

# 1 EC-TYPE EXAMINATION CERTIFICATE



2 Equipment or Protective systems intended for use in Potentially  
Explosive Atmospheres - Directive 94/9/EC

3 EC-Type Examination Certificate No: FM12ATEX0095X

4 Equipment or protective system: TM-01 and TM-04 Electric Actuator  
(Type Reference and Name)

5 Name of Applicant: Enertork Ltd

6 Address of Applicant: 64-6 Ogye-Ri Neungseo-Myeon  
Yeosu-Gun, Gyeonggi-Do 469-811  
Republic of Korea

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Ltd, notified body number 1725 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3040558 dated 18 February 2013

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN 60079-0: 2009, EN 60079-1: 2007, and EN 60529:1991 + A1:2000

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:



II 2 G Ex d IIB T4 Ta = -20°C to +40°C IP68

**Mick Gower**  
Certification Manager, FM Approvals Ltd.

Issue date: 21<sup>st</sup> February 2013

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

FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK. SL4 1RS  
T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

# SCHEDULE



Member of the FM Global Group

to EC-Type Examination Certificate No. FM12ATEX0095X

## 13 Description of Equipment or Protective System:

**General** - The TM-01 and TM-04 Electric Actuators are stationary motor-operated devices designed for multi turn valves - globe, gate valves, and also for quarter turn valves - butterfly, ball valves with 2<sup>nd</sup> worm reducer to drive valves open and closed. The actuators are rated for use on electrical services of 220-480V, three phase, 50 or 60 Hz. The actuator has end of travel limit switches, torque limit switches, local control selector switches, and a visual LCD or LED display. The TM-Series can support a variety of communication systems which include Mod Bus-RTU, Profibus-DP, Foundation FieldBus or HART.

The enclosure of the TM-01 and TM-04 Electric Actuator consists of a gearbox and motor, integral controller which contains the electronics and LED or LCD screen and external switches to operate the valve actuator manually and the common case with contains the torque switch assembly and position indicator. The thrust unit at the valve stem connection consists of two types of drive bushings. A threaded bushing is used for multi-turn valves and a keyed bushing for quarter turn valves. A handwheel is side mounted to the TM-01 and TM-04 Electric Actuators to allow for manual operation. A change lever is used to shift the valve actuator from power operation to manual operation.

**Construction** – The TM-01 and TM-04 Electric Actuators consists of common case, covers and motor covers of AC2A (308 Cast Aluminum) which contains the switching devices and terminal compartment. The integral case which contains the electronics and manual operating switches and motor frame enclosure assemblies consist of ALDC 8 (383 Cast Aluminum). The window cover of the integral controller and switch cover consist of an o-ring under the cover and a metal ring compression fit under the glass. The common case has an internal free area volume of 4850 cm<sup>3</sup>, while the integral controller internal free area volume is 3631 cm<sup>3</sup>. Internal volumes of the motor vary from 1416 cm<sup>3</sup> for a 0.2 kW motor to 2716 cm<sup>3</sup> for a 1.5 kW motor on the TM-01, and from 1525 cm<sup>3</sup> for a 0.4 kW motor to 2316 cm<sup>3</sup> for a 2.2 kW motor on the TM-04.

Equipment Listing:

### ***TM-ab-cde. Electric Actuator.***

a = Model Number: 01 or 04.

b = Model Type: none or i.

c = Control Type: DA, DAC, DAE, DB, DBC, DE, DPR, DMO, DFF or DHA.

d = Motor (Kw): When a = 01: 0.2, 0.4, 0.75 or 1.5.

When a = 04: 0.4, 0.75, 1.5, 2.2 or 3.7.

e = Voltage: 220Vac (3ph), 380Vac (3ph), 400Vac (3ph), 415Vac (3ph), 440Vac (3ph), 460Vac (3ph) or 480Vac (3ph).

## 14 Specific Conditions of Use:

1. Consult the manufacturer if dimensional information on the flameproof joints is necessary.

## 15 Essential Health and Safety Requirements:

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

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

FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK. SL4 1RS

T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: [atex@fmaprovals.com](mailto:atex@fmaprovals.com) [www.fmaprovals.com](http://www.fmaprovals.com)

# SCHEDULE

to EC-Type Examination Certificate No. FM12ATEX0095X

## 16 Test and Assessment Procedure and Conditions:

This EC-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Ltd's ATEX Certification Scheme.

## 17 Schedule Drawings

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

## 18 Certificate History

Details of the supplements to this certificate are described below:

Date	Description
21 <sup>st</sup> February 2013	Original Issue.

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

# 1 EC-TYPE EXAMINATION CERTIFICATE



2 Equipment or Protective systems intended for use in Potentially  
Explosive Atmospheres - Directive 94/9/EC

3 EC-Type Examination Certificate No: FM13ATEX0024X

4 Equipment or protective system: TM-1, TM-3 and TM-07 Electric Actuator  
(Type Reference and Name)

5 Name of Applicant: Enertork Ltd

6 Address of Applicant: 64-6 Ogye-Ri Neungseo-Myeon  
Yeosu-Gun, Gyeonggi-Do 469-811  
Republic of Korea

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Ltd, notified body number 1725 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3043314 dated 15 April 2013

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN 60079-0: 2009, EN 60079-1: 2007, and EN 60529: 1991 +A1:2000

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:



II 2 G Ex d IIB T4 Gb IP68

**Mick Gower**  
Certification Manager, FM Approvals Ltd.

Issue date: 26<sup>th</sup> April 2013

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# SCHEDULE

to EC-Type Examination Certificate No. FM13ATEX0024X

## 13 Description of Equipment or Protective System:

**General** -The TM-1, TM-3 and TM-07 Electric Actuators are stationary motor-operated devices designed for multi turn valves - globe, gate valves, and also for quarter turn valves - butterfly, ball valves with 2nd worm reducer to drive valves open and closed. The actuators are rated for use on electrical services of 220-480V, three phase, 50 or 60 Hz. The actuator has end of travel limit switches, torque limit switches, local control selector switches, and a visual LCD or LED display. The TM-Series can support a variety of communication systems which include (Mod Bus-RTU, Profibus-DP, Foundation FieldBus or HART).

The enclosure of the TM-1, TM-3 and TM-07 Electric Actuator consists of a gearbox and motor, integral controller which contains the electronics and LED or LCD screen and external switches to operate the valve actuator manually and the common case with contains the torque switch assembly and position indicator. The thrust unit at the valve stem connection consists of two types of drive bushings. A threaded bushing is used for multi-turn valves and a keyed bushing for quarter turn valves. A hand wheel is side mounted to the TM-1, TM-3 and TM-07 Electric Actuators to allow for manual operation. A change lever is used to shift the valve actuator from power operation to manual operation.

**Construction** - The TM-1 and TM-07 Electric Actuators consist of common case, covers and motor covers of AC2A (308 Cast Aluminium) which contains the switching devices and terminal compartment. The integral case which contains the electronics and manual operating switches and motor frame enclosure assemblies consist of AC2A (308 Cast Aluminium). The window cover of the integral controller and switch cover consist of an o-ring under the cover and a metal ring compression fit under the glass. The common case has an internal free area volume of 4850 cm<sup>3</sup>, while the integral controller internal free area volume is 5810 cm<sup>3</sup>. Internal volumes of the motor vary from 2608 cm<sup>3</sup> for a 2.2 kW motor to 3438 cm<sup>3</sup> for a 5.5 kW motor on the TM-07.

The TM-3 Electric Actuators consist of common case, switch cover and terminal cover consist of FCD450 (Ductile Iron) which contains the switching devices and terminal compartment, while the gear case consists of FC200 (Grey Cast Iron). The integral case which contains the electronics and manual operating switches and motor frame enclosure assemblies consist of ALDC 8 (383 Cast Aluminum). The window cover of the integral controller and switch cover consist of an o-ring under the cover and a metal ring compression fit under the glass. The common case has an internal free area volume of 7300 cm<sup>3</sup>, while the integral controller internal free area volume is 3630 cm<sup>3</sup>. The motor brackets, frame and rear cover consist of GC150 (Gray Cast iron) and the internal volumes of the motor mount is 10,130 cm<sup>3</sup> while the motors vary from 3438 cm<sup>3</sup> for a 5.5 kW motor to 6620 cm<sup>3</sup> for a 15 kW motor. The internal volume of the 18 kW motor is 5970 cm<sup>3</sup>.

### ***TM-ab-cde. Electric Actuator.***

a = Model Number: 1, 3 or 07.

b = Model Type: none or i.

c = Control Type: DA, DAC, DAE, DB, DBC, DE, DPR, DMO, DFF or DHA.

d = Motor (Kw): When a = 1, d = 2.2, 3.7, 5.5 or 11.0.

When a = 3, d = 5.5, 7.5, 11.0, 15.0 or 18.5.

When a = 07, d = 1.5, 2.2, 3.7, 5.5 or 7.5.

e = Voltage: 220Vac (3ph), 380Vac (3ph), 400Vac (3ph), 415Vac (3ph), 440Vac (3ph), 460Vac (3ph) or 480Vac (3ph).

## 14 Specific Conditions of Use:

Consult the manufacturer if dimensional information on the flameproof joints is necessary.

## 15 Essential Health and Safety Requirements:

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

# SCHEDULE

to EC-Type Examination Certificate No. FM13ATEX0024X

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

**16 Test and Assessment Procedure and Conditions:**

This EC-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Ltd's ATEX Certification Scheme.

**17 Schedule Drawings**

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body

**18 Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
26 <sup>th</sup> April 2013	Original Issue.

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