Actuators. Model abcd-ef.**

a = Model Type:

(1, 2, 3, 4, 5, 6, 7, 8 and 9) Multi-Turn with torque and thrust.

(E or H) Multi-Turn side mount on bevel gear.

(F or G) Multi-turn torque only.

(P, Q and R) Quarter turn-top mount.

(D, S, U or A) Multi-turn (no thrust).

(J, K, L or V) 4 Turn top mount.

(M or W) Quarter turn-side mount on 1/4T gear box.

(B) Multi-turn with ball screw output.

(C) Multi-turn with ball screw temperature compensated.

(T) Multi-turn with temperature compensation.

b = Motor horsepower: A,B,C,D,E,F,G,H,J,K,L,M,N,P,Q,R,S,T,U,V,W,1-9.

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US Certificate Of Conformity No: FM16US0324X

- c = Motor gear ratio: A,B,C,D,E,F,G,H,J,K,L,M,N,P,Q,R,S,T,U,V,W,X,Y and Z.
- d = Valve adaption code to describe max Acme and Stem Size, max Shaft Size, Bolt Circle, Screw Size, Qty Screw, Worm Ratio and Hand of Gearing.
- e = Motor voltage: 1,2,3,4,5,6,7,8,9,B,C,D,E,F,G,H,J,K,L,M,N,P,Q,R or T.
- f = Additional features: F, T, B, C, H, M, E, D, CBM (CBM rated for Groups C,D,E,F,G), RDM or none.

**CBM Circuit Breaker Module.**

**RDM Remote Display Module.**

**TEC 2000, ECP 2000 and EHO Series Electric Valve Actuators. Model abcd-efgh.**

- a = Model Type  
(D, U, S, X, Y, Z) Multi-Turn
- b = Motor Horsepower  
(A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, 1-9)
- c = Motor Gear Ratio  
(A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, X, Y & Z)
- d = Worm Gear Ratio  
(A, B, C, K, L, M, R, S)
- e = Motor Voltage  
[1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R OR T]
- f = Additional Mechanical Features  
(0) None  
(C) Ceramic (Surface Coating)  
(F) Fire Enhanced Model K-Mass (Surface Coating)  
CBM Circuit Breaker Module (CBM does not include Group B)  
RDM Remote Display Module
- g = Gearbox type Mechanical Features  
(0) KWG – Special  
(1) KBG – Special  
(2) KWG – Bronze Worm Gear  
(3) KWG - Ductile Iron Worm Gear  
(4) KBG – Bronze Gear  
(5) KWG – Bronze Gear 360 degree  
(8) MWG  
(A) KWG – Traveling Nut – Bronze Worm Gear  
(B) KWG – Traveling Nut – Ductile Iron Worm Gear
- h = Valve Adaption Code to describe Worm Ratio, and Worm Gear Size

**13. Specific Conditions of Use:**

1. T4 temperature code rating when valve actuator motors are protected with 130°C rated thermal cutouts, and T4A temperature code rating when valve actuator motors are protected with 115°C rated thermal cutouts.
2. Type 6P rating was tested at 50 ft for 7 days.
3. Seal fitting required at the enclosure

**14. Test and Assessment Procedure and Conditions:**

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US Certificate Of Conformity No: FM16US0324X

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
9 <sup>th</sup> June 2003	Original Issue.
7 <sup>th</sup> October 2016	<u>Supplement 4:</u> Report Reference: – RR206357 Dated 16 August 2016 Description of the Change: Name and address change.
7 <sup>th</sup> December 2016	<u>Supplement 5:</u> Report Reference: – Project ID 3053138, dated 7 <sup>th</sup> December 2016. Description of the Change: Addition of seal fitting requirement at the enclosure.

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